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Los Angeles

Latina/o Pathways Through College:
Characteristics of Mobile Students and the Institutional Networks They Create

A dissertation submitted in partial satisfaction of the
requirements for the degree of Doctor of Philosophy

by

Adriana Ruiz Alvarado

2014

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2014

ABSTRACT OF THE DISSERTATION

Latina/o Pathways Through College:
Characteristics of Mobile Students and the Institutional Networks They Create

By

Adriana Ruiz Alvarado

Doctor of Philosophy in Education

University of California, Los Angeles, 2014

Professor Sylvia Hurtado, Chair

Central to the national conversation about bachelor's degree attainment is the persistence and completion of Latina/o students, the fastest growing and most undereducated segment of the population. Racial/ethnic gaps in access and completion are well documented, but far less is known about the different pathways students take once they enroll at four-year institutions that may contribute to degree disparities. It is estimated that one-third of all students who begin college at these institutions lateral transfer to another four-year institution or reverse transfer to a two-year institution, but this mobility receives very little attention in research that tends to focus on single-institution persistence. We have much to learn from Latina/o pathways and how multiple campuses can contribute to degree attainment.

This study addresses the gap in knowledge about Latina/o students' pathways by examining the student and institutional characteristics associated with lateral and reverse

transfer, exploring how they relate to academic undermatching, and describing the informal networks created between institutions as a result of student mobility. Guided by Nora's Student/Institution Engagement Model, Titus' conceptual model of persistence, and Social Network Theory, this study employed HGLM and Social Network Analysis on a national sample of 10,155 Latina/o students who were first-time full-time freshmen at 442 institutions in 2004 and on an institutional subsample of nine colleges and universities in California. The unique longitudinal dataset drew from the CIRP Freshman Survey, National Student Clearinghouse, and IPEDS.

Several findings collectively point to the role of financial insecurity in promoting reverse transfer and reveal that these Latina/o students closely resemble the profile of those who dropout entirely, indicating the reverse transfer pathway is a better alternative that could be addressed by colleges. Lateral transfers are more privileged, have a lower sense of institutional allegiance at college entry, and are likely to persist elsewhere. In terms of institutional networks, the results demonstrate an urgent need to create formal structures to channel mobile students to a degree because connections between institutions are weak. The findings suggest opportunities to implement strategies to decrease mobility or direct students' pathways, including efforts that increase summer school offerings and change the way net tuition is communicated. Given calls for institutional accountability, the study reveals inherent problems with graduation metrics and highlights the importance of a system-wide approach to increase degree attainments.

The dissertation of Adriana Ruiz Alvarado is approved.

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2014

Dedicado a mi familia.

*A los que estuvieron, están, y pronto estarán conmigo –
todos siempre están en mi mente e inspiran mis ambiciones.*

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Hurtado, S., Ruiz, A., & Whang, H. (2012). Advancing and assessing civic learning: New results from the Diverse Learning Environments Survey. *Diversity & Democracy: Civic Learning for Shared Futures*, 15(3), 10-12.

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CHAPTER ONE: INTRODUCTION

Over the last few years, college degree attainment has become a central topic in the national conversation about how to improve the domestic economy and remain competitive globally. It is estimated that half of the fastest-growing occupations in the country will require at least a bachelor's degree (White House, 2010), but attainment rates are not keeping up with these workforce demands (Lumina Foundation, 2012). At the beginning of 2013, the unemployment rate for those with only some college (7.3 percent) was nearly twice as large as the rate for those with a bachelor's degree (3.9 percent) and came in only slightly below the rate of those with only a high school diploma (9.1 percent) (Bureau of Labor Statistics, 2013). Increasing bachelor's degree attainment has implications for not only the well being of individual workers but also for the long-term prosperity of the larger society. It is a serious problem that Latina/os, who over the last decade contributed to more than half of the general population growth in the nation (Humes, Jones, & Ramirez, 2011), remain tied with American Indians as the least educated racial group (Ogunwole, Drewery, & Rios-Vargas, 2012).

The completion gap between Latina/os and other racial groups is important to address but requires a more complex study of Latina/o enrollments, which now constitute the largest numerical minority group at four-year institutions. Still, of all Latina/o college students, only 54 percent were enrolled at a four-year college in 2010, compared to 63 percent of all Black college students, 73 percent of all White college students, and 78 percent of all Asian college students (Fry, 2011). However, these numbers are really never static, and many Latina/os who gain footholds in a four-year college find themselves at other institutions on their way to a degree.

Overall, only half of all Latina/os who begin at four-year colleges graduate from them within six years (Aud et al., 2012), indicating that persistence to completion for students who begin at four-year institutions is a pressing issue that requires further study. Given that Latina/os are projected to continue as the fastest growing segment of the population (U.S. Census, 2011), their comparatively low bachelor's degree attainment rate cannot and should not be ignored.

While gaps in access and completion rates between racial groups are well documented (Aud et al., 2012; Fry, 2011), far less is known about the different paths that students take while they are in college that might contribute to the gaps in time-to-degree and, ultimately, degree attainment. Although the exact number of schools attended per student is still difficult to track, it is estimated that nearly 60% of all college students take classes at more than one college campus by the time they graduate (Adelman, 2004). This mobility includes two forms of transfer that are largely ignored in research and policy: 1) lateral transfer from a four-year institution to a different four-year institution, and 2) reverse transfer from a four-year institution to a two-year institution (Adelman, 2004; McCormick, 2003; Townsend & Dever, 1999). A recent report by the National Student Clearinghouse (NSC) (Hossler et al., 2012b) shows that students actually transfer *out* of four-year institutions at the exact same rate (33.1 percent) that students transfer *into* them from community colleges, but yet the former patterns have received very little attention in educational research.

For Latina/o students in particular, studies on enrollment patterns have found that they attend part-time and have discontinuous enrollment more than any other racial group (Ewert, 2010; Swail et al., 2004), but no studies have examined their mobility across institutions. Enrollment mobility is important to examine because it is a reflection of persistence since students are opting to change institutions rather than drop out of the higher education system

altogether. At the same time, lateral transfer and reverse transfer are cause for concern because they are associated with prolonged time-to degree and lowered rates of degree completion (Goldrick-Rab & Pfeffer, 2009; Li, 2010). Further, individual institutions are held accountable for their degree attainment rates (Astin, 1997; Alexander, 2000), which is problematic when they may be channeling students towards a degree at other places. Mobile students, however, are excluded from most studies or accountability mechanisms because of the limitations in the way that data are collected and linked at the state and federal levels (Ewell & Boeke, 2007). Even National Student Clearinghouse data, which is the most comprehensive source for studying student mobility since it links student unit records across institutions and state lines, has incomplete coverage of demographic information. Consequently, we do not know the extent to which students from different racial groups are engaging in lateral and reverse transfer, whether significant gaps exist between them, nor the causes of variability in paths taken among students of the same racial background. If the objective is to increase persistence to degree, we need to understand enrollment persistence outside of the confines of single institutional contexts.

An Undereducated Latina/o Population

In order to increase degree attainment for the nation, it is necessary to increase the degree attainment of Latina/os and to close the completion gap between them and other racial groups. The levels of education have increased over the last 30 years for all racial groups, but the gaps have also widened. Between 1980 and 2011, the gap in the attainment of a bachelor's degree or higher between Whites and Latina/os steadily increased from 17 to 26 percentage points (Aud et al., 2012). Currently, the percentage of 25- to 29-year-olds who hold a bachelor's degree or higher is only 13 percent for the Latina/o group, compared to 56 percent for Asian, 39 percent for White, 32 percent for Multiracial, 20 percent for Black, and 17 percent for American Indian

(Aud et al., 2012).

It is essential that the gaps in college completion decrease because Latina/os are projected to make up close to one-third (29 percent) of the U.S. population by 2050 (Taylor & Cohn, 2012). This continued population increase will largely be due to the growing numbers of Latina/o youth. In 2010, Latina/os comprised 23 percent of all public school enrollments in the country, a figure that is 11 percentage points higher than it was only 20 years ago (Aud et al., 2012). During the same 20-year-period, the White enrollment decreased 13 percentage points from 67 to 54 percent. Though Latina/os are concentrated in a few states, their share of public school enrollment has increased in all four regions of the country. The increase in Latina/o youth contributes to the projection that Latina/os will have faster college enrollment increases than other groups (NCES, 2009), highlighting the need to better understand their persistence and the different paths that they take to completion.

It is especially important to form a nuanced understanding of Latina/o pathways through college because Latina/o college students are overrepresented in the three lowest levels of institutional selectivity and underrepresented at institutions in the three highest levels (Kelly, Schneider, & Carey, 2010), which tend to have higher completion rates. This is partially due to the academic undermatch phenomena (Bowen, Chingos, & McPherson, 2009), in which Latina/o students enroll at institutions of lower selectivity than they are qualified to attend (Roderick et al., 2008). Students who academically undermatch have a lower probability of completing a degree than similarly qualified peers who attend more selective institutions (Bowen et al., 2009). This study will test whether academically undermatched Latina/o students are more likely to persist through transfer and whether the institutions they transfer to are more or less selective than the ones where they began. It is critical that we continue to identify ways to prevent higher

education from losing students before they finish their degrees.

Lateral and Reverse Transfer

A “classic transfer” student is defined as a “student who starts in a community college and earns more than 10 credits from the community college, then moves to a four-year college and earns more than 10 credits from the four-year college” (Adelman, 2004, p.49). Though this is the traditional form of student mobility between institutions and the one that first comes to mind for most people when they hear the term “transfer student,” it is by no means the only one. The most recent data on postsecondary educational pathways demonstrates that more than one out of every nine students who start at four-year public and four-year private institutions complete their degrees at a different institution than the one where they began (Shapiro et al., 2012)—a student population that is now being referred to as “mobile completers” (Pryor & Hurtado, 2012). Current institutional performance measures such as graduation rates do not account for the mobile completers because students who leave the four-year institution are typically not tracked. To begin understanding their trajectories, it is necessary to first acknowledge that the path these students take to completion inevitably begins with either a lateral transfer to a different four-year institution or a reverse transfer to a community college. This is why understanding students’ first move out of the four-year institution is important.

Despite the fact that students who follow the traditional path to a bachelor’s degree are now in the minority (Hossler et al, 2012b), our understanding of nontraditional transfer paths is still very limited, partially due to limitations in the data available. For instance, thirty-four of the states with student unit record databases calculate and report transfer rates from public two-year colleges to public four-year colleges, but only eight states examine wider transfer patterns (Ewell & Boeke, 2007), and the majority of state-level databases exclude enrollment at private colleges

and out-of-state institutions. Using one of the few national longitudinal samples of student unit records available, a series of signature reports by the National Student Clearinghouse (Hossler, et al., 2012a, 2012b; Shapiro, et al., 2012) provide national rates of classic, lateral, and reverse transfer, disaggregated by the type of institution of origin. However, with the exception of students' age at college entry, no demographic characteristics are included. Consequently, it remains unknown who the students are that are transferring, or which specific type of origin schools send to specific types of destination institutions.

Only a very small body of research has examined the characteristics of students who transfer in nontraditional ways (Goldrick-Rab, 2006; Goldrick-Rab & Pfeffer, 2009; Kalogrides & Grodsky, 2011; Lichtenberger, 2011; Winter & Harris, 1999), and only one study has examined differences in the transfer patterns of students from the same group—low-income students—to determine what contributes to the variability in paths for students from similar backgrounds (Goldrick-Rab & Pfeffer, 2009). No studies have focused on differences between or within racial groups, though one study did find that Latina/o students who transferred out of their original four-year school were less likely to finish their degrees within six years than White students who did the same (Pryor & Hurtado, 2012), highlighting the need to understand the characteristics of the Latina/o students who transfer in the first place.

One thing we do know about nontraditional transfer students is that they are not dropping out of the higher education system altogether, as evidenced by the fact that out of all reverse transfer students who began at a four-year college in 2005, two-thirds had either graduated or were still enrolled at a two-year or four-year institution by 2011 (Hossler et al., 2012a). Other research has also documented their continued intentions to complete a bachelor's degree (Winter & Harris, 1999). Lateral and reverse transfer, thus, can be considered forms of persistence that

need to be better understood.

Student Mobility in California

As the state with the largest Latina/o population (U.S. Census, 2011) and the largest number of degree-granting institutions (NCES, 2009), California is an ideal setting to examine the patterns in which Latina/o students move through the higher education system. Nationally, more than one-quarter (25.5 percent) of students who move from a public four-year institution move to an institution in a different state (Hossler et al., 2012b). However, Latina/os are the least likely to cross state lines (Adelman, 2004). In 2008, 93 percent of Latina/o undergraduate students attended institutions in their state of legal residence, a figure that is higher than all other racial groups (Santiago, Kienzl, Sponsler, & Bowles, 2010). This further strengthens the case for studying the mobility of Latina/o students that happens within the single state.

The fact that California is quickly approaching the possibility of a considerable workforce shortage also creates an urgency to learn how institutions can partner to raise degree attainment. The state has already turned to out-of-state workers to fill some of the positions unable to be filled by residents due to the shortage of qualified degree holders in the state's workforce, and it is anticipated that the shortage will become even greater as 41 percent of California's jobs will require a bachelor's degree or higher by 2025 (Johnson, 2010). One obvious way to combat this problem is to increase the degree attainment of Latina/os, as they are on path to surpass Whites and become the largest racial group in the state by 2014 (Flores, 2013). At the same time, they are more poorly represented in California's four-year institutions than in those of 48 other states (Geiser & Atkinson, 2011). This underrepresentation, coupled with the state's looming employee shortage presents California as a place where it is of utmost importance to track Latina/o students who start at four-year institutions to better understand their

higher education pathways and inform institutions.

Purpose

Although there is a diverse set of pathways through college that students can take, attending a four-year institution immediately after high school already represents a certain level of academic achievement and aspiration. Thus it is crucial to understand which Latina/o students who begin their first year of college at these institutions choose to transfer, and in what institutional patterns they move. The purpose of this study is threefold: First, to examine the factors that are associated with lateral and reverse transfer for a national sample of Latina/o college students who began at four-year institutions to begin uncovering the student and institutional characteristics that are tied to increased odds of mobility. Second, to look at the relationship between academic undermatching and mobility, with special attention to the characteristics of both the sending and receiving institutions. Lastly, to develop a description of the institutional networks created through the aggregate of individual student transfer to understand patterns in the way they move.

Research Questions. Utilizing a longitudinal data that includes both demographic characteristics and student unit records over a six-year period, the present study seeks to answer the following research questions:

1. What pre-college student characteristics and institutional characteristics contribute to lateral and reverse transfer for Latina/o college students who begin at four-year institutions?
2. Are Latina/o students who are academically undermatched more or less likely to transfer out of their first four-year institution? Are the institutions they transfer to more or less selective than the ones where they began?

3. What are the characteristics and patterns of networks among institutions that send and receive Latina/o lateral and reverse transfer students in California?

Scope of Study

The longitudinal analysis in this study draws on national data from three sources: the Higher Education Research Institute's (HERI) 2004 administration of Cooperative Institutional Research Program's (CIRP) Freshman Survey (TFS), term-to-term enrollment data from the National Student Clearinghouse (NSC) from Fall 2004 through Spring 2010, and institutional-level data from the Integrated Postsecondary Education Data System (IPEDS). The merging of the three sources, made possible by grants from the Ford Foundation, National Institutes of Health, and National Science Foundation, creates a unique dataset that allows for the examination of student mobility and six-year persistence and degree attainment. This study begins with setting the context and describing the landscape of student mobility, comparing transfer rates for Latina/o, Asian, Black, Native American, Multiracial, and White students. Through its primary analysis, the study examines the pre-college student characteristics and institutional characteristics that are associated with lateral and reverse transfer for a national sample of Latina/o college students who began at four-year higher education institutions. It also examines the characteristics of the holistic mobility patterns emerging from students' individual mobility using a California subsample.

The sample for the analysis of student and institutional characteristics associated with transfer is comprised of 10,155 Latina/o students who were first-time full-time freshmen at 442 institutions in the fall of 2004. The institutions in the sample include public and private non-profit, Minority Serving Institutions (MSIs), and campuses that range in levels of selectivity. The subsample of California students is comprised of 2,253 Latina/o students who began college

at one of nine different public and private four-year institutions in the state. A series of HGLM models were estimated to take into account the nested structure of the data, and Social Network Analysis was utilized to make sense of the patterns that emerge through mobility and understand the ways in which students transfer.

The conceptual framework guiding this study brings together student-level elements from Nora's (2003) Student/Institution Engagement Model, institutional-level elements from Titus' (2004) conceptual model of student persistence, and Social Network Theory (Barnes, 1954; Scott, 2000; Wasserman & Faust, 1994). An adapted version of the first two models forms a framework of elements that influence persistence at a single institution. Because this study seeks to examine the ways in which the characteristics of Latina/o students who persist through transfer are different than those who persist without transfer, it is important to test for what is already believed to positively influence the latter in order to unravel the differences. Social Network Theory guides the propositions being tested in the analysis of mobility patterns. Social Network Theory focuses on relationships ("ties") between actors ("nodes") and how that affects behaviors, which can be understood as how the relationships between institutions affect student transfer. In the case of the present study, it is applied to uncover relationships and understand how institutions are intrinsically linked together in informal ways.

Significance

This study has multiple objectives through which it derives its significance. First, it is the first to create an understanding of the characteristics of the Latina/o students who transfer in order to help institutions assess the needs of their students and better assist them through their educational trajectory. Though college experience variables were not included in this study, prior research has found that entering student characteristics can explain almost one quarter of

the variance in institutional graduation rates (DeAngelo, Franke, Hurtado, Pryor, & Tran, 2011). If that is the case, pre-college student characteristics should also be informative in relation to student enrollment mobility. Additionally, the study responds to calls for more within-group analysis of Latina/o students (Zarate & Gallimore, 2005).

Second, this study helps to identify patterns in the institutional networks that emerge from individual student mobility, which can have implications for institutional policies such as articulation agreements and partnerships such as the sharing of resources. As a whole, much of the prior research on lateral and reverse transfer is limited to single institutions, single sectors within a state, or lacks demographic characteristics of the students who engage in the two forms of transfer. This study makes use of a unique dataset that allows for examining differences within a racial group. It also expands on previous work by making use of HGLM to account for the nested structure of the data and of SNA to understand larger network patterns in California.

Lastly, it helps to uncover some of the potential impact that lateral and reverse transfer can have on access to all sectors of higher education. Viewing lateral and reverse transfer as factors impacting the equitable distribution of opportunity makes understanding the frequency of their occurrence, the characteristics of the students who travel down these paths, and the patterns of networks through which they move a necessary first step in finding more effective solutions for improving access and reaching more equitable outcomes. In an era defined by limited resources, expectations of institutional accountability, and increased student demand for postsecondary education, the mobility of students who begin at four-year institutions adds complexity to the definition of “capacity” in the higher education system. For instance, some students who successfully access a four-year institutions may permanently lose that access if they leave to and get lost in the two-year sector—a realistic concern considering that close to

three-quarters of all Latina/o college students initially begin at community colleges and less than one-quarter transfer out (Gandara, Alvarado, Driscoll, & Orfield, 2012). Moreover, in states like California, budget cuts have forced the traditionally open-access community college system to turn students away (CCC Chancellor's Office, 2013). Under these conditions, the enrollment of reverse transfer students who may be more knowledgeable in navigating higher education might reduce access to it for other students (Townsend, 2000).

A report by the Lumina Foundation (2012) calls the current state of education a “Kodak moment,” one where higher education is in danger of responding too slowly to its changing landscape and suffering a fate like Kodak’s bankruptcy. This research has the potential to inform both policies and practices that are responsive to the diversity of pathways students take. Ultimately, this study aims to shine light on the understudied topic of Latina/o college student mobility and identify opportunities for various key players to help a growing but undereducated population persist to a degree. Subsequent chapters focus on the literature framing the study (Chapter 2), the details regarding the methodology employed in answering the key research questions (Chapter 3), the results of the HGLM and Social Network analyses (Chapters 4 and 5), and a discussion of the findings in relation to their implications for policy, practice, and future research (Chapter 6).

CHAPTER 2: REVIEW OF THE LITERATURE

A focus on retention and degree completion has resurfaced in higher education research, policy, and practice but the conversation has not yet been reframed around what is now the norm of student enrollment mobility between institutions. Because diverse enrollment patterns complicate definitions of departure and its measurement, it is important to distinguish between retention and persistence before moving forward. Retention refers to remaining enrolled at the same institution until degree completion, while persistence refers to remaining enrolled in the postsecondary education system until degree completion (Hagedorn, 2005). Under these definitions, a student who is retained has persisted, but the reverse is not necessarily true. In fact, many persist toward degree completion but not at the original institution of college entry. In order to help Latina/o students persist to completion, it is necessary to understand the diverse pathways that they embark on.

This study will examine differences between the characteristics of Latina/o students who persist through transfer pathways out of the first four-year institution attended, and students who are retained at a single four-year institution (no departure) or who dropout of higher education altogether. Although previous studies have focused on the degree attainment of Latina/os who attend a single institution (Arellano, 2011; Bowen, Chingos, McPherson, 2009), this study will make important distinctions among the different pathways taken. Additionally, it will build a description of the prevalent patterns of relationships among institutions that send and receive mobile student enrollments. This chapter will present the empirical literature relevant to student enrollment mobility as well as the conceptual framework guiding the study. It will conclude

with a synopsis and an identification of the specific gaps in the literature that the study will address.

Empirical Research on Student Enrollment Mobility

The K-16 system has long been referred to as an “educational pipeline,” but student enrollment mobility across institutions has become so prevalent that some researchers are now instead referring to colleges and universities as a “transportation system” that students move through in nonlinear forms on their way to a degree (Pryor & Hurtado, 2012). Adelman (1999) even claims, “it is not surprising to find students filling their undergraduate portfolios with courses and credentials from a variety of sources, much as we fill our shopping bags at the local mall” (p.39). Nonetheless, limited studies exist that help to explain the phenomena of student mobility. The following section provides an overview of the literature on student enrollment mobility, with a focus on entering student and institutional characteristics that have been demonstrated to have an effect on lateral and reverse transfer. No prior research has examined the mobility patterns of Latina/o students who start at four-year institutions; thus, the review does not focus on Latina/o students but instead highlights findings related to race where pertinent.

Types and frequency of mobility patterns. From an institution’s point of view, when students are not retained they are believed to have dropped out. Though this may be true in some cases, the single heading of “drop out” is misleading, as it indiscriminately groups and assumes failure despite the very different paths that students may take once they depart from their initial institution. Using national data from the National Center for Education Statistics (NCES) to examine the college pathways of the high school classes of 1972, 1982, and 1992, Adelman (1999, 2004) found that the frequency of multi-institutional attendance increased from 40 to 54

percent of undergraduate students between the 1970s and the 1980s, and that by the 1990s roughly 60 percent of all bachelor's degree recipients attended more than one school. These multi-institutional attendance figures include students who begin their college trajectories at community colleges and subsequently transfer to four-year institutions, the form of mobility most commonly promoted and best understood. However, the figures also include students who start at four-year schools and “swirl” (attend multiple institutions back and forth) (de los Santos & Wright, 1989), “double dip” (attend two or more institutions at once) (Gose, 1995), or formally transfer between schools in a variety of ways. Overall, the numbers indicate that student mobility is the new norm in the higher education landscape and, in many cases, students who are considered dropouts because they left their initial institution are persisting elsewhere in the postsecondary education system. What is needed is more information about the paths that students take and the characteristics of the students who follow them.

Scholars have posed numerous classifications of student enrollment mobility patterns in an attempt to understand the diverse pathways students take. McCormick (2003) identified eight patterns of multi-institutional attendance, including (a) trial enrollment where students experiment with the possibility of transferring to another institution, (b) special program enrollment where students take advantage of unique short-term programs offered by other institutions, (c) supplemental enrollment where students accelerate their program by taking one or two terms at another institution, (d) rebounding enrollment where students alternate between two or more institutions, (e) concurrent enrollment where students take courses at two institutions simultaneously, (f) consolidated enrollment where students earn a substantial share of credits at two other institutions, (g) independent enrollment where students pursue work that is unrelated to their degree program, and (h) serial transfer where students make one or more

intermediate transfers on their way to their final destination institution. Though this is a good starting point when trying to understand the pathways conceptually, several of the patterns can overlap, some of the definitions are too broad to operationalize, and much of the taxonomy is based on anecdotal evidence rather than an empirical examination of student pathways.

Considering only pathways that involve the transfer of community college credit to a four-year institution, Townsend (2001) identified six patterns: (a) transfer from a two-year to a four-year before completing an Associates degree, (b) transfer from a two-year to a four-year with a nontransfer degree such as an Associate in Applied Science, (c) student swirl between a two-year and a four-year institution, (d) transfer of dual credit from community college courses taken by students when they were in high school, (e) transfer of community college courses taken during the summer, and (f) transfer of community college courses taken concurrently with four-year college courses. Each of these patterns has a good proportion of students, as demonstrated by one study that found one-third of students took at least one course concurrently at another institution and that 58 percent of them did so at a community college (NSSE, 2005).

Capturing the intersection of stopout and mobility—two dimensions of students' enrollment—Goldrick-Rab (2006) created four categories of attendance patterns to understand the trajectories of students who begin at four-year institutions: (a) traditional enrollment, (b) fluid movement, (c) interruption, and (d) interrupted movement. Using weighted data from the National Education Longitudinal Study from the eighth grade class of 1988 (NELS: 88/00) who was followed for eight years after high school, Goldrick-Rab was able to uniquely classify students into one of the four categories. She found that 52 percent of students only attended one school and did not take time off, 2 percent of students only attended one school but took time off, 37 percent of students attended more than one institution without interruption, and 9 percent of

students attended multiple institutions discontinuously. This means that 46 percent of students who started college in 1992 attended multiple institutions, but the study does not make any distinctions in the type of destination institution attended.

Studies of single institutions have found even more complex patterns. One study of an urban postsecondary institution examined the attendance patterns of 336 students who transferred into the university in 1991 and found 48 discrete patterns, though six of them represented 80 percent of the sample (Bach et al., 2000). Another study of multiple-transfer students found that 44 percent of the institution's incoming transfer population in 1989 had attended more than one institution prior to transferring to the subject university (Kearney, Townsend, & Kearney, 1995). Drawing on a sample of 420 of those students, the researchers found that they attended 305 different institutions, with 28 percent of the sample having attended somewhere between three and seven different schools.

For the purpose of classifying the students in the current study, I draw elements from the taxonomies described above and incorporate them into a simplified version of the overarching multi-institutional enrollment patterns for students who start at four-year institutions (see Table 2.1). Under this classification, students beginning at four-year institutions who only enroll at a single institution during college can still have credit from multiple schools if they received college credit while they were in high school. This can happen formally through dual enrollment programs, which involve partnerships between the high school and a two- or four-year institution, or informally as students take college courses for credit on their own. In the 2010-2011 academic year, 53 percent of all Title IV eligible higher education institutions reported having high school students enrolled (Marken, Gray, Lewis, & Ralph, 2013).

All other students who start at a four-year institution and attend more than one school can

be categorized as having supplemental enrollment or engaging in a transfer. Supplemental enrollment includes students who attend summer school at a different institution from where they began, or concurrently enroll at another institution during the non-summer months. These forms of enrollment are considered supplemental because they can help students accelerate their program of study (McCormick, 2003), as it does not require them to cease enrollment at their home institution during the traditional academic year.

Table 2.1. Types of Multi-Institutional Enrollment among Students Starting at Four-Year Institutions

Type of Enrollment	Patterns Within Type	Description
Single-Institution Enrollment	College Credit from High School	Entering college with prior credit from a two or four-year school but never attending another institution after matriculating
Supplemental Enrollment	Summer School	Attending summer school at an institution different from home institution
	Concurrent Enrollment	Enrolling at another institution while simultaneously taking classes at home institution during the non-summer months
Transfer	Lateral Transfer	Students who cease enrollment at their original institution during the non-summer months and enroll at another four-year institution
	Reverse Transfer	Students who cease enrollment at their original institution during the non-summer months and enroll at a two-year college

The final form of multi-institutional attendance for students who start at four-year schools

is transfer. A recent study by the National Student Clearinghouse (Hossler et al., 2012b) found that two- and four-year institutions had the same transfer rate—33.1 percent within five years. That is, students are transferring out of four-year institutions at the same rate that they are transferring into them. Lateral transfer refers to ceasing enrollment at the home institution during the non-summer months and enrolling at a different four-year institution. Reverse transfer refers to ceasing enrollment at the home institution during the non-summer months and enrolling at a two-year institution. Both of these transfer patterns have been operationalized as the first move out of the four-year institution in research studies and national reports (Goldrick-Rab & Pfeffer, 2009; Hossler et al., 2012a, 2012b), even though the enrollment outcomes that follow the first transfer out of an institution can further differentiate a student who transfers from one who swirls back and forth between institutions.

The present study will also focus on understanding students' first move during the non-summer months, which is important for several reasons. First, the initial departure from the original four-year institution is the one that tends to be considered attrition in single-institution persistence studies, and it is important to create a distinction between departure pathways to reveal differences between students who truly dropout and those who simply continue their education elsewhere. Second, following subsequent enrollment after the first move creates complex patterns that cannot be as thoroughly comprehended as a single move, as demonstrated by the Bach et al. (2000) study where a sample of 338 students engaged in 48 discrete patterns. Lastly, preliminary findings from a pilot study for this project reveal that Latina/o students have lower rates of lateral transfer and higher rates of reverse transfer (both defined by first move) than all other racial groups (Ruiz Alvarado, 2013). As the following sections detail, this finding is alarming given the subsequent degree outcomes associated with each form of transfer and it is

critical to examine what is associated with these rates, especially since no studies thus far have looked at Latina/o student enrollment mobility.

Lateral and reverse transfer are the focus of this study and will be examined while controlling for college credit received in high school and for supplemental enrollment prior to the transfer. The following section reviews the studies examining the characteristics of students who transfer. First, studies that examine transfer in general or distinguish between lateral and reverse transfer in the same study are presented. Following, research findings pertaining specifically to lateral and then to reverse transfer are discussed.

Transfer from four-year institutions. One study makes a notable contribution to the literature by using advanced statistical techniques to examine the characteristics that influence the different types of withdrawal from an institution—including stopout, dropout, and transfer—compared to persistence at a single institution (Rhee, 2008). Utilizing national longitudinal data from the Cooperative Institutional Research Program (CIRP) for students who began college in 1985 and participated in a 1989 follow-up survey, Rhee (2008) found that the odds of both dropping out and transferring out compared to persisting at the home institution were higher for minority students than White students, and that females were also more likely to transfer than to persist at a single institution. The key findings of the study suggest that stop outs and transfers are more susceptible to the institutional context than dropouts, with higher institutional selectivity and high emphasis on institutional diversity both significantly lowering the odds of student transfer.

Though this study expands our knowledge of pathways students take when they depart an institution, it still has several limitations. Namely, the study does not differentiate between transfer to a four-year college and transfer to a two-year college, which is important in creating

an understanding of which students are more prone to follow certain paths. The present study will expand on this work by distinguishing between the two forms of transfer and also comparing them to persistence, dropout, and each transfer path. Distinctions in pathways are important to understand because the differences in how students attend college have been found to represent “an additional layer of stratification in higher education” (Goldrick-Rab, 2006, p.73). Given that the various forms of departure from the first institution are tied to different outcomes, we need to understand which students are most vulnerable to missing opportunities in spite of their intentions to persist.

A similarly designed study (Hossler, Gross, & Dadashova, 2009) looked at the enrollment mobility patterns of students who began at four-year public institutions across Indiana. Using a state unit record database for 29,930 first-time freshman in 2004, Hossler et al. ran five logistic regression models to separately compare lateral and reverse transfer students to persisters and nonpersisters. They found that six percent of the cohort transferred to another public two- or four-year institution in 2005-2006 and that 66 percent of the transfers were lateral. In terms of demographic characteristics, income was not a significant predictor of transferring versus persisting at a single institution, but high-income students were less likely than their middle-income peers to reverse transfer, and men were more likely than women to lateral transfer but less likely to transfer overall. Students in the top quartile of their high school classes were less likely to reverse transfer than to continue (be retained) at their native school. Two significant college experience variables were living on campus, which increased the likelihood of lateral transfer, and earning summer credits, which decreased the likelihood of reverse transfer.

The Hossler et al. (2009) study importantly distinguishes between lateral and reverse transfer students and compares them to both persisters and nonpersisters, but it does not control

for any institutional characteristics, while also employing a single-level analytical technique that does account for the nested structure of the data (Raudenbush & Bryk, 2002). Additionally, there is a strong possibility that students could have been misclassified, as the data is limited to a single sector within a single state, meaning that anyone who transferred to a private institution or to an institution in another state was coded as a nonpersister. Likewise, given the limited time frame covered in the study, students who merely stopped out could have been classified as nonpersisters. The present study will build upon this work by examining pathways in a national sample of Latina/os during a six-year period of time and utilizing multilevel modeling techniques.

Other scholars have used the same national sample from NELS (88:00) data to examine both lateral and reverse transfer in the same study. Goldrick-Rab and Pfeffer (2009) estimated a series of logistic regression models that controlled for clustering to separately predict reverse and lateral transfer. Race was not included in their models, but they did include multiple measures of family background and found that students with parents who possess more than a bachelor's degree are much less likely to reverse transfer than students whose parents earned a bachelor's degree or less. Kalogrides & Grodsky (2011) also conducted multinomial logistic regression using NELS data to compare four paths—persistence at initial four-year, reverse transfer, lateral transfer, and dropout—on number of credits earned in college. Fifty-six percent of their sample persisted at their initial institution, 10 percent reverse transferred, 16 percent lateral transferred, and 18 percent dropped out. Their major finding was that reverse transfer students leave their first institution after earning fewer credits than dropouts, suggesting that those who may be first considered as dropouts are actually not.

Lateral transfer. Very little research exists about lateral transfer between four-year

institutions. In terms of national scope, studies using the National Educational Longitudinal Study (NELS) dataset have projected that anywhere between 16 percent to nearly 20 percent of students who begin at four-year institutions laterally transfer (Goldrick-Rab & Pfeffer, 2009; Kalogrides & Grodsky, 2011). Current figures might be even higher because the students studied using the NELS graduated high school in 1992 and Adelman (2004) found that the rates of multi-institutional attendance have increased every decade. In a study of transfer in the state of Indiana, Hossler et al. (2009) found that men were less likely than women to transfer overall, but more likely than women to lateral transfer. Research has also found that lateral transfer students have higher income than students who remain at a single institution and stop out but have lower income than students who remain continuously enrolled at a single institution (Li, 2010). On the other hand, using a national sample of students who began college in 1989, McCormick and Carroll (1997) found that those who received financial aid were more likely to transfer to another four-year school. Specifically, 60.6 percent of those who received aid transferred within five years, compared to 49.5 percent of those who did not receive aid.

With regard to academic preparation, prior research has demonstrated that lateral transfer is not connected to poor academic performance in college or to inadequate academic preparation in high school (Goldrick-Rab & Pfeffer, 2009). Specifically, the higher the level of academic curriculum students take in high school, the greater the likelihood they will lateral transfer instead of reverse transfer (Horn, Kojaku, & Carroll, 2001). Moreover, among lateral transfer students, those who complete a rigorous high school curriculum are more likely to transfer to a selective institution (Horn et al.). Lateral transfer, nonetheless, raises concern because it is associated with lower rates of degree attainment than traditional enrollment at a single institution. Li (2010) used Beginning Postsecondary Students (BPS) data from the high school

graduating class of 1996 to compare the probability of bachelor's degree attainment between students who transferred laterally and those who remained at their original institution. The results indicated that, even for students who did not have any interruptions in their enrollment between institutions, lateral transfers are 31.9 percent less likely to obtain a degree within a five-year period than traditional students. However, this might just be indicative of a lengthier time to degree, as the previous wave of BPS data for the high school class of 1989 showed that combining bachelor's degree attainment with current enrollments at the end of five years results in lateral transfer students having similar persistence rates as students who never transferred (McCormick & Carroll, 1997).

Reverse transfer. The term “reverse transfer” refers to three different types of students: undergraduate reverse transfers, temporary reverse transfers, and post-baccalaureate reverse transfers (Kajstura & Keim, 1992; Townsend & Dever, 1999). A temporary reverse transfer student is one who earns a few credits at the community college over the summer or concurrently during the academic year (Yang, 2006). This pattern may actually shorten time-to-degree (Townsend, 2001). A post-baccalaureate reverse transfer is a student who completes a bachelor's degree and then enrolls at a community college. Undergraduate reverse transfers are those who start at four-year institution and transfer to a two-year institution during the non-summer months, and they are the focus of this study. Due to different definitions that are applied across studies, the scope of reverse transfers is hard to measure and might be understated (Hillman, Lum, & Hossler, 2008; Townsend, 2000). However, most estimates of undergraduate reverse transfers tend to fall within the range of 7 percent to 16 percent of students who begin at four-year institutions (Adelman, 2005; Grubb, 1991; Hossler et al., 2012a; Townsend, 2000; Townsend & Dever, 1999). It is important to note that these students constitute different

percentages of individual colleges' enrollments, with levels depending on the demographics of the community (Townsend & Dever, 1999). For instance, reverse transfers made up 21.2 percent of the enrollment in an Arizona community college district and 11.1 percent of the community college student population in a Kentucky district (de los Santos & Wright, 1989; Winter & Harris, 1999).

Early descriptive literature on reverse transfers framed these students as being academically deficient and depicted the community colleges as performing a “salvage” function in serving them (Townsend, 2000). Yet, empirical studies over the years have yielded mixed results about the role of academic ability in reverse transfer. Some studies have found that not all reverse transfers were having academic problems at their university before the transfer occurred (Lee, 1976; Vaala, 1991), while others have found that low high school and college GPAs make reverse transfer more likely (Hillman et al., 2008; Kalogrides & Grodsky, 2011; Lichtenberg, 2011; McCormick & Carroll, 1997). Adelman (2005) described reverse transfer students as being academically weaker than their four-year college peers but stronger than the typical community college student.

There have also been conflicting findings about the role of socioeconomic class in the likelihood of reverse transfer. Goldrick-Rab and Pfeffer (2009) found that being in the lowest quintile of SES (based on both an individual continuous measure of family income and on a composite measure of income, parental education, and parental occupation) made a student more likely to reverse transfer, while Hillman et al. (2008) found that having middle income background (\$30,000 to \$70,000) made students more likely to transfer than being of high or low SES, and Kalogrides and Grodsky (2011) found that SES was not predictive of reverse transfer at all. Hossler et al. (2009) also found no significant relation between income and propensity to

transfer compared to continuing at a single institution, but they did find that, among those who do transfer, high-income students are less likely to transfer to a two-year institution than their low and middle-income counterparts. Related to financial circumstances, expecting to work and expecting to receive financial aid were both related to increased odds of reverse transferring in a state study of the Illinois high school class of 2003 (Lichtenberg, 2011).

Additional background characteristics identified by research to contribute to reverse transfer include lower levels of parent education (Goldrick-Rab & Pfeffer, 2009; Kalogrides & Grodsky, 2011), and being female (Hillman et al., 2008). Characteristics of the college experience that are associated with increased odds of reverse transfer include distance of college from home, type of enrollment, and major. Specifically, students who enrolled in a four-year college closer to home (Lichtenberg, 2011) and those who stopped out (Peter & Cataldi, 2005) were more likely to reverse transfer than those who enrolled in college further from home and had continuous enrollment. Students who entered college without a declared major or who declared health were also more likely to reverse transfer, which was speculated by researchers to be a result of changes in career choice or the realization that many health field career options require only a two-year degree or certificate (Hillman et al., 2008; Hossler et al., 2009).

A few studies have delved into the motives for reverse transfer as reported by students. One study of community colleges in Kentucky found that low costs and convenient location were the two most important reasons for enrolling at a two-year school among students who started at a four-year institution (Winter & Harris, 1999), which were the same two reasons cited by students in a study of multiple-transfers at one urban institution (Kearney, Townsend, & Kearney, 1995), and by one-fifth of the reverse transfers in the national Baccalaureate and Beyond Longitudinal Study of the college class of 2000 (B&B:00) (Peter & Cataldi, 2005). The

other major reason reported by B&B participants was that the two-year institution offered a desired program of study. In one study of 10 community colleges in Illinois, the most important reasons cited for leaving the four-year institution were: (1) personal reasons, (2) financial reasons, (3) academic difficulty, (4) career change, and (5) inability to decide on academic goals (Kajstura & Keim, 1992).

Regardless of the motives, reverse transfer is considered a disruptive mobility pattern because the likelihood of completing a bachelor's degree within six years for this group of students is only 22 percent, compared to 79 percent for those who never transfer (Goldrick-Rab & Pfeffer, 2009). These figures, however, may look different when disaggregated by race. The subsequent enrollment patterns for students whose first move out of their original four-year institution is to a two-year school show that less than one-third enroll at the community college for a single term and only 55.1 percent return to any four-year institution (Hossler et al., 2012a). As with lateral transfer, these figures might be indicative of a delayed time-to-degree not captured in current studies, but nonetheless the process increases cost of attendance for both the students and the government (Hilmer, 2000; Li, 2010). Understanding the characteristics of the students who engage in reverse transfer as their first move out of the four-year institution can inform the creation of programs and policies that help facilitate a pathway back to the four-year sector for them.

Though much more research exists on reverse transfer than lateral transfer, much of it is based on data several decades old, which does not reflect the growing diversity of higher education, and most of it is based on single institutions or single systems within a state where Latina/o students are not heavily represented. More research is needed to understand the pattern because it is clear that the students who reverse transfer still aspire to a bachelor's degree—

Winter and Harris (1999) found that 94.8 percent of reverse transfers intend to complete their bachelor's degree, and this intention has been documented by others as well (Cohen, 1985; Winter, Harris, & Ziegler, 2001).

Conceptual Framework

The overarching framework guiding the investigation of Latina/o student enrollment mobility consists of multiple components. An adapted combination of Nora's (2003) Student/Institution Engagement Model and Titus' (2004) conceptual model of student persistence guides the first portion of the study examining the individual and institutional characteristics that increase the odds of Latina/o students transferring out of the four-year institutions where they began their studies. Presently, no theoretical frameworks exist to explain student enrollment mobility, and even the most inclusive student retention models fail to account for multi-institutional attendance. As such, the present study will rely on a combination of these two existing models that are meant to examine persistence at a single institution. Because a key component of this study is to examine the ways in which the characteristics of Latina/o students who persist through transfer are different than those who persist without transfer, it is important to test for what is already believed to influence the latter in order to begin to unravel the differences. Social Network Theory (Barnes, 1954; Scott, 2000; Wasserman & Faust, 1994) will guide the second portion of the study examining the characteristics of the institutional networks that emerge from individual Latina/o student enrollment mobility. The following sections describe the models and theories used in the framework, incorporating the relevant literature on Latina/o college student persistence when relevant.

Nora's Student/Institution Engagement Model. Student retention, and inversely, attrition, has been a focus of higher education scholarship for decades. Though much of the

current work has origins in the concepts developed by Bean (1980), Spady (1970), and Tinto (1975), the general applicability of these early traditional theories to culturally diverse student populations has been frequently questioned by scholars (Hurtado & Carter, 1997; Rendon, Jalomo, & Nora, 2000; Tierney, 1992). In a fruitful attempt to be more inclusive of diverse students who attend college in nontraditional ways, Nora (2003) expanded upon earlier frameworks of student retention by using research on underrepresented minority students to develop the Student/Institution Engagement Model, which emphasizes the interaction between the student and the institution that leads to re-enrollment or withdrawal from the institution. Nora's model is appropriate for this study as it has been applied directly to Latina/o college students at four-year institutions to understand their retention after the first year of college (or reenrollment), their six- and eight-year degree attainment, and their completion of science, technology, engineering, and mathematics (STEM) majors (Arbona & Nora, 2007; Arellano, 2011; Nora, Barlow, & Crisp, 2006; Crisp, Nora, & Taggart, 2009). The Student/Institution Engagement Model, building specifically from Nora and Cabrera's (1996) Student Adjustment Model, proposes six different components: (1) precollege and pull factors, (2) sense of purpose and institutional allegiance, (3) academic and social experiences, (4) cognitive and non-cognitive outcomes, (5) goal determination and institutional allegiance, and (6) persistence. Each of the six components consists of a subgroup of elements that have been found to influence retention in prior empirical studies by Nora and associates (Nora & Cabrera, 1996; Nora, Cabrera, Hagedorn, & Pascarella, 1996).

The first component addresses students' pre-college characteristics including precollege academic experiences, psychosocial factors, financial need, and encouragement and support from family. Academic experiences will play a key role in this study in the form of academic

“undermatching.” Academic undermatching involves students enrolling in colleges that are below their academic qualifications—a phenomenon that is particularly prevalent among low-income and underrepresented racial minority students (Bowen, Chingos, & McPherson, 2009). In one study of Chicago Public Schools, Latina/os were less likely than any other racial group to enroll at an institution that matched or exceeded their level of qualification (Roderick et al., 2008). This may have implications for the pathways that students may take after selecting an institution. The literature focusing on Latina/o college student persistence reveals that academic preparedness is important (Swail et al., 2003), but that their persistence is influenced by several other characteristics that are not typically captured in the traditional persistence literature. One such characteristic that is critical for this population of students is financial need, which in this model is importantly described as two separate factors including a tangible component that includes actual aid received, and also an intangible component that captures the stress associated with meeting financial obligations.

The tangible component of financial need is associated with increased odds of within-year persistence (Hu & St. John, 2001), and Latina/o students have been found to experience the intangible component of financial stress at higher levels than White students (Quintana, Vogel, & Ybarra, 1991). The first component of the model also posits that there is a set of environmental factors that can pull students away from their academic and social campus environments, limiting their ability to integrate into the institution. These factors include family responsibilities, off-campus work responsibilities, and having to commute to campus—three elements that have been found to negatively affect the persistence of underrepresented students (Nora et al., 1996). Latina/o students in particular are more likely to work and subsequently be employed for longer hours than non-Latina/o students (Lyons & Hunt, 2003; Sedlacek,

Longerbeam, & Alatorre, 2003).

The second component addresses students' commitment to attending a specific institution as well as their broader educational aspirations, jointly referred to as students' sense of purpose and institutional allegiance. While these two factors seemingly complement each other in examinations of persistence at a single institution, they may not do so when studying mobile students since it is possible that these students can be committed to their degree goals but not to their institution. The third component of the model represents students' on-campus college academic and social experiences. This component includes formal and informal interactions with institutional agents and peers, which prior research has found to influence persistence both directly and indirectly through its effect on other outcomes (Rendon, 1994). For example, Hurtado, Carter, and Spuler (1996) found that interactions with faculty positively affected the academic adjustment of high-achieving Latina/o students, while Anaya and Cole (2001) found that when these interactions were perceived to be of quality they had a positive association with Latina/o students' academic performance.

The fourth component of the model highlights the importance of several cognitive and non-cognitive outcomes. Cognitive outcomes relate to academic performance and development, whereas non-cognitive outcomes reflect gains in students' valuing of diversity, accepting of others, self-esteem, and other such factors. Research has demonstrated that the cognitive outcome of college grades and the non-cognitive outcome of self-efficacy are both associated with persistence for Latina/o students (Bordes-Edgar, Arredondo, Kurpius, & Rund, 2011; Cerna, Perez, & Saenz, 2009; Gloria, 1997; Nora, 2004; Torres, 2006). The fifth component addresses students' goal determination and continued institutional allegiance that results from their academic and social experiences. In the temporal sequence of an academic year, this

component of the model occurs towards the end after students have determined their college experience to be a worthwhile experience and have converted their degree aspirations to degree goals. The sixth and final component of Nora's (2003) model relates to re-enrollment at the institution.

The current study will take the elements of the model that can be examined using entering freshman data to study persistence via different transfer pathways. Specifically, the adapted model will include eight components: (1) background characteristics, (2) high school experiences and academic preparation, (3) academic undermatch, (4) sense of purpose and institutional allegiance, (5) environmental pull factors, (6) anticipated college experiences, (7) enrollment measures, and (8) pathways through college.

Though Nora (2003) does not specifically mention them, background characteristics can be mapped onto the pre-college component of the model, as they constitute the identities students bring with them to college through which all else is experienced. For instance, Arbona and Nora (2007) found that one of the most important precollege characteristics that influenced bachelor's degree attainment was having a parent with at least some college education. High school experiences and academic preparation also map to pre-college factors since they include Nora's components of precollege ability, financial need, and social factors. Sense of purpose and institutional allegiance corresponds to that same component in Nora's model. Environmental pull factors will be included in the study as a separate component from precollege experiences, but will reflect the same three commitments that are specified in the model. Anticipated college experiences will represent the academic and social experiences component of the model, and will account for the fact that the study is utilizing measures from students who have not yet experienced the college environment. Anticipated experiences are an appropriate proxy for

actual college experiences as prior research has found that the inclination to become socially integrated has been tied to persistence for Latina/o students (Oseguera, 2006).

The final three components—academic undermatch, enrollment measures, and pathways through college—are modifications that expand on Nora’s work to better examine student enrollment mobility. The first, academic undermatch, is important to include because completion has been examined for academically undermatched students but pathways through college have not. In single-institution studies examining persistence after a specified time frame, students who do not re-enroll at the same institution at the end of the time period (e.g., fall term of the second year of college) are said to have dropped out. The enrollment measures component of the adapted student-level model accounts for lapses in enrollment (stopout) that might be considered attrition in other studies, and also incorporates the multi-institutional attendance behaviors described earlier in this chapter. Lastly, the pathway through college component is reflective of the outcome, which in Nora’s case is re-enrollment at the same institution but in the case of this study is the enrollment pathway that students take—lateral transfer, reverse transfer, no departure, or dropout from the higher education system.

Titus’ Conceptual Model of College Student Persistence. Nora’s (2003) model captures the important student-level factors that influence persistence, but it does not specifically account for any institutional-level influences outside of the formal and informal interactions students may have with institutional agents. Previous studies have found that even after controlling for precollege characteristics and college experiences, underrepresented minority students still persist at lower rates than White students (Astin & Oseguera, 2005), suggesting that understanding persistence also requires looking at the institutional context. As such, the institutional elements of Titus’ (2004) conceptual model of student persistence are also

incorporated into the conceptual framework guiding the study. Integrating concepts from Bean's (1990) student attrition model with Berger and Milem's (2000) college impact model, Titus developed a conceptual model that allows for the examination of the role of institutional context on college student persistence, making a significant contribution to the scholarship in this area by including multiple components of the student peer climate. He also tested the model utilizing a multi-institutional sample drawn from students who participated in the Beginning Postsecondary Survey from 1996-1998 (BPS: 96/98). The use of Titus' model in this study will expand our understanding of how pervasive the effect of a peer climate can be since the peer climate has been used in studies of student development and campus climate, but limited research has incorporated peer climate in studies of persistence (Oseguera & Rhee, 2009), especially using a Latina/o-only sample.

At the student-level, Titus (2004) adapts Bean's (1990) work and includes four components: (1) student background characteristics, (2) student experiences, (3) student attitudes, and (4) environmental pull factors. Student background characteristics include ability, educational goals, gender, race/ethnicity, and socioeconomic status. Student experiences include college academic performance, whether the student has declared a major, living on or off campus, and student involvement in campus activities. Student attitudes include institutional commitment, and environmental pull factors include financial need and number of hours worked per week. All of these elements are included in the study's conceptual framework as they can all be mapped on to the adapted version of Nora's student-level model.

At the institutional level, Titus' (2004) model is comprised of five components: (1) student peer characteristics, (2) structural-demographic characteristics, (3) aggregate student experiences, (4) aggregate student attitudes, and (5) aggregate environmental pull factors. The

first component includes measures of average educational goals, racial/ethnic diversity, and socioeconomic background of students attending the same institution. The structural-demographic component reflects characteristics such as institutional control, the size of undergraduate enrollment, and selectivity as defined by average SAT scores. An institution's selectivity is especially important to consider when examining Latina/o student persistence because Latina/o students are concentrated at less selective institutions that have lower admissions standards and lower completion rates (Fry, 2002; Bowen et al., 2009). In addition to structural characteristics like institutional control, size, and selectivity, the percent of Latina/os at a four-year campus (Astin & Oseguera, 2003) has been found to positively predict persistence for Latina/o students and will be incorporated into the framework in the form of an institution's status as a Hispanic Serving Institution (HSI) or Emerging HSI. Hispanic Serving Institutions are those with at least 25 percent, and Emerging HSIs are those with between 15 and 24 percent Latina/o undergraduate full-time-equivalent enrollment (Santiago, 2006; Santiago & Andrade, 2010). The third institutional component includes aggregate measures of students' academic performance as defined by first-year grade point average, percent of students with a declared major, and average level of student involvement.

The first three components are based on Berger and Milem's (2000) model, whereas the last two components are an extension of Bean's (1990) model aggregated to the institutional level. The fourth component captures aggregate student attitudes in the form of institutional commitment, or the percent of full-time freshmen committed to graduating from the same institution in which they are enrolled. Though not specific to Latina/o students, the peer retention climate as measured by students' intention to dropout or transfer and thus not graduate from the same institution where they began as freshmen has been found to influence student

persistence, with higher peer intentions to leave the institution tied to lower rates of persistence (Oseguera & Rhee, 2009; Titus, 2004). This component will be key in the current study since both the Oseguera and Rhee (2009) study and Titus' (2004) test of his model operationalized persistence as remaining at a single institution. That is, lower levels of peer institutional commitment in those studies have a negative effect on persistence, but it could very well be that the students who leave their initial institution are still persisting somewhere else in the higher education system.

The final component of the model addresses aggregate environmental pull factors that include average financial need of full-time freshmen, average hours worked, and percent of students who work off campus. Though this final component was not a significant predictor of persistence at a single institution compared to leaving that institution in Titus' test of his model, elements of it are included in the framework in order to expand its use in disaggregating those who transfer from those who dropout of higher education altogether. Overall, an adaptation of Titus' model will include the same five components with slight modifications to the particular elements that comprise each one.

Social network theory. A social network (Barnes, 1954; Scott, 2000; Wasserman & Faust, 1994) refers to a structure of relationships, where the individuals or objects that are connected are not as important as the fact that they are connected. The formal term for the relationship is a "tie," which connects two "nodes" (Wasserman & Faust, 1994). In this study, the nodes will represent the institutions that send and receive Latina/o students who engage in enrollment mobility in California. Under the premise that the tie is what matters, the characteristics of the institutions themselves are only important when they can be examined in relation to the other institutions that they are connected with because it is believed that the

structure of ties can affect individual behavior. In the case of postsecondary institutions connected through student mobility, the ties may indicate movement that is facilitated through enrollment or articulation agreements. On the other hand, it may simply represent an informal flow of students. In the present study, the idea of the tie affecting individual behavior goes back to the notion of peer climate (Titus, 2004). For instance, it can be speculated that if there is a large amount of movement between a particular set of institutions, the peer mobility climate at those sending and receiving schools might further influence students' engagement with mobility. Though this study will not examine mobility at different time periods to test for recursive effects of the peer climate, it will uncover the informal patterns of institutional networks that exist, which can be utilized to inform their formal behavior and perhaps forge intentional partnerships.

Understanding the patterns of relationships in a social network involves the examination of various network components and the testing of some of the propositions inherent in social network theory. Two of the network components pertinent to this study are: (a) link weights, which represent the strength of a tie, and (b) centrality, which is a measure of how many ties a node has that is interpreted as the level of importance in the network. The central propositions guiding the second portion of the research study are homophily and propinquity. Homophily is the principle that contact occurs at higher rates between those that are similar to each other than between those that are not (McPherson, Smith-Loving, & Cook, 2001). Barnes (1954), in the classic piece where he coined the notion of social networks, described friendship and acquaintance ties on a Norwegian island parish as existing primarily between people who accord equal status to one another. Such similarities between the sending and receiving institutions in the network patterns that emerge will be examined using a list of institutional attributes, whose selection will be guided by the institutional-level of Titus' (2004) model. The second proposition

of interest is propinquity, which poses that physical proximity influences relationships (Kadushin, 2011). Though it is a separate proposition of network theory, propinquity can also be considered a form of homophily since geographic similarity is a source of connections (McPherson, et al., 2001; Moore, 1990).

Summary of conceptual framework. This study will draw on relevant elements from Nora's (2003) Student/Institution Engagement Model, Titus' (2004) Conceptual Model of Student Persistence, and Social Network Theory (Barnes, 1954; Scott, 2000; Wasserman & Faust, 1994) to inform the conceptual framework guiding the examination of enrollment mobility among Latina/o students who began their college trajectories at four-year institutions, and the networks of institutions that they move between. Five components from Nora's model inform the selection of student-level variables in the multi-level model, and five additional components from Titus' model inform the selection of institutional-level variables. Social Network Theory and Titus' model inform the social network analysis. Combined with findings from empirical research on lateral and reverse transfer, the use of this adapted framework to study student enrollment mobility will help to expand research on persistence by giving it a broader definition and untangling the characteristics associated with different student pathways through the higher education system.

Synopsis and Identifying the Gaps

The literature on student enrollment mobility and Latina/o student persistence in the previous sections highlight the prevalence of mobility in the higher education system and demonstrate the importance of examining students' different departure pathways out of the first four-year institution attended. When departure paths are not disaggregated in studies, information on students who persist through multi-institutional attendance gets lost. The

previous sections also identify limitations of prior studies— the exclusive focus on a single sector, the lack of institutional characteristics in models, and not accounting for nested structure of data—that can be addressed through the use of multi-level modeling with a national dataset. Nora (2003) and Titus' (2004) theoretical frameworks, which guide the first portion of the study, are intended to be used to understand the persistence of non-mobile student populations. Thus, this study will use an adapted version of them that also incorporates key variables from studies on lateral and reverse transfer. Together with social network theory, they will guide the full study and contribute to the body of work on persistence by expanding its conceptualization. In addition to making distinctions in departure pathways, this study will make important contributions to the student enrollment mobility literature through its focus on race and institutional contexts. The following sections will describe the limited literature addressing those two areas and elaborate on the contributions of the present study.

Race in mobility studies. A limited amount of research has examined the role of race in student enrollment mobility, and most of the studies that have used it have only included two groups or have combined groups. For instance, one study of lateral transfer compared African American men and women to White men and women and found that lateral transfer had a negative effect on the degree attainment of all four groups, but that the effect was two times as large for African American men compared to White men and three times as large for African American women compared to White women (Kocher & Pascarella, 1990). Several other studies have grouped African American, Native American, and Latina/o students in one group and compared them to Asian and White students in another group (Adelman, 1999, 2006; Goldrick-Rab, 2006; Herzog, 2005). The heterogeneity in these aggregated populations might be reason for the lack of significance of race in those studies. Single state studies that have included

multiple groups have found that in Indiana, White students transferred at lower rates than African American and Latina/o students, but African Americans were more likely to drop out than transfer (Hossler et al., 2009). In Illinois, African American and Asian students who reverse transferred were significantly more likely than White students who reverse transferred to return to a four-year institution, but less likely to earn an Associates degree (Lichtenberg, 2011).

The national studies on mobility are also limited in their inclusion of race. The studies that exist reveal that in the high school class of 1989, Latina/os were more likely than all other groups to transfer out of public four-year institutions (McCormick & Carroll, 1997). In the high school class of 1995, Latina/os also had the highest rates of transfer—30.2 percent compared to 25.8 percent of all students (Peter & Cataldi, 2005). For that same class, American Indian students were most likely to ever enroll in a two-year institution. While the findings from these studies are informative, they do not tell us much about the characteristics of the students in those racial groups that make them more or less likely to engage in lateral or reverse transfer, nor about the institutions that send and receive these students. The present study brings race to the forefront by describing transfer rates for students from different racial backgrounds who graduated high school a decade after the most recent national figures available that include race. Further, the study will also investigate the characteristics that contribute to within-group variability in postsecondary pathways for Latina/o students.

Institutional contexts and networks. The information that is known about the institutions that send and receive lateral and reverse transfer students is limited to their location, control, and selectivity. In terms of location, it is estimated that close to three-quarters of all mobility occurs within state boundaries, meaning that sending and receiving institutions have a strong likelihood of sharing a home state (Goldrick-Rab & Roska, 2008). Another characteristic

that sending and receiving institutions likely share is institutional control, as different studies using multiple cohorts of students have found that the majority of mobility tends to occur from one public institution to another (Hossler et al., 2012b; McCormick & Carroll, 1997; Peter & Cataldi, 2005). Among students in the high school class of 1989, 82 percent of those who transferred from a public four-year institution went to another institution in the public sector (McCormick & Carroll, 1997). This figure hardly changed for the high school class of 2005, where 86 percent of students at four-year public institutions who transferred went to a public two-year or public four-year institution (Hossler et al, 2012b). Sending institutions are also characterized by lower selectivity, since students at the most selective institutions are less likely to transfer (Lichtenberger, 2011).

In one of the few studies that included additional institutional characteristics, Kearney et al. (1995) examined the transfer patterns of 420 multiple-transfer students—those who had attended at least two institutions before all enrolling at the same subject university. Among the entire sample of students, a total of 305 institutions had been attended. The researchers examined the institutional type, control, Carnegie classification, location by state, average tuition/fees, enrollment levels, and selectivity of the institutions students attended and determined that the most prevalent pattern was movement from smaller, more expensive, more selective institutions to larger, less expensive, less selective ones. The present study will build on this work by switching the focus to the sending institutions, from which students' first movement will be followed to as many receiving institutions as they attend rather than just focusing on one receiving campus. Overall, it will also expand the research on student mobility by creating a portrait of the networks that emerge among institutions that send and receive mobile Latina/o students in California, incorporating institutional characteristics beyond

location, control, and selectivity.

A state-focused institutional study can generate information that is not possible to attain through the larger national study. Specifically, the census of institutions across the nation would not lend itself to as detailed an analysis as a specific focus on one region does (Scott, 2000). Previous state studies of student enrollment mobility, however, have been limited in their ability to track students outside of the state or the public sector, and they have also largely ignored the role of institutional contexts (Hossler et al., 2009; Winter & Harris, 1999). The study of mobility in California will overcome both of these limitations by focusing on the institutions and utilizing data that allows students to be tracked across public and private sector and even across state lines. The preliminary results of this study (Ruiz Alvarado, 2013) demonstrate that Latina/os are more susceptible to engaging in reverse transfer patterns and, with 112 community colleges in the state, it is likely that the California rates are even higher than the national average. As a whole, the fact that Latina/os are soon to be the largest population in the state (Flores, 2013), coupled with the fact that California has more postsecondary institutions than any other state in the country (U.S. Census, 2012), make California an ideal setting in which to study the student enrollment mobility of Latina/o students and the institutions that send and receive them.

CHAPTER 3: METHODOLOGY

As demonstrated in Chapter 2, attending a single four-year institution on the way to a degree is no longer the norm among student behavior. Student enrollment mobility is a commonplace practice among students in higher education, but it is not a common focus of research studies. Though scholars have given some attention to reasons for transfer, they have been limited to students from a single institution or a single system. Moreover, only one known study has looked at students from the same underrepresented group—students of low socioeconomic status—to determine what contributes to within-group variation in postsecondary pathways among students who started at a four-year school (Deil-Amen & Goldrick-Rab, 2009). With regard to institutions, recent national reports (Hossler et al., 2012a, 2012b; Shapiro et al., 2012) have begun to describe characteristics of institutions that send and receive reverse transfer students, but their specific relationships to each other have not been explored.

Given the dearth of studies addressing Latina/o enrollment mobility, the purpose of the study is to understand the characteristics of Latina/o students who are most likely to transfer out of the four-year institutions where they began and describe the ways in which they move across institutions. The first part of the study will focus on the students themselves, identifying the pre-college characteristics of Latina/o students as well as the institutional characteristics that increase their probability of transferring out of a four-year institution compared to two alternatives: 1) having no departure from the first institution attended, or 2) dropping out of the higher education system altogether.

After focusing on the student and institutional characteristics associated with the two

mobility patterns of interest, the second part of the study will focus on the institutions in California that send and receive lateral and reverse transfer students. A description of the characteristics and patterns in the networks of institutions that are created as a result of Latina/o student enrollment mobility will be developed, allowing for the identification of specific institutional factors that might contribute to mobility.

This chapter presents details of the methodology employed in this study. It first restates the research questions that guide the study and presents a hypothesis for each. Following, it provides a detailed description of the individual research designs, samples, variables, and methods for both the national student-focused and the California institution-focused analyses. It concludes with the limitations associated with the study.

Research Questions and Hypotheses

This section provides hypotheses and their corresponding rationales for each of the research questions in the study.

Question 1: What pre-college student characteristics and institutional characteristics contribute to lateral and reverse transfer for Latina/o college students who begin at four-year institutions?

Hypothesis 1. I hypothesize that there will be minimal differences in background characteristics and high school experiences between students who switch institutions and students who remain at a single institution. I believe that the major differences between the two groups will be in respect to factors reflecting institutional allegiance and environmental pull, such as reasons for enrolling at a particular institution and concerns about finances. I do, however, hypothesize that there will be differences in the background characteristics, high school experiences, and anticipated college experiences between mobile students and students who drop out of higher education.

The rationale for my hypothesis comes from my framing of transfer as a form of persistence. Persistence literature on Latina/o students has documented academic preparation, parent education, inclination to become socially involved on campus, and financial aid as being influential characteristics in persistence at a single institution (Arbona & Nora, 2007; Gross, 2011; Oseguera, 2006; Swail et al., 2003). Since I consider lateral and reverse transfer to be a reflection of persistence in the larger higher education system, I do not expect to see much of a difference in those areas between those who persist at one institution and those who persist across multiple institutions. Using the same reasoning, I do expect to find differences between students who persist via transfer and students who dropout of the higher education system, since the model that I am testing is a persistence model.

In identifying characteristics that distinguish the two forms of transfer from each other, I expect parent education to play a different role for reverse transfer than for lateral transfer based on prior literature (Goldrick-Rab & Pfeffer, 2009). Due to the fact that a lateral transfer involves the formal transferring of credits from one institution to the other on a more frequent basis than reverse transfer (Bach et al., 2000), indicating that there is a higher degree of planning involved, I also expect reverse transfer students to be more likely to have a stopout before the move.

Question 2: Are Latina/o students who are academically undermatched more or less likely to transfer out of their first four-year institution? Are the institutions they transfer to more or less selective than the ones where they began?

Hypothesis 2. I hypothesize that academic undermatching will play a significant role in distinguishing between the various postsecondary pathways. Academic undermatching refers to enrollment at an institution that is of lower selectivity than one is qualified to attend based on high school academic credentials (Bowen, Chingos, & McPherson, 2009; Roderick, Coca, & Nagaoka, 2011). The rationale behind this hypothesis is that such enrollment might result in a

lack of institutional academic fit, which might make students more likely to switch institutions. Research using a 1999 cohort of North Carolina high school seniors found that being overqualified for an institution affects time to degree, with academically undermatched students having six-year degree completion rates of more than 20 percentage points lower than students who were properly matched (Bowen et al., 2009). It is possible that these students are taking longer because they are taking postsecondary pathways that do not come with institutionalized support, as is the case with lateral and reverse transfer. I also expect that for those academically undermatched students who lateral transfer, their four-year receiving institutions will be more selective than the sending institutions. If students are not finding academic fit at their original institution, they might reconsider their initial decision and attempt to transfer to the more selective school.

Question 3: What are the characteristics and patterns of networks among institutions that send and receive Latina/o lateral and reverse transfer students in California?

Hypothesis 3. I hypothesize that the networks that develop between institutions will be regionally confined and that receiving institutions will for the most part be characterized by lower tuition and lower selectivity than sending institutions. The rationale behind the hypothesis has to do with the large availability of institutions across most geographic regions of the state. The 112 institutions in the California Community College system make it not just the largest system in the state, but also the largest system in the entire nation (CCC Chancellor's Office, 2013). Convenience, low cost, and proximity can make it easy for students to get additional classes they may need on the way to the degree. In addition to the 112 community colleges, the state has 23 California State University and nine University of California campuses that serve undergraduates, plus 75 private, nonprofit institutions, which make it possible for students to lateral or reverse transfer without traveling far.

Due to Latina/o students' documented concern with the price of college (Gross, 2011), I also expect the directionality of movement to be mainly from four-year to two-year institution, representing a move to less expensive options. I hypothesize that the majority of student enrollment mobility in the state will be in the form of reverse transfer not just because of financial reasons but also as a result of existing policies. The California Master Plan (California, 1960) stipulates that priority for admission as a transfer student at both the University of California and the California State University systems is given to students who are transferring from a community college over those who are attempting to transfer from another four-year baccalaureate-granting institution. Due to this policy, I would believe that it is hard for students in the state to lateral transfer from one four-year to another, unless the receiving school is a private institution.

With regard to change in institutional selectivity, prior research has produced mixed results about the role of academic ability in student enrollment mobility (Goldrick-Rab & Pfeffer, 2009; Hillman, Lum, & Hossler, 2008; Kalogrides & Grodsky, 2011; Vaala, 1991), leading me to believe that academic preparation affects mobility in different and nonlinear ways. I expect that the majority of the movement between institutions will be from four-year institutions to community colleges because this type of movement can serve both students having academic difficulty and students who are doing well but might be having a hard time enrolling in courses that will advance their progress at their four-year school. It is important to keep in mind that the latter half of the six-year period covered in this study was marked by serious cuts in state funding to public postsecondary education that resulted in the reduction of course availability in the public sector. These reductions might have led students to explore their options at other institutions.

Research Design I: Latina/o Students' Pathways Through College

Given that this study utilizes a complementary set of research designs to answer the research questions, it is important to separately describe them. The following section provides detailed descriptions of the national data sources, sample, dependent and independent measures used in the model, and the specific multi-level analysis conducted for the first portion of the study examining the individual and institutional characteristics associated with lateral and reverse transfer among Latina/o college students.

Data source. The longitudinal analysis in this study uniquely draws on matched national data from three sources: student data from the Higher Education Research Institute's (HERI) 2004 administration of Cooperative Institutional Research Program's (CIRP) Freshman Survey (TFS); term-to-term enrollment data from the National Student Clearinghouse (NSC) from Fall 2004 through Spring 2010; and institution-level data from the Integrated Postsecondary Education Data System (IPEDS). TFS is the nation's oldest college student survey instrument and has been administered nationally to college freshmen during their first-year orientation or right at the start of the academic year since 1966. The survey contains questions on a wide range of students' academic and social background characteristics, attitudes and values, educational goals, and expectations for college. The NSC is the most comprehensive source of enrollment and degree information in the country, as it collects transcript data for over 96% of all students at more than 3,300 public and private U.S. higher education institutions. The attainment of Clearinghouse data was made possible by grants from the Ford Foundation, National Institutes of Health, and National Science Foundation, and staff at HERI conducted the merging of student unit records and survey responses for the students who participated in the 2004 TFS. To examine the role of institutional context in predicting students' pathways, institutional variables from

IPEDS were also included. IPEDS is a system of interrelated surveys that are conducted annually by the National Center for Education Statistics (NCES). All postsecondary education institutions that participate in the federal student financial aid programs are required to report data in a number of areas including their enrollments, program completions, finances, and employees, making IPEDS a suitable source for institutional variables (NCES, 2013). The merging of the three sources creates a unique dataset that allows for the tracking of students across institutions for six years after high school as well as the examination of six-year enrollment and completion outcomes.

Sample. A total of 424,408 students from 720 institutions participated in the freshman survey in the fall of 2004. However, of those first-time full-time freshmen who graduated high school in 2004 and self-identified their racial background, HERI only obtained matched enrollment data from the Clearinghouse for a total of 239,136 students. A weighted national sample of these students was utilized for initial descriptive analyses. The data were weighted using a two-step procedure based on gender within institution and HERI's 19 institutional stratification groups (see DeAngelo et al., 2011 for full details on weighting procedures). The analysis of student and institutional characteristics that increase the likelihood of lateral and reverse transfer, however, only included the unweighted matched national sample of Latina/o students (n=10,967). In this sample, 52% are Mexican American or Chicano, 13.9 % are Puerto Rican, and 34.1% are from another Latina/o ethnic group. The Latina/o sample is comprised of 61.1% female and 43.4% first-generation college students. More than one-third (34.7%) are from the lowest income quartile (less than \$30,000) and 7.2% are from the highest (\$150,000 or more). The students come from 442 institutions, with 45.8 percent attending a private institution and 54.2 percent attending a public institution.

Dependent variables. The main analysis uses two three-part multinomial and one dichotomous outcome. The first multinomial outcome includes lateral transfer and reverse transfer, with no departure as the referent group. The second includes lateral transfer and reverse transfer, with dropout as the referent group. The final outcome is lateral transfer, with reverse transfer as the referent group. *Lateral transfer* is defined as starting college at a four-year institution and then exclusively enrolling at another four-year institution during the non-summer months. *Reverse transfer* is defined as starting college at a four-year institution and then exclusively enrolling at a two-year institution during the non-summer months. The two dependent variables are part of a larger set of student enrollment mobility variables that I assisted the HERI staff in creating in fall 2011 using students' term-to-term enrollment data, which allows for the identification of movement between institutions. The *no departure* referent group is defined as having no exclusive enrollment at an institution other than the four-year institution of origin during the non-summer months in the 2004 through 2010 period. The *dropout* referent group is defined as stopping out and not returning to higher education during the six-year period covered in this study.

Though not specifically examining the Latina/o student population, prior research using large databases from the National Center for Education Statistics (NCES) and the Higher Education Research Institute (HERI) has estimated that between 7 and 12 percent of college students who graduate do so from an institution different from the four-year school where they began (Berkner, He, Cataldi, & Knepper, 2002; Pryor & Hurtado, 2012; Shapiro et al., 2012). These percentages have not been disaggregated by whether the first type of movement out of the original four-year institution was a lateral or reverse transfer, but these are important distinctions to understand when thinking about how to support mobile students in their path to a degree.

Therefore, the present study categorizes students based solely on their first move and does not consider any subsequent enrollment mobility in defining the dependent variables. There are 172 students who had both forms of transfer at some point during the six-year period in the study who are coded under the form of transfer they had first. For instance, if a student transferred from the original four-year institution where they began to a different four-year institution and then subsequently transferred to a two-year institution, they will still be considered a lateral transfer student in this study.

It is important to emphasize that while summer enrollment at a different campus might constitute multi-institutional attendance, the succeeding pathways associated with such enrollment are substantially different than those associated with a true move to another campus (Hossler et al., 2012a) and so it warrants being studied separately. Additionally, students who are concurrently enrolled at their institution of origin while attending the second school are not considered transfer students because enrollment at the institution of origin has not ceased.

Independent variables. Due to the nested structure of the data, with students clustered within institutions, there are two sets of independent variables: student-level variables (level 1) and institutional-level variables (level 2). Figure 3.1 shows the conceptual model guiding the HGLM analyses, based on previous literature and the study's theoretical framework. In this conceptual model, the independent student-level variables include measures of students' backgrounds, high school experiences and academic preparation, academic undermatching, sense of purpose and institutional allegiance, environmental pull factors, anticipated college experiences, and enrollment measures. Because this study only utilizes survey data collected from incoming freshmen, some measures of high school experiences and anticipated college experiences are used as proxies for some of the elements in Nora's (2003) model, particularly to

account for academic and social integration. The institution-level variables in the conceptual model include measures of student peer characteristics, structural demographic characteristics, aggregate student experiences, aggregate environmental pull, and aggregate student attitudes. A description of each set of measures follows, and a detailed explanation of their coding scheme can be found in Appendix B.

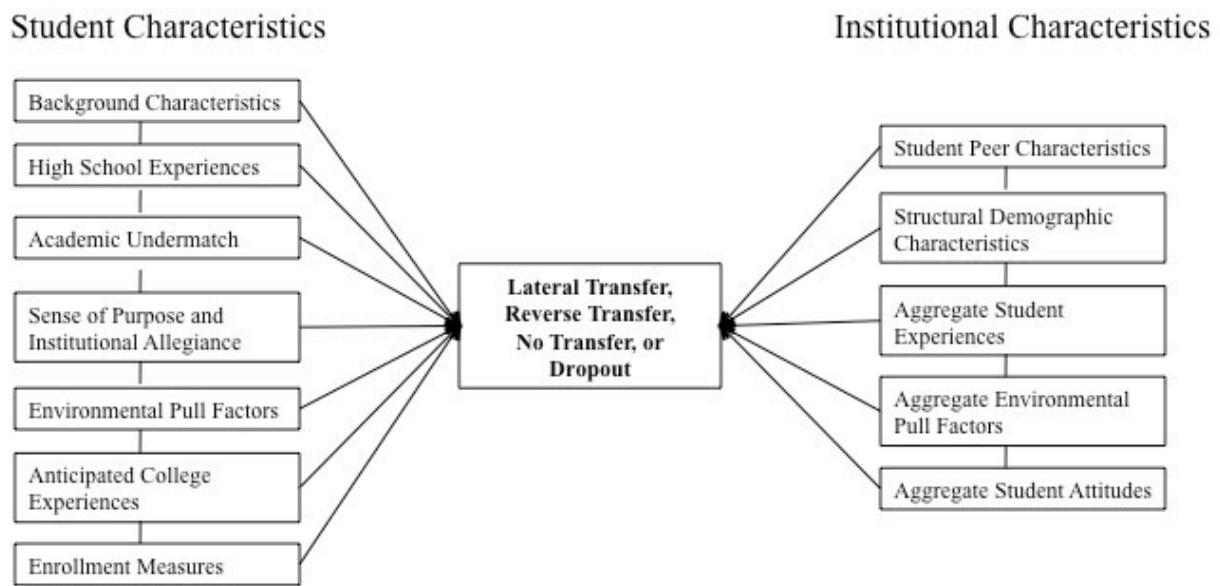


Figure 3.1. Conceptual model guiding HGLM analyses.

Background characteristics. Background characteristics include sex, parent income, whether the student is a native speaker of English, and mother and father’s level of education. Mother and father’s education are included as separate variables rather than one composite parent education variable because it has been found that father’s education has greater salience than mother’s education in getting a degree from anywhere (Pryor & Hurtado, 2012). This study also tests for possible non-linear effects of parental education by using dichotomous variables representing mother and father with some college, Bachelor’s degree, and more than a Bachelor’s degree, with high school education or less as the referent group.

High school experiences. Precollege ability measures include traditional achievement measures such as high school grade point average and SAT scores as well as self-ratings on time management. Since this study investigates student enrollment mobility, two items indicating whether students took courses for credit at a two or four-year college while still in high school are also included as high school academic preparation measures. A final variable capturing a non-academic element of the high school experience is reported hours per week spent participating in student clubs. This measure will serve as one of the proxies for potential involvement in student clubs at the college level.

Academic undermatching. A measure of the academic “undermatching” phenomena that is part of the conceptual framework is included in the model to help answer the second research question. The concept of undermatching refers to enrollment at an institution of lower selectivity than one is qualified to attend (Bowen et al., 2009) and has been operationalized in prior studies as the mismatch between students’ “presumptive eligibility” to institutions of a particular selectivity level and their actual enrollment (Bowen et al., 2009; Smith, Pender, & Howell, 2013). In these studies, presumptive eligibility has been calculated using information on students’ applications and admissions offers in combination with their high school grades, SAT scores, and participation in Advanced Placement coursework. Because not all of these measures were available in the dataset used for this study, academic undermatch is instead operationalized in the main analysis as a dichotomous measure following the criteria set forth in a College Board study, which considers students to be academically undermatched if their SAT scores exceed the mean SAT score in the Barron’s selectivity category above the institution in which they enroll (Hurwitz, Howell, Smith, & Pender, 2012). For the descriptive analyses, the measure is further disaggregated to show whether students are academically undermatched by one Barron’s

selectivity level or by two levels. See Appendix C for a detailed description of the six selectivity categories used to determine academic undermatch.

Sense of purpose and institutional allegiance. To account for institutional commitment at the entering freshmen level, this study includes reasons for attending a particular school in the model. Specifically, variables included represent the importance students placed on relatives wanting them to attend that particular college, and on the cost of the college. Additionally, a variable representing whether the institution was the students' first choice is included. A key variable representing commitment to attend a specific institution as opposed to just being enrolled in postsecondary education is whether the student anticipates transferring to another college. Students' intent to transfer has been negatively associated with persistence at a single institution (Oseguera & Rhee, 2008), and it is important to examine whether the intention turns into reality or if those students actually end up dropping out as might be inferred by studies that only look at persistence in the context of a single institution. Mirroring the parental education measures, students' educational aspirations will be measured using dichotomous variables representing whether they aspire for less than a bachelor's degree, a bachelor's degree, or more than a bachelor's degree.

Environmental pull factors. Reported hours per week spent on household or childcare duties while in high school and distance of college from home are included in the model to represent family responsibilities. Students who spend a lot of time on household or childcare duties in high school might carry those obligations over with them to college (Gloria, 1997), and students who live closer to home are likely to see their families more frequently. Work responsibilities are captured by reported likelihood of working full-time while attending college. An additional pull factor not directly related to work but associated with finances is level of

concern about ability to pay for college. Measures representing the amount of aid received in the form of grants and loans were available in the dataset but not included in the study because they were missing for over 15% of the sample.

Anticipated college experiences. Measures of anticipated college experiences include anticipated living arrangements, social involvements, and academic experiences. Living plans for fall of freshmen year are included as a dichotomous measure of living on campus or not in the fall of 2004. The CIRP construct measure for Likelihood of College Involvement serves as a proxy for social experiences in college. Likelihood of College Involvement is a unified measure of students' expectations about their involvement in college life generally and is comprised of students' best guess that they will socialize with someone from another racial/ethnic group, participate in a study abroad program, participate in volunteer or community service work, participate in student government, and participate in student clubs/groups. This CIRP construct was scored by HERI staff using Item Response Theory and has been validated as an effective measure for looking at the trait it is intended to represent (Sharkness, DeAngelo, & Pryor, 2010). The final anticipated college experience is students' intended major at college entry, which will serve as a proxy for their college academic experiences.

Enrollment measures. The three enrollment measures in the model include stopout, supplemental enrollment, and summer school enrollment. Adelman (1999) defined stopout as a one-year period or two part-year periods of non-enrollment. Other studies have defined it as a single term off from school (Carroll, 1989). In this study, stopout includes anyone who had a period of non-enrollment of any length as long as they re-enrolled during the six years covered in the data (for the no departure sample) or before the point of departure from the first institution (for transfers). Due to limitations in uniquely identifying students' final stopout as something

separate from a dropout, stopout is not included in the model predicting reverse and lateral transfer relative to dropout. Supplemental enrollment includes summer school or concurrent enrollment during the non-summer months at an institution different from the origin school. Similar to stopout, students are coded as having supplemental enrollment if it occurred at any point in the six-year period (for the no departure sample) or before leaving the first institution (for dropouts and transfers).

Though it does not involve multi-institutional attendance, whether students took summer school at their home institution is also included in the model as an important enrollment measure. Research has found that summer enrollment is a predictor of transfer and degree completion for students who begin at community colleges (Lee, Mackie-Lewis, & Marks, 1993), but its role in transfer out of a four-year institution has only been explored in one single-state study that found it decreased the odds of reverse transfer relative to having no departure (Hossler et al., 2009). A final enrollment measure created from NSC enrollment data will only be utilized in the final model comparing lateral transfer students to reverse transfer students. This variable captures in which of the six academic years covered in this study the transfer occurred. In other words, it represents whether students transferred during their first year of college or during one of the subsequent five. The set of enrollment variables will help determine whether there are significant differences in the early college trajectory of Latina/o students that may lead them to take different pathways later down the line.

Institutional variables. The independent institutional-level variables represent the student peer characteristics, structural-demographic characteristics, aggregate student experiences, aggregate environmental pull components, and aggregate student attitudes of Titus' (2004) conceptual model of student persistence. The racial/ethnic diversity of the student body

as represented by the percent of full-time equivalent undergraduates that are underrepresented minority (URM) students, and the percent that receive federal Pell grants capture peer characteristics.

Structural-demographic variables include institutional control (public or private), selectivity as measured by the institutional average composite SAT score divided by 100, geographic region, designation as a Hispanic-Serving Institution (HSI) or an emerging-HSI, size as measured by the number of full-time undergraduates, and one financial measure. Geographic region is important to include because some regions have more four-year institutions and some have more two-year institutions, which can potentially influence the direction of student enrollment mobility. Designation as a Hispanic-Serving Institution (HSI) is defined as a not-for-profit degree-granting institution that has 25 percent or more undergraduate full-time-equivalent Latina/o enrollment (Santiago, 2006), while designation as an Emerging-HSI is defined as an institution with 15 to 24 percent Latina/o enrollment (Santiago & Andrade, 2010). The number of HSIs is not static and this variable represents each institution's designation in 2004. Finally, expenditures per full-time-equivalent student represent the institution's financial resources.

The fact that nearly full cohorts of entering students from the institutions in the sample participated in the 2004 TFS allows for the creation of the peer contexts measures that are part of Titus' (2004) model. In this study, aggregate student experiences are captured through the aggregate of the full freshman cohort's responses on the Likelihood of College Involvement construct and on the single-item indicating whether they will live on or off campus. Aggregate student attitudes are captured through peer intentions to transfer, a measure that has been previously conceptualized as the "peer retention climate" and represents the peer attitude of institutional commitment to the first institution attended (Oseguera & Rhee, 2009). Lastly,

aggregate environmental pull is captured with measures representing peers' distance from college to home and financial concerns, as well as the percent of the student body that is enrolled part-time.

Analysis. Several statistical analyses were employed in order to answer the first two research questions pertaining to the characteristics associated with Latina/o student lateral and reverse transfer from a four-year institution and the role of academic undermatching. First I ran a series of descriptive analyses to create a set of baseline rates that can be used to contextualize the study. Thereafter, I followed with the primary analysis that employed hierarchical generalized linear modeling (HGLM), a multi-level statistical technique. The following sections provide a detailed description of each stage of the analysis examining lateral and reverse transfer, starting with the descriptive analysis, then missing data procedures, and finally the HGLM models.

Descriptive analysis. In order to set the context for the proceeding analyses, I began by running descriptive statistics including frequencies, crosstabs, and post-hoc tests of statistically significant differences to compare lateral and reverse transfer rates for Latina/o, American Indian, Asian, Black, Multiracial, and White students, using the weighted national sample. I also examined the relationship between transfer and six-year persistence, the length of time that students remained at their first institution before transferring, and the extent of academic undermatching for the Latina/o sample. Following, I examined the means, standard deviations, and frequencies for all of the variables in the multi-level model to check for outliers and normality. I also ran correlations and consulted collinearity diagnostics including the variance inflation factor to detect multicollinearity and get a sense of how all of the independent variables are related to one another and to the dependent variables. This resulted in the elimination of

several variables and helped create parsimony in the final HGLM models.

Missing Data. Missing value analysis revealed random missing data patterns and only six variables with more than 5% missing values. Of those, only SAT composite score with 14.9% missing cases had more than 10% missing and, therefore, the results pertaining to this measure should be interpreted with caution. Before compensating for missing cases, those missing data for the dependent variables and demographic characteristics were deleted from the sample. For all other continuous variables in the study, the expectation maximization (EM) algorithm was used to impute values for missing cases. EM uses maximum likelihood techniques to provide a more robust method than other missing value techniques such as listwise deletion or mean replacement (McLachlan & Krishnan, 1997)

Hierarchical Generalized Linear Modeling (HGLM). For the main analysis addressing the first two research questions, a series of three separate two-level HGLM models were constructed using the software package HLM 6.0, which employed a multinomial logit link function to determine the influence of both student and institutional-level characteristics on Latina/o students' likelihood of engaging in lateral or reverse transfer. In the 2004 TFS database, students are nested within institutions, not randomly selected. Multi-level analytical techniques are appropriate when analyzing such clustered data (Hox, 1998) because if students within institutions are more similar than students across different institutions, the final estimates of the variance and standard errors will be biased and can result in a Type I statistical error (Muthen & Satorra, 1995; Raudenbush & Bryk, 2002). HGLM also allows for the examination of the contextual effects of campuses on student mobility patterns. Lastly, HGLM allows for a more efficient estimation of cross-level effects to examine how one variable can affect the interaction between another at a different level and the outcome (Raudenbush & Bryk, 2002).

The special case of HGLM using a multinomial outcome is an appropriate method when the dependent variable has a categorical structure and arbitrary coding values (Hosmer & Lemeshow, 2004; Raudenbush & Bryk, 2002). In multinomial HGLM models, M represents the possible number of categories of the outcome, and $M - 1$ is the number of probabilities required to specify the possible outcome. In this case, the use of a three-point outcome examining the probability that the response, R , takes on the value of m allows for the simultaneous examination of the log odds for each of the two types of transfer against a specified referent group, as represented by Equation 3.1:

$$\begin{aligned} \text{Prob}(R_{ij} = 1) &= \phi_{1ij}, \\ \text{Prob}(R_{ij} = 2) &= \phi_{2ij}, \\ \text{Prob}(R_{ij} = 3) &= 1 - \phi_{1ij} - \phi_{2ij} \end{aligned} \quad (3.1)$$

where i denotes the student, j denotes the institution, and ϕ_{mij} corresponds to students' probability of falling into outcome category m relative to the reference category (Raudenbush & Bryk, 2002, p.326). For this study, two multinomial HGLM models were built. One compared lateral and reverse transfer students to students who had no departure from their first institution attended. The second model compared lateral and reverse transfer students to students who dropped out of the entire higher education system. The *no departure* referent group is defined as having no exclusive enrollment at an institution other than the four-year institution of origin during the non-summer months in the 2004 through 2010 period. The *dropout* referent group is defined as stopping out and not returning to higher education during the six-year period covered in this study. A third HGLM model was constructed, but it had a dichotomous outcome rather than a multinomial one, simply comparing the characteristics that increase the likelihood of one type of transfer over the other in order to fully tease out the unique predictors of each pathway.

The building of each of the three models occurred in three steps. The first step involves

building a fully unconditional model with no explanatory variables at level-1 or level-2 and a randomly-varying intercept to determine the amount of variance in the outcome between clusters (Raudenbush & Bryk, 2002), as represented by Equation 3.2:

$$\begin{aligned} \eta_{mij} &= \beta_{0j(m)} \\ \beta_{0j(m)} &= \gamma_{00(m)} + u_{0j(m)} \end{aligned} \quad (3.2)$$

where m represents the three levels in the multinomial outcome, η_{mij} represents the log-odds of m type of transfer relative to the reference group (no departure or dropout), $\beta_{0j(m)}$ represents the average of the outcome subtracted from the grand mean, $\gamma_{00(m)}$ represents the average likelihood of selecting response m across all institutions, and $u_{0j(m)}$ represents the random variance component for institution j for response outcome m .

The within-group homogeneity that would warrant the use of hierarchical linear modeling is typically determined through the calculation of the intra-class correlation coefficient (ICC) using the level 1 and the level 2 variance estimates produced through this null model. However, due to the heteroscedasticity of the variance at level 1, an intra-class correlation coefficient cannot be computed. Instead, an examination of the randomly varying error component at level 2 indicated that there is significant variation between institutions in the log-odds of the outcome, thus warranting the continued building of the models.

The second step involved the creation of a conditional student-level, or within-institution, model that includes all of the characteristics outlined in the conceptual model (Fig.3.1). Blocks of variables were entered one at a time to gain an understanding of how each set influences the effect of the others. In correspondence with the conceptual model, Equation 3.3 represents how the pair of logits at level 1 was modeled as a function of each of the blocks of variables in the model (Raudenbush & Bryk, p.328):

$$\eta_{mij} = \beta_{0j(m)} + \beta_{1j(m)} * (\text{BACKGROUND}) + \beta_{2j(m)} * (\text{HIGH SCHOOL EXPERIENCES AND ACADEMIC PREPARATION}) +$$

$$\begin{aligned} & \beta_{3j(m)}*(\text{ACADEMIC UNDERMATCH}) + \beta_{4j(m)}*(\text{SENSE OF} \\ & \text{PURPOSE AND INSTITUTIONAL ALLEGIANCE}) + \\ & \beta_{5j(m)}*(\text{ENVIRONMENTAL PULL FACTORS}) + \\ & \beta_{6j(m)}*(\text{ANTICIPATED COLLEGE EXPERIENCES}) + \\ & \beta_{7j(m)}*(\text{ENROLLMENT MEASURES}). \end{aligned} \quad (3.3)$$

where m represents the outcome value, i denotes the student, j denotes the institution, and η_{mij} corresponds to the log-odds of outcome m given the value of the variables in the equation.

As the third step in the multinomial models, the institutional characteristics were added in blocks to determine how students' institutional contexts, coupled with their own individual characteristics, are related to their probability of lateral or reverse transferring compared to having no departure or dropping out. In the dichotomous HGLM model, the third step determined how the context is related to students' probability of taking one transfer path over the other. The level 2 model is represented by Equation 3.4, where $\beta_{0j(m)}$ represents the intercept as a function of all sets of variables in the model, $\gamma_{00(m)}$ represents the average likelihood of having outcome m across all institutions, and $u_{0j(m)}$ represents the random variance component for institution j on outcome m (Raudenbush & Bryk, p.329):

$$\begin{aligned} \beta_{0j(m)} = & \gamma_{00(m)} + \gamma_{01(m)}*(\text{PEER CHARACTERISTICS}) + \gamma_{02(m)}* \\ & (\text{STRUCTURAL DEMOGRAPHIC}) + \gamma_{03(m)}*(\text{AGG. STUDENT} \\ & \text{EXPERIENCES}) + \gamma_{04(m)}*(\text{AGG. ENVIRONMENTAL PULL}) + \\ & \gamma_{01(m)}*(\text{AGG. STUDENT ATTITUDES}) + u_{0j(m)} \end{aligned} \quad (3.4)$$

The HLM software utilized for this analysis has two centering options for the independent variables included in the analytical model: grand-mean centering and group-mean centering. The selection of a centering option as opposed to leaving raw scores requires careful consideration as it affects both the parameter estimates and the interpretation of the intercept, but it can be particularly helpful when predictors have considerably different scales or when the raw scores do not have a meaningful scale (Kreft, de Leeuw, & Aiken, 1994). In this study, grand-mean centering was applied to all non-dichotomous variables in the analysis because it adjusts

for between-institution differences in student-level variables by subtracting the overall mean from each person's value on the variable (Raudenbush & Bryk, 2002). Overall, this series of models examined the unique characteristics influencing each type of transfer, compared to other forms of persistence as well as non-persistence.

Research Design II: Identifying Institutional Networks in California

To complement the focus on students in the first portion of the study, the second piece focuses on the institutions that send and receive mobile students who started their college careers at four-year institutions. Similar to the first research design, the set of analyses for this study relied upon multiple sources of data to create a complete description of the characteristics and patterns of institutional networks that develop as a result of individual Latina/o student enrollment mobility in California. The following sections provide detailed descriptions of said data sources, as well as of the samples and analytical techniques used for both the descriptive analysis that set the context of mobility in California and the social network analysis that was conducted on a subsample to address the second and third research questions.

Data source. This portion of the study drew on the same three sources of data that were utilized in the first research design. That is, it used the term-to-term enrollment data from the National Student Clearinghouse (NSC) that has been matched for the sample of students who participated in the 2004 administration of the CIRP Freshman Survey (TFS). As previously mentioned, the NSC is the most comprehensive source of enrollment and degree information in the country, as it tracks student enrollment mobility across individual institutions, higher education systems in a state, and also across state lines. Since the focus of the main analysis in this part of the study is on the institutions that send and receive mobile Latina/o college students, rather than the students themselves, the majority of the measures in the analysis came from 2004

IPEDS data that was also merged with the NSC and TFS data.

Sample. In order to set the context of mobility in California, the full matched national sample of TFS and NSC data (n=239,136) was used to compare rates of reverse and lateral transfer across racial groups for students in the state and those outside of the state. Additional descriptive analyses on academic undermatch and six-year enrollment outcomes were conducted with only the Latina/o sample (n=10,967), of which 3,553 began college at one of 34 different public and private four-year institutions spread throughout the northern, central, and southern regions of California. Weights were applied to all descriptive analyses using this sample.

Due to the complexity of social network analysis, that analysis focused on one region that included the most variety of institution types and selectivity levels, and also had the largest student sample. In order to have some degree of representativeness, the sample was also be filtered to include only those institutions that were considered to have normative data judged to be representative of their entire first-time full-time freshmen class in 2004 (Sax et al., 2004). Lastly, institutions with fewer than 50 Latina/o students were excluded in order to make the results more meaningful, especially since only a percentage of students at each institution transfer. The final institutional sample consisted of nine four-year colleges and universities where 2,253 Latina/o students began college in 2004 and from which 501 of them transferred to another two or four-year institution within six years. Six colleges and universities in the sample are under public control, three representing the comprehensive university system in the state and three representing the research university system. Among the sample of three private institutions, one is a university, and two are colleges with religious affiliation. The nine institutions include non-HSIs, Emerging HSIs, and HSIs. They also range in level of Barron's selectivity categories (see Appendix C for detailed description of Barron's categories).

Table 3.1 Description of Institutions in Sample (n=9)

Name	Sample Size	Institution Type	Barron's Selectivity	HSI Designation
<i>Public Comprehensive Universities</i>				
Competitive Comprehensive 1	219	Public College	Level 3	Yes
Competitive Comprehensive 2	262	Public College	Level 3	Yes
Competitive Comprehensive 3	414	Public College	Level 3	Yes
<i>Public Research Universities</i>				
Most Competitive Research 1	226	Public University	Level 6	Emerging
Highly Competitive Research 2	225	Public University	Level 5	No
Competitive Research 3	455	Public University	Level 3	Yes
<i>Private Nonprofit System</i>				
Most Competitive Private 1	204	Private University	Level 6	No
Very Competitive Private 2	86	Catholic College	Level 4	Emerging
Very Competitive Private 3	162	Catholic College	Level 4	Yes

Defining the relationship of interest. Network analysis focuses on the relationship (or “links”) between “actors”—in this case, institutions. The relationship of interest in this study is the one formed between institutions that send and those that receive mobile Latina/o students. Since this study only examines the patterns formed as a result of students’ first move out of the four-year institution attended in fall 2004, the set of sending institutions is confined to the nine colleges and universities identified in Table 3.1. The list of receiving institutions was determined through the creation of algorithms whereby a second institution attended variable was computed using the Clearinghouse dataset. The matched TFS and NSC dataset lists the six-digit identification codes originally created by the Federal Interagency Committee on Education (FICE) for each institution that a student attended during each term in the six-year period. The algorithms identified the first mismatch from the origin school FICE code for each student, regardless of when the first move occurred in their college trajectory. All two-year institutions in the study are receiving schools, but it is possible that a four-year sending institution can also turnout to be a receiving institution if students from other colleges and universities in the sending institution sample transferred there. Three multi-campus for-profit receiving institutions had to

be excluded from the analysis because their FICE code only identified the institution name but not which of their locations, making IPEDS data for them unattainable. To maintain consistency, another four for-profit institutions were also excluded; resulting in a total exclusion of seven campuses that combined received 13 Latina/o students. The final receiving institution sample included 105 non-profit higher education institutions.

Node attributes. To understand the significance of the networks that emerge as a result of student enrollment mobility, it is necessary to have a set of information about each institution (or “node”) to better understand the links between sending and receiving campuses. The measures in the node attribute file come from IPEDS and include institutional control, selectivity, location, HSI status, published in-state tuition and fees, and percent of students receiving loan aid. Table 3.2 shows the coding scheme for each of the measures.

Table 3.2 Node Attributes and Coding Schemes

Measure	Coding Scheme
Control	1= Public, 2=Private
Selectivity	1=Non-competitive, 2=Less competitive, 3=Competitive, 4=Very Competitive, 5=Highly Competitive, 6=Most Competitive
Location	Unique value for each institution based on longitude and latitude coordinates
HSI Status	1=Non-HSI, 2=Emerging HSI, 3=HSI
Tuition and Fees	Continuous variable, based on published in-state tuition and fees for the 2004-2005 academic year
Loan Aid	1 to 100, based on the percent of full-time undergraduates receiving loan aid

Source: 2004 IPEDS data

Social network analysis. The main analysis in the second research design explored the relationships between those higher education institutions that send and those that receive mobile Latina/o students in order to understand how individual student enrollment mobility pathways give rise to more holistic patterns. Uncovering these patterns of relationships can show how institutions are intrinsically linked together in informal ways, which can then be compared to

how they are or should be formally linked together through policy or practice. To examine these patterns, social network analysis (SNA) was employed. SNA is an appropriate analytic technique as it is generally defined as the statistical study of the structure of interaction (McFarland, Diehl, & Rawlings, 2011). It is primarily used to examine social relationships in terms of nodes and links (or edges) and how those relationships ultimately affect behaviors. Nodes are the actors within the social networks and links are the relationships between them (Wasserman & Faust, 1994). The analysis was conducted using ORA, a network software developed by the Center for Computational Analysis of Social and Organizational Systems at Carnegie Mellon University (Carley, Pfeffer, Reminga, Storrick, & Columbus, 2013).

The network analyses took place in several steps. First, after identifying the full set of sending and receiving institutions in the sample, the information was transformed into a set of matrices describing the non-symmetric relationships between institutions. The relationships are non-symmetric because they are directional; only the sending institutions can send transfer students to other campuses. Rather than contain a dichotomous indicator of whether a relationship exists between any pair of institutions, each cell in the matrices indicated the amount of movement occurring between the two, or the strength of the tie. This was important because institutions have different sample sizes, and as such, individual students transferring from different institutions should not be given equal weight. The strength of ties is a central idea in SNA, with weak ties being considered important bridges between actors but strong ties being most influential in affecting behavior (Granovetter, 1973). After examining the transfer rates out of each of the nine sending institutions, the cutoff criteria for different levels of weights based on the proportion of transfer students from each campus that move to the same receiving institution was established. This resulted in the creation of five weights, the lowest of which represents that

between one and five percent of the transfer students from an individual campus moved to a particular receiving one. Weights two through four each represent a subsequent five-percent range, and the fifth and largest weight represents a move of more than 20% of transfer students.

Because of the complexity of the graphs produced through SNA using large datasets, the main analysis was parceled into eight different components, each using its own matrix. The first involved the analysis of a complete network, which selects a set of nodes and looks at only their relationships to each other (Borgatti & Ofem, 2010). The complete network in this case utilized only the nine sending institutions and the links between them. The examination of the other seven components used egocentric network analysis, which revolves around a set “egos” (focal nodes) and their links to all “alters” (actors connected with the ego) (Marsden, 1990). In other words, it looked at a sample of sending institutions and their full set of relationships to others, including those not in the sending sample. The seven ego networks are those of the nine sending institutions and their relationships to all receiving institutions, and the reverse and lateral transfer networks for each of the three sending institution types (comprehensive, research, private). Egocentric network analysis was appropriate for these components because complete census information for every single four-year institution in California to analyze each one as a sending institution was not available.

Network statistics. The analysis of each of the eight components included the examination of network statistics. In the whole network analysis of nine sending institutions, it is possible for symmetric links to exist because the institutions can send students to each other. One of the most important network statistics to examine in this type of network is density. The concept of density is an effort to summarize the full distribution of links to understand how far the network is from a state of completion and is calculated by the total number of existing

connections as a proportion of the total number of possible connections (Scott, 2013).

In an ego network, the density statistic is not interpretable unless second-order relationships are examined for the alters, which was not possible using the dataset for the present study (Borgatti & Ofem, 2010; Knoke & Yang, 2008). There are other network statistics, however, that can apply to both whole and ego networks, including centrality. There exist a number of centrality measures that take into account number of paths between nodes and connection to other well-connected nodes (Borgatti, 2005), but the centrality measure of most use given the structure of this study is degree centrality. Degree centrality is a node level metric that measures the amount of links connected to each individual node. With directed data such as the one used in this study, it is possible to calculate two separate measures capturing centrality: a) in-degree, or the number of institutions sending transfer students to the node, and b) out-degree, or the number of receiving institutions to which a node sends transfer students (Scott, 2013). In other words, the centrality measures indicate which colleges and universities are the most common sending and receiving institutions in the network.

Graphs. One of the defining characteristics of SNA is its visual component. The analysis of the matrices will produce a set of directive graphs, known as “sociograms,” demonstrating the patterns of movement between institutions. Each institution is represented in the graphs with a circle, the links are represented with a line, and the direction of the relationships is represented with arrows. The software also allows for the visual demonstration of the weight for each link, as well as several node attributes.

Testing propositions. As presented in Chapter 2, Social Network Theory (Barnes, 1954; Scott, 2000; Wasserman & Faust, 1994) will guide the propositions being tested through the social network analysis. In particular, testing the propositions of homophily (“sameness”) and

propinquity (“nearness”) is important in truly creating an understanding of the patterns that emerge through individual student mobility (Kadushin, 2004; McPherson et al., 2009). As such, for each pair of connected nodes, the amount of change in several of the node attributes from sending to receiving institution and the distance between them was examined.

Limitations

There are a number of limitations associated with this study that will be reviewed in this section. First, the analysis relies on the use of secondary data. All three sources of data were collected for distinct purposes separate from the study of student enrollment mobility, and thus, the study is limited to the variables available in the 2004 TFS, the NSC, and IPEDS. The Clearinghouse data, for instance, includes where students enrolled during every term covered in the six-year period of the study, but it does not include information about their enrollment status to distinguish between full-time and part-time enrollment. Likewise, the TFS offers limited information about students’ hometowns, which would make a more objective measure of distance of college from home and help contextualize enrollment mobility. Furthermore, the data from the 2004 TFS is primarily based on students’ self-assessments, which are themselves accompanied by a number of limitations (Porter, 2011). A number of the key measures in the study, however, can only be obtained through self-reports, such as students’ intended likelihood of transferring and other expectations for college.

A second major limitation involves the lack of variables available to measure experiences during college. The use of high school experiences and entering college student expectations as proxy variables for college academic and social experiences limits the ability to fully test Nora’s (2003) student-level model and draw out the differences between students who are retained at one institution and students who persist through multi-institutional enrollment. Even though

high school academic performance measures such as high school grade point average have been found to reasonably predict college grades (Cole & Kinzie, 2007), it is important to note that student intentions and expectations for college may not manifest into reality and consequently, may not accurately reflect future performance or involvement. A final limitation related to the use of only entering student measures is the inability to explain why mobility occurs—it is only possible to speculate. Nonetheless, the analysis in this study can help to paint a picture of the characteristics of entering Latina/o students who are more prone to transfer out of their first four-year institution.

A third limitation is related to the outcome. In this study, transfer is defined as the first move out of the original four-year institution. Though this definition falls in line with the definition utilized by the National Student Clearinghouse (Hossler et al., 2012a, 2012b), other researchers consider subsequent enrollment in classifying students. For instance, if a student reverse transferred and then returned to their original four-year institution, he or she might be considered a “swirler” who has moved back and forth rather than a reverse transfer student (McCormick, 2003). However, given the growing share of students who are graduating from a different institution than the one where they began (Shapiro et al., 2012), it is important to understand their first point of departure from the “traditional” path. Also related to the transfer outcomes, it is important to mention that while comprehensive, the National Student Clearinghouse is not a full census of higher education institutions. Two percent of colleges and universities in the country do not participate and thus, it is possible that the rates of transfer presented in the results chapters are underreported.

Another limitation tied to the outcome is that transfer occurs at different points in time for different students, and a distinctive set of characteristics might be associated with the move at

the different stages. As in, students who transfer after the first year might look different than students who transfer after the third year, but the analysis in this study aggregates first move regardless of when it happened. To compensate, I present descriptive information about the percent of students who left their first institution in each of years one through six. These statistics will be used when drawing conclusions about the findings and will also help to situate the point of departure within the broader financial context since the country experienced an economic crisis during the latter half of the period covered in the study.

With regard to the key variable of academic undermatch, aside from not being as robust a measure as has been used in other studies (Bowen et al., 2009; Roderick et al., 2008; Smith et al., 2013), it is operationalized around the variable that had the highest level of missing values in the study. For the full Latina/o national sample, SAT was missing for 14.9% of students and for the California sample it was missing for 12.8% of students at comprehensive and 17.8% of students at private institutions. EM is an appropriate and robust technique to replace values for that amount of missing data, but the results pertaining to academic undermatch should still be interpreted with caution.

A final limitation has to do with the ethnicity variables available in the database. Latina/os are a heterogeneous population coming from more than 20 countries of origin, but the ethnicity variable is limited to Mexican-American/Chicana/o, Puerto Rican, and Other Latina/o. The Other Latina/o category makes up a large portion of the sample and it would be ideal to disaggregate it further. Given the wide array of immigration histories and cultural backgrounds of this population, a more focused look at particular ethnic groups might also provide distinct findings. However, given that no research has examined college student mobility among Latina/os in general, this study still provides an important first step in understanding within-

group differences. Moreover, the unique combination of the three data sources allows for a distinctive examination of Latina/o student enrollment mobility that can contribute important insights to understanding the pathways through college for this population of students.

The following two chapters present the results from the HGLM and Social Network analyses examining the characteristics of mobile Latina/o students and their patterns of movement across institutions. The sixth chapter concludes with a discussion of these results as well as their implications for research, policy, and practice.

CHAPTER 4: LATINA/O STUDENTS' PATHWAYS THROUGH COLLEGE

This chapter focuses on the characteristics associated with four different pathways through college for Latina/o students who enrolled in a four-year institution directly after high school: 1) lateral transfer from one four-year institution to another, 2) reverse transfer from one four-year institution to a two-year institution, 3) dropout from higher education, and 4) having no departure from the first college attended. The specific objective of the analysis was to answer research questions 1 and 2, which collectively address: 1) student and institutional characteristics that contribute to lateral transfer, 2) student and institutional characteristics that contribute to reverse transfer, and 3) to determine whether Latina/o students who academically undermatch at the time of enrollment are more or less likely to transfer. Five separate hierarchical generalized linear (HGLM) models were conducted examining differences between students who transfer and students who dropout or who do not depart their initial institution. The analytical model included seven student-level categories, including student background, high school experiences and academic preparation, sense of purpose and institutional allegiance, and anticipated college experiences, which were guided by Nora's Student/Institution Engagement Model (2003). The other two student-level categories, academic undermatch and enrollment measures, were added based on the persistence literature. Five additional groups of variables were entered at the institutional level guided by Titus' (2004) conceptual model of persistence, including student peer characteristics, structural demographic characteristics, aggregated peer experiences, aggregated peer attitudes, and aggregated environmental pull factors.

The chapter begins with a presentation of results from cross-tabulations that provide an

overview of transfer and academic undermatch rates. Next, an overview of the student and institutional sample is presented using results from one-way analysis of variance (ANOVA) and posthoc tests with Bonferroni adjustments demonstrating any differences in independent variables across students who engage in each of the four pathways. Finally, results from each of the five multinomial HGLM analyses are presented and the chapter concludes with a comparison of results across all of the models.

Descriptive Results

Rates of different pathways through college. Before identifying characteristics associated with the two forms of transfer out of a four-year institution for Latina/o students, it is important to know their rates of participation in each of the four pathways through college in the study and how these rates compare to those of other racial groups as a context for understanding the results. The pathways of interest are reverse transfer and lateral transfer, and the two comparison groups are dropout and no departure from the initial institution. Table 4.1 shows the rates of engagement in each of the four pathways through college for American Indian, Asian, Black, Latina/o, White, and multiracial students, using national weighted data.

Table 4.1. Pathways Through College for Weighted National Sample, by Racial Group

	American Indian (n=848)	Asian (n=16,138)	Black (n=17,697)	Latina/o (n=10,963)	White (n=175,992)	Multiracial (n=13,615)
Reverse Transfer	14.0	10.1	16.7	19.1	11.5	14.8
Lateral Transfer	15.1	8.5	16.2	10.8	14.4	14.1
Dropout	28.6	6.8	20.7	15.5	9.3	13.7
No Departure	42.3	74.6	46.5	54.6	64.7	57.5

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data. N's reflect unweighted sample size.

Starting with reverse transfer, 19.1% of all Latina/o students make a move to a two-year school within six years of starting college. This figure is higher than all other racial groups, with

16.7% of Black, 14.5% of multiracial, 14% of American Indian, 11.5% of White, and 10.1% of Asian students reverse transferring. In contrast, Latina/os have the second to lowest rate of lateral transfer at 10.8%, compared to 16.2% of Black, 15.1% of American Indian, 14.4% of White, and 14.1% of multiracial students. Only Asian students have a lower rate of movement from four-year to four-year institution with only 8.5% engaging in that pathway.

In terms of dropping out, 15.5% of Latina/os leave their initial institution and do not return there or elsewhere during the six-year period after initial college enrollment. Their rate falls in the middle of all groups, with White and Asian students having lower rates, and American Indian and Black students having higher rates of departure from higher education altogether. Likewise, Latina/o students are in the middle when it comes to retention at their initial four-year institution, with White and Asian students having higher rates, and American Indian and Black students having lower rates. Using single institution retention figures that do not take into account transfer pathways, the 54.6% no departure figure for Latina/os would suggest that almost half of all Latina/o students dropout of college without a degree. However, as is evidenced here, only 34.2% of the students who depart their first school (15.5% of all Latina/o students) actually dropout of the higher education system altogether. The following subsection will examine the six-year outcomes for Latina/o students who enroll elsewhere upon departure.

Six-year persistence and completion rates by pathway. Having placed Latina/o students within the larger context of enrollment mobility in higher education, the rest of the chapter focuses strictly on their experiences. Table 4.2 shows the six-year persistence and completion outcomes across each of the four pathways for Latina/o students who start at four-year institutions. The last three rows in the table show the aggregated outcomes for all transfers (lateral and reverse), all non-transfers (dropout and no departure), and all Latina/o students as a

whole. Confirming prior research (Goldrick-Rab & Pfeffer, 2009), Latina/o students whose first transfer is to another four-year institution graduate at higher rates (46.4%) than those whose first move is a reverse transfer (14.3%), but at lower rates than students who never depart their initial school (90.8%). This is alarming given that almost one-fifth of Latina/os reverse transfer. Of those who do transfer, 39.9% leave higher education at some point after the transfer, compared to only 22.1% of those who did not transfer. Nonetheless, 26.2% of Latina/os who transfer out of their first four-year institution graduate and another 33.9% remain enrolled at a two- or four-year institution after six years, highlighting the importance of disaggregating departure pathways and students' continuing participation in higher education.

Table 4.2. Six-year Outcomes for Latina/o Students, by College Pathway

	Not Enrolled	Still Enrolled at Two-year	Still Enrolled at Four-year	Four-year Degree Completion
Reverse Transfer	46.4	26.2	13.2	14.3
Lateral Transfer	28.6	2.9	21.7	46.9
Dropout	100.0	0.0	0.0	0.0
No Departure	0.0	0.0	9.2	90.8
All Transfers	39.9	17.7	16.2	26.2
All Non-Transfers	22.1	0.0	7.2	70.7
All Latina/os	27.4	5.3	9.9	57.4

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data.

It is important to note that 13.5% of all Latina/o transfer students (4% of total Latina/o sample) re-enroll at their initial four-year institution at some point after the transfer, with the rates being higher for reverse transfer (17.1%) students than lateral transfer (7.3%) students (figures not shown in Table 4.2). This suggests that there is more potential for four-year institutions to recover their reverse transfer student enrollment, indicating a need for partnerships with community colleges. Table 4.3 shows that 7% of reverse transfer students and 4.9% of lateral transfer students return and earn their bachelor's at their first four-year school, while another 3.8% of reverse transfer and 1.3% of lateral transfer students return and remain enrolled

at that initial institution at the end of six years. Even so, a larger proportion of Latina/o transfer students persist at a different institution than the one where they first begin college. This suggests that the majority of students who reverse and lateral transfer are not just leaving on a temporary basis, but are actually committed to the move. Among reverse transfer students, 16.7% subsequently transfer from the two-year to a different four-year institution and graduate or remain enrolled there after six years. Among lateral transfer students, 62.4% graduate from or remain enrolled at a four-year institution different from the one where they began after six years.

Table 4.3. Post-Transfer Enrollment for Latina/o Reverse and Lateral Transfer Students

	Enrolled at Initial School	Enrolled at Other 4-year	Graduated from Initial School	Graduated from Other 4-year
Reverse Transfer	3.8	9.4	7.0	7.3
Lateral Transfer	1.3	20.4	4.9	42.0

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data.

To further understand what persistence looks like for Latina/o students as a whole, Figure 4.1 demonstrates six-year higher education system-wide persistence rates. Although only 54.6% of students stay at their initial four-year institution, 29.9% of students initially continue to persist through one of the transfer pathways. Only 15% of Latina/o students who leave their first institution actually cease enrollment in higher education altogether and fail to return to any institution within six years. Another 11.9% of students take one of the transfer pathways but eventually also leave higher education, suggesting that transfer students face hurdles on their pathways and need support to continue persisting. Nonetheless, 18% of all Latina/o students who enroll at a four-year institution after high school depart that institution but graduate from or remain enrolled at another two or four-year institution after six years. What this means is that inclusive of transfer pathways, 57.4% of all Latina/o students graduate and 15.2% remain enrolled, which means that 72.6% of all Latina/o students who begin at four-year institutions persist in the higher education system after six years. This indicates that acknowledging

differences in departure and taking a more proactive approach at facilitating system-wide persistence has the potential to increase overall Latina/o completion rates.

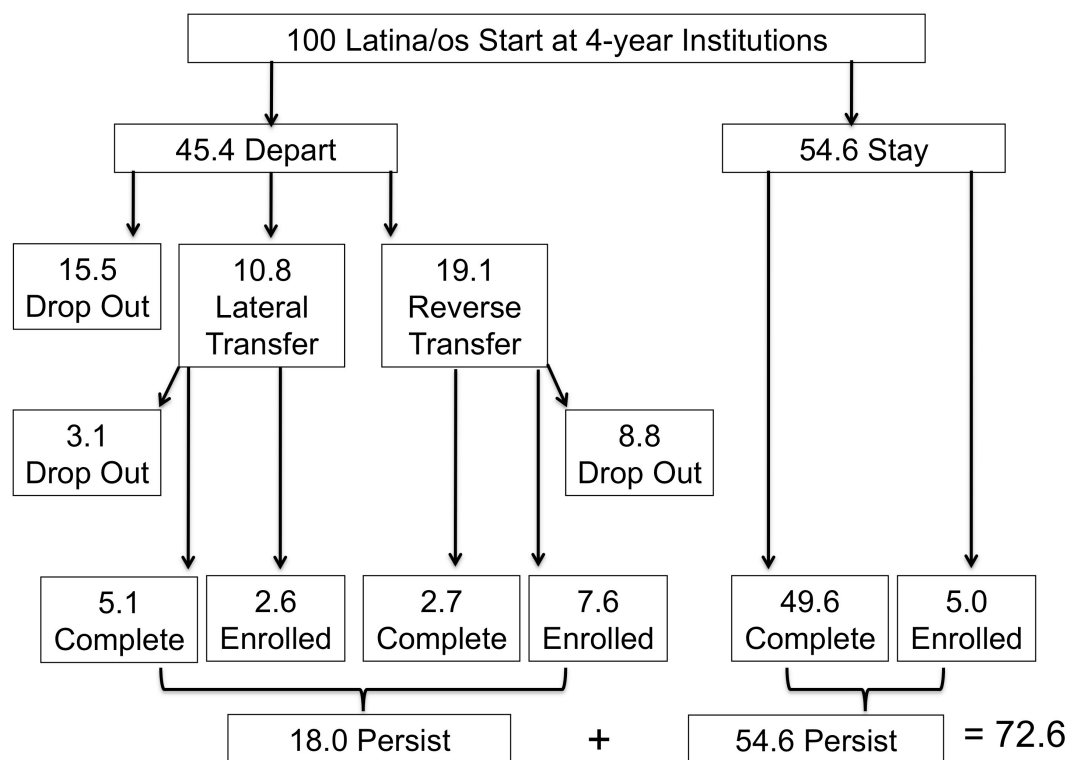


Figure 4.1. Six-year Latina/o Student Persistence Inclusive of Transfer Pathways.

Timing of transfer. Table 4.4 demonstrates the timing of reverse and lateral transfer for Latina/o students. For a transfer to be counted as happening during year one, students need to enroll at another institution in the winter or spring of their first year after completing their first term. To be counted during years two through six, the enrollment at another institution needs to take place in the fall, winter, or spring of the respective academic year. The majority of Latina/o students' first movement out of their initial four-year school takes place during their second year of college, with 39.8% of all transfers happening during that academic year. Table 4.4 shows there are minimal differences in the timing of the transfer between students who reverse and students who lateral transfer. The rates for each during the first two years are very close to each other. In fact, the same percentage (47.7%) of both lateral and reverse transfer occurs by the end

of year two. Another 25.5% of lateral transfers happen during the third year of college, which is 3.9% more than reverse transfers, who move at slightly higher rates during years four through six. Overall, though most movement occurs in the earlier college years, 29.4% of all transfers still happen in academic years four through six. Taking that figure as a proportion of all Latina/o students, it means that 8.8% of all Latina/o students leave for another institution sometime after completing three years of college, which is still a considerable amount of movement and suggests that retention efforts focused on the first and second years of college are not enough.

Table 4.4. Timing of Reverse and Lateral Transfer for Latina/o Students

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Reverse Transfer	8.0	39.7	21.6	13.5	10.7	6.5
Lateral Transfer	7.5	40.2	25.5	12.8	8.7	5.4
All Transfer	7.8	39.8	23.0	13.3	10.0	6.1

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data.

Transfer rates by institutional characteristics. Table 4.5 shows the percent of Latina/o students compared to all students who reverse and lateral transfer, by characteristics of their first institution attended. In terms of institutional control, there appears to be very minimal difference between public and private institutions when looking at the aggregate Latina/o transfer rate. However, a considerable difference exists for Latina/o students when separately examining the two transfer pathways. Roughly one-fifth (20.8%) of Latina/o students at public institutions reverse transfer compared to 14.6% of Latina/o students at private institutions. The six-percentage point difference between public and privately controlled institutions also exists for lateral transfer, but in this case the gap is reversed with 15.2% of students at private and 9.1% of students at public institutions taking this pathway. Though both types of institutions send almost one-third of their Latina/o students to other colleges and universities, there are considerable differences in two versus four-year destinations, suggesting that students at public institutions are more susceptible to eventually taking community college courses. These differences between

public and private institutions are more pronounced for Latina/o students than for others, as demonstrated by the smaller gap in lateral and reverse transfer rates for all students.

Table 4.5. Percent of Latina/o Students and All Students who Transfer, by Characteristics of First Institution Attended

	<u>Reverse Transfer</u>		<u>Lateral Transfer</u>		<u>All Transfer</u>	
	Latina/o	All	Latina/o	All	Latina/o	All
Control: Public	20.8	13.8	9.1	13.1	29.9	27.0
Control: Private	14.6	10.2	15.2	15.4	29.8	25.6
Select 1: Non-Competitive	31.7	23.8	16.9	23.6	48.6	47.5
Select 2: Less Competitive	19.9	17.2	14.6	18.6	34.5	35.8
Select 3: Competitive	21.3	15.1	10.0	14.9	31.3	30.1
Select 4: Very Competitive	17.1	10.7	11.3	12.9	28.4	23.6
Select 5: Highly Compet.	10.8	6.4	8.8	11.3	19.6	17.8
Select 6: Most Competitive	5.2	2.1	5.4	5.3	10.6	7.4
HSI	25.1	22.2	9.0	12.6	34.1	34.8
Emerging HSI	18.8	13.0	8.0	8.7	26.9	21.7
Region: East	12.2	10.0	13.6	13.9	25.8	23.9
Region: Midwest	25.8	15.9	10.1	14.5	35.9	30.4
Region: South	9.6	11.1	21.5	15.6	31.1	26.6
Region: West	21.1	14.1	8.7	11.7	29.8	25.9

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data.

Clear patterns also emerge for institutional selectivity, with overall transfer rates for both Latina/o students and for all students continuously decreasing as selectivity increases. The selectivity categories reflect those identified by Barron's (2005; see Appendix C). At the most competitive institutions (level 6), only 5.2% of Latina/os reverse and 5.4% lateral transfer, compared to 31.7% and 16.9% at non-competitive institutions (level 1). In contrast, 23.8% of all students reverse and 23.6% lateral transfer out of non-competitive institutions (level 1), suggesting that non-Latina/o students are more likely to remain in the four-year sector even when they depart from the least selective schools. In total, almost one-half of all students (47.5%) and Latina/o students (48.6%) transfer out of non-competitive institutions (level 1) and just above one-third transfer out of less competitive institutions (level 2), which can have negative implications for these institutions when they need to report retention rates for accountability

purposes. More importantly, Latina/o students who attend less selective institutions already have a lower likelihood of graduating (Bowen et al., 2009; Fry, 2004) and taking transfer pathways will only increase their time to degree.

A full quarter of Latina/o students (25.1%) at Hispanic Serving Institutions (HSIs) reverse transfer, a figure that is 6% higher than the Latina/o national average, but only 2.9% higher than that of all students at HSIs, indicating that students at these institutions reverse transfer at higher rates regardless of race. This may be due to HSIs generally being underfunded, which can leave students looking for other options to satisfy certain course requirements or supplement their instruction (Malcom-Piqueux & Lee, 2011). Since four-year HSIs have been lauded for providing Latina/os with college options when access to selective flagship institutions is limited (Perna, Li, Walsh, & Raible, 2010), the fact that one out of every four Latina/o students who enrolls at a four-year HSI eventually transfers to a community college is something that warrants attention. Studies have found that Latina/os who enroll at four-year HSIs prioritize college costs and proximity to home over other factors in the college choice process (Nuñez & Bowers, 2011; Santiago, 2008) and perhaps other factors not available at these institutions become important later on. Though it is likely a mixture of student and institutional characteristics that exacerbate the transfer phenomena in these contexts, HSIs are by definition Hispanic-Serving and should attempt to provide their students with resources that can help them persist even if they do not remain enrolled at those particular campuses.

The final institutional characteristic examined is region, where notable differences are also found. Overall, Latina/o students at institutions in the East transfer at lower rates than students in the rest of the country, though there is more lateral transfer taking place in that region than in both the West and Midwest. Institutions in the Midwest and West, on the other hand,

have the highest rates of reverse transfer, with 25.8% of students in the Midwest and 21.1% of students in the West departing for a community college. This may be tied to the large availability of two-year schools in those regions. Only 9.6% of students in the South reverse transfer, but this region has the highest lateral transfer rates with 21.5% of students taking that pathway.

Academic undermatch. Studies have not conclusively shown the rates of academic undermatch for Latina/o students, but research using aggregated national data has estimated that 40% of Latina/o students enroll at a four-year institution that is below the highest level of selectivity for which they may have qualified to attend (Smith, Pender, & Howell, 2012). This figure, however, is not exclusive to Latina/o students who enroll at four-year institutions but also includes students who enroll at community colleges after high school and students who do not enroll in higher education at all. Given the large representation of Latina/o students in the two-year college sector (Fry & Taylor, 2013), it is likely that many of those who academically undermatch do not enroll at four-year institutions. Among those who do, this study shows that 12.9% of Latina/o students have an SAT score that exceeds the mean of the selectivity category above the one in which they initially enroll. Nearly one-third of those academically undermatched students (4.2% of total sample) exceed the mean SAT score of institutions that are two selectivity levels above the one in which they enroll, suggesting they academically undermatch by two levels.

Table 4.6 demonstrates the pathways through college taken by academically undermatched Latina/o students who begin at four-year institutions. As an aggregate, a larger proportion of students who academically undermatch participate in the lateral transfer pathway, and a slightly smaller proportion reverse transfer, drop out, or have no departure from their initial institution than students who are not academically undermatched. Disaggregated, there are larger

differences as 16.1% of students who enroll one level below their qualifications reverse transfer, compared to 24.2% of students who enroll two levels below and 19.1% of students who do not academically undermatch. It is possible that students who enroll at institutions at least two levels below the academic selectivity they may have qualified to attend are enrolled at broad access institutions that are low resourced and overcrowded, and find it more convenient to just enroll at a two-year college where classes can be smaller and less expensive.

Table 4.6 Latina/o Pathways Through College, by Level of Academic Undermatch (AUM)

	One Level	Two Levels	All AUM	All Non-AUM
Reverse Transfer	16.1	24.2	18.8	19.1
Lateral Transfer	15.5	12.7	14.6	10.2
Dropout	14.9	12.6	14.1	15.7
No Departure	53.6	50.5	52.6	54.9

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data.

In terms of lateral transfer, 10.2% of students who do not undermatch make this transfer as their first move out of their initial four-year school, while 12.7% of those who are academically undermatched by two levels and 15.5% of those who are academically undermatched by one level take this pathway. More academically undermatched Latina/o students (35.2%) enter college indicating some or a very good chance of transferring to another college than students who are not academically undermatched (30.3%), a difference that is statistically significant ($p < .001$). Given this information, the difference in lateral transfer rates may indicate that some academically undermatched students are aware of their academic qualifications and choose their college based on important but possibly temporary non-academic factors. Alternatively, it may be that academically undermatched Latina/o students are not aware of which institutions their qualifications and financial options can get them into, but once enrolled they begin to feel unchallenged or they learn more about financial aid and opt to seek other options.

To better understand the role of institutional selectivity in the transfer process for academically undermatched students, Table 4.7 demonstrates the four possible pathways based on the level of selectivity of the initial institution of enrollment. On the high end, 31% of academically undermatched students at non-competitive (level 1) institutions reverse transfer. Yet, nearly one-fifth (19.3%) of all academically undermatched students at very (level 4) and highly competitive (level 5) institutions reverse transfer as well, indicating that there are other important factors associated with the decision to persist through college on that pathway than simply an academic match. In terms of lateral transfer, aside from a dip to 6.6% in the very competitive category, all of the rates remain within a two-percentage-point range of each other across the different selectivity levels. Even at highly selective institutions, 13.8% of academically undermatched students lateral transfer—a figure that is higher than the national Latina/o average.

Table 4.7. Pathways Through College for Academically Undermatched Students, by Selectivity Level of First Institution Attended

	Non Competitive	Least Competitive	Competitive	Very Competitive	Highly Competitive
Reverse Transfer	31.0	14.3	12.1	15.1	4.2
Lateral Transfer	16.7	16.5	14.7	6.6	13.8
Dropout	13.9	16.7	13.8	13.0	7.7
No Departure	38.4	52.5	59.4	65.4	74.2

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data. Note: Missing Most Competitive category, where by definition students cannot be academically undermatched.

It is important to note many of the institutions at the highest levels of selectivity have holistic admissions processes and do not admit students solely based on SAT or other academic indicators. As such, the academic undermatch measure used in this study, and even the more robust measures used in others, does not guarantee that a student would have actually been admitted to the higher selectivity category (Bastedo & Flaster, 2014). It only indicates that the student would be a good academic fit there. Coupled with the earlier findings about intention to

transfer, it may be that some academically undermatched students have a dream school that they were not initially admitted to and choose to use a different four-year institution as a platform to get there. On the other hand, the findings can also suggest that academically undermatched students who lateral transfer are not necessarily looking for a more academically challenging experience but are considering multiple other factors in their decision to take that pathway.

Description of variables included in HGLM models. Table 4.8 shows the ranges, means, and standard deviations for the full Latina/o sample for all variables included in the HGLM models predicting the two transfer pathways relative to dropout and having no departure from the initial school. In terms of background characteristics, females and native English speakers both comprise 61% of the total sample. The ethnic breakdown is 52% Mexican American, 14% Puerto Rican, and 34% Other Latina/o. The majority of the sample has parents with less than a bachelor's degree, as 71% of mothers' and 72% of fathers' highest level of education obtained is high school or some college. Three-fourths (75%) of students come from families in the first two income quartiles and only 7% come from families in the highest income quartile.

As far as high school experiences, the mean of 5.07 for high school grades indicates that the average student graduated high school with a B+ average, while the average math and verbal combined SAT score was 972.41. Only 8% of students took a course at a community college for credit during high school, and only 3% took a course at a four-year institution. The means for self-rating on time management and hours per week spent on student clubs suggests that the average student rated themselves as "average" on time-management skills and spent one to two hours per week involved in student clubs. Though the rate is higher for the national weighted sample, 10% of the Latina/o students in this analysis academically undermatched. In making the

Table 4.8. Description of Student and Institutional-Level Variables in HGLM Models, n=10,155 Latina/o students, 442 institutions

	Min	Max	Mean	S.D.
STUDENT VARIABLES				
<i>Background</i>				
Sex: Female	1.00	2.00	1.61	0.49
Mexican American	1.00	2.00	1.52	0.50
Puerto Rican	1.00	2.00	1.14	0.35
Other Latina/o	1.00	2.00	1.34	0.47
Native English Speaker	1.00	2.00	1.61	0.49
Father's Ed: High School or less	1.00	2.00	1.53	0.50
Father's Ed: Some College	1.00	2.00	1.18	0.39
Father's Ed: Bachelor's	1.00	2.00	1.15	0.35
Father's Ed: More than Bachelor's	1.00	2.00	1.14	0.35
Mother's Ed: High School or Less	1.00	2.00	1.50	0.50
Mother's Ed: Some College	1.00	2.00	1.22	0.41
Mother's Ed: Bachelor's	1.00	2.00	1.17	0.38
Mother's Ed: More than Bachelor's	1.00	2.00	1.11	0.31
Income Quart. 1 (<\$30k)	1.00	2.00	1.35	0.48
Income Quart. 2 (\$30k-\$74,999)	1.00	2.00	1.40	0.49
Income Quart. 3 (\$75k-\$149,999)	1.00	2.00	1.18	0.38
Income Quart. 4 (\$150,000+)	1.00	2.00	1.07	0.26
<i>High School Experiences/Academic Prep</i>				
High School Grades	1.00	7.00	5.07	1.45
SAT	400.00	1600.00	982.41	171.58
Credit from Community College	1.00	2.00	1.08	0.27
Credit from Four-year	1.00	2.00	1.03	0.17
Self-rating: Time Management	1.00	5.00	3.20	0.87
Hrs/wk: Student Clubs	1.00	6.00	2.98	1.54
<i>Academic Undermatch</i>				
Academic Undermatch	1.00	2.00	1.10	0.30
<i>Sense of Purpose/Institutional Allegiance</i>				
Advice from Relatives	1.00	3.00	1.54	0.70
Cost of College	1.00	3.00	2.11	0.78
Choice of Institution	1.00	4.00	3.51	0.76
Likelihood of transferring	1.00	4.00	2.02	0.92
Deg. Asp.: Less than Bachelor's	1.00	2.00	1.02	0.12
Deg. Asp.: Bachelor's	1.00	2.00	1.22	0.41
Deg. Asp.: More than Bachelor's	1.00	2.00	1.76	0.42
<i>Environmental Pull Factors</i>				
Hrs/wk: Household/childcare	1.00	6.00	3.04	1.43
Distance from College to Home	1.00	6.00	3.76	1.48

	Min	Max	Mean	S.D.
Likelihood of Working Full-Time	1.00	4.00	2.16	0.92
Financial Concerns	1.00	3.00	2.05	0.66
<i>Anticipated College Experiences</i>				
Live Off Campus	1.00	2.00	1.34	0.47
Likelihood of College Involvement	19.74	62.13	46.50	7.30
Major: STEM	1.00	2.00	1.36	0.48
Major: Professional Fields	1.00	2.00	1.23	0.42
Major: Social Sciences	1.00	2.00	1.17	0.37
Major: Arts and Humanities	1.00	2.00	1.10	0.30
Major: Undecided	1.00	2.00	1.07	0.26
<i>Enrollment Measures</i>				
Stopout	1.00	2.00	1.31	0.46
Supplemental Enrollment	1.00	2.00	1.21	0.41
Summer School at TFS04	1.00	2.00	1.31	0.46
Years Before Transfer	1.00	6.00	1.92	1.31
INSTITUTIONAL VARIABLES				
<i>Peer Characteristics</i>				
Percent URM	2.00	99.00	16.86	17.78
Percent Pell	3.00	88.00	25.67	13.49
<i>Structural Demographic</i>				
Control: Private	1.00	2.00	1.71	0.46
Selectivity	820.00	1510.00	1100.81	127.69
East	1.00	2.00	1.37	0.48
Midwest	1.00	2.00	1.24	0.43
South	1.00	2.00	1.21	0.41
West	1.00	2.00	1.18	0.38
Core Expenditures/FTE (log)	8.81	11.64	9.83	0.49
HSI	1.00	2.00	1.04	0.19
EHSI	1.00	2.00	1.04	0.19
Size (FTE Undergrad) (log)	5.99	10.29	7.92	0.89
<i>Aggregated Experiences</i>				
Peer: Involvement	35.98	52.48	45.69	2.88
Peer: Live Off Campus	1.00	2.00	1.16	0.20
<i>Aggregated Attitudes</i>				
Peer: Transfer	1.57	2.67	2.02	0.18
<i>Aggregated Environmental Pull</i>				
Peer: Distance from Home	1.85	5.62	4.15	0.69
Peer: Financial Concerns	1.41	2.29	1.82	0.13
Percent Part-Time Students	1.00	81.00	14.59	12.46

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data.

decision to enroll in a particular college, the average student placed more importance on the cost of attending the college than on advice from relatives. Moreover, the 1.54 mean for choice of institution and the 2.02 mean for likelihood of transferring indicate that the average student enrolled in their first or second choice and reported “very little chance” of transferring to another college upon entry. The majority of the sample (76%) also reported aspiring for more than a bachelor’s degree.

The indicators for environmental pull factors show that the average Latina/o student spent one to two hours per week on household/childcare duties during high school. The 3.76 mean for distance from college to home indicates that the average student moved close to 51 to 100 miles. In terms of finances, the average student reported “very little chance” of working full-time during college and had “some” concerns about their ability to finance college. In terms of anticipated college experiences, 34% of students had plans to live off-campus. With regard to major, 36% of students indicated intentions of majoring in a STEM field, followed by 23% in professional fields, 17% in social sciences, 10% in arts and humanities, 8% in other majors, and 7% who entered college undecided. The only measures of actual college experiences in the models show that 31% of students had a period of non-enrollment (stopout) at some point during the six years covered in the study. The same amount took summer school at their home institution, while 21% either took summer school or concurrently enrolled at another two or four-year institution during the traditional academic year. Lastly, among students who transferred, the average Latina/o student enrolled at a different institution during the fall or spring of their second academic year in college.

Mean differences across samples. Before moving forward with the analysis, independent sample t-tests and one-way analysis of variance (ANOVA) were used to determine whether there

were differences in the means of the student-level independent variables across each of the four pathways: reverse transfer, lateral transfer, dropout, and no departure. All but six of the F statistics showed significant between-group differences at $p < .05$, which suggests important differences across students in each pathway. As such, Dunnett T3 posthoc tests were used to identify where the differences exist and the Bonferroni method was used to adjust p values and reduce the chances of obtaining a Type I error (Bland & Altman, 1995). Table 4.9 shows the means and standard deviations for each of the subsamples comprising each of the four pathways. All significant differences are noted in the final six columns, indicating where the samples differ from each other, which is useful in the interpretation of the results.

As a whole, the four samples seem to have quite a few differences. The most differences exist between reverse transfer and lateral transfer, reverse transfer and no departure, lateral transfer and dropout, and dropout and no departure. In other words, the characteristics of Latina/os who reverse transfer and dropout most closely resemble each other, as do those of students who engage in lateral transfer and do not depart from their first institution. In terms of background characteristics, the reverse transfer sample has the greatest proportion of Mexican Americans at 64%, whereas the lateral transfer and no departure samples have the greatest proportion of Other Latina/os at 38% each. The lateral transfer and no departure samples also have the highest percentage of parents with more than a bachelor's degree, while the dropout sample has the most parents with the lowest education levels (high school or less). The dropout sample has significantly more students in the lowest income quartile than all three of the other samples, and the lateral transfer sample has more students in the highest quartile than the reverse transfer and dropout samples. These findings collectively suggest that lateral transfer students enter college more privileged than their reverse transfer peers.

Table 4.9. Descriptive Statistics by Pathway Through College (n=10,155)

	Reverse (1)			Lateral (2)			Dropout (3)			No Departure (4)			Differences			
	Min	Max	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	1 v 2	1 v 3	1 v 4	2 v 3	2 v 4	3 v 4
Sex: Female	1.00	2.00	1.59	0.49	1.61	0.49	1.55	0.50	1.63	0.48			**	*		***
Mexican American	1.00	2.00	1.64	0.48	1.43	0.50	1.57	0.49	1.49	0.50	***	**	***	***	***	***
Puerto Rican	1.00	2.00	1.13	0.33	1.19	0.39	1.17	0.37	1.13	0.33	***	*		***	***	***
Other Latina/o	1.00	2.00	1.24	0.43	1.38	0.49	1.26	0.44	1.38	0.49	***		***	***	***	***
Native English Speaker	1.00	2.00	1.63	0.48	1.67	0.47	1.60	0.49	1.60	0.49			*	**	***	
Father: HS or Less	1.00	2.00	1.59	0.49	1.50	0.50	1.64	0.48	1.49	0.50	***	*	***	***	***	***
Father: Some College	1.00	2.00	1.19	0.39	1.18	0.38	1.17	0.38	1.19	0.39						
Father: BA/BS	1.00	2.00	1.12	0.32	1.17	0.37	1.10	0.31	1.16	0.36	**		**	***	***	***
Father: More than BA/BS	1.00	2.00	1.10	0.30	1.16	0.37	1.08	0.27	1.17	0.37	***	*	***	***	***	***
Mother: HS or Less	1.00	2.00	1.54	0.50	1.43	0.50	1.60	0.49	1.48	0.50	***	**	***	***	**	***
Mother: Some College	1.00	2.00	1.24	0.43	1.22	0.41	1.19	0.40	1.21	0.41						
Mother: Bachelor's	1.00	2.00	1.14	0.35	1.20	0.40	1.14	0.35	1.18	0.38	***		**	***	***	**
Mother: More than BA/BS	1.00	2.00	1.08	0.27	1.15	0.35	1.06	0.24	1.13	0.33	***		***	***	***	***
Income Q1 (<\$30k)	1.00	2.00	1.35	0.48	1.32	0.47	1.46	0.50	1.33	0.47			*	***	***	***
Income Q2 (\$30k-\$74,999)	1.00	2.00	1.43	0.50	1.39	0.49	1.39	0.49	1.40	0.49	*					
Income Q3 (\$75k-\$149,999)	1.00	2.00	1.15	0.36	1.20	0.40	1.11	0.31	1.20	0.40	**	*	***	***	***	***
Income Q4 (\$150,000+)	1.00	2.00	1.06	0.24	1.09	0.29	1.04	0.19	1.08	0.27	**	***	***	***	***	***
High School Grades	1.00	7.00	4.49	1.47	4.88	1.45	4.48	1.48	5.41	1.32	***		***	***	***	***
SAT	400.00	1600.00	923.53	154.00	977.05	158.46	916.09	164.27	1016.25	171.52	***		***	***	***	***
Community College Credit	1.00	2.00	1.09	0.29	1.08	0.27	1.07	0.25	1.08	0.28						
Four-Year College Credit	1.00	2.00	1.02	0.13	1.04	0.19	1.03	0.16	1.03	0.17	**					
Time Management	1.00	5.00	3.08	0.86	3.15	0.88	3.06	0.87	3.27	0.87			***	*	***	***
HS Student Clubs	1.00	6.00	2.80	1.59	2.94	1.56	2.77	1.58	3.08	1.50			***	*	**	***
Academic Undermatch	1.00	2.00	1.09	0.29	1.12	0.32	1.10	0.30	1.10	0.30						
Advice from Relatives	1.00	3.00	1.58	0.71	1.49	0.68	1.55	0.70	1.54	0.70	**					
Cost of College	1.00	3.00	2.11	0.77	2.04	0.79	2.17	0.76	2.11	0.79				***	*	*
Choice of Institution	1.00	4.00	3.51	0.76	3.42	0.80	3.53	0.76	3.52	0.74	**			**	***	***
Likelihood of transferring	1.00	4.00	2.11	0.97	2.29	0.97	2.05	0.93	1.93	0.87	***		***	***	***	***
Asp.: Less than BA/BS	1.00	2.00	1.03	0.16	1.01	0.11	1.02	0.16	1.01	0.10	**		***	**	***	***

	Reverse (1)		Lateral (2)		Dropout (3)		No Departure (4)		Differences					
	Min	Max	Mean	S.D.	Mean	S.D.	Mean	S.D.	1 v 2	1 v 3	1 v 4	2 v 3	2 v 4	3 v 4
Asp.: BA/BS	1.00	2.00	1.25	0.43	1.22	0.42	1.26	0.44	1.20	0.40	***	***	***	***
Asp.: More than BA/BS	1.00	2.00	1.72	0.45	1.76	0.42	1.71	0.45	1.79	0.41	***	***	**	***
Household/childcare duties	1.00	6.00	3.17	1.49	3.01	1.48	3.14	1.51	2.98	1.39	*	***	***	**
Distance from Home	1.00	6.00	3.58	1.39	3.99	1.49	3.40	1.47	3.84	1.49	***	**	***	**
Work Full-Time	1.00	4.00	2.32	0.95	2.13	0.94	2.36	0.95	2.08	0.89	***	***	***	***
Financial Concerns	1.00	3.00	2.14	0.68	2.00	0.68	2.15	0.66	2.02	0.65	***	***	***	***
Live Off Campus	1.00	2.00	1.42	0.49	1.31	0.46	1.47	0.50	1.30	0.46	***	*	***	***
College Involvement	19.74	62.13	45.12	7.48	46.55	7.34	45.10	7.27	47.21	7.15	***	***	***	*
Major: STEM	1.00	2.00	1.40	0.49	1.34	0.47	1.36	0.48	1.35	0.48	*			
Major: Professional Fields	1.00	2.00	1.23	0.42	1.23	0.42	1.23	0.42	1.23	0.42				
Major: Social Sciences	1.00	2.00	1.15	0.36	1.17	0.37	1.13	0.34	1.18	0.38				***
Major: Arts/Humanities	1.00	2.00	1.08	0.27	1.10	0.30	1.10	0.30	1.10	0.30	*			
Major: Undecided	1.00	2.00	1.07	0.25	1.06	0.23	1.07	0.26	1.07	0.26				
Stopout	1.00	2.00	1.44	0.50	1.34	0.48	2.00	0.00	1.10	0.29	***	---	***	---
Supplemental Enrollment	1.00	2.00	1.19	0.39	1.18	0.38	1.11	0.31	1.24	0.43	***	***	***	***
Summer School at TFS04	1.00	2.00	1.12	0.32	1.09	0.29	1.23	0.42	1.44	0.50	***	***	***	***
Year of Transfer	1.00	6.00	2.94	1.34	2.90	1.27	---	---	---	---	---	---	---	---

*p<.05, **p<.001, *** p<.001 with Bonferroni adjustment

When it comes to high school experiences, the no departure sample had the highest grades, SAT scores, self-ratings on time management, and the most hours per week in student clubs, followed by the lateral transfer and then reverse transfer samples. Though the students' scores in the dropout sample are the lowest, there are no significant differences between them and the reverse transfer sample on these measures. A notable difference pertaining to choosing a particular college is that the lateral transfer sample considered the cost of attending the college as less important than both the dropout and no departure samples. The students in the lateral transfer sample also enrolled in their first choice institution significantly less and indicated a higher chance of transferring than all three of the other samples. With regard to environmental pull factors, the reverse transfer sample indicated a greater likelihood of working full-time than both the lateral transfer and no departure samples. The reverse transfer and dropout samples also entered college with greater concerns about their ability to finance college than the other two samples, and students in the lateral sample moved the furthest distance to college from home.

When anticipating college experiences, the reverse transfer sample was significantly more likely to live off campus than all others and the no departure sample was significantly more likely to report intentions of getting involved in college activities. When considering actual college experiences, a greater percentage of the reverse transfer sample (44%) had stopouts, or periods of non-enrollment, than those in the lateral transfer (34%) and no departure samples (10%). The samples for both types of transfer had significantly more supplemental enrollment in the form of summer school at a different institution or concurrent enrollment during the academic year than the dropout sample and less than the no departure sample, and also had less enrollment in summer school at their home institution than both the dropout and no departure samples.

These characteristics begin to tell a story about the probable reasons that Latina/o students follow particular pathways. Before introducing any controls, it seems that students may reverse transfer due to academic or financial reasons, whereas students may lateral transfer for other strategic reasons or simply because they entered college with intentions to do so. The following sections will present results of the HGLM models to help create yet a better portrait of the students who take transfer pathways through college.

Multinomial HGLM Results

For a multi-level model with a continuous dependent variable, the intra-class correlation (ICC) is used to determine the amount of variation in the outcome that is attributed to group-level effects, or institutional differences. However, because this study employs multi-level modeling with a dichotomous outcome, the individual-level variance is heteroscedastic, which reduces the accuracy and instructive value of the ICC (Raudenbush & Bryk, 2002). In its place, each model was run as a fully unconditional model with no predictors to determine the significance of the variance component at level two. Table 4.10 shows the variance component, standard deviation, and the chi-square statistic for each of the models. The significance at $p < .001$ of the chi-square statistic for all five outcomes suggests that the variance in reverse and lateral transfer between institutions is significant and that the use of HGLM is warranted.

Table 4.10. Description of Between-Institution Variance in Students' Average Probability of Transferring Out of Four-year Institutions

	Variance Component	S.D.	Chi-Square	Sig
Model 1: Reverse Transfer (Ref: No Departure)	0.929	0.864	1347.64	***
Model 2: Lateral Transfer (Ref: No Departure)	0.857	0.735	1049.34	***
Model 3: Reverse Transfer (Ref: Dropout)	0.551	0.304	583.62	***
Model 4: Lateral Transfer (Ref: Dropout)	0.773	0.597	767.52	***
Model 5: Lateral Transfer (Ref: Reverse Transfer)	0.823	0.677	853.31	***

Source: Multinomial HGLM Analyses of 2004 Freshman Survey and 2004-2010 National Student Clearinghouse data. * $p < .05$, ** $p < .01$, *** $p < .001$

Each of the multinomial HGLM models was built in a series of seven steps at level one and five steps at level two in order to analyze the influence of each cluster of predictors on the outcome. The full 12 steps for each model are available in Appendix D. In addition, several cross-level interaction effects were tested in the different models to determine if particular student characteristics had varying effects based on institutional contexts, but none emerged as significant.¹ The following subsections review the significant predictors for each of the five outcomes across two different steps in the multinomial HGLM analyses—when controlling for only level-one variables and when controlling for the full model. Findings are reported as delta-p statistics, calculated using the methods prescribed by Petersen (1985) and Cruce (2009). Delta-p statistics represent the change in probability of the respective form of transfer associated with a one-unit change from the mean in the predictor variable. For predictors that are dichotomous, the delta-p statistic represents the difference in probability of reverse or lateral transfer compared to students who do not exhibit that trait.

Results for reverse transfer (relative to no departure reference group). Table 4.11 shows the model statistics related to reverse transfer, relative to students who have no departure from their initial institution. After controlling for all the student variables at level one, 31.4% of the variance between institutions is explained. The institutional characteristics at level two account for an additional 10.2% of the variance, resulting in a total explanation of 41.6% of the between-institution variance in students' average probability of reverse transfer.

The results for the HGLM model for reverse transfer relative to no departure are also

¹ The cross-level interactions tested were: a) Model 1- Reason: Cost (level 1) and Percent URM (level 2), b) Model 2 - Distance to college from home (level 1) and distance to college from home (level 2), c) Model 3 - Distance to college from home (level 1) and distance to college from home (level 2), d) Model 4 - Financial concerns (level 1) and Percent URM (level 2), and e) Model 5 - Likelihood of transfer (level 1) and distance to college from home (level 2)

presented in Table 4.11. The level one model includes the student characteristics and experiences, and the full model includes that as well as institutional measures. In terms of students' backgrounds, three characteristics are significant predictors of reverse transfer after controlling for everything. Students who are native English speakers are 3.26 percentage points more likely to reverse transfer than to stay at their initial institution, while students whose fathers have a bachelor's degree are 4.29 percentage points less likely to do so than students whose fathers earned a high school diploma or less. Students whose mothers have some college education compared to students whose mothers have a high school education or less are more likely to reverse transfer when only controlling for student characteristics, but the difference is no longer significant once institutional characteristics are controlled, indicating that there are differences in the types of institutions these two groups of students initially attend that helps account for the variance.

One notable finding related to background is that the probability of reverse transfer significantly increases as parental income increases, with students in the lowest income quartile being 10.96 percentage points, students in the second quartile being 8.77 percentage points, and students in the third quartile being 8.55 percentage points less likely to reverse transfer than those in the highest income quartile. This relationship between reverse transfer and income for Latina/o students exists even when only controlling for background characteristics (see Appendix D for step 1 of the model), even though the descriptive statistics show that the reverse transfer sample has significantly more students from the lowest income quartile than the no departure sample. Previous studies have found contradictory results pertaining to the role of income in reverse transfer, showing that students in the lowest income quintile are the most likely to engage in this pathway (Goldrick-Rab & Pfeffer, 2009), that middle-income students

Table 4.11. Multinomial HGLM Results for Reverse Transfer, with No Departure Reference Group
(n=9,241 students, 427 institutions)

	Level One Model				Full Model			
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p
LEVEL ONE								
<i>Background Characteristics</i>								
Sex: Female	-0.103	0.073			-0.094	0.073		
Puerto Rican	-0.214	0.118			0.038	0.130		
Other Latina/o	-0.358	0.096	***	-6.05	-0.160	0.097		
Native English Speaker	0.223	0.085	**	3.77	0.192	0.085	*	3.26
Father's Ed: Some College	-0.028	0.091			-0.048	0.093		
Father's Ed: Bachelor's	-0.249	0.115	*	-4.11	-0.260	0.116	*	-4.29
Father's Ed: More than Bachelor's	-0.086	0.139			-0.075	0.141		
Mother's Ed: Some College	0.182	0.093	*	2.77	0.164	0.094		
Mother's Ed: Bachelor's	0.096	0.121			0.106	0.120		
Mother's Ed: More than Bachelor's	-0.132	0.143			-0.115	0.143		
Income Q1	-0.554	0.159	**	-10.22	-0.585	0.158	***	-10.96
Income Q2	-0.391	0.146	**	-7.51	-0.453	0.145	**	-8.77
Income Q3	-0.376	0.142	**	-7.25	-0.440	0.144	**	-8.55
<i>High School Experiences/Academic Prep</i>								
High School Grades	-0.339	0.027	***	-5.26	-0.325	0.027	***	-5.07
SAT	-0.027	0.003	***	-0.46	-0.020	0.003	***	-0.34
Credit from Community College	0.237	0.119	*	4.29	0.207	0.121		
Credit from Four-Year	-0.274	0.290			-0.239	0.295		
Self-Rating: Time Management	-0.145	0.038	***	-2.38	-0.144	0.038	***	-2.37
Hrs/wk: Student Clubs	-0.005	0.027			0.004	0.027		
<i>Academic Undermatch</i>								
Academic Undermatch	0.238	0.131			-0.001	0.135		
<i>Sense of Purpose/Inst. Allegiance</i>								
Reason: Relatives	0.010	0.050			0.029	0.050		
Reason: Cost	-0.087	0.050			-0.108	0.051	*	-1.80
Choice of Institution	0.006	0.048			0.014	0.048		
Likelihood of Transferring	0.091	0.040	*	1.60	0.074	0.041		
Deg. Asp: Less than Bachelor's	0.267	0.266			0.294	0.271		
Deg. Asp: More than Bachelor's	0.091	0.078			0.124	0.078		
<i>Environmental Pull Factors</i>								
Hrs/wk: Household/childcare Duties	0.064	0.031	*	1.12	0.060	0.031		
Distance to College	0.066	0.034			0.055	0.034		
Likelihood of Working Full-time	0.156	0.034	***	2.79	0.145	0.034	***	2.59
Financial Concerns	0.167	0.056	**	3.00	0.177	0.057	**	3.19
<i>Anticipated College Experiences</i>								
Live Off-Campus	0.170	0.096			0.105	0.099		
Likelihood of College Involvement	-0.011	0.007			-0.009	0.007		
Major: STEM	0.395	0.093	***	7.11	0.392	0.093	***	7.01
Major: Professional Fields	-0.029	0.099			-0.044	0.101		
Major: Arts and Humanities	-0.113	0.139			-0.095	0.138		
Major: Undecided	-0.099	0.147			-0.074	0.149		

	<u>Level One Model</u>				<u>Full Model</u>			
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p
<i>Enrollment Measures</i>								
Stopout	2.034	0.107	***	43.12	2.031	0.106	***	43.07
Supplemental Enrollment	-0.330	0.085	***	-5.36	-0.343	0.086	***	-5.57
Summer School	-2.289	0.128	***	-31.79	-2.340	0.130	***	-32.35
Year of transfer	---	---			---	---		
LEVEL TWO								
<i>Peer Characteristics</i>								
Percent URM					-0.016	0.007	*	-0.27
Percent Pell					0.009	0.009		
<i>Structural Demographic</i>								
Selectivity					0.010	0.013		
Institutional Control: Private					-0.260	0.216		
Region: East					-0.883	0.176	***	-14.35
Region: Midwest					-0.020	0.196		
Region: South					-0.067	0.213		
Core Expenditures per FTE (log)					-0.561	0.213	**	-8.14
HSI					0.414	0.252		
EHSI					0.298	0.237		
FTE undergrad enrollment (log)					0.012	0.100		
<i>Aggregate Student Experiences</i>								
Peer: Likelihood of Involvement					-0.058	0.040		
Peer: Live Off-Campus					-0.720	0.509		
<i>Aggregate Student Attitudes</i>								
Peer: Likelihood of transferring					0.466	0.388		
<i>Aggregate Environmental Pull</i>								
Peer: Distance to College					-0.154	0.162		
Peer: Financial Concerns					1.344	0.728		
Percent Part-time Students					0.005	0.008		
MODEL STATISTICS								
Level 2 Variance Explained	0.314				0.416			
Intercept Reliability	0.329				0.264			

*p<.05, **p<.001, *** p<.001

are the most likely to do so (Hillman, Lum, & Hossler, 2008; Hossler, Gross, & Dadashova, 2009), and that there are no significant differences between income groups (Kalogrides & Grodsky, 2011). Yet, these studies did not control for the environmental pull factors that distinguish low-income Latina/os from their higher-income peers. The results from this study contribute a more nuanced understanding of why income is associated with reverse transfer, suggesting that the pathway is not a result of income itself, but rather the traits that low-income students exhibit such as lower academic indicators and greater pull factors.

Adelman (2005) found that reverse transfer students as a whole were academically weaker than their four-year college peers, and this seems to hold true for Latina/o reverse transfer students as well, at least relative to four-year peers who do not depart the first institution where they enroll after high school. This study finds that for every categorical increase from the mean in high school grades, the probability of reverse transfer decreases by 5.07 percentage points, while also decreasing by 0.34 percentage points for every 100-point increase in SAT score. Taking a course for credit at a community college during high school is a significant predictor in the level one model, increasing students' probability of reverse transferring by 4.29 percentage points; however, this is no longer significant once the peer environment at the first college enrolled is accounted for in final model. This suggests such high school dual enrollment programs do not predict reverse transfer, but this depends on the peer environment of the college students elected to attend. The final academic preparation measure that is significant is time management, with students' likelihood of reverse transferring decreasing by 2.37 percentage points for every unit increase in self-rating on this measure.

In terms of academic undermatch at the time of enrollment, Latina/o students who meet this criterion are significantly more likely to reverse transfer than students who are not

academically undermatched when controlling for background characteristics, high school experiences and academic preparation, sense of purpose and institutional allegiance, environmental pull factors, and anticipated college experiences (see Appendix D). However, once enrollment measures are entered into the model, the probability is no longer significant, indicating that these students are more likely to engage in enrollment patterns that decrease their probability of reverse transferring.

Students who place more importance on college costs in making the decision of where to attend are less likely to reverse transfer, while students who indicate a greater likelihood of working full-time while in college and students who express greater concerns about their ability to pay for college are more likely to reverse transfer. It is possible that students who place greater importance on estimating net college costs for the institution they select may feel they do not need to take courses at two year institutions to reduce costs. On the other hand, students who continually are concerned about money for college may take courses at a two-year college to reduce costs, facilitate their full-time employment, and reduce their concerns about being able to pay for college. These set of findings indicate that finances play an important role in the decision to reverse transfer.

In terms of anticipated college experiences, the only significant measure is one of the major fields. Compared to those intending to major in one of the social sciences, students who want to major in STEM upon college entry have 7.01 percentage point greater likelihood of reverse transferring compared to students intending to major in the social sciences. Hillman et al. (2008) found that health majors were most likely to reverse transfer, and the findings from this study indicate that for Latina/o students it may be the broader STEM field that is vulnerable to this pathway. Given the difficult nature of STEM introductory courses that serve as gateways

into those majors (PCAST, 2012), it may be that students intend to take these courses at a community college before returning to a four-year institution. In terms of actual college experiences, all three of the enrollment measures are significant. Students who have a stopout are 43.07 percentage points more likely to reverse transfer than students who remain continuously enrolled. On the other hand, students who supplement their enrollment at another institution or take summer school at their home institution are both less likely to reverse transfer. Specifically, summer school at the home institution reduces the probability of reverse transfer by 32.35 percentage points, which may indicate that additional course offerings are part of the solution to preventing student mobility.

At the institutional level, only three variables are significantly predictive of reverse transfer. Though the initial correlation ($r=.08$, $p<.01$) between percent of the full-time undergraduate student body that is an underrepresented minority student (URM) and reverse transfer is positive, it seems that after controlling for all other student characteristics, the relationship reverses. For every one-unit increase from the mean in the percent of URM students, the average probability of reverse transfer decreases by 0.27 percentage points. Another institutional characteristic that is associated with reverse transfer is region. Students at institutions in the East have a 14.35 percentage point lower probability of taking that pathway than students in the West, which may be associated with the larger availability of community colleges in the latter region. The final institutional variable that emerges as significant is core expenditures per full-time equivalent student. The more resources expended, the lower the probability of reverse transferring among individual Latina/os, which makes sense intuitively and indicates that resources can be utilized to help retain students at a single institution. In short, fewer Latina/os depart institutions with the best resources, which is further illustrated in the next

section comparing the lateral transfer and no departure samples.

Results for lateral transfer (relative to no departure reference group). Table 4.12 shows the model statistics related to lateral transfer, relative to students who have no permanent departure from their initial institution. Although several student characteristics are significant, the level one model only accounts for 3.5% of the variance between institutions. The institutional characteristics at level two account for an additional 36% of the variance, resulting in a total explanation of 39.5% of the between-institution variance in students' average probability of lateral transfer.

Table 4.12 also presents the results for the HGLM model for lateral transfer relative to having no departure. Only two background characteristics emerged as significant in the final model, father's education and income. Students with fathers who have some college education, compared to high school or less, are 2.8 percentage points less likely to lateral transfer than to stay at their initial institution. Research has found that lateral transfer students have higher income than students who remain at a single institution and stop out, but lower income than students who remain continuously enrolled at a single institution (Li, 2010). It seems that for Latina/o students, both low-income and lower-middle income students are less likely to lateral transfer than students from the highest income quartile, controlling for stopout habits. This suggests that transferring from one four-year institution to another may come with costs that are less feasible for those with lower family incomes.

While no relationship between academic preparation and lateral transfer has been found in prior research comparing that pathway to remaining at a single institution (Goldrick-Rab & Pfeffer, 2009), the results of this model reveal that high school grades and SAT scores are both negatively associated with lateral transfer for Latina/o students. In other words, every categorical

Table 4.12. Multinomial HGLM Results for Lateral Transfer, with No Departure Reference Group
(n=9,241 students, 427 institutions)

	Level One Model				Full Model			
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p
LEVEL ONE								
<i>Background Characteristics</i>								
Sex: Female	-0.056	0.087			-0.049	0.088		
Puerto Rican	0.132	0.111			0.094	0.124		
Other Latina/o	-0.011	0.087			-0.041	0.093		
Native English Speaker	0.165	0.092			0.130	0.093		
Father's Ed: Some College	-0.173	0.093			-0.188	0.094 *		-2.80
Father's Ed: Bachelor's	-0.230	0.123			-0.241	0.125		
Father's Ed: More than Bachelor's	-0.192	0.130			-0.189	0.132		
Mother's Ed: Some College	0.055	0.095			0.037	0.094		
Mother's Ed: Bachelor's	0.229	0.128			0.210	0.128		
Mother's Ed: More than Bachelor's	0.195	0.132			0.167	0.132		
Income Q1	-0.360	0.165 *		-5.65	-0.423	0.166 *		-6.76
Income Q2	-0.315	0.156 *		-5.01	-0.383	0.159 *		-6.19
Income Q3	-0.160	0.163			-0.217	0.166		
<i>High School Experiences/Academic Prep</i>								
High School Grades	-0.184	0.029 ***		-2.55	-0.167	0.030 ***		-2.33
SAT	-0.015	0.003 ***		-0.22	-0.008	0.004 *		-0.12
Credit from Community College	0.024	0.156			0.023	0.158		
Credit from Four-Year	0.424	0.188 *		7.07	0.462	0.187 *		7.80
Self-Rating: Time Management	-0.048	0.045			-0.051	0.045		
Hrs/wk: Student Clubs	-0.021	0.024			-0.014	0.024		
<i>Academic Undermatch</i>								
Academic Undermatch	0.138	0.127			-0.107	0.137		
<i>Sense of Purpose/Inst. Allegiance</i>								
Reason: Relatives	-0.089	0.051			-0.083	0.051		
Reason: Cost	-0.130	0.053 *		-1.83	-0.147	0.053 **		-2.07
Choice of Institution	-0.053	0.046			-0.039	0.047		
Likelihood of Transferring	0.359	0.041 ***		5.91	0.338	0.041 ***		5.53
Deg. Asp: Less than Bachelor's	-0.619	0.348			-0.543	0.349		
Deg. Asp: More than Bachelor's	0.088	0.092			0.120	0.093		
<i>Environmental Pull Factors</i>								
Hrs/wk: Household/childcare Duties	0.030	0.027			0.023	0.027		
Distance to College	0.103	0.034 **		1.57	0.098	0.034 **		1.49
Likelihood of Working Full-time	-0.008	0.047			-0.015	0.047		
Financial Concerns	-0.038	0.057			-0.020	0.058		
<i>Anticipated College Experiences</i>								
Live Off-Campus	0.015	0.110			-0.014	0.119		
Likelihood of College Involvement	0.004	0.006			0.009	0.006		
Major: STEM	0.100	0.096			0.096	0.097		
Major: Professional Fields	-0.113	0.104			-0.135	0.105		
Major: Arts and Humanities	-0.088	0.138			-0.087	0.139		
Major: Undecided	-0.159	0.125			-0.148	0.126		

	Level One Model				Full Model			
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p
<i>Enrollment Measures</i>								
Stopout	1.707	0.140	***	32.75	1.708	0.144	***	32.76
Supplemental Enrollment	-0.302	0.101	**	-4.22	-0.290	0.102	**	-4.06
Summer School	-2.491	0.096	***	-29.34	-2.517	0.098	***	-29.59
Year of transfer	---	---			---	---		
LEVEL TWO								
<i>Peer Characteristics</i>								
Percent URM					-0.004	0.006		
Percent Pell					0.022	0.009	*	0.33
<i>Structural Demographic</i>								
Selectivity					0.011	0.012		
Institutional Control: Private					0.195	0.192		
Region: East					0.006	0.181		
Region: Midwest					0.136	0.205		
Region: South					0.856	0.214	***	14.38
Core Expenditures per FTE (log)					-0.603	0.179	**	-7.28
HSI					-0.131	0.292		
EHSI					0.050	0.202		
FTE undergrad enrollment (log)					0.044	0.099		
<i>Aggregate Student Experiences</i>								
Peer: Likelihood of Involvement					-0.105	0.042	*	-1.50
Peer: Live Off-Campus					0.118	0.510		
<i>Aggregate Student Attitudes</i>								
Peer: Likelihood of transferring					0.433	0.408		
<i>Aggregate Environmental Pull</i>								
Peer: Distance to College					0.476	0.178	**	8.11
Peer: Financial Concerns					0.966	0.676		
Percent Part-time Students					0.012	0.011		
MODEL STATISTICS								
Level 2 Variance Explained	0.035				0.395			
Intercept Reliability	0.381				0.301			

*p<.05, **p<.001, *** p<.001

grade increase from the mean reduces the probability of transfer by 2.33 percentage points and every 100-point increase from the mean in SAT score reduces it by 0.12 percentage points. The other high school experience measure that is significant is taking a course for credit at a four-year institution during high school. Students who earn such credit have a 7.80 percentage point greater chance of lateral transferring than students who do not have previous credit. Students who enter college with prior exposure to a four-year institution may be more comfortable navigating the context and find greater ease in realizing a lateral transfer.

Students who place a greater importance on costs in deciding on where to attend college are less likely to lateral transfer, with a 2.07 percentage point decrease in probability for every unit increase from the mean in importance placed. This indicates that students who are attending an institution for which they have carefully evaluated the costs are more likely to stay there. In contrast, students who enter college having indicated a greater chance of transferring are more likely to lateral transfer. The probability increases by 5.53 percentage points for every unit increase from the mean. The last of the entering student characteristics that is a significant predictor of lateral transfer is one of the environmental pull factors. The greater the distance students move to college from home, the greater the probability of engaging in the lateral transfer pathway.

In terms of college experiences, all three of the enrollment measures included in the model are significantly associated with lateral transfer, relative to no departure. Students who have a stopout during college have a 32.76 percentage point greater probability of transferring to another four-year institution. It cannot be determined based on this analysis if students decide to transfer because they have already been out of school for a period of time, or if they have a period of non-enrollment because a seamless lateral transfer is not possible. Nonetheless, stopout

behavior is linked to this pathway. Students who supplement their enrollment through concurrent enrollment or summer school at another two or four-year institution have a 4.06 percentage point lower probability of lateral transfer, and students who take summer school at their home institution have a 29.59 percentage point lower probability of lateral transfer. These findings are possibly indicative of strategic course-taking patterns to satisfy institutional and major requirements among students who do not intend to depart their institution.

Five institutional-level variables emerged as significant in the analysis. For every one-percent increase from the mean of the student body that receives Pell grants, the individual probability of lateral transfer increases by 0.33 percentage points. This peer measure has not been previously tested in relation to lateral transfer at the institutional level, but at the individual-level McCormick and Carroll (1997) found that receiving financial aid increased the probability of transferring to another four-year school. The results here demonstrate that this also applies to Latina/o students in relation to the aggregate peer context. Institutions in the southern part of the country have a 14.38 percentage point higher average probability of lateral transfer than institutions in the western part of the country, and institutions that have a higher amount of core expenditures per full-time equivalent student have a lower average probability of lateral transfer.

The final two institutional predictors are an aggregate peer experience and an aggregate environmental pull. The greater peer likelihood of involvement, the lower the average chance of lateral transfer, while the greater the peer distance from college to home the greater the probability of taking a lateral pathway. Distance to college from home is the only variable that is significant at both the individual student and the institutional levels. This implies that above and beyond any individual student's distance from home, the peer climate has an additional effect on the decision to lateral transfer. It is possible that being further from home can contribute to

homesickness, which may lead students to consider other college options. Additionally, descriptive analysis of the Latina/os in this study show that students who move away the furthest applied to the most colleges, indicating that these students are more savvy about the college choice process. This capital may be a contributor to the ability to lateral transfer at the individual level, and aggregated as a context can influence even those students who did not move too far away from home.

Results for reverse transfer (relative to dropout reference group). Table 4.13 shows the model statistics related to reverse transfer, relative to dropout. The student characteristics at level one explain 16.5% of the variance between institutions. The institutional characteristics at level two account for an additional 6% of the variance, resulting in a total explanation of 22.5% of the between-institution variance in students' average probability of reverse transfer.

The results of the HGLM analysis for this model are also presented in Table 4.13. After controlling for everything, few significant differences were found between the two samples. In terms of background characteristics, only mother's education and income affect students' probability of reverse transfer. Students with mothers who have some college education compared to high school education or less are 6.57 percentage points more likely to reverse transfer than to dropout. Compared to students in the fourth income quartile, being in the lowest income quartile decreases the probability of reverse transfer by 15.69 percentage points and being in the second income quartile decreases it by 9.65 percentage points. This suggests a particularly vulnerable population: the lowest income Latina/o students are more likely to dropout of higher education altogether than to reverse transfer. None of the variables related to high school experiences or academic preparation have a significant relationship with the outcome after controlling for the level one model. This suggests that other than parental education and

Table 4.13. Multinomial HGLM Results for Reverse Transfer, with Dropout Reference Group
(n=4,507 students, 392 institutions)

	Level One Model				Full Model			
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p
LEVEL ONE								
<i>Background Characteristics</i>								
Sex: Female	0.164	0.104			0.158	0.104		
Puerto Rican	-0.226	0.128			-0.126	0.148		
Other Latina/o	0.016	0.116			0.081	0.135		
Native English Speaker	0.141	0.109			0.171	0.109		
Father's Ed: Some College	-0.018	0.120			-0.012	0.121		
Father's Ed: Bachelor's	0.171	0.145			0.176	0.145		
Father's Ed: More than Bachelor's	-0.005	0.164			-0.006	0.163		
Mother's Ed: Some College	0.263	0.111 *		6.46	0.267	0.112 *		6.57
Mother's Ed: Bachelor's	0.053	0.148			0.070	0.149		
Mother's Ed: More than Bachelor's	0.247	0.167			0.267	0.167		
Income Q1	-0.680	0.216 **		-16.39	-0.650	0.219 **		-15.69
Income Q2	-0.432	0.198 *		-10.21	-0.407	0.201 *		-9.65
Income Q3	-0.273	0.194			-0.265	0.197		
<i>High School Experiences/Academic Prep</i>								
High School Grades	-0.037	0.033			-0.044	0.036		
SAT	-0.001	0.003			-0.005	0.004		
Credit from Community College	0.224	0.136			0.240	0.138		
Credit from Four-Year	-0.293	0.274			-0.323	0.279		
Self-Rating: Time Management	0.021	0.043			0.022	0.044		
Hrs/wk: Student Clubs	0.019	0.028			0.017	0.028		
<i>Academic Undermatch</i>								
Academic Undermatch	-0.155	0.171			-0.089	0.171		
<i>Sense of Purpose/Inst. Allegiance</i>								
Reason: Relatives	0.092	0.058			0.090	0.059		
Reason: Cost	-0.047	0.051			-0.031	0.053		
Choice of Institution	-0.021	0.061			-0.029	0.061		
Likelihood of Transferring	0.057	0.047			0.061	0.049		
Deg. Asp: Less than Bachelor's	-0.001	0.242			0.016	0.240		
Deg. Asp: More than Bachelor's	-0.007	0.080			-0.021	0.080		
<i>Environmental Pull Factors</i>								
Hrs/wk: Household/childcare Duties	-0.007	0.030			-0.003	0.030		
Distance to College	0.068	0.031 *		1.68	0.085	0.032 **		2.09
Likelihood of Working Full-time	-0.018	0.038			-0.014	0.038		
Financial Concerns	0.022	0.057			0.008	0.058		
<i>Anticipated College Experiences</i>								
Live Off-Campus	-0.112	0.115			-0.113	0.117		
Likelihood of College Involvement	-0.011	0.006			-0.013	0.006 *		-0.32
Major: STEM	0.049	0.130			0.046	0.131		
Major: Professional Fields	-0.070	0.148			-0.058	0.149		
Major: Arts and Humanities	-0.313	0.173			-0.318	0.173		
Major: Undecided	-0.165	0.180			-0.180	0.179		

	<u>Level One Model</u>				<u>Full Model</u>			
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p
<i>Enrollment Measures</i>								
Stopout	---	---			---	---		
Supplemental Enrollment	0.674	0.124	***	15.97	0.659	0.124	***	15.63
Summer School	-0.871	0.118	***	-21.38	-0.883	0.122	***	-21.66
Year of transfer	---	---			---	---		
LEVEL TWO								
<i>Peer Characteristics</i>								
Percent URM					0.003	0.006		
Percent Pell					-0.008	0.008		
<i>Structural Demographic</i>								
Selectivity					0.018	0.012		
Institutional Control: Private					-0.017	0.196		
Region: East					-0.311	0.194		
Region: Midwest					0.103	0.192		
Region: South					0.026	0.228		
Core Expenditures per FTE (log)					-0.200	0.195		
HSI					0.104	0.219		
EHSI					0.382	0.165	*	9.20
FTE undergrad enrollment (log)					0.048	0.088		
<i>Aggregate Student Experiences</i>								
Peer: Likelihood of Involvement					0.042	0.037		
Peer: Live Off-Campus					-0.353	0.498		
<i>Aggregate Student Attitudes</i>								
Peer: Likelihood of transferring					-0.100	0.355		
<i>Aggregate Environmental Pull</i>								
Peer: Distance to College					-0.467	0.182	*	11.62
Peer: Financial Concerns					0.866	0.681		
Percent Part-time Students					-0.015	0.007	*	0.37
MODEL STATISTICS								
Level 2 Variance Explained	0.165				0.225			
Intercept Reliability	0.206				0.186			

*p<.05, **p<.001, *** p<.001

income differences, the students in these two pathways have similar characteristics.

One environmental pull factor and one anticipated college experience significantly influence students' pathway through college. The greater the distance to the college from home, the greater the probability that a student reverse transfers rather than drops out. This may suggest that students who are initially willing to commute or move further are committed to staying in higher education even if circumstances lead them to attend a community college. In contrast, as the likelihood of college involvement students report upon college entry increases, the probability of reverse transferring relative to dropping out decreases. It is possible that students who wanted to get involved in study abroad, student government, and student groups are not likely to reverse transfer because they may believe these college experience are not widely available at two-year schools.

Both of the enrollment measures included in the analyses emerged as significant predictors, but with opposite relationships to the reverse transfer outcome. Students who have supplemental enrollment have a 15.63 percentage point greater probability of reverse transferring, while students who take summer school at their home institution have a 21.66 percentage point lower probability of taking the reverse transfer pathway relative to dropping out. Perhaps the reason for taking summer school for some students in this sample is related to academic difficulty, which would help explain the dropout pathway.

At the contextual level, Table 4.13 shows that students at Emerging HSIs are more likely to reverse transfer than drop out compared to students at non-HSIs; the average probability of reverse transfer is 9.20 percentage points higher for students at Emerging HSIs. The normative peer context also significantly influences students' pathways. Latina/o students who attend institutions where their peers, on average, have a greater distance from college to home tend to

have lower probabilities of reverse transferring, relative to dropping out. This peer context has an opposite effect from the individual distance from college to home. It is possible that when students move further away from home and decide to leave the four-year institution, they return to a local community college, but seeing a lot of their peers leave may promote a dropout context if students think that departure equals dropout.

The final institutional variable that emerged as significant is the percent of the undergraduate student body comprised of part-time students. For every one percent increase from the mean, the average probability of reverse transfer decreases by 0.37 percentage points. Stated another way, Latina/os at institutions that have higher percentages of part-time students are more likely to dropout rather than take courses at a two-year institution. In this case, reverse transfer begins to emerge as an alternative to dropping out completely and efforts to facilitate the pathway are particularly important at institutions with large numbers of part-time students.

Results for lateral transfer (relative to dropout reference group). Table 4.14 presents the model statistics related to lateral transfer, relative to dropout. The level one model accounted for 27.1% of the variance between institutions, and the institutional characteristics accounted for an additional 42.1% of the level two variance. Combined, this resulted in a total explanation of 69.2% of the between-institution variance in students' average probability of lateral transfer.

The results from the HGLM analysis for this outcome are also presented in Table 4.14, which shows that several background characteristics are associated with lateral transfer in this model. Compared to males, females are 6.90 percentage points more likely to lateral transfer than to drop out. Compared to Mexican-Americans, students from Other Latina/o ethnicities other than Puerto Rican are 5.86 percentage points more likely to lateral transfer than to drop out. Students with mothers who have an education level of more than a bachelor's degree have a 4.30

Table 4.14. Multinomial HGLM Results for Lateral Transfer, with Dropout Reference Group
(n=4,507 students, 392 institutions)

	Level One Model				Full Model			
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p
LEVEL ONE								
<i>Background Characteristics</i>								
Sex: Female	0.295	0.106	**	7.32	0.278	0.107	*	6.90
Puerto Rican	0.135	0.129			-0.048	0.143		
Other Latina/o	0.409	0.102	***	10.19	0.235	0.113	*	5.86
Native English Speaker	0.095	0.108			0.103	0.111		
Father's Ed: Some College	-0.150	0.120			-0.132	0.120		
Father's Ed: Bachelor's	0.122	0.186			0.137	0.188		
Father's Ed: More than Bachelor's	-0.073	0.189			-0.088	0.190		
Mother's Ed: Some College	0.095	0.116			0.101	0.114		
Mother's Ed: Bachelor's	0.189	0.144			0.173	0.144		
Mother's Ed: More than Bachelor's	0.596	0.168	**	14.78	0.567	0.170	**	4.30
Income Q1	-0.509	0.210	*	-12.66	-0.534	0.215	*	-13.27
Income Q2	-0.387	0.193	*	-9.63	-0.373	0.199		
Income Q3	-0.115	0.204			-0.102	0.208		
<i>High School Experiences/Academic Prep</i>								
High School Grades	0.123	0.030	***	3.07	0.119	0.032	***	2.97
SAT	0.012	0.004	**	0.30	0.007	0.004		
Credit from Community College	0.049	0.190			0.078	0.196		
Credit from Four-Year	0.309	0.266			0.291	0.272		
Self-Rating: Time Management	0.124	0.054	*	3.10	0.116	0.054	*	2.90
Hrs/wk: Student Clubs	-0.001	0.029			-0.007	0.029		
<i>Academic Undermatch</i>								
Academic Undermatch	-0.257	0.175			-0.152	0.181		
<i>Sense of Purpose/Inst. Allegiance</i>								
Reason: Relatives	-0.003	0.059			-0.008	0.059		
Reason: Cost	-0.109	0.064			-0.085	0.065		
Choice of Institution	-0.068	0.058			-0.068	0.058		
Likelihood of Transferring	0.320	0.051	***	7.98	0.324	0.052	***	8.08
Deg. Asp: Less than Bachelor's	-0.897	0.373	*	-20.49	-0.888	0.377	*	-20.34
Deg. Asp: More than Bachelor's	0.016	0.102			0.005	0.103		
<i>Environmental Pull Factors</i>								
Hrs/wk: Household/childcare Duties	-0.055	0.028			-0.051	0.029		
Distance to College	0.130	0.036	**	3.25	0.115	0.038	**	2.87
Likelihood of Working Full-time	-0.172	0.044	***	-4.25	-0.158	0.044	**	-3.91
Financial Concerns	-0.179	0.068	**	-4.43	-0.189	0.068	**	-4.67
<i>Anticipated College Experiences</i>								
Live Off-Campus	-0.235	0.120	*	-5.84	-0.281	0.127	*	-6.98
Likelihood of College Involvement	0.008	0.006			0.007	0.006		
Major: STEM	-0.182	0.146			-0.180	0.150		
Major: Professional Fields	-0.077	0.143			-0.065	0.146		
Major: Arts and Humanities	-0.282	0.176			-0.303	0.179		
Major: Undecided	-0.181	0.183			-0.194	0.184		

	<u>Level One Model</u>				<u>Full Model</u>			
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p
<i>Enrollment Measures</i>								
Stopout	---	---			---	---		
Supplemental Enrollment	0.708	0.128	***	17.45	0.740	0.128	***	18.20
Summer School	-1.206	0.189	***	-27.38	-1.200	0.194	***	-27.27
Year of transfer	---	---			---	---		
LEVEL TWO								
<i>Peer Characteristics</i>								
Percent URM					0.016	0.006	*	0.40
Percent Pell					0.004	0.008		
<i>Structural Demographic</i>								
Selectivity					0.020	0.012		
Institutional Control: Private					0.462	0.189	*	11.38
Region: East					0.548	0.179	**	13.33
Region: Midwest					0.306	0.199		
Region: South					0.891	0.211	***	21.84
Core Expenditures per FTE (log)					-0.179	0.180		
HSI					-0.449	0.252		
EHSI					0.102	0.178		
FTE undergrad enrollment (log)					0.079	0.101		
<i>Aggregate Student Experiences</i>								
Peer: Likelihood of Involvement					-0.001	0.042		
Peer: Live Off-Campus					0.603	0.493		
<i>Aggregate Student Attitudes</i>								
Peer: Likelihood of transferring					0.023	0.371		
<i>Aggregate Environmental Pull</i>								
Peer: Distance to College					0.146	0.169		
Peer: Financial Concerns					0.334	0.712		
Percent Part-time Students					-0.008	0.007		
MODEL STATISTICS								
Level 2 Variance Explained	0.271				0.692			
Intercept Reliability	0.217				0.129			

*p<.05, **p<.001, *** p<.001

percentage point higher probability of transferring to a four-year institution than students with mothers who have a high school education or less. Confirming the vulnerability of students from the lowest income quartile, these students are 13.27 percentage points less likely to lateral transfer than to dropout, compared to students from the highest income quartile who tend to explore other college and/or enrollment options rather than drop out completely.

Both higher high school grades and SAT scores improve the probability of lateral transfer when controlling for only student-level characteristics, but the effect of SAT scores diminishes and becomes insignificant after accounting for institutional contexts. High school grades remain significant in the final model, with every categorical grade increase from the mean contributing to a 2.97 percentage point increase in the likelihood of lateral transfer. The other high school experience and academic preparation measure to significantly contribute to this pathway is time management skills. Every one-unit increase from the mean in students' self-rating on this measure increases the probability of transfer by 2.90 percentage points. Academic undermatch initially enters the model as a significant negative predictor of lateral transfer, but the effect becomes insignificant after controlling for environmental pull factors and continues to diminish throughout the remainder of the steps in the final model (see Appendix D).

Two measures of sense of purpose and institutional allegiance significantly affect students taking the lateral transfer pathway over the dropout pathway. For every one-unit increase from the mean in students' reported chance of transferring at the time of college entry, the probability of lateral transfer increases by 8.08 percentage points. And though the proportion of students who indicate degree aspirations of less than a bachelor's degree is small, entering college with such aspirations decreases the likelihood of lateral transfer by 20.34 percentage points. Stated another way, students with the lowest degree aspirations tend to drop out instead

of seek a lateral transfer pathway.

Students whose college is a greater distance from home have a greater probability of lateral transferring relative to dropping out. This finding indicates students with longer commutes or who move further away from home are committed to continuing their higher education at another four-year institution even if their first institution of enrollment ends up not being the best match. The two other environmental pull factors to emerge as significant both reduce the probability of lateral transfer. For every one-unit increase from the mean in students' reported chance of working full-time while in college, the likelihood of transfer to another four-year institution decreases by 3.91 percentage points. Likewise, for every unit-increase from the mean in students' reported concerns about their ability to finance their college education, the probability of lateral transfer decreases by 4.67 percentage points. The pull factor findings indicate that financial obligations and concerns make students more vulnerable to leaving higher education.

One anticipated college experience and two actual college experiences contribute to changes in the probability of lateral transfer. Students who report living off-campus during their first year of college have a 6.98 percentage point lower probability of lateral transferring and are more likely to drop out of college, compared to students who report living at some form of campus housing. Students who supplement their enrollment by taking concurrent or summer school courses at another institution have an 18.20 percentage point higher probability of lateral transfer than those students who do not have such enrollment elsewhere. On the other hand, students who take summer school at their home institution are 27.27 percentage points less likely to lateral transfer, and thus more likely to dropout, than those students who do not. It seems counterintuitive that taking summer school at the home institution would lead to dropout, but it is

possible that in this sample the students who did so were having academic difficulty and were taking summer school to make up courses rather than to get ahead on requirements.

At the institutional level, three measures are significantly associated with lateral transfer. For every one-percent increase from the mean in the percent of the full-time undergraduate student body that is URM, the average probability of lateral transfer increases by 0.40 percentage points. Students who attend private institutions have significantly higher probabilities of lateral transfer compared to their peers who attend public colleges and universities. Attending a privately controlled institution corresponds to an 11.38 percentage point greater likelihood of lateral transfer, relative to dropout. In terms of region, compared to students at institutions in the West, students at institutions in the East and South both have a greater average probability of lateral transfer. The average likelihood of lateral transfer is 11.38 percentage points higher in the East and 21.84 percentage points higher in the South.

Results for lateral transfer (relative to reverse transfer reference group). Table 4.15 demonstrates the model statistics related to lateral transfer, relative to reverse transfer. The level one model accounts for 20% of the between-institution variance. The institutional characteristics in the full model account for an additional 38.4% of that variance, bringing the total between-institution variance in students' average probability of lateral transfer explained to 58.4%.

The HGLM results for this model are also presented in Table 4.15. The level one model shows that, in comparison to Mexican-Americans, Puerto Rican are 8.92 percentage points and students from other Latina/o backgrounds are 8.60 percentage points more likely to lateral transfer. However, this effect becomes insignificant after controlling for students' institutional contexts. In the full model, the only background characteristic to significantly predict one type of transfer over the other is mother's education level. Students with mothers who received more

Table 4.15. Multinomial HGLM Results for Lateral Transfer, with Reverse Transfer Reference Group
(n=3,071 students, 361 institutions)

	Level One Model				Full Model			
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p
LEVEL ONE								
<i>Background Characteristics</i>								
Sex: Female	0.098	0.083			0.108	0.093		
Puerto Rican	0.364	0.118	**	8.92	0.110	0.143		
Other Latina/o	0.351	0.085	***	8.60	0.140	0.094		
Native English Speaker	-0.055	0.095			-0.071	0.109		
Father's Ed: Some College	-0.155	0.097			-0.154	0.106		
Father's Ed: Bachelor's	0.000	0.124			0.003	0.138		
Father's Ed: More than Bachelor's	-0.060	0.150			-0.105	0.166		
Mother's Ed: Some College	-0.151	0.095			-0.168	0.104		
Mother's Ed: Bachelor's	0.140	0.128			0.110	0.139		
Mother's Ed: More than Bachelor's	0.372	0.130	**	9.24	0.361	0.141	*	8.97
Income Q1	0.200	0.166			0.163	0.180		
Income Q2	0.048	0.154			0.035	0.168		
Income Q3	0.169	0.176			0.185	0.191		
<i>High School Experiences/Academic Prep</i>								
High School Grades	0.152	0.030	***	3.76	0.167	0.032	***	4.13
SAT	0.014	0.003	***	0.33	0.013	0.004	**	0.33
Credit from Community College	-0.204	0.160			-0.199	0.178		
Credit from Four-Year	0.563	0.306			0.599	0.322		
Self-Rating: Time Management	0.106	0.046	*	2.62	0.106	0.050	*	2.62
Hrs/wk: Student Clubs	-0.015	0.025			-0.021	0.028		
<i>Academic Undermatch</i>								
Academic Undermatch	-0.133	0.137			-0.096	0.160		
<i>Sense of Purpose/Inst. Allegiance</i>								
Reason: Relatives	-0.066	0.054			-0.082	0.061		
Reason: Cost	-0.069	0.056			-0.068	0.062		
Choice of Institution	-0.060	0.048			-0.054	0.053		
Likelihood of Transferring	0.230	0.040	***	5.71	0.248	0.045	***	6.15
Deg. Asp: Less than Bachelor's	-0.834	0.361	*	-18.28	-0.846	0.415	*	-18.46
Deg. Asp: More than Bachelor's	0.031	0.092			0.042	0.105		
<i>Environmental Pull Factors</i>								
Hrs/wk: Household/childcare Duties	-0.050	0.031			-0.056	0.034		
Distance to College	0.082	0.035	*	2.02	0.060	0.041		
Likelihood of Working Full-time	-0.118	0.040	**	-2.78	-0.119	0.044	**	-2.89
Financial Concerns	-0.198	0.065	**	-4.78	-0.214	0.072	**	-5.15
<i>Anticipated College Experiences</i>								
Live Off-Campus	-0.080	0.098			-0.125	0.113		
Likelihood of College Involvement	0.015	0.005	**	0.37	0.017	0.005	**	0.42
Major: STEM	-0.184	0.104			-0.199	0.118		
Major: Professional Fields	0.000	0.126			-0.002	0.140		
Major: Arts and Humanities	0.067	0.176			0.064	0.188		
Major: Undecided	0.019	0.156			0.001	0.166		

	Level One Model				Full Model			
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p
<i>Enrollment Measures</i>								
Stopout	-0.443	0.099	***	-10.75	-0.472	0.109	***	-11.44
Supplemental Enrollment	-0.047	0.112			0.011	0.126		
Summer School	-0.332	0.148	*	-7.94	-0.329	0.166	*	-7.87
Year of transfer	0.123	0.047	**	3.04	0.129	0.051	*	3.19
LEVEL TWO								
<i>Peer Characteristics</i>								
Percent URM					0.012	0.006		
Percent Pell					0.012	0.008		
<i>Structural Demographic</i>								
Selectivity					0.002	0.012		
Institutional Control: Private					0.499	0.202	*	12.00
Region: East					0.883	0.188	***	21.06
Region: Midwest					0.175	0.204		
Region: South					0.848	0.211	***	20.18
Core Expenditures per FTE (log)					0.071	0.207		
HSI					-0.518	0.278		
EHSI					-0.246	0.189		
FTE undergrad enrollment (log)					0.025	0.095		
<i>Aggregate Student Experiences</i>								
Peer: Likelihood of Involvement					-0.051	0.039		
Peer: Live Off-Campus					0.911	0.506		
<i>Aggregate Student Attitudes</i>								
Peer: Likelihood of transferring					0.175	0.390		
<i>Aggregate Environmental Pull</i>								
Peer: Distance to College					0.597	0.172	**	10.89
Peer: Financial Concerns					-0.615	0.700		
Percent Part-time Students					0.008	0.008		
MODEL STATISTICS								
Level 2 Variance Explained	0.200				0.584			
Intercept Reliability	0.313				0.210			

*p<.05, **p<.001, *** p<.001

education than a bachelor's degree are 8.97 percentage points more likely to lateral transfer than to reverse transfer, compared to students with mothers who received a high school education or less. With regard to high school experiences and academic preparation, three measures emerged as significant distinctions between students in the transfer pathways. Students with higher high school grades and SAT scores have higher likelihood of lateral transfer. Every one-unit increase from the mean in high school grades is associated with a 4.13 percentage point increased probability, while every 100-point increase from the mean in SAT scores contributes to a 0.33 percentage point greater likelihood of lateral transfer. Time-management skills are the other measure that has a positive association with the lateral transfer outcome. Every one-unit increase from the mean in students' self-rating is associated with an increase of 2.62 percentage points in the probability of taking this pathway. Combined, the high school experiences and academic preparation results suggest that students who lateral transfer enter college academically stronger than students who reverse transfer.

Two measures representing sense of purpose and institutional allegiance are associated with the probability of lateral transfer. Students who enter college indicating a greater chance of transferring during college are more likely to lateral transfer. Specifically, every one-unit increase from the mean in the likelihood of transferring measure corresponds to a 6.15 percentage point increase in the probability of lateral transfer. This suggests that students who enter college with intentions of transferring are likely intending to transfer to another four-year institution. In other words, students do not typically enter college with predetermined intentions of transferring to a community college. Similarly, students who enter with degree aspirations of less than a bachelor's degree are 18.46 percentage points less likely to lateral transfer, indicating that those students who begin at a four-year institution with the lowest degree aspirations are

more likely to eventually enroll at a community college.

The likelihood of working full-time during college negatively corresponds to the likelihood of lateral transferring. For every one-unit increase from the mean in students' reported chance of working full-time at college entry, the probability of this path decreases by 2.89 percentage points. Likewise, for every one-unit increase from the mean in students' reported level of concern about their ability to finance college, the likelihood of lateral transfer is reduced by 5.15 percentage points. This suggests that environmental pull factors are contributors of reverse transfer when only comparing students in the two transfer pathways. It also further confirms the reverse transfer pathway as a potential way for students to save money or ease their financial concerns.

One anticipated college experience and three enrollment measures are significant in predicting lateral transfer. Students who indicate a greater likelihood of college involvement in the form of student clubs, student government, study abroad, volunteer and community service work, and socializing with peers from different racial/ethnic groups are more likely to lateral transfer than students who indicate lower likelihood of such involvement. In terms of enrollment measures, stopping out and taking summer school at the home institution are both negatively related to making a lateral transfer. Having a stopout results in an 11.44 percentage point lower probability of taking this pathway, while taking summer school decreases its likelihood by 7.87 percentage points. Only year of transfer positively contributes to the outcome, with the probability of lateral transfer increasing by 3.19 percentage points for every year that a student remains at their home institution. In other words, students who transfer earlier in their college trajectories are more likely to enroll at a community college and those who transfer later are more likely to attend a four-year institution.

In examining the results related to students' college contexts, Table 4.15 shows that students at private institutions are on average 12 percentage points more likely to lateral transfer than their peers at public higher education institutions. The location of the college is also related to students' pathways, as attending a college or university in both the East and the South are positively associated with lateral transfer, compared to attending an institution in the West. Students at schools in the East have a 21.06 percentage point higher probability of lateral transfer, and students at institutions in the South have a 20.18 percentage point higher likelihood of taking this pathway. Finally, a normative peer context representing environmental pull is significantly associated with lateral transfer. Students at institutions where their peers, on average, have a greater distance from college to home have a greater likelihood of lateral transferring, relative to reverse transferring.

Comparing Results Across Models

Table 4.16 shows the model statistics for each of the five outcomes. Model 4 predicting lateral transfer relative to dropout has the most between-institution variance explained at 69.2%, while model 3 predicting reverse transfer relative to dropout has the least between-institution variance explained at 22.5%. Models 1 and 2 predicting the two types of transfer relative to no departure have similar levels of variance explained, with 41.6% for reverse transfer and 39.5% for lateral transfer. Finally, model 5 explains more than half (58.4%) of the between-institution variance in students' average probability of lateral transfer relative to reverse transfer. The results for the five HGLM models predicting reverse and lateral transfer, relative to no departure, dropout, and each other are also presented in Table 4.16.

As a final step in the analysis, a test of the equality of regression coefficients was conducted using the equation recommended by Paternoster, Brame, Mazerolle and Piquero

Table 4.16. Results from Final Multinomial HGLM Models Predicting Reverse and Lateral Transfer, Relative to No Departure, Dropout, and Each Other

	Model 1 Reverse Transfer:			Model 2 Lateral Transfer:			Model 3 Reverse Transfer:			Model 4 Lateral Transfer:			Model 5 Lateral Transfer:			
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p
LEVEL ONE																
<i>Background</i>																
Sex: Female	-0.094	0.073		-0.049	0.088		0.158	0.104	0.278	0.107 *		6.90	0.108	0.093		
Puerto Rican	0.038	0.130		0.094	0.124		-0.126	0.148	-0.048	0.143			0.110	0.143		
Other Latina/o	-0.160	0.097		-0.041	0.093		0.081	0.135	0.235	0.113 *		5.86	0.140	0.094		
Native English Speaker	0.192	0.085 *		3.26	0.130	0.093	0.171	0.109	0.103	0.111			-0.071	0.109		
Father's Ed: Some College	-0.048	0.093		-0.188	0.094 *		-0.012	0.121	-0.132	0.120			-0.154	0.106		
Father's Ed: Bachelor's	-0.260	0.116 *		-4.29	-0.241	0.125	0.176	0.145	0.137	0.188			0.003	0.138		
Father's Ed: More than Bachelor's	-0.075	0.141		-0.189	0.132		-0.006	0.163	-0.088	0.190			-0.105	0.166		
Mother's Ed: Some College	0.164	0.094		0.037	0.094		0.267	0.112 *	6.57	0.101	0.114		-0.168	0.104		
Mother's Ed: Bachelor's	0.106	0.120		0.210	0.128		0.070	0.149	0.173	0.144			0.110	0.139		
Mother's Ed: More than Bachelor's	-0.115	0.143		0.167	0.132		0.267	0.167	0.567	0.170 **		4.30	0.361	0.141 *		8.97
Income Q1	-0.585	0.158 ***		-10.96	-0.423	0.166 *	-6.76	-0.650	-15.69	0.219 **		-13.27	0.163	0.180		
Income Q2	-0.453	0.145 **		-8.77	-0.383	0.159 *	-6.19	-0.407	-9.65	0.201 *			0.035	0.168		
Income Q3	-0.440	0.144 **		-8.55	-0.217	0.166	-0.265	0.197	-0.102	0.208			0.185	0.191		
<i>High School Exp./Academic Prep.</i>																
High School Grades	-0.325	0.027 ***		-5.07	-0.167	0.030 ***	-2.33	-0.044	0.119	0.032 ***		2.97	0.167	0.032 ***		4.13
SAT	-0.020	0.003 ***		-0.34	-0.008	0.004 *	-0.12	-0.005	0.007	0.004			0.013	0.004 **		0.33
Credit from Community College	0.207	0.121		0.023	0.158		0.240	0.138	0.078	0.196			-0.199	0.178		
Credit from Four-Year	-0.239	0.295		0.462	0.187 *		-0.323	0.279	0.291	0.272			0.599	0.322		
Self-Rating: Time Management	-0.144	0.038 ***		-2.37	-0.051	0.045	0.022	0.044	0.116	0.054 *		2.90	0.106	0.050 *		2.62
Hrs/wk: Student Clubs	0.004	0.027		-0.014	0.024		0.017	0.028	-0.007	0.029			-0.021	0.028		
<i>Academic Undermatch</i>																
Academic Undermatch	-0.001	0.135		-0.107	0.137		-0.089	0.171	-0.152	0.181			-0.096	0.160		
<i>Sense of Purpose/Inst. Allegiance</i>																
Reason: Relatives	0.029	0.050		-0.083	0.051		0.090	0.059	-0.008	0.059			-0.082	0.061		
Reason: Cost	-0.108	0.051 *		-1.80	-0.147	0.053 **	-2.07	0.053	-0.085	0.065			-0.068	0.062		
Choice of Institution	0.014	0.048		-0.039	0.047		-0.029	0.061	-0.068	0.058			-0.054	0.053		
Likelihood of Transferring	0.074	0.041		0.338	0.041 ***		0.061	0.049	0.324	0.052 ***		8.08	0.248	0.045 ***		6.15
Degree Asp: Less than Bachelor's	0.294	0.271		-0.543	0.349		0.016	0.240	-0.888	0.377 *		-20.34	-0.846	0.415 *		-18.46
Degree Asp: More than Bachelor's	0.124	0.078		0.120	0.093		-0.021	0.080	0.005	0.103			0.042	0.105		
<i>Environmental Pull Factors</i>																
Hrs/wk: Household/childcare duties	0.060	0.031		0.023	0.027		-0.003	0.030	-0.051	0.029			-0.056	0.034		
Distance to college from home	0.055	0.034		0.098	0.034 **		1.49	0.085	0.032 **	2.09		2.87	0.060	0.041		
Likelihood of working full-time	0.145	0.034 ***		2.59	-0.015	0.047	-0.014	0.038	-0.158	0.044 **		-3.91	-0.119	0.044 **		-2.89
Financial concerns	0.177	0.057 **		3.19	-0.020	0.058	0.008	0.058	-0.189	0.068 **		-4.67	-0.214	0.072 **		-5.15
<i>Anticipated College Experiences</i>																
Live Off-Campus	0.105	0.099		-0.014	0.119		-0.113	0.117	-0.281	0.127 *		-6.98	-0.125	0.113		
Likelihood of College Involvement	-0.009	0.007		0.009	0.006		-0.013	0.006 *	0.007	0.006			0.017	0.005 **		0.42
Major: STEM	0.392	0.093 ***		7.01	0.096	0.097	0.046	0.131	-0.180	0.150			-0.199	0.118		
Major: Professional Fields	-0.044	0.101		-0.135	0.105		-0.058	0.149	-0.065	0.146			-0.002	0.140		
Major: Arts and Humanities	-0.095	0.138		-0.087	0.139		-0.318	0.173	-0.303	0.179			0.064	0.188		
Major: Undecided	-0.074	0.149		-0.148	0.126		-0.180	0.179	-0.194	0.184			0.001	0.166		

	Model 1 Reverse Transfer:			Model 2 Lateral Transfer:			Model 3 Reverse Transfer:			Model 4 Lateral Transfer:			Model 5 Lateral Transfer:				
	No Departure Reference			No Departure Reference			Dropout Reference			Dropout Reference			Reverse Transfer Reference				
	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p	Coeff.	S.E.	Sig.	Delta-p	
<i>Enrollment Measures</i>																	
Stopout	2.031	0.106	***	43.07	1.708	0.144	***	32.76	---	---	---	---	-0.472	0.109	***	-11.44	
Supplemental Enrollment	-0.343	0.086	***	-5.57	-0.290	0.102	**	-4.06	0.659	0.124	***	15.63	0.740	0.128	***	18.20	
Summer School	-2.340	0.130	***	-32.35	-2.517	0.098	***	-29.59	-0.883	0.122	***	-21.66	-1.200	0.194	***	-27.27	
Years of transfer	---	---	---	---	---	---	---	---	---	---	---	---	---	0.129	0.051	*	3.19
<u>LEVEL TWO</u>																	
<i>Peer Characteristics</i>																	
Percent URM	-0.016	0.007	*	-0.27	-0.004	0.006			0.003	0.006			0.016	0.006	*	0.40	
Percent Pell	0.009	0.009			0.022	0.009	*	0.33	-0.008	0.008			0.004	0.008			
<i>Structural Demographic</i>																	
Selectivity	0.010	0.013			0.011	0.012			0.018	0.012			0.020	0.012			
Institutional Control: Private	-0.260	0.216			0.195	0.192			-0.017	0.196			0.462	0.189	*	11.38	
Region: East	-0.883	0.176	***	-14.35	0.006	0.181			-0.311	0.194			0.548	0.179	**	13.33	
Region: Midwest	-0.020	0.196			0.136	0.205			0.103	0.192			0.306	0.199			
Region: South	-0.067	0.213	**		0.856	0.214	***	14.38	0.026	0.228			0.891	0.211	***	21.84	
Core Expenditures per FTE	-0.561	0.213	**	-8.14	-0.603	0.179	**	-7.28	-0.200	0.195			-0.179	0.180			
HSI	0.414	0.252			-0.131	0.292			0.104	0.219			-0.449	0.252			
EHSI	0.298	0.237			0.050	0.202			0.382	0.165	*	9.20	0.102	0.178			
Size (FTE undergraduate enrollment)	0.012	0.100			0.044	0.099			0.048	0.088			0.079	0.101			
<i>Aggregated Peer Experiences</i>																	
Peer: Likelihood of involvement	-0.058	0.040			-0.105	0.042	*	-1.50	0.042	0.037			-0.001	0.042			
Peer: Live Off-Campus	-0.720	0.509			0.118	0.510			-0.353	0.498			0.603	0.493			
<i>Aggregated Peer Attitudes</i>																	
Peer: Likelihood of transferring	0.466	0.388			0.433	0.408			-0.100	0.355			0.023	0.371			
<i>Aggregated Environmental Pull</i>																	
Peer: Distance to college from home	-0.154	0.162			0.476	0.178	**	8.11	-0.467	0.182	*	11.62	0.146	0.169			
Peer: Financial Concerns	1.344	0.728			0.966	0.676			0.866	0.681			0.334	0.712			
Percent Part-Time Students	0.005	0.008			0.012	0.011			-0.015	0.007	*	0.37	-0.008	0.007			
<u>MODEL STATISTICS</u>																	
Level Two Variance Explained	0.416				0.395				0.225				0.692				0.584
Reliability Estimate	0.264				0.301				0.186				0.129				0.210

*p<.05, **p<.01, ***p<.001

(1998) to compare each of the predictors across the different models. This section will discuss the results across models and highlight the measures that operate differently according to the equality of coefficients test. Beginning with background characteristics, previous studies have found females to be more likely to transfer than to persist at a single institution (Hossler et al., 2008; Rhee, 2008), but for Latina/os it appears that there are no significant differences by sex in terms of transferring and not departing. Rather, the only significant effect for sex across all models is that females are more likely to lateral transfer than to dropout. Ethnicity and native language also only have one significant effect across the models. Students from Latina/o backgrounds other than Mexican-American or Puerto Rican are more likely to lateral transfer than to dropout, and native English speakers are more likely to reverse transfer than have no departure.

In terms of parents' level of education, having a father with some college or with a bachelor's degree reduces the probability of both transfers, relative to no departure. Having a mother with some college education increases the likelihood of reverse transfer relative to dropout, and having a mother with more than a bachelor's degree increases the probability of lateral transfer, relative to both dropout and reverse transfer. Taken together, the results for parents' level of education suggests that students who have parents with education beyond high school will most likely remain at their home campus, but if they do have a departure it will be a transfer to a two or four-year institution rather than dropout from the higher education system. Moreover, having parents with education beyond a bachelor's degree makes lateral transfer more likely than reverse transfer.

Income is the background characteristic that is significant across the most models. Being in the lowest income quartile, compared to being in the highest, decreases the probability of both

types of transfer relative to both no departure and dropout. The most income differences are found in model 1 for reverse transfer relative to no departure, where students from each of the first three income quartiles have significantly lower probabilities of taking that pathway than students in the high-income group. Though some of this may seem counterintuitive, Goldrick-Rab (2006) found that high-income students were more likely to have fluid movement across institutions, while low and middle income students were more likely to have interrupted pathways through college. This suggests that while higher-income Latina/os may be more likely to transfer, controlling for everything in the model, they are probably being strategic about their mobility and still completing their degrees at higher rates. Interestingly, no significant differences by income emerged when comparing lateral transfer and reverse transfer to each other, but students in the lowest income quartile are least likely to have any form of mobility, making them most vulnerable to dropping out if circumstances are not ideal at their first institution. Overall, the fewest differences on demographic characteristics exist between students who engage in the two forms of transfer.

When considering high school experiences and academic preparation, students' high school grades and SAT scores are significantly associated with transfer across several of the models. Increases in both measures are related to decreases in the probability of both reverse and lateral transfer, relative to having no departure. Though the effects of the measures are negative for both outcomes, the test of equality of coefficients reveals that they are more pronounced in predicting reverse transfer. In other words, having higher SAT scores and high school grades reduces the probability of reverse transfer more than it reduces the probability of lateral transfer, which coincides with the finding that increases in both measures contribute to a greater probability of lateral transfer relative to reverse transfer. Higher high school grades also

have a more prominent effect on lateral transfer when predicting the pathway relative to dropout than when relative to no departure. What these findings collectively mean is that students who do not depart their initial institution tend to have higher high school grades and SAT scores than all transfer students, but that lateral transfer students tend to have higher grades than both dropouts and reverse transfer students.

Two additional high school measures emerged as significant in at least one of the models. Higher self-ratings on time-management are associated with lower probability of reverse transfer relative to no departure, and to higher probability of lateral transfer relative to dropout and reverse transfer. Taking a course for credit at a four-year institution before college is associated with an increased likelihood of lateral transfer relative to no departure. None of the high school experiences and academic preparation measures emerged as significant in predicting reverse transfer relative to dropout, suggesting that there are other important factors that differentiate the decision to drop out completely rather than follow a reverse transfer pathway that are not related to how academically strong students are at the time of initial college entry.

One variable of interest that was not significant in any of the models is academic undermatch. Although descriptively it seems that academically undermatched Latina/o students are more likely to take a college pathway that involves lateral transfer, the multivariate model suggests that this population's higher rates of lateral transfer can be attributed to characteristics that these students exhibit and are controlled for in the HGLM model. To further examine this, an additional post-hoc HGLM model was estimated predicting academic undermatch controlling for only the background, high school experience, and academic preparation measures that entered the original models in steps 1 and 2 before academic undermatch entered. The results of this model (see Appendix E) suggest that the relationship between academic undermatch and

lateral transfer is accounted for in the main analysis by these students' positive performance in high school, as higher high school GPA and SAT scores both predicted enrollment at an institution of lower selectivity than what the student may have been qualified to attend.

In regards to sense of purpose and institutional allegiance measures, a few have a significant effect throughout the models. Students who place greater importance on costs when choosing a college are less likely to engage in either transfer pathway than to have no departure. Indicating a greater likelihood of transfer at college entry corresponds to an increased probability of lateral transfer relative to all three of the reference groups, but is not significant in any of the reverse transfer models. Descriptive analyses of the sample reveal that 56.2% of Latina/o students who enroll in less than their third choice of institution indicate some or a very good chance of transferring upon college entry, compared to 51% of students who enroll in their third choice, 37.9% of students who enroll in their second choice, and 20.4% of students who enroll in their first choice. This correlation between the two measures is significant ($r=-.263$, $p<.01$), indicating that an early intention to transfer is probably an intention to transfer to a different four-year institution, possibly the result of not enrolling at one's first choice. Similarly, aspiring to a degree below a bachelor's at college entry decreases the likelihood of lateral transfer relative to dropout and reverse transfer. This finding may mean that these students are unsure about their decision to attend a four-year institution in the first place. As with high school experiences and academic preparation, there are no significant sense of purpose and institutional allegiance measures that predict reverse transfer relative to dropout.

Distance from home increases the probability of both types of transfers relative to dropout, suggesting that students who move or commute further than a few miles from home are committed to staying in higher education even if not at their first institution. Two other

environmental pull factors have parallel effects on the transfer outcomes. Increases in the likelihood of working full-time during college and in concerns about ability to pay for college correspond to increases in the probability of reverse transfer relative to no departure, but they also decrease the likelihood of lateral transfer relative to dropout and reverse transfer. This finding coupled with the lack of significance for these two measures in the reverse transfer with dropout reference group model suggests that students who enter college worried about their financial responsibilities are most vulnerable to taking the reverse transfer or dropout pathways.

In terms of anticipated college experiences, living off campus with family or in a private home or apartment reduces the probability of reverse transfer relative to dropout. Higher scores on the likelihood of college involvement are related to lower probability of reverse transfer relative to dropout, and also to higher likelihood of lateral transfer relative to reverse transfer. The final anticipated college experience to have a positive effect on students' pathways is expected major. Students who enter college intending to major in one of the STEM fields tend to be more likely to reverse transfer than to stay at their initial institution. These students enter college with significantly higher high school performance in the form of grades than non-STEM majors (mean difference: .356, $p < .001$), indicating that perhaps they are reverse transferring for strategic reasons rather than academic difficulty. No anticipated college experiences emerged as significant in explaining the decision to lateral transfer relative to not departing.

Students' enrollment behavior proved to affect their pathways through college. Having a period of non-enrollment significantly increases the probability of both lateral and reverse transfer relative to having no departure. It also decreases the probability of lateral transfer relative to reverse transfer. This finding indicates that students who stay at their initial institution tend to have more continuous enrollment than transfer students as a whole, but that among

transfer students those who stop out are more likely to transfer to a two-year institution than a four-year college or university. Having supplemental enrollment decreases the likelihood of both types of transfer relative to no departure, increases the likelihood of each relative to dropping out, and has no significant effect in differentiating the two types of transfer from each other. Though the effect is significant on both transfer pathways relative to both reference groups, the test of equality of coefficients reveals that the role of supplemental enrollment is greater in predicting transfer relative to dropping out than to no departure. This means that taking courses at another two or four-year institution during the summer or concurrently during the academic year decreases the odds of dropping out considerably more than it reduces the odds of transfer relative to staying at the initial school. This suggests that institutions may benefit from promoting supplemental enrollment to their students who are looking to get ahead or make up coursework. In contrast, taking summer school at the home institution reduces the probability of reverse and lateral transfer relative to all reference groups, but its effect is most pronounced relative to having no departure. This finding suggests that regardless of the reason why students enroll in summer school, this enrollment is not associated with transferring to another institution and having a wide variety of course offerings during the summer session may help institutions retain students. Finally, the longer a student stays at the initial institution, the greater the probability that they will lateral transfer relative to reverse transfer.

In examining students' college environments, Table 4.16 shows that at least one measure in each of the five level-two categories is significant in at least one of the models. For peer characteristics, the percent of the full-time undergraduate student body composed of URM students is related to lower probabilities of reverse transfer relative to no departure, and to higher probabilities of lateral transfer relative to dropout. The percent of the full-time undergraduate

study body composed of Pell grant recipients is also associated with an increased likelihood of lateral transfer relative to no departure.

Several structural demographic characteristics significantly influence students' pathways. Though no differences were found in selectivity, institutional control has a positive effect on lateral transfer relative to both dropout and reverse transfer. In other words, private control does not influence lateral transfer relative to no departure, but students at private colleges and universities are more likely to lateral transfer than to take one of the other departure pathways. In terms of an institution's location, no significant effects were found for the Midwest compared to the West, but students at institutions in the East are on average more likely to lateral transfer than to dropout or reverse transfer. In addition, students at institutions in the South are more likely to lateral transfer than to take any of the other pathways. These regional differences may be indicative of the concentration of certain institution types in particular regions, or may perhaps reflect existing regional policies that facilitate some pathways. For instance, Pennsylvania has a statewide program-to-program articulation agreement between its 14 community colleges and 14 public four-year universities, which allows a core set of courses to transfer to any of the participating institutions (Commonwealth of Pennsylvania, 2014). The final structural demographic characteristic to have a significant effect in more than one model is expenditures per full-time student, which is negatively associated with both types of transfer relative to no departure.

In examining the results across all models, Table 4.16 shows that the normative peer context has some significant effects on students' pathways through college. When it comes to normative peer experiences, students who attend institutions where their peers, on average, report greater likelihood of getting involved in college activities are less likely to lateral transfer

relative to no departure. Surprisingly, increases in the peer attitude measure likelihood of transfer do not have a significant effect in any of the models. Oseguera and Rhee (2009) refer to this measure as the peer transfer climate and found it to be negatively related to degree completion at a single institution, which they speculated could mean it was positively related to transfer. For Latina/o students, however, it appears to have no significant effect after controlling for the other four categories of contextual measures.

Aggregated environmental pull in the peer context significantly influences the transfer outcomes. A greater average distance from home among peers at the college is associated with a lower probability of reverse transfer relative to dropout and with higher probability of lateral transfer relative to no departure and reverse transfer. This indicate that Latina/o students attending institutions where their peers are not necessarily from the local community are more likely to lateral transfer or dropout than reverse transfer, suggesting that fostering a sense of belonging may be particularly important in these environments.

CHAPTER 5: IDENTIFYING INSTITUTIONAL NETWORKS IN CALIFORNIA

This chapter will focus on the results of the social network analysis, which was used to understand the pathways Latina/o students use moving from their initial four-year institutions. The specific objective of the analysis was to examine the characteristics of the institutions that send and receive Latina/o lateral and reverse transfer students who started their college careers at four-year institutions, and to understand the patterns in the networks of institutions that are created as a result of this enrollment mobility. Five separate sets of matrices were examined, first looking at the full sample in two different ways and then separately at each of three different institution types: public comprehensive universities, public research universities, and private non-profit four-year institutions. The social network analysis included institutional structural characteristics and average peer characteristics.

Findings presented in this chapter address research questions 2 and 3, which address academic undermatch and patterns of movement among Latina/o college students who lateral and reverse transfer. The chapter begins with a presentation of results from cross-tabulations that provide an overview of transfer and academic undermatch rates in the state of California, compared to all other states in the country. Next, an overview of the institutional sample is presented, describing both the sending and the receiving institutions included in the social network analysis. Finally, a description of the patterns of movement for Latina/o students is presented through the results of the social network analysis for the full sample and for each of the three institution types. The chapter concludes with a summary of the results across all five sets of social network analyses.

Descriptive Results: Full California Sample

Rates of different pathways through college. Before examining the enrollment mobility patterns for a sample of institutions in the state, it is important to know the rates of participation in each of the four pathways through college for students in California and how these rates compare to those of the rest of the country. As with Chapter 4, knowing how rates compare across racial groups in each setting is also important in creating a context for understanding the results of the analysis. The pathways of interest are: a) reverse transfer, defined as a transfer from a four-year institution to a two-year institution during the traditional academic year, b) lateral transfer, defined as a transfer from a four-year institution to another four-year institution during the traditional academic year, c) dropout, defined as a ceasing enrollment in the higher education system and not returning during the six-year period covered in the study, and d) no departure, defined as remaining at the initial four-year institution of enrollment after high school. Table 5.1 shows the rates of engagement in each of the four pathways through college for students in California compared to an aggregate of students in the other 49 states, using weighted national data. The table also shows how the rates differ for American Indian, Asian, Black, Latina/o, White, and multiracial students.

Table 5.1 Pathways Through College for Weighted National Sample, by State and Racial Group

	All (n=239,136)		Am. Indian (n=848)		Asian Am. (n=16,151)		Black (n=17,704)		Latina/o (n=10,967)		White (n=179,841)		Multiracial (n=13,625)	
	CA	Other	CA	Other	CA	Other	CA	Other	CA	Other	CA	Other	CA	Other
Reverse Transfer	13.1	12.5	19.3	13.8	10.5	9.8	17.2	16.6	19.7	18.6	11.6	11.5	14.9	14.7
Lateral Transfer	7.0	15.0	6.6	15.4	5.5	11.3	7.8	16.5	5.4	14.6	8.7	14.9	6.4	16.5
Dropout	7.6	11.6	27.7	28.6	6.5	7.1	9.6	21.1	15.0	15.8	5.0	9.7	8.2	15.4
No Departure	72.3	60.9	46.4	42.1	77.5	71.8	65.4	45.8	59.9	50.9	74.7	63.9	70.5	53.3

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data. Note: n's reflect unweighted sample size

Starting with reverse transfer, 13.1% of all students in California made a move to a two-year institution at some point during the six years covered in the study. For all racial groups, the reverse transfer rate in California is higher than the reverse transfer rate in other states. Latina/o students, however, have the highest reverse transfer rate both in California and outside of California, which highlights the need to better understand which Latina/o students are most vulnerable to taking this pathway and what both the sending and receiving institutions can do to help them remain in the higher education system. Almost one-fifth (19.7%) of all Latina/o students in California transfer to a community college, as do 18.6% of Latina/o students in other states. In California, the Latina/o reverse transfer rate is followed by 19.3% of American Indian, 17.2% of Black, 14.9% of multiracial, 11.6% of White, and 10.5% of Asian American students.

In contrast, the lateral transfer rate for students in California (7%) is considerably lower than the rate for students in other states (15%) and this holds true even when disaggregating by racial group. The largest gap in lateral transfer rates between students in and out of California exists for multiracial students, with a 10.1 percentage point difference. Latina/o students have the second highest gap at 9.2 percentage points, but they also have the lowest lateral transfer rate overall in California at only 5.4%, compared to 8.7% of White, 7.8% of Black, 6.6% of American Indian, 6.4% of multiracial, and 5.5% of Asian American students. In other states, 14.6% of Latina/o students move from one four-year institution to another, which is more than double their California rate but is also lower than all other racial groups except Asian American. What this suggests is that lateral transfer may be a harder pathway to embark on in California, where the California Master Plan (1960) gives priority for transfer admission into the public four-year system to students from the California community colleges. Even public four-year institutions of lower selectivity such as the University of California, Merced publicly state that

prospective students from other four-year institutions will have a harder time identifying transferability of courses (UC Merced Admissions, 2014). Nonetheless, lateral transfer is a pathway that keeps students in the four-year sector and the fact that Latina/os engage in this path less than other students suggests that they may not have access to the type of resources that facilitate such a move. Other states with fewer community colleges force students to seek courses at other four-year colleges, if needed, while the California system of colleges may create more ease for reverse transfer.

In terms of dropping out, 15% of Latina/o students in California left their initial institution and did not return there or enroll anywhere else during the six-year period covered in the study. This is almost double the rate of California students as a whole (7.6%) and is higher than all other racial groups except American Indian students at 27.7%. Nonetheless, the dropout rate for students across all racial groups is lower in California than it is nationally outside of California. Lastly, Chapter 4 shows that 54.6% of Latina/os nationwide have no departure from the four-year institution where they initially enroll as freshmen. Table 5.1 shows in California, that rate is higher at 59.9% and almost 10 percentage points higher than the no departure rate for Latina/o outside of California. This difference is likely attributed to the difference in lateral transfer rates in and out of the state. As a whole, 72.3% of all students in California and 60.9% of students outside of California have no departure from their first four-year institution, meaning that after six years they either graduate or continue to persist. The following subsection will examine the six-year outcomes for Latina/o students who do depart their initial institution to enroll elsewhere.

Six-year outcomes by pathway. Table 5.2 shows the six-year outcomes across each of the four pathways for Latina/o students who start at four-year institutions in California. The last

three rows in the table show the aggregated outcomes for all transfers (lateral and reverse), all non-transfers (dropout and no departure), and all Latina/o students as a whole. As with the national rates demonstrated in chapter 4, Latina/o reverse transfer students obtain a bachelor’s degree at less than half the rate of Latina/o lateral transfer students. Nevertheless, 41.4% of students whose first move is to a two-year institution remain enrolled in the higher education system after six years, which suggests they may very well still persist to a degree. Although close to half (46.8%) of lateral transfer students complete a bachelor’s degree within six years, that rate is still considerably lower than the 88.7% completion rate for Latina/o students who do not depart their first institution of enrollment and even the 70.8% graduation rate for all non-transfers. This confirms prior research suggesting that transfer out of a four-year institution tends to delay time-to-degree regardless of the type of transfer (Adelman, 2004). Overall, 16.5% of Latina/o students who begin at a four-year institution in California transfer out but remain enrolled at either a two-year or four-year college or university after six years.

Table 5.2 Six-year Outcomes for Latina/o Students in California, by College Pathway (n=3,551)

	Not Enrolled	Enrolled at Two-year	Enrolled at Four-year	Four-year Degree
Reverse	41.8	28.5	12.9	16.8
Lateral	24.7	2.8	25.7	46.8
Dropout	100	0.0	0.0	0.0
No departure	0.0	0.0	11.3	88.7
All transfers	38.1	23.0	15.7	23.2
All non-transfers	20.1	0.0	9.1	70.8
All Latina/os	24.5	5.8	10.7	59.0

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data. Note: n reflects unweighted sample size.

Timing of transfer. Table 5.3 shows the academic year during which Latina/o students’ first reverse and lateral transfer took place. As an example, if a student first enrolled at a different institution than their initial school in the fall, winter, or spring terms of their second

year of college, they are counted in the column for year 2. The table compares those who started college in California to an aggregate of those in all other states. Almost half of all reverse transfers (47.1%) amongst Latina/o students who enroll at four-year California higher education institutions after high school occur by the end of the second year of college, while about one-third (32.7%) of all lateral transfers happen within the same time period. In total, the most movement from a California four-year college or university to a two-year institution occurs during the second year of college (40.6%) and the most movement to a four-year institution occurs during the third-year of college (30.9%). This differs for lateral transfer in other states outside of California, where the most movement to another four-year institution occurs during year two (44.6%). Likewise, 36.4% of lateral transfers from California institutions occur during years four through six, while only 24.5% of these transfers outside of California occur during those academic years. This suggests that lateral transfer in California may require more planning. Most of the campuses in the California State University system, for example, do not accept lower-division transfer students in order to accommodate more first year students at college entry (California State University Office of the Chancellor, 2014).

Table 5.3 Timing of Reverse and Lateral Transfer for Latina/o Students, by State (California n=907, Other n=2,259)

	<u>Year 1</u>		<u>Year 2</u>		<u>Year 3</u>		<u>Year 4</u>		<u>Year 5</u>		<u>Year 6</u>	
	CA	Other	CA	Other	CA	Other	CA	Other	CA	Other	CA	Other
Reverse Transfer	6.5	9.2	40.6	39.0	18.2	24.1	13.6	13.4	14.1	8.2	6.9	6.1
Lateral Transfer	9.6	6.9	23.1	44.6	30.9	24.1	17.5	11.6	12.0	7.8	6.9	5.1
All Transfer	7.2	8.2	36.8	41.4	20.9	24.1	14.5	12.6	13.7	8.0	6.9	5.7

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data. Note: n's reflect unweighted sample size

Reverse transfer rates for students who first attend California schools are also higher in years four through six than the rates for students at institutions in other states, though the difference (6.9%) is not as pronounced as it is for lateral transfer (11.9%). Overall, though the

majority of Latina/o student enrollment mobility occurs in the first few years of college, more than one-third (35.1%) of all transfers in California happen starting in students' fourth academic year in college, a point by which they would presumably be considered college seniors. This is likely part of the reason for the low six-year completion rates for lateral and reverse transfer students, as the data suggests that many students transfer later in their college trajectories and continue to persist but extend their time to degree.

Academic undermatch. Each institution in the sample was assigned a selectivity category based on *Barrons Profile of American Colleges* (2005). In this study, academic undermatch is defined as having an SAT score that is greater than the mean SAT score for the next selectivity group above the institution where the student is enrolled. As demonstrated in Chapter 4, the national rate of academic undermatching for Latina/o students who start at four-year institutions after high school is 12.9%. Table 5.4 shows that the rate for Latina/o students who start college at a four-year institution in California is only roughly half (6.1%) of that amount. This, however, does not necessarily indicate that students in the state are better matched academically than students in other states. Given that this study does not account for academically undermatched students who initially enroll in two-year institutions after high school when they are qualified to enroll at a four-year institution, it is likely that the actual rate is much higher, especially since California has the largest community college system in the country (California Community Colleges Chancellor's Office, 2013). Table 5.4 also shows that 4.7% of Latina/o students in California enroll at a four-year institution that is one Barron's selectivity category below the highest level of selectivity for which they may have been qualified to attend, and 1.4% enroll at institutions that are two categories below their qualifications.

Table 5.4 Frequency of Academic Undermatch for Latina/o College Students Enrolled at Four-Year Institutions, by State

	CA (n=3,551)	Other (n=7,412)
One Level	4.7	11.5
Two Levels	1.4	6.3
All Academic Undermatch	6.1	17.8

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data. Note: n's reflect unweighted sample size

Table 5.5 demonstrates the pathways through college taken by academically undermatched Latina/o students who start college in California. Mirroring the national rates for all academically undermatched students discussed in Chapter 4, a smaller proportion of these students reverse transfer or have no departure from their first institution than students who are not academically undermatched. Likewise, academically undermatched students as a whole have slightly greater participation rates in the lateral transfer pathway than students who are not academically undermatched, but they also have higher dropout rates.

Table 5.5 Pathways Through College for CA Latina/o Students, by Level of Academic Undermatch (AUM)

	One Level (n=204)	Two Levels (n=64)	All AUM (n=268)	All Non-AUM (n=3,283)
Reverse Transfer	15.7	14.7	15.5	20.0
Lateral Transfer	8.1	4.5	7.3	5.3
Dropout	18.4	19.9	18.7	14.8
No Departure	57.9	60.9	58.6	60.0

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data. Note: n's reflect unweighted sample size.

Dissagregating the data by the level of academic undermatch, Table 5.5 also shows that academically undermatched Latina/o students are more likely to lateral transfer if they are only one level below the selectivity category for which they may have been qualified to attend than if they are two levels below. Those who are two levels below appear to be less likely to transfer in general and more likely to stay at their first institution or dropout. This finding, however, should be interpreted with caution as only 1.4% of Latina/o students (n=64) enroll at a four-year

institution that is two levels below.

Descriptive Results: Social Network Analysis Sample

The previous descriptive results were based on analysis using a weighted national sample. The results in the following sections are based on social network analysis that follows Latina/o students' first departure from nine institutions in California. The total Latina/o student sample at these nine institutions is $n=2,253$ but the mobile Latina/o sample that was used for the analysis is $n=501$.

Sending institutions. The social network analysis employed in this study included nine four-year sending institutions, evenly representing three institution types: public comprehensive universities (Comprehensive), public research universities (Research), and private non-profit colleges and universities (Private). Table 5.6 describes the transfer rates and the number of institutional links for each of the nine institutions in the sample, which are referred to in the rest of the chapter by pseudonyms indicating their level of selectivity. These institutions are considered “sending” because in the analysis they are the only ones that were students' institutions of initial enrollment after high school and the only ones from which students' first movement was followed. On average, a greater proportion of students transfer out of public comprehensive universities, with 28.4% of all students at those institutions moving to a two-year college or another four-year institution. Private colleges and universities follow with an average of 19.8% of students transferring out, though there is a large range between the three schools in this sample with Most Competitive Private 1 only having 8.3% of its students transfer and Very Competitive Private 3 having more than one-third (33.5%) of them do so. Public research universities have the lowest transfer rates with an average of 17.6%, suggesting that overall they are doing a better job of retaining their students.

Table 5.6 Latina/o Transfer Rates and Number of Institutional Links for Each Institution in the Sample (n=9)

	Lateral Transfer	Reverse Transfer	All Transfer	Number of Links
Public Comprehensive Universities				
Competitive Comprehensive 1 (n=219)	2.2	23.8	26.0	22.0
Competitive Comprehensive 2 (n=262)	5.3	23.4	28.7	30.0
Competitive Comprehensive 3 (n=414)	5.3	25.1	30.4	33.0
Average	4.3	24.1	28.4	28.3
Public Research Universities				
Most Competitive Research 1 (n=226)	2.6	8.3	10.9	20.0
Highly Competitive Research 2 (n=225)	4.4	15.6	20.0	22.0
Competitive Research 3 (n=455)	7.0	14.9	21.9	55.0
Average	4.7	12.9	17.6	32.3
Private Colleges and Universities				
Most Competitive Private 1 (n=204)	3.9	4.4	8.3	15.0
Very Competitive Private 2 (n=86)	9.6	8.1	17.7	14.0
Very Competitive Private 3 (n=162)	6.2	27.3	33.5	28.0
Average	6.6	13.3	19.8	19.0

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data.

When looking at lateral transfer, private colleges and universities have the highest average rate at 6.6%. Very Competitive Private 2 actually has the highest rate of lateral transfer in the entire sample, with almost one out of every 10 students transferring to another four-year college or university within six years after high school. Public comprehensive universities have the lowest average lateral transfer rate at 4.3%, and Competitive Comprehensive 1 has the lowest rate in the entire sample with only 2.2%. The opposite is true when it comes to reverse transfer, as the average rate is highest for public comprehensive universities with almost one out of every four students (24.1%) transferring to a community college. Public research universities have the lowest average reverse transfer rate (12.9%) but that is due to Very Competitive Private 3 having the highest rate in the entire sample (27.3%), which skews the average for private colleges and universities to be higher than the public research universities even though Most Competitive Private 1 and Very Competitive Private 2 both have lower rates than all three of the Public

Research Universities. This all suggests that within the public higher education system in California, the better resourced research universities send fewer students to other institutions than the comprehensive universities which tend to face more financial challenges that can affect students through such things as reduction in courses offered or cuts in student services.

Overall, this study tracked students' first move out of these nine institutions and the figures presented in Table 5.6 show that there is a considerable amount of student enrollment mobility taking place in the sample, though most of it is in the form of reverse transfer. The last column in the table shows the number of links created through this movement for each of the sending institutions. A link is a unique relationship between one sending and one receiving institution. Since not all students from a sending institution transfer to the same receiving institution, sending institutions each have multiple links. Likewise, it is possible for a receiving institution to have incoming transfer students from multiple campuses and, thus, also have multiple links. As such, the number of links represents the number of total connections between all nine of the sending institutions and all of the receiving colleges and universities. The last column also indicates the average number of receiving institutions by each of the three type of sending institutions. In total, there are 239 links created by the nine institutions in the sample. On average, private colleges and universities send students to the least number of schools ($n=19$) and public research universities send students to the most number of schools ($n=32.3$), even though they have the lowest average transfer rates. What this means is that a lower proportion of students from research universities are transferring to the same destinations than students from private institutions.

At the high end, the 21.9% of students who transferred out of Competitive Research 3 enrolled at 55 different two- and four-year colleges and universities. On the low end, the 17.7%

of students who transferred out of Very Competitive Private 2 went on to enroll at 14 different higher education institutions. These descriptive results as a whole suggest that the institutional networks created through student enrollment mobility are not small and that lateral and reverse transfer students are not heavily concentrated at just a few receiving institutions, but rather spread across a large number of destinations, which may make efforts targeted at mobile students harder to implement. The results of the social network analysis in a later section will further examine the emerging patterns.

Receiving institutions. Of the 239 links created through students' enrollment mobility, there are a total of 105 receiving institutions, meaning that several institutions received lateral and reverse transfer students from more than one of the nine sending schools. Table 5.7 shows the characteristics of the 105 receiving institutions as well as the 239 links. In terms of control, 14.3% of the receiving institutions are privately controlled while the other 85.7% are publically controlled. The privately controlled institutions, however, only account for 7.9% of the 239 links, suggesting that they may receive their incoming transfer students from a limited number of the sending campuses. The majority of the publically controlled institutions are community colleges, which make up 59% of all receiving institutions and 68.6% of all links, indicating that some community colleges receive students from multiple sending institutions, rather than from a limited number as the private four-year institutions seem to do. Public four-year colleges and universities comprise around one-quarter (26.7%) of all receiving schools and a roughly similar share of links at 23.4%.

With regard to selectivity, just above three-fifths (61.9%) of the destination colleges and universities are considered to be in the lowest Barron's category of selectivity, the non-

Table 5.7 Characteristics of Institutions Receiving Latina/o Transfer Students

	Percent of Institutions (n=105)	Percent of Links (n=239)
Control and Sector		
Public four-year	26.7	23.4
Private four-year	14.3	7.9
Public two-year	59.0	68.6
Selectivity		
Non-Competitive (Level 1, SAT: not required)	61.9	69.9
Less Competitive (Level 2, SAT: below 1000)	5.7	7.1
Competitive (Level 3, SAT: 1000-1144)	14.3	11.7
Very Competitive (Level 4, SAT: 1146-1238)	8.6	4.2
Highly Competitive (Level 5, SAT: 1240-1308)	2.9	1.7
Most Competitive (Level 6, SAT: 1310-1600)	6.7	5.4
Hispanic Serving Institution (HSI) Status		
Non-HSI	39.0	21.7
Emerging HSI	24.8	24.3
HIS	36.2	54.0
State		
California	79.2	90.4
Out of state	20.8	9.6
Published In-State Tuition and Fees		
Less than \$1,000	52.4	65.7
\$1,000 to \$5,000	25.7	20.1
\$5,001 to \$10,000	9.5	7.1
Over \$10,000	12.4	7.1
Percent of Students with Loans		
Zero	12.4	11.7
1 to 10	43.8	56.1
10.01 to 30	18.1	16.3
30.01 to 50	15.2	9.6
More than 50	10.5	6.3

Source: 2004 CIRP Freshman Survey, 2004-2010 National Student Clearinghouse data, and 2004 IPEDS

competitive group (level 1), and this group also accounts for 69.9% of all links. There is no clear pattern created as selectivity increases, with the 105 receiving campuses being comprised of 5.7% less competitive institutions (level 2), 14.3% competitive institutions (level 3), 8.6% very competitive institutions (level 4), 2.9% highly competitive institutions (level 5), and 6.7% most competitive institutions (level 6). A total of 7.1% of the links between the nine sending institutions and the 105 receiving ones have a destination in the top two selectivity levels. Just as

few links end with an institution in the highest levels of selectivity, only 9.6% of all links between sending and receiving colleges and universities have a receiving institution outside the state of California even though 20.8% of all receiving institutions are in another state. This suggests that out-of-state institutions are generally not receiving large numbers of Latina/o transfer students from California.

In terms of student demographics, about one-quarter (24.8%) of the destination institutions are Emerging Hispanic Serving Institutions (HSI) and over one-third (36.2%) are HSIs, meaning that Latina/os comprise at least 15% of the full-time-equivalent student body at 64 out of the 105 receiving campuses. When examining the HSI status of the destination campuses counting all 239 links, more than three-quarters (78.3%) are emerging HSI or HSI institutions. This suggests that non-HSI colleges are not connected to as many sending institutions as those with some type of HSI status. It also indicates that EHSIs and HSIs play an important role in channeling Latina/o students to a degree since they receive a large proportion of lateral and reverse transfer students.

The final two sections of Table 5.7 show financial indicators. Almost one-third of all links (65.7%) have a destination where the published in-state tuition and fees for the 2004-2005 academic year was less than \$1,000. Likewise, 67.8% of all links have a destination where only 10% or less of the student body takes out loans. Together, this indicates that cost is likely an important part of the reason for the transfer. Only 12.4% of all receiving institutions have tuition of more than \$10,000 and only 10.5% have more than half of their student body taking out loans.

Link characteristics. Table 5.8 shows the percent of change in institutional control and selectivity between sending and receiving institutions, based on both students and links. In other words, it shows the percent of the 501 Latina/o transfer students in the sample whose second

institution attended is of a different control and selectivity level than their first institution attended, as well as the percent of the 239 institutional links where the sending and receiving schools are different on those same institutional characteristics. In terms of institutional control, the change statistics presented here confirm that the majority of lateral and reverse transfer students end up at a public institution. Only 2% of students and 4.7% of the links from the public comprehensive universities have a private institution as a destination. Likewise, only 7.3% of students and 9.3% of links from public research universities end up at a privately controlled campus. The public sending institution with the highest rate of change in control is Competitive Research 3, where close to one-tenth of both transfer students (9.4%) and links (10.9%) change from public to private control.

On the other end, a large majority of the transfer out of private institutions involves a move to a publicly controlled campus, as 93% of all lateral and reverse transfer students from private institutions go to a public institution, which represents 89.5% of the links created between the three private sending institutions and the respective receiving campuses. The higher rates of reverse transfer than lateral transfer in the sample largely account for the great amount of movement to public institutions, as all community colleges in the sample are public. Nonetheless, as previously demonstrated in Table 5.7, public four-years do comprise a larger share of receiving institutions and links than private four-year campuses. This suggests that it may be harder for Latina/o students to transfer to private institutions even if they initially enroll at one. Compared to public institutions in the state, private institutions in California do not have uniform transfer admissions criteria, which can make the articulation of courses more difficult. Nonetheless, taking the inverse of the figures, it can be seen that 14.3% of links from Very Competitive Private 2 and 13.3% of links from Most Competitive Private 1 do not involve a

change in institutional control, meaning that students stay in the private sector. These percentages are higher than any of the link percentages from the six public sending institutions, suggesting that there may be some social and navigational capital accumulated at private institutions that makes the transition to other private institutions a little easier than for those students who start at public ones. Alternatively, students who initially enroll at private institutions may just start college with more cultural capital than their peers at public institutions.

Table 5.8 Percent of Change in Institutional Control and Selectivity Between Sending and Receiving Institutions, by Students (n=501) and Links (n=239)

	<u>Control Change</u>		<u>Select. Decrease</u>		<u>Select. Increase</u>	
	Students	Links	Students	Links	Students	Links
Competitive						
Comprehensive 1	1.8	4.5	96.4	90.9	1.8	4.5
Competitive						
Comprehensive 2	2.7	3.3	86.5	80.0	5.4	10.0
Competitive						
Comprehensive 3	1.7	6.1	90.9	75.8	2.5	9.1
All Comprehensive	2.0	4.7	90.8	81.2	3.2	8.2
Most Competitive						
Research 1	4.0	5.0	100.0	100.0	0.0	0.0
Highly Competitive						
Research 2	4.5	9.1	93.2	90.9	6.8	9.1
Competitive						
Research 3	9.4	10.9	82.3	76.4	12.5	14.5
All Research	7.3	9.3	87.3	84.5	9.1	10.3
Most Competitive						
Private 1	88.2	86.7	82.4	80.0	0.0	0.0
Very Competitive						
Private 2	86.7	85.7	80.0	78.6	13.3	14.3
Very Competitive						
Private 3	96.3	92.9	98.1	96.4	0.0	0.0
All Private	93.0	89.5	91.9	87.7	2.3	3.5
All	19.4	26.8	89.8	84.1	5.0	7.9

Source: 2004 CIRP Freshman Survey, 2004-2010 National Student Clearinghouse data, and 2004 IPEDS

With regard to changes in institutional selectivity, across the nine sending institutions it appears that the majority of transfer involves a decrease in selectivity level, though there is some variation. Comparing the two most selective sending institutions in the sample, for instance,

shows that there is a difference in whether students stay within their selectivity level or decrease. At Most Competitive Research 1 (level 6 selectivity), 100% of the students who transfer (n=25) enroll at a college or university of lower selectivity, whereas at Most Competitive Private 1 (level 6 selectivity) only 82.4% (n=14) do so. Given that these schools are in the top Barron's selectivity category, they both have zero students transferring upward on the institutional selectivity scale. But the difference in their selectivity decrease rates suggest that 17.6% of transfer students who initially enroll at Most Competitive Private 1 transfer laterally to a school of equal selectivity, while none of the students from Most Competitive Research 1 are making such a move. This adds support to the previous finding that students who initially enroll at private four-year institutions may either enter college with or accumulate a certain navigational capital while there that facilitates lateral transfer. Competitive Research 3 (level 3 selectivity) and Very Competitive Private 2 (level 4 selectivity) have the highest percentage of students and links that have a destination of higher selectivity than the origin. Though the students who transferred to an institution of higher selectivity from Very Competitive Private 2 did not enter college with intentions to transfer, 58.4% of those who transferred to a higher selectivity institution from Competitive Research 3 indicated that there was "some" or a "very good" chance that they would transfer, suggesting that students may perhaps see these institutions as stepping-stones to other more preferable institutions.

Table 5.9 shows the percent of change between sending and receiving institutions in financial characteristics, specifically published in-state tuition and fees and the percent of students receiving loans. In terms of tuition and fees, the public research universities have the greatest proportion of links (83.5%) that involve a decrease in tuition, while the private universities have the most students (86.7%) who make a move to an institution with a lower

price tag. Nonetheless, there is not a lot of difference in the three sending institution types when it comes to students transferring to a less expensive campus.

Table 5.9 Percent of Change in Institutional Financial Characteristics Between Sending and Receiving Institutions, by Students (n=501) and Links (n=239)

	<u>Tuition Decrease</u>		<u>Tuition Increase</u>		<u>Pct Loans Dec.</u>		<u>Pct Loans Inc.</u>	
	Students	Links	Students	Links	Students	Links	Students	Links
Competitive								
Comprehensive 1	94.5	86.4	3.6	9.1	10.9	18.2	9.1	22.7
Competitive								
Comprehensive 2	82.4	70.0	5.4	10.0	82.4	70.0	8.1	16.7
Competitive								
Comprehensive 3	86.0	66.7	4.1	15.2	89.3	69.7	5.0	18.2
All Comprehensive	86.8	72.9	4.4	11.8	70.0	56.5	6.8	18.8
Most Competitive								
Research 1	96.0	95.0	4.0	5.0	96.0	95.5	4.0	5.0
Highly Competitive								
Research 2	86.4	81.8	2.3	4.5	86.4	81.8	0.0	0.0
Competitive								
Research 3	83.3	80.0	9.4	10.9	83.3	80.0	8.3	9.1
All Research	86.1	83.5	6.7	8.2	86.1	83.5	5.5	6.2
Most Competitive								
Private 1	88.2	86.7	0.0	0.0	94.1	93.3	0.0	0.0
Very Competitive								
Private 2	86.7	85.7	0.0	0.0	80.0	78.6	0.0	0.0
Very Competitive								
Private 3	96.3	92.9	0.0	0.0	96.3	92.9	0.0	0.0
All Private	93.0	89.5	0.0	0.0	93.0	89.5	0.0	0.0
All	87.6	81.2	4.4	7.5	79.2	75.3	5.2	9.2

Source: 2004 CIRP Freshman Survey, 2004-2010 National Student Clearinghouse data, and 2004 IPEDS

The differences between sending institution types are much more pronounced when looking at mobility that involves transferring to a more expensive institution, as zero percent of both students and links from private institutions end up at a destination campus that has higher published tuition and fees than the origin institution. This is not surprising since private institutions tend to be more expensive than public institutions. In the first year of college for students in this sample, the average published tuition for private four-year institutions was \$20,863, compared to \$5,286 at public four-year institutions (Baum & Ma, 2010). However, not

all mobility from private institutions involves a decrease in tuition, meaning that some moves are lateral transfers to equally expensive campuses. Similarly, none of the students or links originating at private institutions have a destination where a larger share of students take out loans. In contrast, 22.7% of the links from Competitive Comprehensive 1 involve a move to an institution where a larger percent of students borrow money, and those links comprise 9.1% of all transfers from that sending institution—the highest in the entire sample. The disparity in link rates between movement that involves a destination campus where a lower percentage of students take out loans (56.5%) and movement that involves a destination campus that is less expensive (72.9%) is notable in the public comprehensive system as a whole. The difference suggests that, even though the public comprehensive system is the most affordable of the three sending institution types, students still give considerable weight to the published price tag of their other options, possibly not considering how grant aid and loans may change those numbers.

Not shown in the table is that 61.1% of all links with an increase in tuition are also associated with an increase in institutional selectivity and 97.4% of links with a decrease in tuition are associated with a decrease in selectivity. This suggests that students are more willing to accept higher tuition when they are able to attend more prestigious institutions, but those who are most concerned about costs are probably also less concerned about the academic reputation of their destination campus

Academic undermatch. The number of academically undermatched students in the nine-institution sample is too small (n=25) to conduct in-depth analysis of their movement across institutions, but it is worth noting that their patterns pertaining to selectivity are different than the rest of the sample. Among the academically undermatched transfer students, 20% increase selectivity, compared to 4.2% of the transfer students who are not academically undermatched.

Another 16% (n=4) transfer laterally to an institution of equal selectivity, which means that only 64% of them decrease selectivity, compared to 91.2% of those who are not academically undermatched. It is possible that some academically undermatched Latina/o students choose their initial college based on temporary circumstances that later change and allow them to pursue different options.

Peer characteristics. To get a better understanding of the students that comprise the links in this analysis, the average characteristics of Latina/o transfer students were calculated and compared across three categories: type of transfer, sending institution type, and selectivity of receiving institution. Table 5.10 shows the ranges, means, and standard deviations for the sample, based on the type of transfer. The final column shows where there are significant differences between reverse and lateral transfer students, based on independent sample t-tests. In terms of background characteristics, the only significant difference exists for income ($p < .05$). Reverse transfer students on average have a parent income between \$30,000 and \$39,999, whereas lateral transfer students have an average parent income between \$40,000 and \$49,999.

In terms of the academic background, there are significant differences between reverse and lateral transfer students with regard to high school grades and SAT scores. Reverse transfer students have a B- to B grade average in high school and average close to 900 on the SAT, compared to lateral transfer students who average a solid B and SAT scores close to 1000. In addition to having higher academic indicators, the lateral transfer sample also has a higher proportion of academically undermatched students. Twelve percent of lateral transfers are academically undermatched, while only 3% of reverse transfer students initially enroll at an institution of lower selectivity than they may be qualified to attend. The other significant differences in peer characteristics pertain to financial concerns, likelihood of transfer, and

stopout behavior. The 2.23 mean on financial concerns for reverse transfer indicates that the average student reported “some” to “major” concerns, which significantly ($p < .001$) differs from lateral transfer students’ 1.93 mean indicating only “some” concern. Lateral transfer students enter college indicating a greater intention to transfer ($p < .01$) than reverse transfer students, and they are also less likely to have a period of non-enrollment before making the move to another institution. Specifically, 51% of reverse transfer students have a stopout before the transfer, compared to 38% of lateral transfer students ($p < .05$). This all suggests that lateral transfer is a pathway that involves more advance planning than reverse transfer does and that reverse transfer is related to more immediate environmental factors such as finances.

Table 5.10 Range, Mean, and Standard Deviation for Peer Characteristics of Latina/o Transfer Students, by Type of Transfer

	Min	Max	Reverse (n=399)		Lateral (n=102)		Mean Diff.
			Mean	S.D.	Mean	S.D.	R v L
Sex: Female	1.00	2.00	1.62	0.49	1.55	0.50	
Income	1.00	14.00	6.27	3.16	7.10	3.48	*
Parent Education	1.00	8.00	3.76	2.15	3.99	2.27	
High School Grades	1.00	7.00	4.53	1.36	5.08	1.21	***
SAT Score	4.00	16.00	8.97	1.51	9.87	1.70	***
Undermatch	1.00	2.00	1.03	0.18	1.12	0.32	*
Distance from Home	1.00	5.00	3.06	1.18	3.30	1.24	
Financial Concerns	1.00	3.00	2.23	0.65	1.93	0.58	***
Likelihood Transfer	1.00	4.00	2.06	0.94	2.37	0.92	**
Stopout	1.00	2.00	1.51	0.50	1.38	0.49	*
Supp. Enrollment	1.00	2.00	1.25	0.44	1.20	0.40	
Summer School	1.00	2.00	1.17	0.38	1.11	0.31	
Year of Transfer	1.00	6.00	3.14	1.40	3.01	1.32	

Source: 2004 CIRP Freshman Survey, 2004-2010 National Student Clearinghouse data, and 2004 IPEDS; * $p < .05$, ** $p < .01$, *** $p < .001$

Table 5.11 shows the ranges, means, and standard deviations for the same peer characteristics as Table 5.10, but this time based on the type of home institution (comprehensive, research, or private). The final three columns in the table show the significant differences between Comprehensive and Research (1 v 2), Comprehensive and Private (1 v 3), and Research

and Private (2 v 3) institutions. Because examining significant differences between the three samples involved making multiple comparisons, the Bonferroni method was employed. The Bonferroni method is an adjustment made to p values to reduce the chances of obtaining a Type I error (false positive) when multiple pair wise tests are performed (Bland & Altman, 1995). After adjusting all the post-hoc test p values, the only significant difference in background characteristics exists for sex, with females comprising a greater share at private institutions (76%) than comprehensive (56%) or research (58%) universities. Significant differences are also evident for the two academic background measures, with students at comprehensive universities having lower high school grades and SAT scores than students at both research universities and private institutions ($p < .001$) by about one full letter grade and 100 SAT points.

Table 5.11 Range, Mean, and Standard Deviation for Peer Characteristics of Latina/o Transfer Students, by Home Institution Type

			<u>Comp. (1)</u>		<u>Research (2)</u>		<u>Private (3)</u>		<u>Mean Differences</u>		
	Min	Max	<u>(n=250)</u>		<u>(n=165)</u>		<u>(n=86)</u>		1v2	1v3	2v3
			Mean	S.D.	Mean	S.D.	Mean	S.D.			
Sex: Female	1.00	2.00	1.56	0.50	1.58	0.49	1.76	0.43	**	*	
Income	1.00	14.00	6.60	3.22	6.40	3.10	6.05	3.54			
Parent Ed.	1.00	8.00	3.86	2.23	3.69	2.04	3.88	2.28			
HS Grades	1.00	7.00	4.20	1.30	5.20	1.18	4.82	1.34	***	***	
SAT Score	4.00	13.00	8.62	1.47	9.74	1.38	9.56	1.79	***	***	
Acad. Undermatch	1.00	2.00	1.05	0.21	1.06	0.24	1.03	0.18			
Distance from Home	1.00	5.00	2.54	0.90	3.83	1.16	3.38	1.16	***	***	**
Financial Concerns	1.00	3.00	2.08	0.66	2.24	0.61	2.30	0.65	*	*	
Likelihood of Transfer	1.00	4.00	2.02	0.95	2.24	0.89	2.22	1.01	*		
Stopout	1.00	2.00	1.52	0.50	1.49	0.50	1.40	0.49			
Supp. Enroll.	1.00	2.00	1.23	0.42	1.25	0.44	1.24	0.43			
Summer School	1.00	2.00	1.16	0.37	1.23	0.42	1.00	0.00		**	***
Year of Transfer	1.00	6.00	3.14	1.38	3.13	1.33	3.01	1.52			

Source: 2004 CIRP Freshman Survey, 2004-2010 National Student Clearinghouse data, and 2004 IPEDS; * $p < .05$, ** $p < .01$, *** $p < .001$ with Bonferroni adjustment.

Though no significant differences were found for students' distance from college to home when examining the two transfer pathways, the students at the three institution types all significantly differed on this measure. Students at research universities move or commute the furthest from home, followed by students at private institutions and then comprehensive universities. This makes sense as the institutions in the comprehensive university system in California have designated local service areas and these are given preference in their admissions decisions. Along with attending college closer to home, the students at comprehensive universities also indicate lower levels of concern about their ability to pay for college ($p < .05$) than students at the other two institution types. This finding makes sense since the comprehensive universities in the sample are the least expensive to attend. The mobile Latina/o students who begin at these institutions also indicate an average of "no chance" of transferring to another institution upon college entry, which is significantly lower ($p < .05$) than students at research universities. Nonetheless, their transfer rates are actually higher than both other institution types, suggesting that the transfer is a reaction to experiences during college rather than something premeditated. Lastly, students at private institutions have significantly lower rates of summer school attendance at their home institution before the transfer than students at the other two institution types.

The final comparison of peer characteristics between samples involved the selectivity of the receiving institutions. Table 5.12 shows the ranges, means, and standard deviations for Latina/o students who transferred to institutions in each of the Barron's selectivity categories: non-competitive (level 1 selectivity, SAT not required), less competitive (level 2 selectivity, median SAT below 1000), competitive (level 3 selectivity, median SAT between 1000 and 1144), very competitive (level 4 selectivity, median SAT between 1146 and 1238), and

highly/most competitive (level 5 selectivity, median SAT between 1240 and 1600). Highly (median SAT between 1240 and 1308) and most competitive institutions are combined in this analysis because the cell size for highly competitive is below five. It appears that the most differences exist between students who transfer to non-competitive (level 1) institutions and those who transfer to institutions in the other selectivity categories. Across the five selectivity groups, the only differences evident in terms of students' background characteristics are between non-competitive (level 1) and highly/most competitive (level 5). Of those Latina/os who transfer to non-competitive institutions, 63% are female, compared to 29% of those who transfer to highly/most competitive institutions. Students who transfer to non-competitive institutions also have lower levels of parental education.

More significant differences exist between the samples with regard to high school academic measures. Inclusive of all sending institutions, Latina/o students who transfer to non-competitive (level 1) institutions have lower high school grades ($p < .05$), with an average between a B- and B, than those who transfer to very (level 4) and highly/most (level 5) competitive institutions who each average between a B and B+. Students who transfer to non-competitive (level 1) institutions also have SAT scores that are significantly lower than students who transfer to competitive (level 3) ($p < .05$), and highly/most competitive (level 5) ($p < .001$) campuses. For non-competitive receiving institutions, the average SAT score for transfer students is close to 900, compared just below 1000 for competitive, and just below 1100 for highly/most competitive. Differences also exist between the receiving institutions when it comes to academic undermatch. Highly/most competitive (level 5) institutions receive a significantly higher ($p < .001$) proportion of academically undermatched transfer students than non-competitive (level 1) institutions.

Table 5.12 Range, Mean, and Standard Deviation for Peer Characteristics of Latina/o Transfer Students, by Institutional Selectivity of Receiving School

	Non-Comp. (1) (n=404)		Less Comp. (2) (n=24)		Competitive (3) (n=40)		Very Comp. (4) (n=12)		High/Most Comp. (5) (n=21)		Sig. Diff.
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	
Sex: Female	1.62	0.49	1.63	0.49	1.58	0.50	1.75	0.45	1.29	0.47	*(1 v 5)
Parent Income	6.27	3.15	6.42	3.16	6.53	3.86	8.00	3.38	8.67	2.89	** (1 v 5)
Parent Education	3.78	2.15	3.92	2.36	3.43	2.12	4.42	2.35	4.67	2.33	
High School Grades	4.53	1.35	4.75	1.19	4.93	1.05	5.67	1.37	5.48	1.36	*(1 v 4,5)
SAT Score	8.97	1.51	9.58	1.69	9.75	1.55	9.75	2.42	10.80	1.24	*(1 v 3), *** (1 v 5)
Academic Undermatch	1.03	0.18	1.08	0.28	1.10	0.30	1.08	0.29	1.24	0.44	*** (1 v 5)
Distance from Home	3.07	1.18	3.25	0.90	2.95	1.30	4.17	1.19	3.52	1.33	*(1, 3 v 4)
Financial Concerns	2.23	0.65	1.79	0.66	2.10	0.55	1.75	0.62	1.86	0.57	*(1 v 2)
Likelihood of Transfer	2.06	0.94	2.17	0.82	2.35	0.98	2.33	0.98	2.71	0.78	*(1 v 5)
Stopout	1.51	0.50	1.46	0.51	1.45	0.50	1.25	0.45	1.19	0.40	*(1 v 5)
Supp. Enrollment	1.25	0.43	1.08	0.28	1.28	0.45	1.17	0.39	1.24	0.44	
Summer School	1.17	0.38	1.13	0.34	1.05	0.22	1.08	0.29	1.19	0.40	
Year of Transfer	3.15	1.41	2.92	1.38	3.20	1.32	2.33	1.07	3.00	1.18	

Source: 2004 CIRP Freshman Survey, 2004-2010 National Student Clearinghouse data, and 2004 IPEDS; *p<.05, **p<.01, ***p<.001 with Bonferroni adjustment.

Two environmental pull factors where differences exist between the samples are distance from home and financial concerns. Compared to non-competitive (level 1) and competitive (level 3) institutions, students who transfer to very competitive (level 4) institutions initially enroll in college a further distance from home ($p < .05$). Specifically, the first college they attend is on average of 51 to 100 miles away from home, whereas students who transfer to the other two institutional selectivity categories first attend college an average of 11 to 50 miles away from home. With regards to financial concerns, the average level of concern about the ability to pay for college as entering college freshmen is higher ($p < .05$) among students who transfer to non-competitive (level 1) institutions than among students who transfer to less competitive (level 2) institutions. The final two significant differences found between the different selectivity groups for receiving institutions are in students' likelihood of transfer and in their stopout behavior during college. Students who transfer to non-competitive (level 1) institutions indicate a lower likelihood of transferring and have more periods of non-enrollment before transferring than students who transfer to highly/most competitive (level 5) institutions.

Overall, there is only one significant difference in the sample that does not involve the non-competitive (level 1) group; all other differences pertain to students who transfer to these institutions. This indicates that the reasons for transferring to institutions of different selectivity for Latina/os in California are not necessarily related to high school academic indicators, environmental pull factors, or enrollment behaviors, except when it comes to choosing a non-competitive institution. The findings in this section collectively suggest that there are clear differences between students who transfer to the lowest and those who transfer to the highest selectivity categories, which makes sense given that they are at the two extremes of admissions criteria. The findings also suggest that two possible reasons for transfer to the lowest selectivity

level compared to others that are not highly/most selective may be related to starting college with lower academic indicators and financial concerns or obligations. Since many of the non-competitive institutions (level 1) in this sample are community colleges, it may be that students elect to take courses at campuses where tuition is more affordable.

Social Network Analysis Results

This study utilized the network analysis tool ORA, developed by the Center for Computational Analysis of Social and Organizational Systems at Carnegie Mellon (Carley, Pfeffer, Reminga, Storrick, & Columbus, 2013), to examine one complete network for the nine sending campuses where students began college in addition to four ego-centric networks. A complete or whole network analysis involves using a select set of nodes and exclusively measuring only all the ties between them, whereas an ego network selects a set of focal nodes and examines their links to all others with which the relationship of interest exists (Borgatti & Ofem, 2010). Nodes are the unit of analysis, in this case institutions, and links or ties are the relationships or connections between two nodes. For this study, the relationships between just the nine sending institutions, also referred to in the description of the results as the primary nodes, were examined in isolation as one complete network. Then, the four ego networks analyzed included: a) all primary nodes and their relationships to all other receiving institutions, inclusive of those that are not part of the sending sample in this study, b) the three comprehensive sending institutions and their links to all receiving institutions, c) the three research sending institutions and their links to all receiving institutions, and d) the three private sending institutions and their links to all receiving institutions.

Complete network results: All sending institutions. One of the key features of social network analysis is its visual component. In addition to producing network statistics, the analysis

can produce “sociograms” that visually represent the relationships between all nodes. The sociogram in Figure 5.1 demonstrates all of the relationships that exist between the nine sending institutions in the study and also shows some of the node attributes. Specifically, the shape of the node indicates the control of the institution, with circles representing public institutions and squares representing private institutions. The size of the node is scaled to represent its level of institutional selectivity, with the most competitive institutions having the largest nodes in the sociogram. Because this study analyzed directional data, the arrows represent which institutions send and which ones receive Latina/o reverse and lateral transfer students. Finally, the lines are weighted to represent the proportion of transfer students from the sending institutions that move to each of the receiving institutions. In other words, the longer the dashes are, the greater proportion of transfer students attended the corresponding receiving institution or the greater the strength of the tie. Based on an examination of the distribution of transfer students from each of the sending institutions to each individual receiving campus, five different weights were created. The lowest weight with the shortest dashes represents that between one and five percent of the transfer students from an individual campus moved to a particular receiving one. The next three weights each represent a subsequent five-percent range, and the largest weight with the longest dashes represents that 20% or more of the transfer students from one campus attended the same receiving institution.

By simply examining the sociogram in Figure 5.1, it can be seen that Most Competitive Research 1 and Competitive Comprehensive 2 receive students from the most number of institutions in this network as they each have five arrows directed at them. The term for being on the receiving end of the greatest number of links in a network is in-degree centrality. On the other hand, Research 3 has arrows pointing to the most institutions, which is referred to as out-

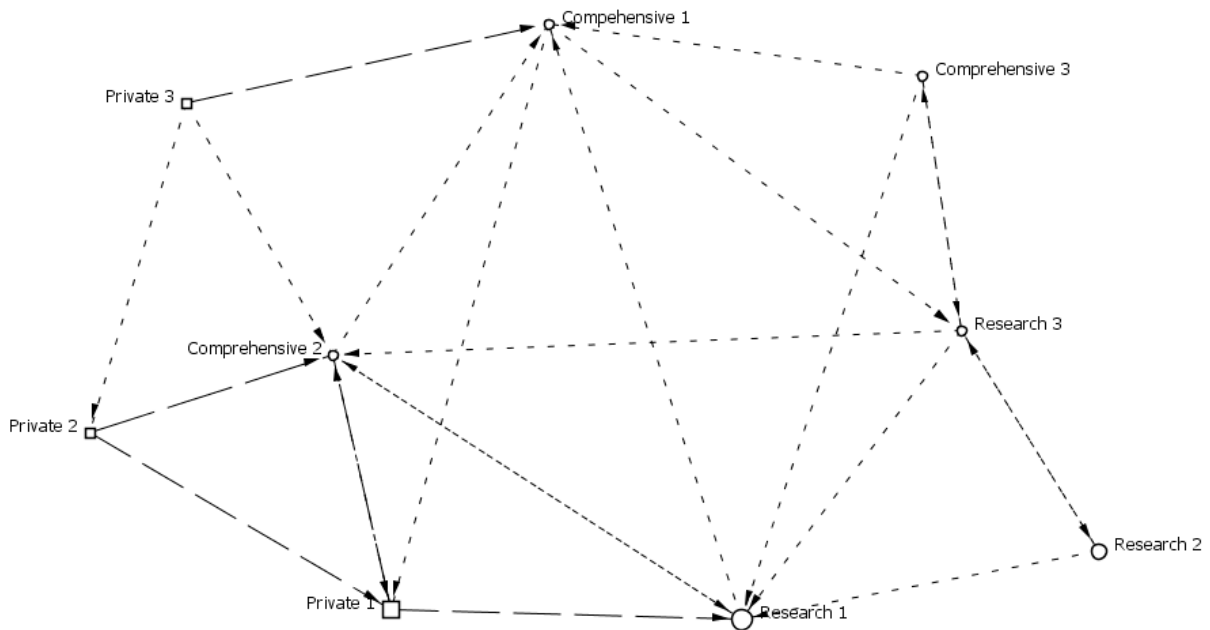


Figure 5.1 Sociogram representing complete network among nine four-year sending institutions. Size of node represents institutional selectivity, with larger nodes being more selective. Squares represent private and circles represent public institutions. Line weights represent proportion of transfers moving from one institution to another, with longer dashes indicating larger proportions.

degree centrality. The weight of the links shows that though there is lots of movement evident in this graph, there is variation in the proportion of students that these institutions receive from each other. Though Most Competitive Research 1 and Competitive Comprehensive 2 have the highest in-degree centrality based on the number of inward links, the length of the dashes show that Most Competitive Research 1 receives a lower proportion of students from the other institutions than Competitive Comprehensive 2 does. It is Competitive Comprehensive 2 that receives the greatest proportion of students from any one institution, with the two longest-dashed lines in the graph pointing to it, from Most Competitive Private 1 and Very Competitive Private 2. Though it is not particularly obvious from the sociogram, those two links have a weight of three, indicating that somewhere between 10 and 15% of the transfer students from each of those two institutions

enroll at Competitive Comprehensive 2 as their second campus. To further clarify the weights in this sociogram, the links from Very Competitive Private 3 to Competitive Comprehensive 1, Very Competitive Private 2 to Most Competitive Private 1, and Most Competitive Private 1 to Most Competitive Research 1 each have a weight of two, indicating that somewhere between 5 to 10% of the transfer students from the respective sending institutions attend the receiving institution. All other links have a weight of one.

Another observation that can be made from the sociogram is that there are four symmetric ties between the nine nodes. In other words, there are four links that have arrows pointing both ways, demonstrating that those pairs of institutions are, in a sense, trading students. The sociogram also demonstrates that Very Competitive Private 3 has outward links but no inward links, suggesting that among this sample of 9 institutions, it does not assist in channeling reverse and lateral transfer students to a college degree. Nonetheless, considering only one of the nine institutions has a zero in-degree, the snapshot of student enrollment mobility provided in this small sample demonstrates it is not just a small concentration of four-year institutions that are helping to graduate students who were not native to their campus. Instead, many four-year campuses are sharing that responsibility.

While the sociogram can provide a great and quick overview of the patterns in a small network such as this one, it becomes more difficult to assess the characteristics of a network when it is larger, as is the case in the rest of the analyses conducted for this study. Thus, it is important to also examine the network statistics calculated using the software program. Table 5.13 shows the network statistics for the complete network of nine four-year sending institutions. As the names suggest, the node and link counts indicate the number of nodes and links present in the network. One of the network statistics most appropriate for interpretation in the analysis of a

whole network such as this one is its density, which represents the network’s level of completeness. A network is considered to be complete when every node is directly connected to every other node, and so the density is defined as the number of existing links as a proportion of the maximum number of possible links, on a 0 to 1 scale (Scott, 2013). In other words, because all institutions in this sample send students, it is possible for each one of them to have 8 inward links.

In this network, the density figure shows the 23 existing links make up 31.9% of the possible links, suggesting that while visually there is a lot of movement in the network, the nine institutions are not completely connected. Nonetheless, this figure is still high considering that the network consists of only nine institutions and many students are transferring out of the network. Even if this were the entire universe of higher education institutions, 100% density would still not be desired because that would suggest that some students transfer to institutions that do not have as strong a connection to their first campus as others do. From a policy standpoint, less density but stronger weights would be ideal because the linked institutions would be able to work together to affect a greater proportion of students. The final figures in the table, in- and out-degree centrality, were already discussed in the description of the network’s sociogram.

Table 5.13 Network Statistics for Complete Network of Sending Institutions (n=9)

Node Count	9
Link Count	23
Density	0.319
Highest In-Degree Centrality	5 (Competitive Comprehensive 2, Most Competitive Research 1)
Highest Out-Degree Centrality	4 (Research 3)

Source: Social network analysis using 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data

Ego network results: All sending institutions. Demonstrating how much more visually complex a larger network looks, Figure 5.2 shows the sociogram representing the ego-centric

network with the nine sending institutions as focal nodes. Whereas the previous sociogram showed only the nine institutions and their links to each other, this sociogram shows every institution that receives Latina/o lateral and reverse transfer students from these campuses. The dashed lines and shapes mean the same as in the previous sociogram, and the triangles represent the focal nodes since there are more than those nine institutions in this graph.

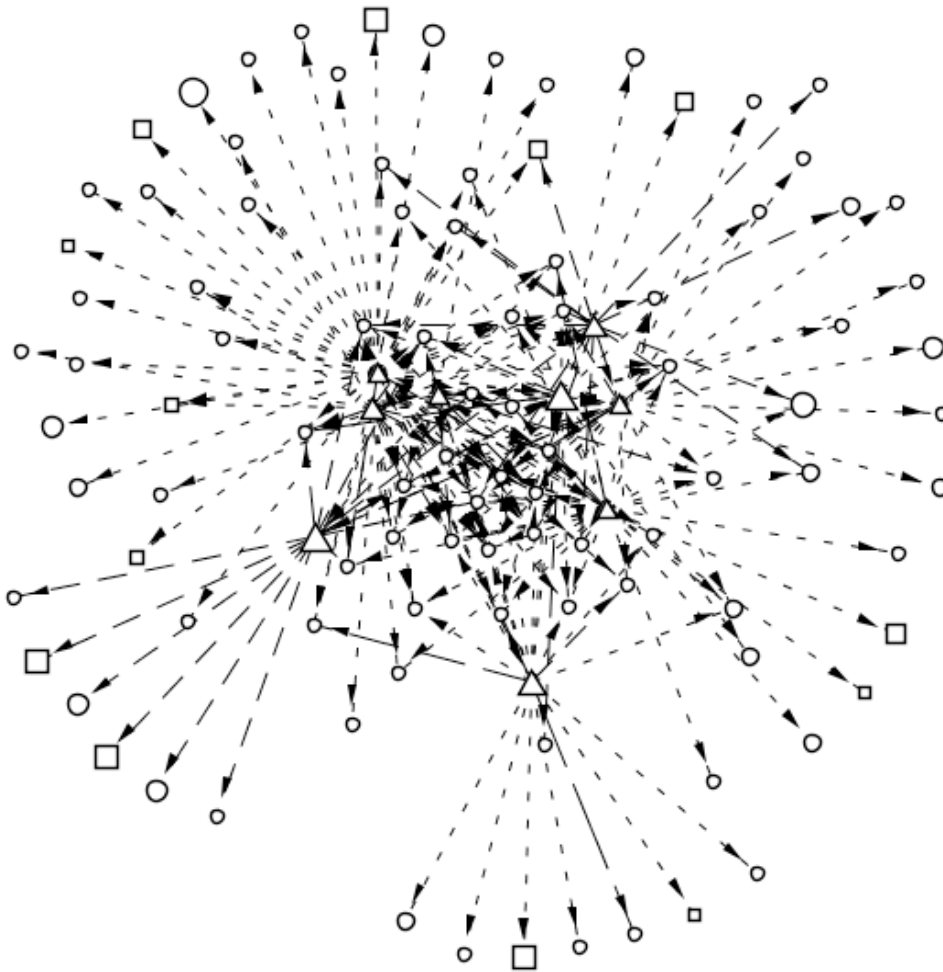


Figure 5.2 Sociogram representing ego network for nine focal institutions. Size of node represents institutional selectivity, with larger nodes being more selective. Squares represent private, circles represent public, and triangles represent sending institutions. Line weights represent proportion of transfers moving from one institution to another, with longer dashes indicating larger proportions.

Visually, it is hard to decipher which nodes are most central in the network, but there

does appear to be a cluster of institutions in the middle that receive students from multiple campuses. Those in the middle, however, seem to be mostly small circles, indicating non-competitive public institutions. The larger shapes appear along the periphery with single links, suggesting that the more selective institutions may have informal ties with particular campuses but are likely not serving large numbers of four-year transfer students. One other thing that can be observed from the dashed lines in the sociogram is that there are large amounts of links that have low weights. This indicates that the primary nodes are sending small proportions of their transfer students to many campuses rather than large proportions to few campuses, which would signal stronger transfer channels between those institutions. This suggests very little cooperation between institutions in educating students toward a degree even though enrollment patterns suggest it may be possible. This pattern will be further discussed in the following subsections individually focused on the comprehensive, research, and private institution types.

To make better sense of the nine-institution ego network, Table 5.14 shows its network statistics. As mentioned in an earlier section on receiving institutions, the 501 Latina/o lateral and reverse transfer students from the nine sending campuses make their first move to 105 different receiving institutions. The complete network in Figure 5.1 also showed that Very Competitive Private 3 sends but does not receive students from this nine-institution network, though it likely receives students from other institutions outside of those nine. Thus, the node count is 106 with 239 total links. Confirming what the sociogram indicated, receiving nodes with the highest in-degree centrality in this network are all community colleges. One two-year institution receives reverse transfer students from eight of the nine sending institutions, three receive from seven, and six receive from six. These 10 institutions alone account for 65 links, or 27.2% of all network connections, suggesting that particular community colleges can play a very

important role in helping mobile Latina/o students continue persisting to completion. At the same time, this has implications for community colleges in California, which are stretching their missions even further beyond their already existing multiple purposes to educate these students.

In total, 55.7% of the nodes have only one link, or in-degree, and 34% have three or more. With respect to the proportion of students transferring from the same sending institution to the same receiving institution, the figures in Table 5.14 confirm what appeared to be the case in the sociogram: in general, small proportions of transfers are attending many institutions and not vice versa. Only 2 of the 239 links comprise 20% or more of the transfer students from one school attending the same second institution, whereas 181 of the links represent 5% or fewer students doing so. Lastly, because only relationships from focal nodes were examined in network, the density statistic is not interpretable and will not be reported for this or the other ego centric networks that follow (Borgatti & Ofem, 2010; Carolan, 2014).

Table 5.14 Network Statistics for Ego Networks of Sending Institutions (n=9)

Node Count	106
Link Count	239
Highest In-Degree Centrality	8 (one community college), 7 (three community colleges), 6 (six community colleges)
Percent of nodes with 1 in-degree	55.7
Percent of nodes with 3+ in-degrees	34.0
Highest Out-Degree Centrality	4 (Competitive Research 3)
Number of Links with Weight 1 (0.01-5%)	181
Number of Links with Weight 2 (5.01-10%)	44
Number of Links with Weight 3 (10.01-15%)	9
Number of Links with Weight 4 (15.01-20%)	3
Number of Links with Weight 5 (20%+)	2

Source: Social network analysis using 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data

The following three sections will individually describe the ego networks for each of the three four-year institution types among the sending nodes: comprehensive, research, and private.

Ego network results: Comprehensive institutions. Figure 5.3 shows the sociogram

representing the *reverse transfer ego network* for the three comprehensive sending institutions in the study. As with the sociogram demonstrating the ego network for all nine sending institutions, it seems that there is a set of community colleges in the center that receive reverse transfer students from all three schools. Forming somewhat of a triangle around that cluster are eight nodes that receive students from two of the three primary nodes, and around that are 17 additional nodes that have single links from one of the institutions. All 17 of the latter appear to have the lowest weight, indicating that in addition to only receiving students from one of the campuses, they are receiving a small proportion (1% to 5%) of the transfer students from that campus. It is likely that those institutions are more embedded in other networks of sending institutions that are possibly geographically closer or have more of a formal relationship with them than the sending nodes in this sample.

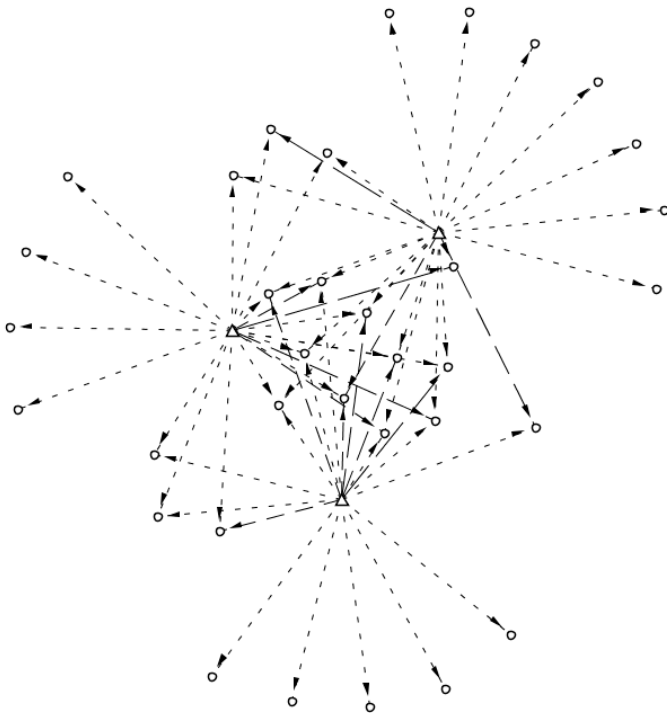


Figure 5.3. Sociogram representing reverse transfer ego network for three comprehensive focal institutions. Size of node represents institutional selectivity, with larger nodes being more selective. Circles represent public and triangles represent sending institutions. Line weights represent proportion of transfers moving from one institution to another, with longer dashes indicating larger proportions.

Figure 5.4 shows the sociogram representing the *lateral transfer ego network* for the three comprehensive sending institutions. Compared to the reverse transfer network, there are fewer nodes and no links with a weight greater than one, visually demonstrating that the three comprehensive institutions send fewer students to fewer schools in the four-year sector than in the two-year sector. Because this network is smaller, it is possible to tell by the sociogram that there is only one four-year institution that receives lateral transfer students from all three of the sending nodes. There are also five institutions with links from two of the comprehensive institutions, one of which is actually one of the three sending nodes that receives students from the other two. Two of the five also seem to be of higher selectivity than the first institution. This suggests that while not many students follow that path based on the proportion of transfers indicated in the graph, it can be expected that there are at least a couple of Latina/o students at each campus that will transfer from a comprehensive to a more selective institution.

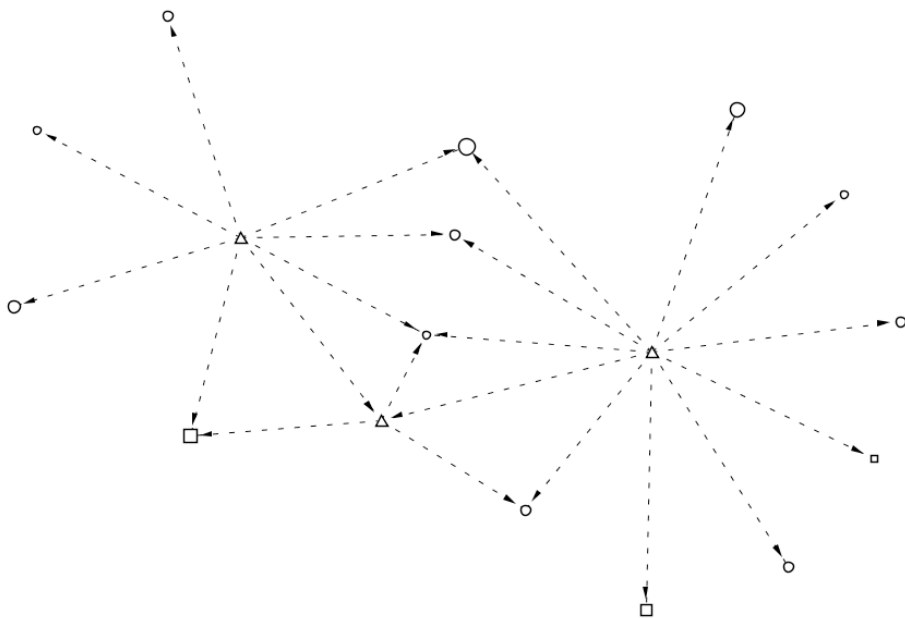


Figure 5.4. Sociogram representing lateral transfer ego network for three comprehensive focal institutions. Size of node represents institutional selectivity, with larger nodes being more selective. Squares represent private, circles represent public, and triangles represent sending institutions. Line weights represent proportion of transfers moving from one institution to another, with longer dashes indicating larger proportions.

Combining the information presented in the previous two sociograms, Table 5.15 presents the network statistics for the ego network of comprehensive institutions, including both reverse and lateral transfer. Students from the three comprehensive sending institutions go on to attend 52 different institutions, forming 85 links between the nodes. Of these 52 institutions, 11 have links to all three of the primary nodes, representing 61.2% of all the relationships in the full comprehensive institution network. Ten of the 11 institutions are community colleges, which students from comprehensive institutions may possibly elect to attend due to lower costs or better availability of required courses. As such, these community colleges have an important responsibility to keep students on track to a degree, but it is a difficult task to take on if they do not know which individuals are reverse transfer students because they have distinct needs from others.

Table 5.15 Network Statistics for Ego Networks of Comprehensive Institutions (n=3)

Node Count	52
Link Count	85
Highest In-Degree Centrality	3 (Less Competitive Comprehensive 4), 3 (10 community colleges)
Percent of nodes with 2+ in-degree	46.2%
Number of Links within Comprehensive system	9
Highest Out-Degree Centrality	33 (Competitive Comprehensive 3)
Number of Links with Weight 1 (0.01-5%)	72
Number of Links with Weight 2 (5.01-10%)	6
Number of Links with Weight 3 (10.01-15%)	4
Number of Links with Weight 4 (15.01-20%)	2
Number of Links with Weight 5 (20%+)	1

Source: Social network analysis using 2004 CIRP Freshman Survey, 2004-2010 National Student Clearinghouse data

Only one of the institutions with the highest in-degree centrality is a four-year campus, and it happens to be part of the same public comprehensive system, though of a lower selectivity (level 2) than the sending campuses (level 3). In addition to the three links to that one institution, six other links exist between institutions that are in the same university system for a total of nine,

or 10.6% of all relationships in the network. Though it was not yet in place during the period covered in the study, the public comprehensive system in California now has an intrasystem visitor enrollment program that allows students in good academic standing to enroll at another campus for one term (California State University, 2013). Such a program may not have been the cause of the intrasystem student mobility captured in this study, but it may help to facilitate a return transfer to the home campus in the future. Overall, almost half (46.2%) of the 52 nodes have links to at least two of the three sending campuses in the study. In addition, the final figures in Table 5.14 show that three links have a weight of four or five, meaning that 15% or more of the transfer students from one institution move to the same destination. Though on face value this figure is low, the full sample of sending institutions only has five links with those weights, and three of them come from the comprehensive sending nodes. This all suggests that comprehensive institutions have potential to channel their mobile Latina/o students to a degree by strengthening their relationships with the institutions that are on the receiving end of the reverse and lateral transfer.

Ego network results: Research institutions. Figure 5.5 shows the sociogram representing the *reverse transfer ego network* for three research focal sending institutions. The number of links for each of the sending institutions has been previously described, but the graph again makes it immediately clear that Competitive Research 3 has more than Most Competitive Research 1 and Very Competitive 2. What it also highlights is that there is only one community college to which Competitive Research 3 sends more than 5% of its transfer students, as all lines but one show the minimum weight. Most Competitive Research 1 and Very Competitive Research 2, on the other hand, each seem to have at least two connections with weights above the lowest value. The sociogram also demonstrates there are four two-year colleges that receive

Latina/o reverse transfer students from all three of the research institutions and a dozen that receive students from two of them.

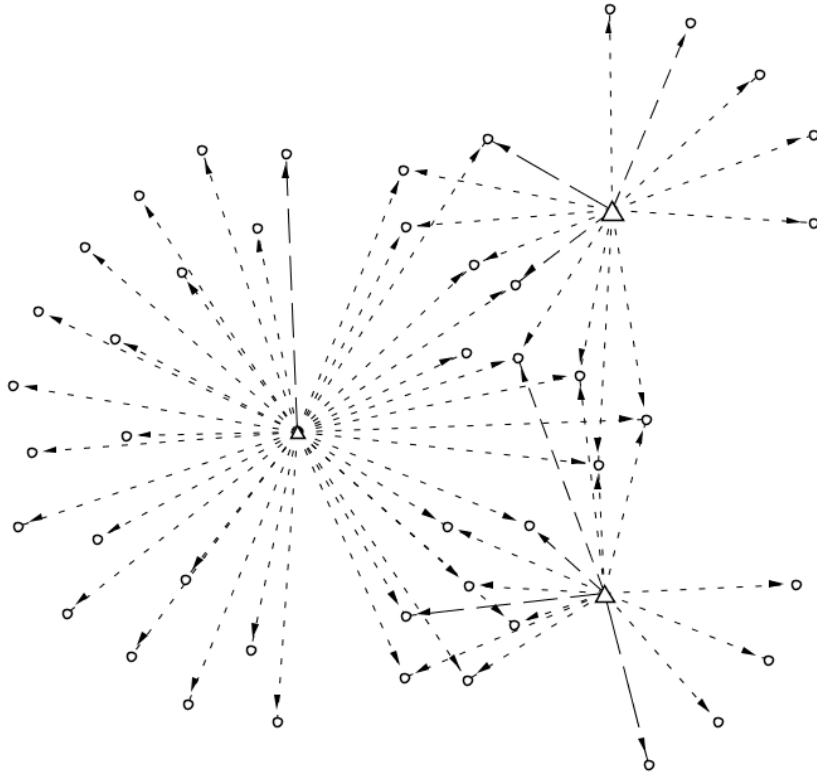


Figure 5.5. Sociogram representing reverse transfer ego network for three research focal institutions. Size of node represents institutional selectivity, with larger nodes being more selective. Circles represent public and triangles represent sending institutions. Line weights represent proportion of transfers moving from one institution to another, with longer dashes indicating larger proportions.

Figure 5.6 shows the sociogram representing the *lateral transfer ego network* for the three research institutions. Competitive Research 3 again shows more links than Most Competitive Research 1 and Very Competitive Research 2, but this time all of the weights appear to be low. Only one symmetric link exists in this sociogram, between Very Competitive Research 2 and Competitive Research 3. Though this suggests that they serve each other's students, the weight of the line indicates that only 5% or fewer transfer students from each campus transfer to the other.

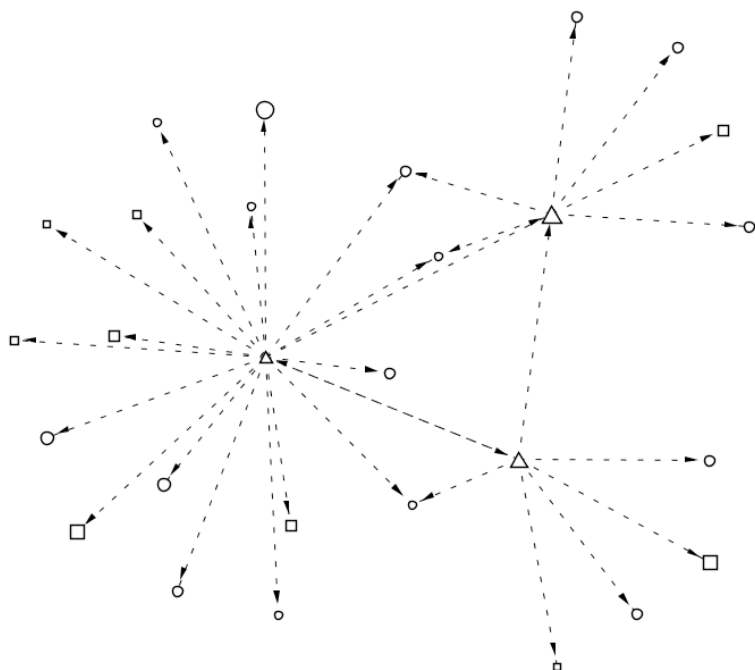


Figure 5.6. Sociogram representing lateral transfer ego network for three research focal institutions. Size of node represents institutional selectivity, with larger nodes being more selective. Squares represent private, circles represent public, and triangles represent sending institutions. Line weights represent proportion of transfers moving from one institution to another, with longer dashes indicating larger proportions.

Separately, the two sociograms for research institutions allow for a quick overview of the mobility patterns for students from these sending institutions. But to get a complete picture of the research institution network, it is necessary to examine the ego network statistics for the three primary research nodes in Table 5.16. Students from the three sending institutions transfer to a total of 73 receiving institutions, forming a total of 97 links between campuses. Four receiving campuses, all community colleges, welcome reverse transfer students from all three of the research institutions. Another 16 institutions receive Latina/o transfer students from two of the three. Of those 16, one-quarter are four-year colleges and universities, indicating that some four-year campuses may be appealing to students from multiple locations. In total, more than one-quarter (27.4%) of the 73 nodes receive students from more than one research institution. Though as the visual weights in the sociograms suggest, they are not necessarily receiving large

numbers of students from these campuses.

Table 5.16 Network Statistics for Ego Networks of Research Institutions (n=3)

Node Count	73
Link Count	97
Highest In-Degree Centrality	3 (Four community colleges)
Percent of nodes with 2+ in-degree	27.4
Number of Links within Research system	7
Highest Out-Degree Centrality	55 (Research 3)
Number of Links with Weight 1 (0.01-5%)	89
Number of Links with Weight 2 (5.01-10%)	4
Number of Links with Weight 3 (10.01-15%)	2
Number of Links with Weight 4 (15.01-20%)	1
Number of Links with Weight 5 (20%+)	1

Source: Social network analysis using 2004 CIRP Freshman Survey, 2004-2010 National Student Clearinghouse data

Given the public research universities in the study are part of a larger state system, the intrasystem relationships were also examined. A total of seven links originated with one of the primary research nodes and ended at a different California public research university campus. This comprises less than 10% of all links in the network, but it is important to acknowledge because the supports for mobile students within the same system seem like the natural first place to start strengthening. The final five figures in Table 5.16 demonstrate the distribution of the 97 links by their weight. As it appears in the sociograms, the large majority of the links (n=89) represent a low proportion of transfer students, comprising no more than 5% of the transfer students from a given university. There are, however, four links that have a weight of three or higher, indicating that more than 10% of the transfer students from one campus enroll in the same second campus. The destination institutions that receive such high proportions of transfer students are not many, but they are the ones best positioned to assist mobile students. As such, the node pairs with the largest weights and the individual nodes with the highest in-degree centrality will be the subject of a later section in this chapter.

Ego network results: Private institutions. The final institution type whose student enrollment mobility patterns were examined in this study is the private four-year institution. The three focal campuses are not part of a larger state system, but with over 100 institutions in the state, the private non-profit four-year sector is a critical part of California's higher education system and approximately 16% of its students are Latina/o (Association of Independent California Colleges and Universities, 2014). Earlier descriptions in this chapter have highlighted how privately-controlled institutions are destinations for only a small percentage of Latina/o lateral transfer students, but also how they themselves send a considerable proportion of their students elsewhere. As the first institution attended for many students, they serve as a conduit to a degree and understanding the networks that are created through their students' mobility helps to paint a more complete picture of larger patterns.

Figure 5.7 shows the sociogram representing the *reverse transfer ego network* for the three private focal institutions in the study. The first thing that stands out is that, unlike the comprehensive and research university reverse transfer networks, the figure here shows that multiple links from each of the three primary nodes have a weight greater than one. An earlier section in this chapter showed that the private colleges and universities send their students to fewer campuses overall than the other two institution types and so it makes sense that those moves would include greater proportions of their transfer students. The visual depiction of the reverse transfer network also reveals that there are no community colleges with links from all three of the sending schools, but that there are seven campuses that receive Latina/o reverse transfer students from two of them.

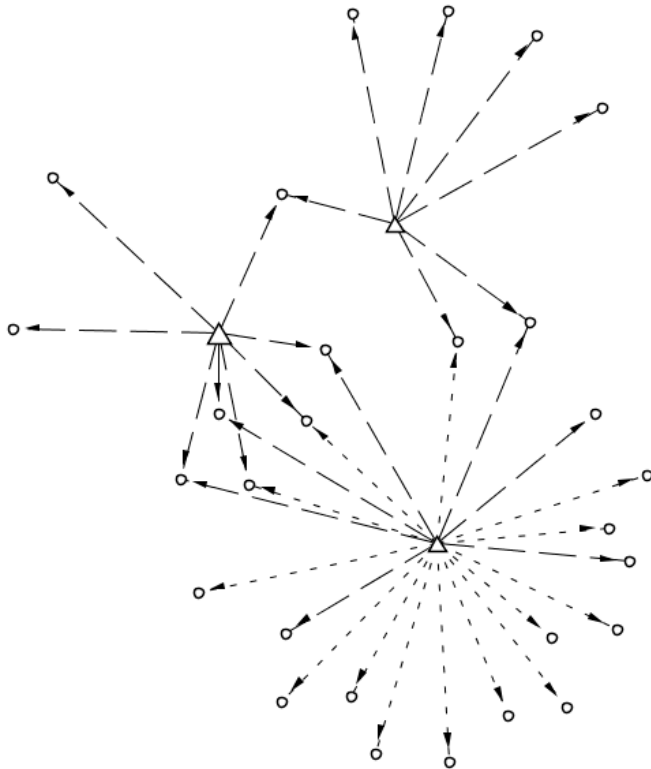


Figure 5.7. Sociogram representing reverse transfer ego network for three private focal institutions. Size of node represents institutional selectivity, with larger nodes being more selective. Circles represent public and triangles represent sending institutions. Line weights represent proportion of transfers moving from one institution to another, with longer dashes indicating larger proportions.

Figure 5.8 demonstrates the sociogram representing the *lateral transfer ego network* for the three private focal institutions. As with the reverse transfer network for these three sending campuses, several links have weights greater than one, especially from Most Competitive Private 1 and Very Competitive Private 2. This indicates that most of the four-year institutions receiving students from those two campuses receive 5% or more of all the mobile Latina/o students that they send. The two nodes in the sociogram with three arrows directed at them are both public institutions in seemingly one of the lower selectivity categories, as indicated by the size of the nodes. As with some of the previous sociograms, the more selective institutions are along the border of the graph, suggesting that transfer to them is not as commonplace and that they do not play as important a role in facilitating the degree completion of mobile Latina/o students who

begin college in California.

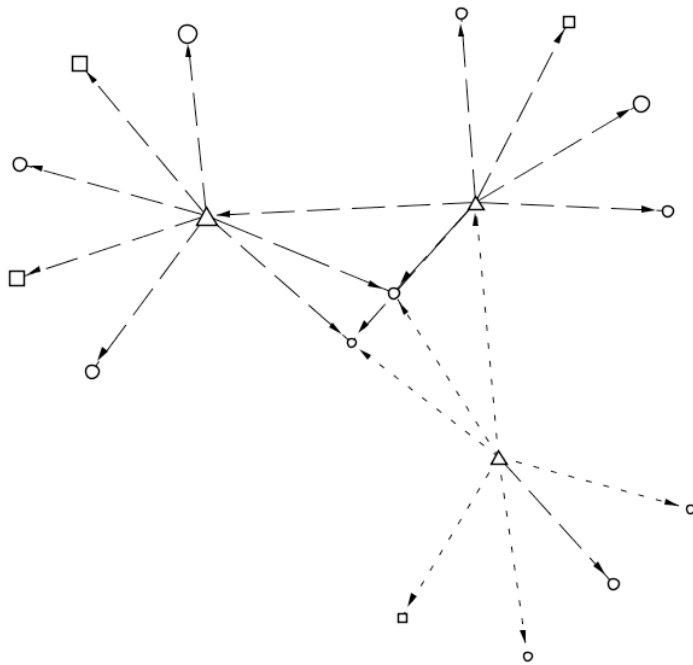


Figure 5.8. Sociogram representing lateral transfer ego network for three private focal institutions. Size of node represents institutional selectivity, with larger nodes being more selective. Squares represent private, circles represent public, and triangles represent sending institutions. Line weights represent proportion of transfers moving from one institution to another, with longer dashes indicating larger proportions.

Table 5.17 shows the network statistics for the combined reverse and lateral transfer ego network of the three private institutions. There are 46 total nodes in the network, 45 of which are receiving institutions since Very Competitive Private 3 is the only institution in the sending sample that has no incoming transfer students. There are 57 links between the three primary nodes and the others, 28 of which originate from Very Competitive Private 3. Two four-year campuses have the highest in-degree centrality, with connections to all three of the sending campuses in the sample. The two campuses are in the public comprehensive university system, suggesting that they can be central players in channeling students to completion since the institutions in that system send and receive students to and from multiple locations. Rounding the top 10 are eight community colleges that have links to two of the three private sending

institutions. Finally, the table shows the distribution of weights among the links in the private institution network. Though no tie between any two campuses comprises a move of more than 15% of the students from any one sending institution, the figures confirm what is apparent in the reverse and lateral transfer sociograms: the private network has more links with a weight higher than one. Specifically, there are 37 different paths between two institutions that more than 5% of the transfer students from one of the sending campuses follow. The public comprehensive university system only has 13, and the public research university system only has eight.

Table 5.17 Network Statistics for Ego Networks of Private Institutions (n=3)

Node Count	46
Link Count	57
Highest In-Degree Centrality	3 (Competitive Comprehensive 2), 3 (Less Competitive Comprehensive 5), 2 (Eight community colleges)
Percent of nodes with 2+ in-degree	21.7
Highest Out-Degree Centrality	28 (Private 3)
Number of Links with Weight 1 (0.01-5%)	20
Number of Links with Weight 2 (5.01-10%)	34
Number of Links with Weight 3 (10.01-15%)	3
Number of Links with Weight 4 (15.01-20%)	0
Number of Links with Weight 5 (20%+)	0

Source: Social network analysis using 2004 CIRP Freshman Survey, 2004-2010 National Student Clearinghouse data

Testing propositions. The five networks analyzed in this study demonstrate patterns of enrollment mobility for Latina/o students who start at four-year institutions in California. In order to help explain those patterns and the individual connections that form them, this section will apply social network theory. Two of the concepts most commonly examined in explaining social network connections are homophily and propinquity. The proposition of homophily suggests that similarity breeds connection, or that relationships occur at higher rates between those that are alike than between those that are not (McPherson et al., 2009). It is possible that the connected institutions described in this chapter are similar on characteristics not captured in

the study, but the institutional characteristics that were included (e.g. tuition, selectivity) imply that the informal relationships between institutions as a result of student mobility are based on difference more than likeness. However, it has been suggested that one of the basic sources of homophily is geographic location because it takes more effort to connect with those that are far away (Zipf, 1949 cited in McPherson et al., 2009), which ties to the idea of propinquity. The proposition of propinquity poses that physical proximity influences relationships. In particular, it suggests that nodes are more likely to be connected to one another if they are geographically near to each other (Kadushin, 2011). To test this proposition, the distance in miles between institutions was calculated for each set of linked nodes using the Haversine formula (Sinnott, 1984), which uses latitude and longitude coordinates to arrive at the shortest distance over the earth's surface between two points.

Table 5.18 provides a description of the distance between pairs of nodes, by institution type, transfer type, selectivity change, link weight, and in-degree centrality. Counting all 239 connections in the full network, the mean distance between any two institutions is 201.11 miles, but that varies considerably when disaggregating the data by the stated characteristics. The mean is 160.71 for the network of public comprehensive sending institutions, 223.15 for the network of public research sending institutions, and 223.84 for the network of private sending institutions. This suggests that Latina/o students who start college at four-year institutions that are less focused on research are more likely to pursue transfer destinations closer to their home institution.

Students who reverse transfer ($\mu= 110.17$) tend to move to institutions that are closer to their initial institution of enrollment than students who lateral transfer ($\mu= 392.42$). This makes intuitive sense as the needs of reverse transfer students are likely satisfied by a number of local

Table 5.18 Description of Distance in Miles Between Nodes, by Institution Type, Transfer Type, Selectivity Change, Weight, and In-Degree Centrality

	Min	Max	Mean	SD
All Links (n=239)	1.59	2463.11	201.11	484.22
Institution Type				
Comprehensive (n=85)	1.59	2310.82	160.71	439.8
Research (n=97)	2.85	2429.12	223.15	488.39
Private (n=57)	4.40	2463.11	223.84	541.86
Transfer Type				
Reverse (n=162)	1.59	2332.63	110.17	291.422
Lateral (n=77)	6.34	2463.11	392.42	706.86
Selectivity Change				
Decrease (n=201)	1.59	2463.11	165.83	418.24
No Change (n=19)	6.34	1745.98	231.91	482.64
Increase (n=19)	7.30	2400.43	543.49	886.04
Link Weight				
1 (0.01 to 5%) (n=181)	5.95	2429.12	204.37	469.23
2 (5.01 to 10%) (n=44)	4.40	2463.11	248.88	601.4
3 (10.01 to 15%) (n=9)	2.85	21.71	11.75	6.31
4 (15.01 to 20%) (n=3)	2.25	3.77	3.22	0.84
5 (20.01% or more) (n=2)	1.59	6.36	3.98	3.37
In-Degree Centrality				
All Sending Institution Network: 8	7.78	93.84	31.32	29.77
All Sending Institution Network: 7	5.95	85.57	28.78	20.71
All Sending Institution Network: 6	2.25	101.23	28.18	24.77
All Sending Institution Network: 5	3.77	107.79	33.52	25.78
All Sending Institution Network: 4	1.59	138.51	52.49	39.59
All Sending Institution Network: 3	6.20	112.7	33.95	29.96
All Sending Institution Network: 2	7.34	236.84	86.04	77.6
All Sending Institution Network: 1	5.43	2463.11	667.78	792.28
Comprehensive Institution Network: 3	2.25	119.41	23.02	22.88
Research Institution Network: 3	11.01	120.19	51.97	35.96
Private Institution Network: 3	19.18	29.55	23.48	5.41

Source: Social network analysis using 2004 CIRP Freshman Survey, 2004-2010 National Student Clearinghouse, and 2012 IPEDS data

options, whereas lateral transfer students may have a goal destination for unique reasons.

Nonetheless, there is a large range for the amount of miles between the sending nodes and the two-year institutions. Though data on students' home location is not available in the dataset used in the present study, one possible explanation for the large maximum value for reverse transfer

distance is that some of the students who enroll at four-year institutions in California do so as out-of-state residents and the reverse transfer to an institution several thousand miles away is simply a return home. This may also be the case with some of the lateral movement that occurs, as prior research on lateral transfer shows that the receiving campus is usually closer to a student's home than the sending campus (Mattern, Wyatt, & Shaw, 2013).

A similar pattern to that of transfer type is evident when examining distance based on the selectivity change involved in the transfer. The links, both reverse and lateral, ending in a second institution of lower selectivity than the first have a lower mean ($\mu=165.83$) than those links representing lateral transfer to an institution of equal selectivity ($\mu=231.91$) or to one of higher selectivity ($\mu= 543.49$). Studies have not teased out differences in reasons for moving across categories of selectivity, but it is likely that students whose transfer involves a decrease in selectivity have very different motives than those whose transfer involves an increase in selectivity.

Earlier in this chapter, Table 5.12 showed that statistically significant differences exist in peer characteristics representing academic background, environmental pull factors, and enrollment behaviors between students who transfer to lower electivity categories and students who transfer to higher ones. This, coupled with the mean difference in miles between nodes based on selectivity change suggests that those who decrease selectivity possibly transfer for academic support and financial need. There is a larger amount of institutions on the lower end of the selectivity scale than on the higher end (Barron's, 2005) and these institutions can meet those possible needs, suggesting that students have more options to choose from in proximity to the first institution. On the other hand, students who make lateral transfers to institutions of equal or higher selectivity probably have a goal that trumps distance, such as a desire for more

institutional prestige, a dream first choice college that they could not attend at initial enrollment, or an academic major not available at their first campus.

In terms of link weight, there is a considerable difference between the lowest and the highest when it comes to distance between nodes. On average, when an institution sends 5% or fewer students to the same transfer destination, the mean distance between the two institutions is 204.37 miles. Though the mean does not decrease in a completely linear fashion, the mean distance generally decreases as the weight of the link increases. Links with a weight of three, which represent primary nodes that send between 10 to 15% of their transfer students to the same receiving institution, have an average distance of 11.75 miles. Links with the highest weight, representing primary nodes that send more than 20% of their transfer students to one transfer destination, have an average distance of 3.98 miles. This pattern shows that while some students may be willing to go further away from their first institution, large movement only tends to happen within a local context.

The final characteristic across which distance between nodes was examined is in-degree centrality. As with link weight, the mean distance between nodes as the in-degree values for the network of all sending institutions increase is not strictly linear but does generally decrease. Receiving nodes that have only one connection have an average distance of 677.78 miles between them, whereas receiving nodes that have connections with eight out of the nine sending institutions have an average distance of 31.32 miles between them and each of the sending campuses. This pattern adds support to the proposition of propinquity in that geographic proximity makes connections more likely. Campuses that are further from the nine sending institutions may receive students from one of them, likely because individual students are returning home or want to transfer to those particular campuses for their own reasons. But it is

only campuses that are closer to all of them that have multiple connections because in the end, location matters.

Connecting Patterns to Outcomes

To better understand the implications of the findings presented in this chapter, which will be further discussed in Chapter 6, it is important to understand how the enrollment mobility presented here ultimately connects to persistence and degree completion. Table 5.19 shows the percent of Latina/o transfer students who return to their initial institution at some point after the transfer. Of all transfer students, 18.4% return to their home campus within six years. This figure is highest at the public comprehensive university system and lowest at private colleges and universities. When disaggregating by the type of transfer, it is evident that the reverse transfer pathway is the one that most commonly brings students back to their first campus, as more than one-fifth (21.6%) of all reverse transfer students in this sample made their way back to the home institution. This confirms the important role of community colleges in channeling mobile Latina/o students to a degree and suggests that the students who take this pathway may only need a temporary solution to academic, financial, or other personal problems. It is likely that if both four-year sending institutions and two-year receiving campuses made concerted efforts to help these students stay on track through their movement, the return transfer rates would be even higher. Lateral transfer, on the other hand, appears to be a more intentional and permanent move, as only 5.9% of these students return to their first institution attended.

Table 5.19 Percent of Latina/o Transfer Students Returning to Initial Institution (n=501)

	All	Comprehensive	Research	Private
All Transfer	18.4	19.6	17.6	16.3
Reverse	21.6	21.2	22.1	21.7
Lateral	5.9	9.1	4.7	3.8

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data

Table 5.20 shows the six-year enrollment outcomes for the 501 Latina/o transfer students

in the social network analysis sample. Of all transfer students, 62.6% either graduated or remained enrolled in the non-profit higher education system after six years. That means 37.4% of transfers left higher education, a figure that is large enough to raise concern and highlights the necessity for institutions to work together to help these students persist. When disaggregating by sending institution type, it appears that students who reverse transfer out of Competitive Comprehensive 1, 2, and 3 have a harder time getting back to the four-year sector than reverse transfer students from the other two institution types. As a result, only 13.2% of all transfers from these institutions graduate within six years though another 46.4% remain enrolled at a two or four-year campus. As the largest public four-year higher education system in the country (California State University Office of the Chancellor, 2013), public comprehensive institutions need to be more intentional in channeling students to a degree.

Table 5.20 Six-Year Enrollment Outcomes for Latina/o Reverse and Lateral Transfer Students in California

	Enrolled at two-year	Enrolled at four-year	Graduated from other four-year	Graduated from initial school	Total who persist
All Students (n=501)	24.4	14.2	15.2	8.8	62.6
Institution Type					
Comprehensive (n=250)	31.2	15.2	6.8	6.4	59.6
Research (n=165)	20.0	13.3	22.4	11.5	67.2
Private (n=86)	12.8	12.8	25.6	10.5	61.7
Transfer Type					
Reverse (n=399)	30.1	13.0	7.3	9.3	59.7
Lateral (n=102)	2.0	18.6	47.1	5.9	73.6
Selectivity Change					
Decrease (n=450)	26.9	13.8	10.7	9.1	60.5
No Change (n=26)	0.0	26.9	46.2	3.8	76.9
Increase (n=25)	4.0	8.0	64.0	8.0	84.0

Source: 2004 CIRP Freshman Survey and 2004-2010 National Student Clearinghouse data

About one-fifth (21.6%) of reverse transfer students make their way back to their first four-year school, but only 9.3% of reverse transfer students graduate from those initial campuses

within six years. This suggests one of two possibilities: 1) as a result of all the mobility, these students have a longer time-to-degree than six years, or 2) the community colleges are successful in sending the students back but the initial four-year institutions does not provide adequate support for them to stay. In either scenario, the onus of responsibility falls on the four-year campus, which may be better able to help students if their pathways through college are tracked so that counselors can have a clearer understanding of their needs. In contrast, the small percentage of lateral transfer students (5.9%) who return to their first institution all graduate within the six-year window, confirming earlier speculation that lateral transfer students have more capital that facilitates their mobility.

When looking at six-year enrollment outcomes by the selectivity of the receiving institution, it is clear that the more selective campuses do a better job at graduating mobile Latina/o students just as they are more successful at graduating the Latina/os who start there as freshmen (Fry, 2004; Melguizo, 2010). Lateral transfers to equally selective campuses and to more selective institutions, however, are the ones noted in the sociograms as having fewer inward links and lower link weights, indicating that few students take these pathways. Nonetheless, knowing that their ultimate outcomes are positive validates the idea that the focus of institutional partnerships to channel mobile students to a degree should be on the links that involve a decrease in selectivity whether it be to a two-year or a less selective four-year college or university. Given that decreases in selectivity involve a transfer to an institution that is closer to the home campus than increases in selectivity or lateral moves, the possibility of establishing such partnerships should be more feasible.

As a whole, the findings presented in this chapter shed light on the networks of institutions created as a result of individual Latina/o students' enrollment mobility and on some

of the possible reasons for and consequences of particular patterns. Chapter 6 revisits the key findings from Chapters 4 and 5, discusses them in a larger context, and offers implications for policy, practice, and future research.

CHAPTER 6: DISCUSSION AND IMPLICATIONS

In the last few years, degree completion has dominated the national conversation about higher education, largely as a result of President Obama's American Graduation Initiative (The White House, 2009). Adding to the increased push for accountability for individual colleges and universities, the Obama administration is also set to soon release a rating system for institutions, presumably based on graduation rates and affordability (The White House, 2013). Though college presidents and higher education associations are overwhelmingly opposed to such ratings (Lederman, Stratford, & Jaschik, 2014), the renewed attention to degree attainment will likely not be short-lived. An unavoidable component in this conversation is the persistence and degree completion of Latina/os, the fastest growing segment of the population (U.S. Census, 2011). College enrollment rates for Latina/os have for the first time surpassed that of Whites, but Latina/os remain under-enrolled in the four-year sector and a considerable gap in completion continues to exist (Aud et al., 2012; Fry & Taylor, 2013). Part of the problem is that very little is known about the different paths students take once they enroll at four-year institutions that might contribute to this gap.

A report by the National Student Clearinghouse (NSC) demonstrates that one-third of all students who begin college at a four-year institution lateral transfer to another four-year institution or reverse transfer to a two-year institution—a figure that actually matches the percent of students who transfer to four-year institutions from community colleges (Hossler et al., 2012b). Yet, multi-institutional pathways through college are often ignored in research, as mobile students are excluded because of limitations in the way data are collected and linked

(Ewell & Boeke, 2007). As a result, very little is known about which students transfer, whether there are differences by racial group, and what contributes to within-group variability in pathways through college. This is a problem because increasing persistence to a degree requires an understanding of persistence within the entire higher education system rather than a focus on a single institution. Using a unique national longitudinal dataset that overcomes many of the limitations present in other data, this study sought to understand which Latina/o students transfer out of four-year institutions, and develop a description of the institutional networks created through the aggregate of individual student transfer to understand Latina/o student mobility patterns.

Significant Contributions of the Study

This overarching study about student enrollment mobility and Latina/o student persistence explored three specific areas: (1) the pre-college student characteristics and institutional contexts that contribute to reverse and lateral transfer for Latina/o college students who begin at four-year institutions after high school, (2) the role of academic undermatch in student mobility, and (3) the institutional networks that emerge as a result of this mobility. The study helps to confirm existing research on general student mobility, as well as Latina/o student persistence and academic undermatch, but it also significantly extends our understanding of these areas in several important ways.

First, it expands the knowledge base on student mobility through its focus on race and institutional contexts and through its use of a national database that follows mobile students across sectors and state lines. To the first point, a limited amount of research has examined the role of race in reverse and lateral transfer pathways. Some studies have completely excluded race (Hossler et al., 2012a; Hossler et al., 2012b), while others have aggregated multiple racial groups

together for a dichotomous comparison of underrepresented minority students to White and/or Asian students (Adelman, 1999, 2006; Goldrick-Rab, 2006; Goldrick-Rab & Pfeffer, 2009; Herzog, 2005; Kocher & Pascarella, 1990). Others have included disaggregated racial groups but with a focus on a single state (Hossler et al., 2009; Lichtenberg, 2011). In fact, inclusion of race aside, many studies of student mobility have been limited to a single state or a single sector within a state because of limitations in data collection. As of 2007, only eight states maintain student unit record databases that follow students from four-year institutions to other institutions, and most of these databases still exclude enrollment at private and out-of-state institutions (Ewell, & Boeke, 2007). This makes the National Student Clearinghouse one of the only national longitudinal student unit record databases available, but this database does not include student demographic characteristics aside from students' age at college entry, making it hard to determine which students engage in which pathways (Hossler et al, 2012a, 2012b; Shapiro et al, 2012).

By linking term-to-term enrollment data from the National Student Clearinghouse to national freshman data collected by the Cooperative Institutional Research Program (CIRP), this study was able to examine what contributes to within-group differences in reverse and lateral transfer for Latina/o students and place that information in context since it was also able to show national mobility rates by race. In particular, the findings from this study show Latina/o students have the highest rates of reverse transfer (19.1%) and close to the lowest rates of lateral transfer (10.8%) compared to other racial groups. Disaggregating by selectivity of the initial institution attended shows non-Latina/os are more likely to remain in the four-year sector even when they depart the least selective schools, confirming the importance of this investigation.

This study also contributes to the student mobility literature through its focus on

institutions and the relationships that are created amongst them as a result of student mobility. Though some research has been able to describe a few of the characteristics of institutions that send and receive mobile students (Hossler et al, 2012b; Kearney et al., 1995; McCormick & Carroll, 1997; Peter & Cataldi, 2005), no studies have uncovered patterns in movement to show nuances in the flow of students. For instance, it has been estimated that close to three-quarters of all mobility remains within state boundaries (Goldrick-Rab & Roska, 2008), but this study went further to show Latina/o students largely remain within a reasonable driving distance from their first institution, which has policy implications that will be further discussed in the last section of the chapter.

The second body of work to which this study contributes is that of Latina/o student persistence, by expanding its conceptualization to include system-wide persistence. Research on Latina/o persistence and completion has examined it within a single-institutional context, meaning the outcome is coded so that students who depart are considered to have dropped out altogether. Studies that have disaggregated Latina/os by various characteristics have found important differences that should be considered by both researchers and practitioners (Arellano, 2011; Nuñez & Crisp, 2012), suggesting that disaggregation continues to be warranted whenever possible and this study disaggregates students by a critical component of their college experience that has not previously been explored. In disaggregating departure from the first four-year institution attended, an important distinction is created between students who truly dropout and those who simply continue their education elsewhere.

The findings in this study show that 18% of all Latina/o students who first enroll at a four-year institution leave that campus but actually graduate from or remain enrolled at another institution after six years. As demographic data linked to student mobility has been limited in

past research, this study is the first to provide insight into the characteristics associated with transfer out of four-year institutions, which is critical to understand since Latina/os are underrepresented at four-year institutions as it is (Fry & Taylor, 2013). The findings presented in Chapter 4 help to create a profile of Latina/o reverse and lateral transfer students that can help institutions better assist them through their educational trajectories and be responsive to their needs. A forthcoming section in this chapter provides a thorough description of each of these profiles.

Following the lines of within-group analysis, the final area of research that this study contributes to is Latina/o student academic undermatching in college selection process. Studies have found that Latina/o students have higher rates of academic undermatching than students of other racial backgrounds (Roderick et al., 2008; Smith et al., 2013), but no academic undermatch studies have focused exclusively on this population. Additionally, most studies on the topic examine the extent of and reasons for the mismatch and the degree outcomes associated with this type of enrollment (Bowen et al., 2009; Dillon & Smith, 2013; Roderick et al., 2011; Smith et al., 2013), while this study contributes new information by explaining the pathways that academically undermatched Latina/o students who begin at four-year institutions take through higher education.

These contributions will be further elaborated upon in the rest of this chapter. The next section first presents an overview of the study, including a summary of the literature and the frameworks used to guide the study, as well as the research methods employed to examine the problem. Following, the chapter discusses how the findings address the research questions presented in Chapter 1 and whether they support the hypotheses presented in Chapter 3. Finally, the chapter concludes with a discussion of the implications of the study's findings in regards to

policy, practice, and future research.

Overview of the Study

Guiding literature and frameworks. A number of perspectives informed the study's examination of Latina/o college student enrollment mobility. As currently there are no existing retention/persistence frameworks that are meant to explicitly explain or that even include multi-institutional attendance as a component, the study relied upon a combination of existing models meant to examine retention at a single institution. These models are nonetheless helpful as a first step in unraveling distinctions in the characteristics associated with institutional and system-wide persistence. The first of these frameworks, Nora's (2003) Student/Institution Engagement Model, helped in the selection of the student-level variables included in the study. Nora's model builds upon some of the earlier retention and attrition models (Bean, 1980; Nora & Cabrera, 1996; Spady, 1970; Tinto, 1975) by incorporating elements that make it more inclusive of diverse students and the unique circumstances that affect their college experience and persistence decisions. The Student/Institution Engagement Model proposes there are five components that lead to persistence. Given that the data used in the study mainly captures students' pre-college experiences, the model was adapted to reflect the following: (1) background characteristics, (2) high school academic and social experiences, (3) sense of purpose and institutional allegiance, (4) environmental pull factors, and (5) anticipated college experiences.

Two additional components were included at the student-level based on prior research. The first is academic undermatch, which involves students enrolling in colleges of lower selectivity than ones where they would be qualified to attend based on high school academic indicators (Bowen, Chingos, & McPherson, 2009). In this study, academic undermatch was operationalized as having an SAT score greater than the mean SAT of the Barron's selectivity

category above the one in which the student first enrolled. The second component is enrollment behaviors. Informed by the literature reviewed, a taxonomy of multi-institutional enrollment patterns for students who start at four-year institutions was created and subsequently guided the selection of a set of enrollment variables, including dual enrollment during high school and supplemental enrollment in the form of summer school at a different institution or concurrent enrollment during the traditional academic year.

One of the limitations of Nora's model is that it does not account for the institutional contexts that may influence students' behaviors. As such, the institutional-level elements that were included in the study were guided by Titus' (2004) conceptual model of student persistence. Titus' model combines components of Berger and Milem's (2000) college impact model and aggregate components of Bean's (1990) student attrition model to examine the role of institutional factors on average persistence rates. The institutional-level of Titus' model includes five components: (1) student peer characteristics, (2) structural-demographic characteristics, (3) aggregate student experiences, (4) aggregate student attitudes, and (5) aggregate environmental pull factors. Though this study did not include the full list of measures that Titus used for each of the components, variables representing each of the five were selected for inclusion in the analytical models.

When shifting the focus from individual student and institutional attributes to the patterns of movement between institutions that emerge as a result of individual mobility, it was important to use Social Network Theory (Barnes, 1954; Wasserman & Faust, 1994), which helps to explain patterns and relationships that are informally created between institutions that send and those that receive mobile Latina/o students. Social network theory focuses on how relationships between actors affect individuals' behaviors, or in this case, how existing flows of students between

institutions may further promote transfer. Two central propositions of social network theory are homophily and propinquity, which propose that relationships occur more frequently between those institutions that resemble and are geographically close to each other (Kadushin, 2011; McPherson, Smith-Loving, & Cook, 2001). These two tenants helped to guide the analysis of lateral and reverse transfer patterns in California.

Combined, the three components of the framework allowed for an examination of multiple layers of student mobility—the student, institution, and institutional networks. Though this combination was appropriate for the study, the findings suggest considerable modifications to the student persistence models, which Social Network Theory can actually inform. As is described in more detail later in this chapter, the networks of institutions created through student mobility are large but weakly connected, indicating they are informally created by students rather than by intentional institutional efforts. That may look different, however, for a different sample of institutions than the ones included in this study. Social Network Theory poses that strong ties can influence behaviors, suggesting that deliberate connections between institutions can help guide mobile students to a degree (Borgatti & Ofem, 2010; Granovetter, 1973). As such, the level of formal and informal relationships between institutions is an important element that should be included as a contextual effect in models seeking to understand system-wide persistence as a student behavior. Additional recommendations for persistence models are discussed in implications for future research.

Research design. This two-part study explored the relationship between student and institutional characteristics and transfer out of four-year institutions, as well as the networks created between institutions as a result of student enrollment mobility. For the first portion of the study, the nesting of students within institutions and the binary nature of transfer (yes or no)

made hierarchical generalized linear modeling (HGLM) the most appropriate analytical tool. A sample of 10,155 Latina/o students who began at 442 four-year institutions was used in a series of multinomial models to compare those who reverse and lateral transferred to those who dropped out or had no permanent departure from their initial institution, as well as to each other. The second portion of the study employed social network analysis, as the examination of mobility patterns inherently made the relationships between institutions a central focus rather than their individual attributes. Using 501 Latina/o transfer students who began college at nine four-year institutions in California (three public comprehensive universities, three public research universities, and three private institutions) the holistic mobility patterns emerging from students' individual mobility across institutions were examined.

Discussion of Findings

Research question 1. The first research question in this study was: *What student and institutional characteristics contribute to lateral and reverse transfer for Latina/o college students who begin at four-year institutions?* The hypothesis proposed that the differences between Latina/o students who transfer and those who remain at their first institution would exist in the areas representing institutional allegiance and environmental pull, rather than in background characteristics and high school experiences. It was also hypothesized that the reverse would be true when it came to differences between Latina/o students who transfer out of their first four-year institution and those who drop out, as it was expected that the key predictors distinguishing between those two pathways would be measures of students' background and high school academic experiences.

While the findings demonstrate that there is some truth to this hypothesis, the reality is also more complex as there are considerable differences that distinguish the two transfer

pathways. The findings presented in Chapter 4 reveal two distinct profiles for Latina/o reverse transfer and lateral transfer students, which are detailed below.

Lateral transfer students. The findings from the comparison of means on student characteristics across each of the four pathways demonstrate that Latina/o students who lateral transfer tend to be privileged and most closely resemble the characteristics of those who do not depart their initial institution. Confirming part of the hypothesis in regard to student background characteristics and high school experiences, lateral transfer students have significantly higher levels of parental education, income, high school grades, and SAT scores than students who dropout. They also, however, have significantly lower high school grades and SAT scores than students who have no departure. In contrast to the hypothesis pertaining to environmental pull factors, lateral transfer students are actually very similar to those who do not depart their institutions but have significantly fewer pull factors than those who dropout. Lateral transfer students initially enroll at their first choice institutions significantly less and enter college indicating a significantly higher likelihood of transferring than students who take the other three pathways, suggesting that their initial institutional allegiance is what makes them most unique at college entry.

The abovementioned characteristics are ones that Latina/o lateral transfer students exhibit, but are not necessarily ones that uniquely contribute to the pathway. In order to understand what student characteristics actually contribute to lateral transfer, it is necessary to also discuss the findings from the multivariate analysis. When controlling for all student and institutional characteristics in the analyses presented in Chapter 4, a few student characteristics emerge as contributors to lateral transfer. Latina/os with more educated parents were more likely to stay at their initial institution, and also more likely to laterally transfer than either dropout or

reverse transfer. Low-income Latina/os were more likely to either dropout or stay, rather than make a lateral transfer compared to high-income students, who seek seem to seek this option as a middle ground. Given that parental education and income are two of the three common components of socioeconomic class (American Psychological Association, 2014), together these two findings indicate that Latina/o students of higher socioeconomic backgrounds are more likely to lateral transfer than students from lower socioeconomic backgrounds. It suggests that SES determines options for Latina/os to remain in the higher education system.

In terms of academic preparation, students with higher high school grades are less likely to lateral transfer than remain enrolled at their first college, but more likely to lateral transfer than to dropout or reverse transfer. Similarly, students with better self-ratings on time management are also more likely to lateral transfer than to drop out or reverse transfer. This means that those Latina/o students entering college with the strongest academic backgrounds and study habits are not likely to leave for another institution, but that those transferring to another four-year are probably leaving for reasons other than academic difficulty. In fact, they may be transferring to more selective institutions as research has found the more rigorous a high school curriculum, the more likely a lateral transfer will have a selective destination (Horn et al., 2001).

One of the key findings for lateral transfer pertains to institutional allegiance. Specifically, the greater likelihood students indicate that they will transfer upon starting college, the higher the chance that they will go to another four-year campus. Prior research has found that intention to transfer predicts departure from the first institution (Oseguera & Rhee, 2009) and this study demonstrates that for Latina/os it does indeed predict departure from the first institution, but it also predicts persistence since lateral transfer students remain in the higher education system. This unique finding for lateral transfers suggests these students behave like

free agents. Just as in professional sports where a player can solicit contract offers from other more lucrative teams, students who lateral transfer seem to keep their options open even after enrolling at their first institution.

With regard to environmental pull, a previous study found that attending college a greater distance from home contributes to lateral transfer, but that study only included five measures in the analytic model (Mattern, Wyatt, & Shaw, 2013). This study confirms the relationship for Latina/o students using a more robust model and analytic technique. Lastly, when compared to students who have no departure from their first college, lateral transfer students are more likely to stopout and less likely to supplement their enrollment by taking courses at another institution during the summer or concurrently during the academic year. Lateral transfer also occurs later in students' college trajectory than reverse transfer, which may be part of the reason their time-to-degree is longer (McCormick & Carroll, 1997).

Reverse transfer students. The findings from the comparison of means across samples shows that, without controlling for other measures, Latina/os who reverse transfer most closely resemble the characteristics of Latina/os who dropout. Yet, the two are not similar in all aspects, which is why it is important to extend previous research by disaggregating departure pathways (Rhee, 2008). In terms of background characteristics, more reverse transfer students come from a Mexican background than students in the other three pathways. Reverse transfer students also have significantly lower levels of parental education and income than students with no departure, but have higher income levels than students who dropout. The profile of reverse transfer students further differs from those who do not depart in regards to their academic preparation, institutional allegiance, and environmental pull factors. They have lower high school grades and SAT scores, are more likely to indicate a likelihood of transferring, have lower degree

aspirations, more household/childcare obligations, higher financial concerns, and indicate greater intentions of working full-time while in college.

The findings from the multivariate analyses in Chapter 4 show the student characteristics that uniquely contribute to reverse transfer when holding all other measures constant. As with lateral transfer, having parents with education beyond high school decreases the odds of reverse transfer relative to having no departure and increases the odds relative to dropping out. This suggests that students who have parents with lower levels of education are more vulnerable to leaving the four-year sector altogether, which is troubling since close to half of all Latina/o college students are the first generation to go to college (National Center for Education Statistics, 2010). On the other hand, lower income students are less likely to utilize the community college than their higher income peers, but more likely to drop out of higher education.

The reverse transfer pathway is most uniquely associated with academic preparation and environmental pull. Lower high school grades, SAT scores, and self-ratings on time management, as well as greater financial concerns and likelihood of working full-time during college all increase the likelihood of reverse transfer relative to having no departure or lateral transfer. Those academic and financial indicators, however, do not help predict reverse transfer in comparison to dropping out, suggesting that there are other considerations that distinguish the decision to reverse transfer from that of permanently leaving higher education. Together, these findings suggest that reverse transfer is a better alternative to dropping out that can be addressed by colleges. These findings also extend prior work that found no significant relationship between financial constraints and reverse transfer by including more intangible measures of financial constraints than simply parents' ability to pay for college and aid received (Goldrick-Rab & Pfeffer, 2009). That study suggested that the role of SES in influencing the pathway is through

academic difficulty associated with parents' lower levels of education. In capturing feelings of financial insecurity, this study demonstrates that for Latina/o students, perceived costs are as much a predictor of reverse transfer as academics.

As far as experiences during college, entering college with an intended major in one of the STEM fields contributes to reverse transfer, indicating that community college introductory STEM courses may be the ones most impacted by the enrollment of reverse transfer students. Taking summer school at the home institution, on the other hand, reduces the likelihood of that pathway. Reverse transfer students are more likely to transfer earlier in their college trajectory than lateral transfer students, and also more likely to have a stopout before enrolling at the second institution. Goldrick-Rab (2006) found that of four possible pathways through higher education (traditional enrollment, fluid movement, interruption, and interrupted movement), interrupted movement was the most concerning as it led to the lowest degree attainment rates. This study shows that among Latina/os, reverse transfer students are most vulnerable to having interrupted mobility.

Institutional characteristics. The findings presented in Chapter 4 show that several institutional characteristics contribute to lateral and reverse transfer for Latina/o students who begin at four-year institutions. Interestingly, although the findings from Chapter 5 show that an institution's transfer-out rate for Latina/os decreases as selectivity increases, selectivity is not a significant predictor of individual student transfer after controlling for students' individual characteristics. This suggests that the reason students transfer out of lower selectivity institutions at higher rates is that the students who attend those schools possess more of the aforementioned characteristics that make them vulnerable to taking these alternate pathways. This finding highlights the importance of altering accountability measures to incorporate students'

characteristics at college entry (DeAngelo, Franke, Pryor, Hurtado, & Tran, 2011).

Some of the institutional factors that do contribute to transfer include structural-demographic and peer climate measures. Institutional control has a positive effect on lateral transfer relative to both dropout and reverse transfer. In other words, among the pathways that involve departing the original institution, students attending a private institution are more likely to laterally transfer. An institution's region also contributes to whether or not students transfer. Students at institutions in the East and in the South are more likely to lateral transfer than students at institutions in the West. Moreover, those at institutions in the East are less likely to reverse transfer. Since close to three-quarters of mobility occurs within state boundaries, these findings suggest that the differences are related to the availability of institutions in those particular regions (Goldrick-Rab & Roska, 2008). One measure representing an aggregated environmental pull was significant across several of the analytical models in Chapter 4. Peers' average distance of the college from home is positively associated with lateral transfer and negatively associated with reverse transfer. In other words, students at institutions where most students have moved a greater distance from home are more likely to lateral transfer and less likely to reverse transfer, regardless of how far away their own home is located. Distance from home has been included in previous studies on mobile students at the individual level (Lichtenberger, 2011; Mattern et al., 2013), but the findings here expand on that work and demonstrate the important role it also plays as a peer context.

Research question 2. The second research question this study sought to address is: *Are Latina/o students who are academically undermatched more or less likely to transfer out of their first four-year institution? Are the institutions they transfer to more or less selective than the ones where they began?* It was hypothesized that academically undermatched students would be

more likely than those who did not academically undermatch to switch institutions, and that those academically undermatched students who lateral transfer would be more likely to move to a more selective institution.

The findings in Chapter 4 show that 12.9% of all Latina/o students who enroll at a four-year institution after high school enroll somewhere that is below the level of selectivity for which they are presumably qualified to attend based on their performance on the SAT. It is important to note that this national figure only captures academic undermatch that involves enrollment at a four-year institution and would be much higher were it to capture academic undermatch that involves enrollment at a two-year college after high school since Latina/os are overenrolled at community colleges (Fry & Taylor, 2013; Smith et al., 2013). Nonetheless, it seems that this particular population of academically undermatched students has higher rates of lateral transfer than Latina/o students who are not academically undermatched (14.6% compared to 10.2%), which confirms part of the hypothesis. The rates of reverse transfer, however, are similar for those who are academically undermatched (18.8%) and those who are not (19.1%).

When disaggregating by the selectivity level of the first institution attended, 31% of academically undermatched students at noncompetitive institutions reverse transfer, compared to 4.2% of those at highly competitive institutions. Research on academically undermatched students has found that, for these students, attending a less selective institution is associated with a less challenging environment and lower levels of satisfaction with college (Fosnacht, 2014). Given these findings, academically undermatched students at noncompetitive institutions may opt to reverse transfer in search of smaller classes that may be more satisfying. In terms of lateral transfer, the national rate for Latina/os is 10.8%, and the rates are higher for academically undermatched students across all levels of selectivity (except very competitive). Even at highly

selective institutions, 13.8% of academically undermatched students lateral transfer, suggesting that for these students there are other factors involved in the decision to take this pathway aside from the academic quality of the institution. This finding challenges the assumption that we know what factors students match on and highlights the problem with privileging academic indicators in studying college choice.

Though it seems that academically undermatched students are more likely to lateral transfer based on the descriptive results, after controlling for all of the student and institutional characteristics in the models the measure is not a significant predictor. In fact, academic undermatch was only initially significant in the model predicting reverse transfer relative to having no departure. In that model, the measure was a significant positive predictor of reverse transfer when controlling for all student characteristics except for enrollment measures. Once enrollment measures were controlled for, academic undermatch was no longer significant, indicating that these students are more likely to engage in enrollment patterns that decrease their probability of reverse transferring, such as attending summer school at their home institution and not having periods of non-enrollment (stopout).

To better understand the probable reason for academic undermatch not being a significant predictor of lateral transfer, given the higher rates for the population, an additional model predicting academic undermatch was estimated controlling only for background and academic preparation measures. The major finding from that model is that higher high school grades and SAT scores are associated with academic undermatch, as they are with lateral transfer. Therefore, it seems that the effect of academic undermatching on lateral transfer is accounted for by these students' high school academic performance. The pathways through college for academically undermatched students, however, deserve more attention in future research.

The findings presented in Chapter 5 address the second part of the research question pertaining to the change in institutional selectivity for the academically undermatched students who transfer in California. The results need to be interpreted with caution since the sample of academically undermatched transfer students in that portion of the study was very small (n=25) compared to the sample of non-undermatched transfer students (n=2,228). Nonetheless, it is worth mentioning that 20% of those who are academically undermatched transfer to an institution of higher selectivity, compared to 4.2% of the students who are not academically undermatched. Only 64% transfer to an institution of lower selectivity than their first, a figure that is considerably lower than the 91.2% of students who are not undermatched. The 64% majority shows that as a whole, academically undermatched Latina/o students in California tend to transfer to institutions of lower selectivity than where they began. However, they also transfer upward on the selectivity scale more often than their non-academically undermatched peers. Specifically, institutions at the highest level of selectivity receive a greater share of academically undermatched Latina/o students than institutions at the lowest level of selectivity.

Research question 3. The final research question addressed in this study is: *What are the characteristics and patterns of networks among institutions that send and receive Latina/o lateral and reverse transfer students in California?* It was hypothesized that mobility would mostly be regionally confined and that receiving institutions would be mostly two-year institutions, which are characterized by lower tuition and lower selectivity than the four-year sending institutions.

The findings presented in Chapter 5 reveal that mobility from one institution is not concentrated in just a small network of receiving institutions. The 501 reverse and lateral transfer students from the nine sending institutions in the study went on to attend 105 different receiving

institutions, creating a total of 239 unique links between sending and receiving campuses. Link weight, which refers to the proportion of transfer students from one sending institution that enrolls at the same receiving institution, is one important network characteristic that can help describe the patterns created through mobility. Only two of the 239 links have the highest weight of five, meaning that in only two cases do more than 20% of transfer students from one institution move to the same second institution. And only another 12 links represent a move of more than 10% of students, indicating that overall small proportions of students are attending many institutions rather than large proportions attending a few institutions. Because strong ties are influential in behavior adoption and can support opportunities for resources to be shared (Borgatti & Ofem, 2010; Granovetter, 1973), they are necessary for the intentional channeling of students. The lack of strong ties demonstrates an urgent need to create formal structures to channel mobile students to a degree because current connections between institutions are weak.

Another network statistic that describes patterns of movement is in-degree centrality, which refers to the amount of sending institutions a receiving institution is connected to through student mobility. The ten institutions with the highest in-degree centrality in the sample, alone accounting for more than one-quarter of all network connections, are all community colleges. This suggests that particular community colleges can play a very important role in helping Latina/o students persist to degree attainment, especially if they form partnerships with the sending campuses since reverse transfer students are more likely than lateral transfers to return to their first institution. Largely due to the higher rate of reverse transfer than lateral transfer in California, the majority of the overall student movement also has a public institution as a destination, regardless of whether the sending school is publically or privately controlled.

In terms of changes in selectivity from the sending to the receiving campus, 84.1% of all links involve a decrease in Barron's selectivity categories. There are, however, two campuses in the nine sending institution sample that have more than 10% of their transfer students move up in the selectivity scale, which suggests that students may view particular institutions as a pathway to others. For instance, one qualitative study of student mobility showed that some four-year institutions are viewed by students as community college equivalents that they can attend for general education before transferring elsewhere (Guillermo-Wann, Hurtado, & Alvarez, 2013). Overall, the social network analysis results for the full ego network of nine sending institutions show that the more selective institutions have single links, indicating that transfer to these institutions is not routine and even though they do serve individual students, they do not play as important a role in facilitating the degree completion of mobile Latina/o students who begin college in California as community colleges do for keeping them in the higher education system.

With regard to the hypothesis about regionally confined mobility, the findings in Chapter 5 demonstrate that for the most part that is true. The average distance between any pair of institutions in the study is 201.11 miles, but this number is much smaller when disaggregating by certain characteristics, such as type of transfer, selectivity change, and link weight. Reverse transfer networks remain more regionally confined than lateral transfer networks. Likewise, moves that involve a decrease in institutional selectivity have a lower average distance than moves that involve an increase in selectivity. Finally, as the proportion of students from one campus who attend the same second campus increases, the distance between those institutions decreases. Institutions that receive the highest proportion of students are only an average of 3.98 miles away from the sending campus, whereas institutions that receive 5% or fewer students from any one campus are an average of 204.37 miles away. This confirms the hypothesis that,

though some students choose transfer destinations that are far from their first campus, large amount of movement is confined to a local region as the proposition of propinquity would suggest (Kadushin, 2004).

Implications for Policy, Practice and Future Research

Several important conclusions arise from the findings collectively presented in Chapters 4 and 5. One of the biggest takeaways is that a certain amount of Latina/o student mobility is by and large inevitable. In the context of increased attention to degree attainment, accountability pressures for institutions, and a continuously growing Latina/o population, this section will discuss the implications of this mobility on policy and practice, and outline areas for future research.

Limitations of the study. Before describing the implications of the study's findings, it is necessary to acknowledge its biggest limitations. The first is that, while the data used allows the study to overcome many of the limitations of prior research on student mobility, it also lacks measures that capture students' college experiences. Measures of high school experiences and entering college student expectations are used as proxies for the college academic and social experiences proposed in Nora's (2003) Student/Institution Engagement model, but it is possible that initial intentions or predispositions can change. The study, however, does include a few college experiences in the form of students' actual enrollment behaviors during the six-year period in which students were tracked. Moreover, it helps paint a picture of the characteristics of entering students who are more prone to transfer out of their first institution, regardless of whether their expectations match their experiences.

Another limitation arises from the operationalization of academic undermatching. This mismatch between students' presumptive eligibility to institutions of a particular selectivity level

and their actual enrollment is typically operationalized using information on students' applications and admissions offers in combinations with their high school grades, SAT scores, and participation in Advanced Placement coursework (Bowen et al., 2009; Roderick et al., 2008; Smith et al., 2013). Because not all of these measures were available in the dataset utilized in the study, academic undermatch was operationalized to mirror a more basic criteria used by the College Board (Hurwitz et al., 2012), indicating whether students' SAT scores exceed the mean SAT score in the selectivity category above the institution in which they enroll. In sum, the measure has been previously used but it is not as robust as it could be. Nonetheless, any approach is inherently problematic because it assumes that researchers can predict the results of holistic admissions processes that rely on more than academic measures (Bastedo & Flaster, 2014).

Implications for policy. The results of the two sets of analyses in this study reveal inherent problems with current accountability mechanisms and graduation metrics that only give institutions credit for graduating their own first-time students. It is obvious that institutional retention rates do not accurately reflect the reality of enrollments, but the tracking of students across institutions is not a commonplace practice (Ewell & Boeke, 2007). Among the cohort of Latina/o students included in this study, 29.9% transferred to a two-year or another four-year college and 18% either graduated or remained enrolled in the higher education system after six years. This means that institutions are failing to get credit for almost one-fifth of all Latina/o students who start at four-year colleges and universities. At the same time, receiving institutions are not properly being credited for their contributions to Latina/o degree completion. This is particularly problematic for community colleges and Hispanic Serving Institutions (HSIs), which the findings indicate bear much of the burden of educating not only their own first-time students

but a also a large share of four-year transfer students who have different needs. All this begs for a better and more universal student unit-record tracking system and better metrics that take a system-wide approach to degree completion rather than focus on an individual institution.

A system-wide tracking and metric approach may allow institutions to receive credit for students they helped graduate, but that in of itself will not be enough to actually help channel students to completion. The network analysis showed that institutional networks created by Latina/o student mobility are large and not very dense, but that when large proportions of students from a campus transfer to the same school, it tends to be to one that is very close by, suggesting that regional collaborations to develop coordinated approaches have the potential to affect the majority of Latina/o student movement. Examples of policies to help track regional mobility and facilitate articulation of courses exist. For instance, a different version of “reverse transfer” is a process through which academic credits for applicable coursework at the four-year institution are transferred back to the community college for the purpose of awarding an associates degree and allowing the community college to receive credit for its role in educating students (Marling, 2012). This concept has gained traction in many states and has even inspired a grant program through the Lumina Foundation because it helps students get credentials and also helps to more accurately capture graduation rates (Fain, 2012). Similar local partnerships should be established to facilitate movement between schools to benefit both students and institutions. Since reverse transfer is more prominent than lateral transfer, focusing efforts on establishing partnerships between four-year institutions and the local community colleges would be a good start.

Currently, the majority of reverse transfer students do not transfer their four-year credits to the community college. Changing institutional policies at both origin and destination

institutions to become more accepting of mobility as the norm by tracking students and encouraging them to share their multi-institutional course plans may help prevent them from having stopouts between enrollments at the different campuses, accidentally repeating courses, and not receiving the proper guidance with course planning to facilitate a return to the four-year sector. The large amounts of mobility also have implications for access at the receiving campuses, where being able to identify reverse transfer students can allow for strategic planning to prevent capacity issues from inadvertently displacing native students. Though it may be daunting to set up an infrastructure to track facilitate mobility, it would be worth it since the Latina/o reverse transfer student profile shows that the pathway is a positive alternative to dropping out. Also, if federal graduation metrics changed to reflect system-wide degree completion, it is likely that grant money would be channeled through various foundations to facilitate the creation of such infrastructures.

Implications for practice. Although some mobility is inevitable, the findings from this study demonstrate there are some strategies four-year institutions can employ in an attempt to reduce their transfer-out rates. One of the most obvious themes across the results pertains to the cost of college and financial concerns. Students who place greater importance on the cost of college when enrolling are less likely to transfer, indicating these students chose institutions they feel they can afford without having to take courses at other institutions to reduce costs. While this has practice implications for educators who work with high school students during the college choice process, it also has implications for practitioners in higher education, especially coupled with the findings that greater concerns about ability to pay for college and greater likelihood of working full-time during college both increase the odds of reverse transfer and that students largely transfer to institution with lower published tuition.

Institutions need to be proactive in helping students to alleviate their financial concerns. For many Latina/o students, especially those without college-educated parents, sticker shock is hard to overcome even with reasonable financial aid (Gross, 2011). To prevent students from transferring to an institution with a lower price tag, institutions should make changes to the way tuition and fees are communicated, possibly publishing ranges based on net costs rather than the largest possible amount on its own. Institutions can also offer personal finance workshops that can both help students learn strategies for financing their education and understand the return on their investment. These workshops can be embedded into first-year courses, counseling appointments, orientation, or offered as a required online class such as Alcohol Edu, which research shows has been effective in curbing high-risk behaviors (Wall, 2007; Walters, Miller, & Chiauzzi, 2005). At most campuses, students are only required to participate in financial workshops when they are taking out loans, but the intervention may be too late at that point. Before students transfer to incur fewer costs, they should also be made aware that mobility will likely increase time-to-degree, which reduces the years of higher earnings, better health insurance, and greater job satisfaction from the type of professions that postsecondary credentials can make available (Baum, Ma, & Payea, 2010).

In addition to personal finance skills, time management skills are also important to help develop, as students with higher self-ratings on time management are less likely to reverse transfer than stay at their first institution, and also more likely to lateral transfer than to dropout. Balancing the demands of college is difficult after having a structured high school schedule with bells indicating to students where they need to be, but time management skills help Latina/o students with academic and social adjustment (Hurtado, Carter, & Spuler, 1996). At the same time, it is necessary to acknowledge that providing useful information about finances and time-

management may benefit some students but others have personal responsibilities that take a toll on their time and do not allow them to quit their full-time jobs or fit everything into an 8am to 5pm schedule. This may lead them to look for more flexible alternatives in the form of other institutions. For these students who need more flexibility, institutions can offer courses and make student services available during evening hours. Understandably, this comes at a cost which many institutions may not have funds for, but there are other cost-effective options such as rotating schedules so that counselors have alternating shifts.

Building off of the flexibility recommendation, one measure that emerged as critical across models is taking summer school at the home institution, with enrollment decreasing the odds of reverse transfer by 32.35% and lateral transfer by 29.59% relative to having no departure. Adelman (2006) referred to summer credit as a metaphor for “high octane persistence” because of its positive relationship to degree completion for the high school class of 1992, but the results of this study more than a decade later show that for Latina/o students this is more complicated since summer enrollment at the home institution also decreased the odds of both types of transfer relative to dropping out. The dropout finding suggests that students in academic difficulty who may be repeating courses in the summer should be monitored since they are vulnerable to leaving higher education. On the other hand, the transfer finding suggests that students who can find ways to be strategic in their course taking at their own institution will persist there. As such, institutions should make sure that a wide range of courses across majors is available in the summer so that students who want to be strategic do not need to consider taking courses at other campuses. Additionally, academic advisors should work in partnership with financial aid advisors to help students plan for their summer coursework both academically and financially since the per-unit summer fee at most institutions can be a deterrent. Taking summer

school at a different campus or concurrently enrolling during the academic year also reduces the odds of both transfer pathways relative to having no departure and promotes system-wide persistence relative to dropping out. This suggests that students are strategically supplementing their studies and this form of enrollment should not be discouraged as it currently is at some institutions (UCLA Undergraduate Admissions, 2014).

The last implication for practice pertains to retention efforts. This study showed that 8.8% of all Latina/o students transferred to another institution sometime after completing three years of college, demonstrating that the current focus on the first and second year is not enough to keep students retained at a single campus. As such, efforts should be expanded to target advanced students as well. Attention must still be paid, however, to the newer students. The findings from this study reveal that students who attend institutions further from home are more likely to transfer, which may be due to homesickness as Mattern, Wyatt, and Shaw (2013) found that the second institution attended by lateral transfer students tends to be significantly closer to home. In this study, students who attend college a greater distance from home demonstrate a strong commitment to staying in higher education, possibly because they were more savvy about the college process upon entry. Student affairs officers can help students find others with whom to build community because social engagement, which is an important component of the guiding framework (Nora, 2003) that was not fully accounted for in this study, may help them commit to staying at their first institution.

Future research. In paving new territory in the student mobility literature, the findings presented in this study also create several new areas for future research. The findings suggest that Latina/o students have the highest rate of reverse transfer and near the lowest rate of lateral transfer, but Latina/os are such a heterogeneous population that the examination of their

pathways can be further disaggregated. Research has found considerable differences in college experiences and outcomes when separately examining males and females, as well as students from different Latina/o ethnic groups (Arellano, 2011; Nuñez & Crisp, 2012; Zarate & Gallimore, 2005), which suggests that the transfer rates, profiles, and ultimate degree outcomes for Latina/o transfer students will look different when split by such characteristics. Another characteristic that warrants disaggregation is the timing of transfer, as different factors are likely associated with the move at different stages in students' college trajectories. A comparison of characteristics based on year of transfer was outside of the scope of this study, but future research should consider employing event history analysis to examine any distinctions. Given that the national recession that started in 2007 affected course availability and student services at many public institutions (Zumeta, 2010), it may have also encouraged transfer and made the rates for students' fourth through sixth years artificially high, thus highlighting the need for more analysis on this topic.

Another area to examine for Latina/o students is how their personal networks play into mobility. In the social network analysis employed in this study, the links were weighted to reflect a proportion of students but the proportion was an aggregate of the six-years covered in the study, meaning that not all of the transfer occurred at the same time. A social network analysis of students' personal connections may reveal new causes for particular movement or possibly even reflect similar patterns as the chain migration that occurs for many Latina/os from high school to college (Perez & McDonough, 2008). Along those lines, future research should examine how the decision to transfer mirrors or differs from the initial college choice process for Latina/os. Studies have found that Latina/os' college choice processes do not align with the traditional theories of college choice that stress rational decisions about investments and returns, but instead

are rational in their own way by giving priority to other factors that are culturally important like family and other personal relationships (Gandara & Contreras, 2009; Perez & McDonough, 2008; Person & Rosenbaum, 2006; Santiago, 2008). Knowing whether mobility follows a similar process would greatly inform the understanding of Latina/o pathways through college.

In addition to considering within-group distinctions for this diverse population, more studies should extend the current research by examining the student and institutional characteristics that contribute to reverse and lateral transfer for students from other racial groups. Mobility research for all students can also build upon one of the limitations of this study by exploring how specific college experiences contribute to reverse and lateral transfer. This can include important factors that have been found to influence persistence such as the campus climate for diversity, relationships with institutional agents, participation in formal curricular and co-curricular programs, and informal experiences with peers (Hurtado, Alvarez, Guillermo-Wann, Cuellar, & Arellano, 2012; Nora, 2003). While this study identified the background and pre-college characteristics associated with transfer out of four-year institutions, which allows for educated speculation as to reasons for the transfer, much more can be explored about possible causes.

Future research should also delve deeper into the institutional networks created through student mobility in two ways. The first is to examine a different set of institutional characteristics that may contribute to the emerging patterns. The visual component of the analysis only allowed for a few key characteristics to be displayed in the sociograms, but this area is ripe for further study. The second is to take a small number of sending campuses from which to follow students beyond their first move to see how those patterns develop and to eventually identify a completion rate for each set of paired institutions to see what the characteristics are of the

connections that are most successful at channeling students toward a degree.

Lastly, the first part of this study employed an adapted combination of Nora's (2003) Student/Institution Engagement Model and Titus' (2004) Conceptual Model of Student Persistence. These frameworks, developed to examine persistence at a single institution, were used to guide the study because they were deemed the most appropriate for the population under examination since no current persistence model incorporates multi-institutional attendance. Yet, students do not confine their college trajectories to a single institution and neither should the frameworks used to study these students. Mobile students are strategizing and persisting in their own way, but in using single-institution models that exclude them we overlay our own purposes and present them in a deficit manner. For instance, the findings from this study demonstrate that there are considerable differences between the characteristics of students who take the reverse transfer and the no departure pathways. These are both forms of persistence but cannot be predicted using the same model components. Likewise, while sense of purpose and institutional allegiance are presented as complementary in Nora's model, they are not when examining lateral transfer students who are committed to their degree goals but not necessarily their institution. Thus, an important future development for higher education scholars is a persistence model that can be applied to assess the impact of experiences at more than one college campus and understand the role they each play in degree attainment. One study has started this important work with students who begin at community colleges, but had to draw from multiple frameworks as was done in the present study (Herrera, 2013). Further, incorporating mobility into college impact models can also help determine its effect on other outcomes. Overall, just as a system-wide approach to college completion is necessary in institutional metrics on the policy end, it is also imperative for research.

Conclusion

In 1981, a young man made a lateral transfer from Occidental College to Columbia University. More than 30 years later, as President of the United States he has placed a renewed spotlight on degree attainment for the nation, which has drawn particular attention to the graduation rates of Latina/os who are the fastest growing population in the country. But to really address degree attainment, it needs to be acknowledged and accepted that student mobility was not rare when he was a college student and it is certainly not rare among students today. The findings of this study can inform policies and practices that are responsive to the diversity of pathways Latina/o students take through college and help to channel them to completion of a degree.

NAME: FIRST MI LAST
 ADDRESS:
 CITY: STATE: ZIP: PHONE: - -
 When were you born?
 Month (01-12) Day (01-31) Year

2004 STUDENT INFORMATION FORM

MARKING DIRECTIONS

Your responses will be read by an optical mark reader. Please,

- Use a pencil or black or blue pen.
- Fill in the oval completely.
- Erase cleanly any marks you wish to change or "X" out mark if in pen.

CORRECT MARK INCORRECT MARKS

PLEASE PROVIDE YOUR ID NUMBER (as instructed)										Mark here if directed	
										GROUP CODE A	GROUP CODE B
0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9

8. From what kind of secondary school did you graduate? (Mark one)

- Public school (not charter or magnet)
- Public charter school
- Public magnet school
- Private religious/parochial school
- Private independent college-prep school
- Home school

9. What were your scores on the SAT I and/or ACT?

SAT VERBAL

--	--	--

 SAT MATH

--	--	--

 ACT Composite

--	--

10. Citizenship status:

- U.S. citizen
- Permanent resident (green card)
- Neither

11. Prior to this term, have you ever taken courses for credit at this institution?

- Yes
- No

12. Since leaving high school, have you ever taken courses at any other institution? (Mark all that apply in each column)

	For Credit	Not for Credit
Yes, at a community/junior college	<input type="radio"/>	<input type="radio"/>
Yes, at a 4-yr. college or university	<input type="radio"/>	<input type="radio"/>
Yes, at some other postsecondary school (For example, technical, vocational, business)	<input type="radio"/>	<input type="radio"/>

13. During your last year of high school what proportion of the time did you live with: (Mark one in each row)

	All	Most	Some	None
Mother	<input type="radio"/> A	<input type="radio"/> M	<input type="radio"/> S	<input type="radio"/> N
Father	<input type="radio"/> A	<input type="radio"/> M	<input type="radio"/> S	<input type="radio"/> N
Stepmother	<input type="radio"/> A	<input type="radio"/> M	<input type="radio"/> S	<input type="radio"/> N
Stepfather	<input type="radio"/> A	<input type="radio"/> M	<input type="radio"/> S	<input type="radio"/> N
Grandparent	<input type="radio"/> A	<input type="radio"/> M	<input type="radio"/> S	<input type="radio"/> N
Legal guardian	<input type="radio"/> A	<input type="radio"/> M	<input type="radio"/> S	<input type="radio"/> N
Other adult(s)	<input type="radio"/> A	<input type="radio"/> M	<input type="radio"/> S	<input type="radio"/> N

14. Where do you plan to live during the fall term? (Mark one)

- With my family or other relatives
- Other private home, apartment or room
- College residence hall
- Fraternity or sorority house
- Other campus student housing
- Other

15. Is this college your: (Mark one)

- First choice?
- Second choice?
- Third choice?
- Less than third choice?

16. To how many colleges other than this one did you apply for admission this year?

- None
- 1
- 2
- 3
- 4
- 5
- 6
- 7-10
- 11 or more

17. During high school (grades 9-12) how many years did you study each of the following subjects? (Mark one for each item)

	None	1/2	1	2	3	4	5 or more
English	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mathematics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Foreign Language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biological Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
History/Am. Govt.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Arts and/or Music	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Do you have a disability? (Mark all that apply)

- None
- Hearing
- Speech
- Orthopedic
- Learning disability
- Health-related
- Partially sighted or blind
- Other

19. What is the highest academic degree that you intend to obtain?

	Highest Planned At This College	Highest Planned At This College
None	<input type="radio"/>	<input type="radio"/>
Vocational certificate	<input type="radio"/>	<input type="radio"/>
Associate (A.A. or equivalent)	<input type="radio"/>	<input type="radio"/>
Bachelor's degree (B.A., B.S., etc.)	<input type="radio"/>	<input type="radio"/>
Master's degree (M.A., M.S., etc.)	<input type="radio"/>	<input type="radio"/>
Ph.D. or Ed.D.	<input type="radio"/>	<input type="radio"/>
M.D., D.O., D.D.S., or D.V.M.	<input type="radio"/>	<input type="radio"/>
J.D. (Law)	<input type="radio"/>	<input type="radio"/>
B.D. or M.DIV. (Divinity)	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>

20. Are your parents: (Mark one)

- Both alive and living with each other?
- Both alive, divorced or living apart?
- One or both deceased?

21. How much of your first year's educational expenses (room, board, tuition, and fees) do you expect to cover from each of the sources listed below? (Mark one answer for each possible source)

	None	Less than \$1,000	\$1,000-2,999	\$3,000-5,999	\$6,000-9,999	\$10,000+
Family resources (parents, relatives, spouse, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My own resources (savings from work, work-study, other income)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aid which need <u>not</u> be repaid (grants, scholarships, military funding, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Aid which <u>must</u> be repaid (loans, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other than above	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. What is your best estimate of your parents' total income last year? Consider income from all sources before taxes. (Mark one)

<input type="radio"/> Less than \$10,000	<input type="radio"/> \$50,000-59,999
<input type="radio"/> \$10,000-14,999	<input type="radio"/> \$60,000-74,999
<input type="radio"/> \$15,000-19,999	<input type="radio"/> \$75,000-99,999
<input type="radio"/> \$20,000-24,999	<input type="radio"/> \$100,000-149,999
<input type="radio"/> \$25,000-29,999	<input type="radio"/> \$150,000-199,999
<input type="radio"/> \$30,000-39,999	<input type="radio"/> \$200,000-249,999
<input type="radio"/> \$40,000-49,999	<input type="radio"/> \$250,000 or more

23. Current religious preference: (Mark one in each column)

	Yours	Father's	Mother's
Baptist	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Buddhist	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Church of Christ	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eastern Orthodox	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Episcopalian	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hindu	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Islamic	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jewish	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
LDS (Mormon)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lutheran	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methodist	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Presbyterian	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Quaker	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Roman Catholic	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seventh Day Adventist	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unitarian/Universalist	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
United Church of Christ/Congregational	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Christian	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other Religion	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
None	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. Do you consider yourself a Born-Again Christian?

Yes No

25. Please indicate your ethnic background. (Mark all that apply)

White/Caucasian

African American/Black

American Indian/Alaska Native

Asian American/Asian

Native Hawaiian/Pacific Islander

Mexican American/Chicano

Puerto Rican

Other Latino

Other

26. For the activities below, indicate which ones you did during the past year. If you engaged in an activity frequently, mark . If you engaged in an activity one or more times, but not frequently, mark (Occasionally). Mark (Not at all) if you have not performed the activity during the past year. (Mark one for each item)

	Frequently	Occasionally	Not at all
Attended a religious service	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was bored in class	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participated in organized demonstrations	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tutored another student	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Studied with other students	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Was a guest in a teacher's home	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smoked cigarettes	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drank beer	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drank wine or liquor	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt overwhelmed by all I had to do	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Felt depressed	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performed volunteer work	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Played a musical instrument	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Asked a teacher for advice after class	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed politics	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Voted in a student election	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Socialized with someone of another racial/ethnic group	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Came late to class	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used the Internet for research or homework	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Performed community service as part of a class	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used a personal computer	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Discussed religion/spirituality:			
In class	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
With friends	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
With family	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Worked on a local, state, or national political campaign	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintained a healthy diet	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stayed up all night	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Missed school because of illness	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. For each item, please mark Yes or No:

Did your high school require community service for graduation? Yes No

Have you participated in:

A summer research program?

A health science research program sponsored by a university?

28. What is the highest level of formal education obtained by your parents? (Mark one in each column)

	Father	Mother
Grammar school or less	<input type="radio"/>	<input type="radio"/>
Some high school	<input type="radio"/>	<input type="radio"/>
High school graduate	<input type="radio"/>	<input type="radio"/>
Postsecondary school other than college	<input type="radio"/>	<input type="radio"/>
Some college	<input type="radio"/>	<input type="radio"/>
College degree	<input type="radio"/>	<input type="radio"/>
Some graduate school	<input type="radio"/>	<input type="radio"/>
Graduate degree	<input type="radio"/>	<input type="radio"/>

29. In deciding to go to college, how important to you was each of the following reasons?

(Mark one answer for each possible reason)

	Very Important	Somewhat Important	Not Important
My parents wanted me to go	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
I could not find a job	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wanted to get away from home	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
To be able to get a better job	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
To gain a general education and appreciation of ideas	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
There was nothing better to do	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
To make me a more cultured person	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
To be able to make more money	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
To learn more about things that interest me	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
To prepare myself for graduate or professional school	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
To get training for a specific career	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
To find my purpose in life	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

30. How would you characterize your political views? (Mark one)

Far left

Liberal

Middle-of-the-road

Conservative

Far right

31. Rate yourself on each of the following traits as compared with the average person your age. We want the most accurate estimate of how you see yourself. (Mark one in each row)

	Highest 10%	Above Average	Average	Below Average	Lowest 10%
Academic ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Artistic ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compassion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cooperativeness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Courage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Creativity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drive to achieve	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotional health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Forgiveness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Generosity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kindness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leadership ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mathematical ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Public speaking ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Religiousness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-confidence (intellectual)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-confidence (social)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-understanding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spirituality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Understanding of others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Writing ability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

32. Mark only three responses, one in each column.

- (M)** Your mother's occupation
 - (F)** Your father's occupation
 - (Y)** Your probable career occupation
- NOTE: If your father or mother is deceased, please indicate his or her last occupation.**

Accountant or actuary	Y	F	M
Actor or entertainer	Y	F	M
Architect or urban planner	Y	F	M
Artist	Y	F	M
Business (clerical)	Y	F	M
Business executive (management, administrator)	Y	F	M
Business owner or proprietor	Y	F	M
Business salesperson or buyer	Y	F	M
Clergy (minister, priest)	Y	F	M
Clergy (other religious)	Y	F	M
Clinical psychologist	Y	F	M
College administrator/staff	Y	F	M
College teacher	Y	F	M
Computer programmer or analyst	Y	F	M
Conservationist or forester	Y	F	M
Dentist (including orthodontist)	Y	F	M
Dietitian or nutritionist	Y	F	M
Engineer	Y	F	M
Farmer or rancher	Y	F	M
Foreign service worker (including diplomat)	Y	F	M
Homemaker (full-time)	Y	F	M
Interior decorator (including designer)	Y	F	M
Lab technician or hygienist	Y	F	M
Law enforcement officer	Y	F	M
Lawyer (attorney) or judge	Y	F	M
Military service (career)	Y	F	M
Musician (performer, composer)	Y	F	M
Nurse	Y	F	M
Optometrist	Y	F	M
Pharmacist	Y	F	M
Physician	Y	F	M
Policymaker/Government	Y	F	M
School counselor	Y	F	M
School principal or superintendent	Y	F	M
Scientific researcher	Y	F	M
Social, welfare or recreation worker	Y	F	M
Therapist (physical, occupational, speech)	Y	F	M
Teacher or administrator (elementary)	Y	F	M
Teacher or administrator (secondary)	Y	F	M
Veterinarian	Y	F	M
Writer or journalist	Y	F	M
Skilled trades	Y	F	M
Laborer (unskilled)	Y	F	M
Semi-skilled worker	Y	F	M
Unemployed	Y	F	M
Other	Y	F	M
Undecided	Y		

33. Mark one in each row:

- 1 Disagree Strongly
- 2 Disagree Somewhat
- 3 Agree Somewhat
- 4 Agree Strongly

There is too much concern in the courts for the rights of criminals	4	3	2	1
Abortion should be legal	4	3	2	1
The death penalty should be abolished	4	3	2	1
Marijuana should be legalized	4	3	2	1
It is important to have laws prohibiting homosexual relationships	4	3	2	1
Racial discrimination is no longer a major problem in America	4	3	2	1
Realistically, an individual can do little to bring about changes in our society	4	3	2	1
Wealthy people should pay a larger share of taxes than they do now	4	3	2	1
Colleges should prohibit racist/sexist speech on campus	4	3	2	1
Same-sex couples should have the right to legal marital status	4	3	2	1
Affirmative action in college admissions should be abolished	4	3	2	1
The activities of married women are best confined to the home and family	4	3	2	1
Federal military spending should be increased	4	3	2	1
Colleges have the right to ban extreme speakers	4	3	2	1
If two people really like each other, it's all right for them to have sex even if they've known each other for only a very short time	4	3	2	1
The federal government should do more to control the sale of handguns	4	3	2	1

34. Below is a list of community service/volunteer activities. Indicate which of these you participated in during high school. (Mark all that apply)

None	<input type="checkbox"/>	Elder care	<input type="checkbox"/>	Community improvement/construction	<input type="checkbox"/>
Tutoring/teaching	<input type="checkbox"/>	Hospital work	<input type="checkbox"/>	Conflict mediation	<input type="checkbox"/>
Counseling/mentoring	<input type="checkbox"/>	Substance abuse education	<input type="checkbox"/>	Service to my religious community	<input type="checkbox"/>
Environmental activities	<input type="checkbox"/>	Other health education	<input type="checkbox"/>	Other community service	<input type="checkbox"/>
Child care	<input type="checkbox"/>	Services to the homeless	<input type="checkbox"/>		

35. During your last year in high school, how much time did you spend during a typical week doing the following activities?

Hours per week:	None	Less than 1 hour	1-2	3-5	6-10	11-15	16-20	Over 20
Studying/homework	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Socializing with friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Talking with teachers outside of class	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exercise or sports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Partying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working (for pay)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Volunteer work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Student clubs/groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Watching TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Household/childcare duties	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reading for pleasure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Playing video/computer games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prayer/meditation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

36. Do you have any concern about your ability to finance your college education? (Mark one)

None (I am confident that I will have sufficient funds)	<input type="checkbox"/>
Some (but I probably will have enough funds)	<input type="checkbox"/>
Major (not sure I will have enough funds to complete college)	<input type="checkbox"/>

37. Below are some reasons that might have influenced your decision to attend this particular college. How important was each reason in your decision to come here? (Mark one answer for each possible reason)

	Very Important	Somewhat Important	Not Important
My relatives wanted me to come here	V	S	N
My teacher advised me	V	S	N
This college has a very good academic reputation	V	S	N
This college has a good reputation for its social activities	V	S	N
I was offered financial assistance	V	S	N
The cost of attending this college	V	S	N
High school counselor advised me	V	S	N
Private college counselor advised me	V	S	N
I wanted to live near home	V	S	N
Not offered aid by first choice	V	S	N
This college's graduates gain admission to top graduate/professional schools	V	S	N
This college's graduates get good jobs	V	S	N
I was attracted by the religious affiliation/orientation of the college	V	S	N
I wanted to go to a school about the size of this college	V	S	N
Rankings in national magazines	V	S	N
Information from a website	V	S	N
I was admitted through an Early Action or Early Decision program	V	S	N
A visit to the campus	V	S	N

Appendix B: Variables and Coding Schemes for HGLM Models

Variables and Coding Schemes for HGLM Models

Independent Variable	Coding
LEVEL ONE	
<i>Background</i>	
Sex: Female	1=Male, 2=Female
Puerto Rican (ref: Mexican American/Chicano)	1=No, 2=Yes
Other Latlino (ref: Mexican American/Chicano)	1=No, 2=Yes
Native English Speaker	1=No, 2=Yes
Father's Ed: Some College (ref: HS or less)	1=No, 2=Yes
Father's Ed: Bachelor's (ref: HS or less)	1=No, 2=Yes
Father's Ed: More than Bachelor's (ref: HS or less)	1=No, 2=Yes
Mother's Ed: Some College (ref: HS or less)	1=No, 2=Yes
Mother's Ed: Bachelor's (ref: HS or less)	1=No, 2=Yes
Mother's Ed: More than Bachelor's (ref: HS or less)	1=No, 2=Yes
Income Q1: \$30,000 or less (ref: Quart.4)	1=No, 2=Yes
Income Q2: \$30k to \$74,999 (ref: Quart.4)	1=No, 2=Yes
Income Q3: \$75k to \$149,999 or less (ref: Quart.4)	1=No, 2=Yes
<i>High School Experiences and Academic Preparation</i>	
High School Grades	1=C or lower to 7=A or A+
SAT	400 - 1600, 100-pt increments
Previous Credit from community college	1=No, 2=Yes
Previous Credit from four-year institution	1=No, 2=Yes
Self-Rating: Time Management	1= Lowest 10% to 5= Highest 10%
Hours Per Week: Student Clubs	1=0 to 6=11 or more
<i>Academic Undermatch</i>	
Exceeds Mean SAT for Next Selectivity Level	1=No, 2=Yes
<i>Sense of Purpose and Institutional Allegiance</i>	
Reason for Choosing: Relatives	1= Not Important to 3=Very Important
Reason for Choosing: Cost of Institution	1= Not Important to 3=Very Important
Choice of Institution	1 = Less than 3rd to 4=1st choice
Likelihood of Transferring to Another College	1= No Chance to 4=Very Good Chance
Degree Asp.: Less than Bachelor's (ref: Bachelor's)	1=No, 2=Yes
Degree Asp.: More than Bachelor's (ref: Bachelor's)	1=No, 2=Yes
<i>Environmental Pull Factors</i>	
Hours Per Week in HS: Household/childcare duties	1=0 to 6=11 or more
Miles from College to Home	1= Five or less to 6= Over 500
Likelihood of Working Full-Time While in College	1= No Chance to 4=Very Good Chance
Financial Concerns	1= None to 3= Major
<i>Anticipated College Experiences</i>	
Living Plans: Off Campus	1=No, 2=Yes
Likelihood of College Involvement Construct	Continuous 1-100, mean of 50

Major: STEM (ref: Social Sciences)	1=No, 2=Yes
Major: Professional Fields (ref: Social Sciences)	1=No, 2=Yes
Major: Arts and Humanities (ref: Social Sciences)	1=No, 2=Yes
Major: Undecided (ref: Social Sciences)	1=No, 2=Yes
<i>Enrollment Measures</i>	
Stopout Ever (No Departure)/ Before Departure (Transfer)	1=No, 2=Yes
Supplemental Enrollment Ever (No Departure)/ Before Departure (Transfer/Dropout)	1=No, 2=Yes
Summer School Ever (No Departure)/ Before Departure (Transfer/Dropout)	1=No, 2=Yes
Year of transfer	1=First Year to 6=Sixth Year
 LEVEL TWO	
<i>Peer Characteristics</i>	
Percent FTE URM	0 to 100, 1-pt increments
Percent FTE Pell Grant Recipients	0 to 100, 1-pt increments
<i>Structural Demographic Characteristics</i>	
Selectivity	400 - 1600, 100-pt increments
Control	1= Public, 2= Private
Region: East (ref: West)	1=No, 2=Yes
Region: Midwest (ref: West)	1=No, 2=Yes
Region: South (ref: West)	1=No, 2=Yes
Core Expenditures per FTE Student	
HSI (ref: Non-HSI)	1=No, 2=Yes
Emerging HSI (ref: Non-HSI)	1=No, 2=Yes
Size: FTE Undergraduate Enrollment	
<i>Aggregate Student Experiences</i>	
Peer: Likelihood of Involvement	Aggregated Likelihood of Involvement
Peer: Live Off-Campus	Aggregated Live Off-Campus
<i>Aggregate Student Attitudes</i>	
Peer: Likelihood of Transferring	Aggregated Likelihood of Transferring
<i>Aggregate Environmental Pull</i>	
Peer: Distance from College to Home	Aggregated Distance College to Home
Peer: Financial Concerns	Aggregated Financial Concerns
Percent of Part-Time Undergraduate Students	0 to 100, 1-pt increments

Appendix C: Description of Barron's Selectivity Categories

Description of Barron's Selectivity Categories		
Category	Level	Description
Non-Competitive	1	Require evidence of high school graduation Admit 98% or more of applicants
Less Competitive	2	Median SAT between 1000 High school class rank top 65% Grade averages generally C or below Admit 85% or more of applicants
Competitive	3	Median SAT between 1000 and 1144 High school class rank between 50% and 65% Grade averages no less than B- to C+ Admit fewer than half of applicants
Very Competitive	4	Median SAT between 1146 and 1238 High school class rank between 35% and 50% Grade averages no less than B- Admit fewer than one-third of applicants
Highly Competitive	5	Median SAT between 1240 and 1308 High school class rank between 20% and 35% Grade averages of B+ to B Admit fewer than one-quarter of applicants
Most Competitive	6	Median SAT between 1310 and 1600 High school rank in top 10% to 20% Grade averages of A to B+ Admit fewer than one-third of applicants

Source: Barron's Profile of American Colleges, 2005

Appendix D: Step by Step Results of HGLM Models

Step by Step Results for Model Predicting Reverse Transfer (Relative to No Departure)

	Background			High School Experiences			Academic Undermatch			Sense of Purpose and Inst. Alleg.			Environ. Pull Factors			Anticipated College Exp.		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
	Intercept	1.023	0.687		0.662	0.698		0.505	0.691		-0.198	0.735		0.357	0.751		-0.286	0.803
Sex: Female	-0.263	0.056	***	-0.201	0.060	**	-0.201	0.060	**	-0.189	0.060	**	-0.246	0.061	***	-0.183	0.065	**
Puerto Rican	0.025	0.106		-0.061	0.104		-0.073	0.104		-0.068	0.104		-0.075	0.104		-0.095	0.104	
Other Latina/o	-0.357	0.088	***	-0.434	0.087	***	-0.442	0.087	***	-0.443	0.087	***	-0.417	0.089	***	-0.437	0.092	***
Native English Speaker	0.212	0.064	**	0.252	0.067	***	0.251	0.067	***	0.253	0.067	***	0.275	0.069	***	0.302	0.072	***
Fath. Ed: Some College	-0.178	0.077	*	-0.084	0.077		-0.084	0.077		-0.082	0.077		-0.069	0.078		-0.053	0.078	
Fath. Ed: Bachelor's	-0.351	0.090	***	-0.290	0.092	**	-0.290	0.091	**	-0.289	0.091	**	-0.256	0.093	**	-0.219	0.096	*
Fath. Ed: More than Bach.	-0.386	0.122	**	-0.289	0.129	*	-0.288	0.130	*	-0.297	0.131	*	-0.252	0.126	*	-0.190	0.132	
Moth. Ed: Some College	0.125	0.078		0.186	0.083	*	0.185	0.083	*	0.177	0.083	*	0.172	0.083	*	0.186	0.085	*
Moth. Ed: Bachelor's	-0.010	0.093		0.062	0.096		0.056	0.096		0.060	0.097		0.070	0.097		0.083	0.105	
Moth. Ed: More than Bach.	-0.135	0.112		-0.066	0.117		-0.068	0.116		-0.070	0.119		-0.053	0.120		-0.033	0.128	
Income Q1	-0.158	0.133		-0.244	0.131		-0.258	0.131	*	-0.215	0.135		-0.399	0.141	**	-0.396	0.152	**
Income Q2	-0.161	0.125		-0.146	0.123		-0.156	0.124		-0.121	0.127		-0.290	0.134	*	-0.279	0.143	*
Income Q3	-0.315	0.118	**	-0.276	0.122	*	-0.286	0.122	*	-0.256	0.125	*	-0.360	0.129	**	-0.367	0.137	**
High School Grades				-0.355	0.021	***	-0.353	0.021	***	-0.348	0.021	***	-0.341	0.021	***	-0.353	0.022	***
SAT				-0.021	0.002	***	-0.023	0.003	***	-0.023	0.003	***	-0.023	0.003	***	-0.024	0.003	***
Credit from CC				0.155	0.094		0.152	0.094		0.148	0.093		0.137	0.097		0.107	0.109	
Credit from Four-Year				-0.356	0.229		-0.364	0.227		-0.356	0.224		-0.340	0.219		-0.352	0.248	
Time Management				-0.179	0.033	***	-0.178	0.033	***	-0.173	0.032	***	-0.166	0.032	***	-0.172	0.034	***
Hours/week: Student Clubs				-0.026	0.021		-0.025	0.021		-0.026	0.021		-0.041	0.022		-0.018	0.024	
Academic Undermatch							0.229	0.113	*	0.238	0.112	*	0.228	0.111	*	0.223	0.114	*
Reason: Relatives										-0.014	0.041		-0.007	0.041		-0.028	0.044	
Reason: Cost										-0.072	0.039		-0.093	0.039	*	-0.085	0.041	*
Choice of Institution										0.011	0.037		0.006	0.037		0.013	0.039	
Likelihood of Transferring										0.091	0.035	**	0.063	0.034		0.089	0.035	*
Deg. Asp: Less than Bach.										0.395	0.219		0.365	0.216		0.299	0.251	
Deg. Asp: More than Bach.										0.075	0.075		0.067	0.076		0.015	0.076	
Hrs/wk: Household/childcare													0.070	0.025	**	0.075	0.027	**
Distance: College to home													0.034	0.032		0.066	0.035	
Likelihood of working FT													0.175	0.029	***	0.195	0.031	***
Financial concerns													0.175	0.051	**	0.169	0.052	**
Live Off-Campus																0.214	0.090	*
College Involvement																-0.013	0.006	*
Major: STEM																0.333	0.094	**
Major: Professional Fields																0.002	0.103	
Major: Arts and Humanities																-0.066	0.124	
Major: Undecided																-0.110	0.138	
Stopout																		
Supplemental Enrollment																		
Summer School																		
Percent URM																		
Percent Pell																		
Selectivity																		
Institutional Control: Private																		
Region: East																		
Region: Midwest																		
Region: South																		
Core Expenditures per FTE																		
HSI																		
Emerging HSI																		
Size (FTE undergrad enroll)																		
Peer: College Involve.																		
Peer: Live Off-Campus																		
Peer: Likelihood of Transfer																		
Peer: Distance to home																		
Peer: Financial Concerns																		
Percent Part-Time Students																		

*p<.05, **p<.01, ***p<.001

Step by Step Results for Model Predicting Reverse Transfer (Relative to No Departure), continued

	Enrollment			Institutional:			Institutional:			Institutional:			Institutional:					
	Measures			Peer Character.			Structural-Demog.			Agg. Peer Exp.			Agg. Peer Attit.			Agg. Environ. Pull		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Intercept	0.494	1.000		0.733	0.996		1.503	1.272		1.408	1.300		0.277	1.308		1.482	1.302	
Sex: Female	-0.103	0.073		-0.101	0.073		-0.087	0.073		-0.085	0.073		-0.084	0.073		-0.094	0.073	
Puerto Rican	-0.214	0.118		-0.226	0.119		0.032	0.130		0.033	0.130		0.033	0.130		0.038	0.130	
Other Latina/o	-0.358	0.096	***	-0.355	0.097	***	-0.165	0.097		-0.164	0.097		-0.165	0.097		-0.160	0.097	
Native English Speaker	0.223	0.085	**	0.215	0.085	*	0.188	0.085	*	0.187	0.085	*	0.188	0.085	*	0.192	0.085	*
Fath. Ed: Some College	-0.028	0.091		-0.026	0.092		-0.047	0.093		-0.047	0.093		-0.046	0.092		-0.048	0.093	
Fath. Ed: Bachelor's	-0.249	0.115	*	-0.237	0.115	*	-0.257	0.116	*	-0.256	0.116	*	-0.256	0.116	*	-0.260	0.116	*
Fath. Ed: More than Bach.	-0.086	0.139		-0.070	0.139		-0.081	0.140		-0.081	0.141		-0.078	0.140		-0.075	0.141	
Moth. Ed: Some College	0.182	0.093	*	0.178	0.093		0.165	0.094		0.164	0.094		0.163	0.094		0.164	0.094	
Moth. Ed: Bachelor's	0.096	0.121		0.086	0.120		0.101	0.121		0.099	0.121		0.101	0.121		0.106	0.120	
Moth. Ed: More than Bach.	-0.132	0.143		-0.136	0.143		-0.112	0.144		-0.114	0.143		-0.115	0.143		-0.115	0.143	
Income Q1	-0.554	0.159	**	-0.585	0.159	***	-0.577	0.159	**	-0.578	0.159	**	-0.581	0.159	***	-0.585	0.158	***
Income Q2	-0.391	0.146	**	-0.423	0.145	**	-0.443	0.145	**	-0.444	0.145	**	-0.447	0.145	**	-0.453	0.145	**
Income Q3	-0.376	0.142	**	-0.397	0.142	**	-0.430	0.144	**	-0.431	0.144	**	-0.433	0.144	**	-0.440	0.144	**
High School Grades	-0.339	0.027	***	-0.332	0.027	***	-0.326	0.027	***	-0.326	0.027	***	-0.325	0.027	***	-0.325	0.027	***
SAT	-0.027	0.003	***	-0.024	0.003	***	-0.020	0.003	***	-0.020	0.003	***	-0.020	0.003	***	-0.020	0.003	***
Credit from CC	0.237	0.119	*	0.240	0.119	*	0.204	0.121		0.201	0.121		0.202	0.121		0.207	0.121	
Credit from Four-Year	-0.274	0.290		-0.264	0.291		-0.224	0.294		-0.224	0.295		-0.226	0.295		-0.239	0.295	
Time Management	-0.145	0.038	***	-0.143	0.038	***	-0.145	0.038	***	-0.146	0.038	***	-0.145	0.038	***	-0.144	0.038	***
Hours/week: Student Clubs	-0.005	0.027		-0.002	0.027		0.005	0.027		0.005	0.027		0.005	0.027		0.004	0.027	
Academic Undermatch	0.238	0.131		0.169	0.131		0.004	0.136		0.004	0.136		-0.003	0.135		-0.001	0.135	
Reason: Relatives	0.010	0.050		0.012	0.050		0.023	0.050		0.023	0.050		0.024	0.050		0.029	0.050	
Reason: Cost	-0.087	0.050		-0.096	0.050		-0.108	0.051	*	-0.109	0.051	*	-0.108	0.051	*	-0.108	0.051	*
Choice of Institution	0.006	0.048		0.016	0.048		0.014	0.047		0.014	0.047		0.016	0.048		0.014	0.048	
Likelihood of Transferring	0.091	0.040	*	0.088	0.040	*	0.076	0.040		0.076	0.040		0.072	0.040		0.074	0.041	
Deg. Asp: Less than Bach.	0.267	0.266		0.287	0.268		0.293	0.271		0.296	0.272		0.298	0.272		0.294	0.271	
Deg. Asp: More than Bach.	0.091	0.078		0.101	0.078		0.123	0.078		0.124	0.078		0.124	0.078		0.124	0.078	
Hrs/wk: Household/childcare	0.064	0.031	*	0.061	0.031		0.060	0.031		0.061	0.031		0.061	0.031		0.060	0.031	
Distance: College to home	0.066	0.034		0.060	0.034		0.055	0.034		0.056	0.034		0.056	0.034		0.055	0.034	
Likelihood of working FT	0.156	0.034	***	0.154	0.034	***	0.147	0.034	***	0.147	0.034	***	0.147	0.034	***	0.145	0.034	***
Financial concerns	0.167	0.056	**	0.170	0.056	**	0.184	0.057	**	0.184	0.057	**	0.184	0.057	**	0.177	0.057	**
Live Off-Campus	0.170	0.096		0.135	0.097		0.104	0.097		0.111	0.099		0.109	0.099		0.105	0.099	
College Involvement	-0.011	0.007		-0.010	0.007		-0.009	0.007		-0.009	0.007		-0.009	0.007		-0.009	0.007	
Major: STEM	0.395	0.093	***	0.395	0.093	***	0.395	0.094	***	0.393	0.093	***	0.396	0.093	***	0.392	0.093	***
Major: Professional Fields	-0.029	0.099		-0.034	0.100		-0.042	0.101		-0.043	0.101		-0.043	0.101		-0.044	0.101	
Major: Arts and Humanities	-0.113	0.139		-0.109	0.139		-0.087	0.137		-0.088	0.137		-0.087	0.137		-0.095	0.138	
Major: Undecided	-0.099	0.147		-0.090	0.148		-0.078	0.149		-0.077	0.149		-0.077	0.149		-0.074	0.149	
Stopout	2.034	0.107	***	2.026	0.107	***	2.033	0.106	***	2.033	0.106	***	2.034	0.106	***	2.031	0.106	***
Supplemental Enrollment	-0.330	0.085	***	-0.323	0.085	***	-0.346	0.086	***	-0.346	0.086	***	-0.345	0.086	***	-0.343	0.086	***
Summer School	-2.289	0.128	***	-2.297	0.128	***	-2.336	0.128	***	-2.337	0.129	***	-2.336	0.129	***	-2.340	0.130	***
Percent URM				-0.012	0.006	*	-0.019	0.007	**	-0.017	0.007	*	-0.016	0.007	*	-0.017	0.007	*
Percent Pell				0.029	0.007	***	0.017	0.009		0.015	0.009		0.015	0.009		0.009	0.009	
Selectivity							-0.007	0.011		-0.004	0.011		-0.002	0.011		0.010	0.013	
Institutional Control: Private							-0.285	0.201		-0.238	0.208		-0.159	0.212		-0.260	0.216	
Region: East							-0.846	0.167	***	-0.869	0.175	***	-0.848	0.176	***	-0.883	0.176	***
Region: Midwest							0.072	0.179		0.053	0.192		0.060	0.192		-0.020	0.196	
Region: South							-0.230	0.200		-0.231	0.199		-0.216	0.200		-0.067	0.213	
Core Expenditures per FTE							-0.538	0.206	*	-0.509	0.208	*	-0.484	0.209	*	-0.561	0.213	**
HSI							0.398	0.260		0.451	0.263		0.417	0.257		0.414	0.252	
Emerging HSI							0.325	0.237		0.348	0.237		0.325	0.241		0.298	0.237	
Size (FTE undergrad enroll)							0.012	0.094		0.003	0.097		0.041	0.099		0.012	0.100	
Peer: College Involve.										-0.040	0.039		-0.039	0.039		-0.058	0.040	
Peer: Live Off-Campus										-0.265	0.371		-0.330	0.363		-0.720	0.509	
Peer: Likelihood of Transfer													0.598	0.376		0.466	0.388	
Peer: Distance to home																-0.154	0.162	
Peer: Financial Concerns																1.344	0.728	
Percent Part-Time Students																0.005	0.008	

*p<.05, **p<.01, ***p<.001

Step by Step Results for Model Predicting Lateral Transfer (Relative to No Departure)

	Background			High School Experiences			Academic Undermatch			Sense of Purpose and Inst. Alleg.			Environ. Pull Factors			Anticipated College Exp.		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Intercept	-0.121	0.649		-0.811	0.666		-0.933	0.664		-0.811	0.709		-0.840	0.722		-0.498	0.808	
Sex: Female	-0.149	0.067	*	-0.097	0.071		-0.097	0.071		-0.078	0.073		-0.083	0.074		-0.121	0.082	
Puerto Rican	0.230	0.106	*	0.194	0.104		0.191	0.104		0.218	0.102	*	0.240	0.101	*	0.230	0.104	*
Other Latina/o	-0.022	0.078		-0.071	0.078		-0.072	0.078		-0.052	0.077		-0.032	0.078		-0.060	0.081	
Native English Speaker	0.199	0.074	**	0.208	0.075	**	0.209	0.075	**	0.215	0.076	**	0.221	0.076	**	0.226	0.083	**
Fath. Ed: Some College	-0.267	0.084	**	-0.219	0.084	*	-0.219	0.084	*	-0.224	0.084	**	-0.227	0.085	**	-0.185	0.086	*
Fath. Ed: Bachelor's	-0.244	0.107	*	-0.219	0.103	*	-0.220	0.103	*	-0.214	0.105	*	-0.221	0.106	*	-0.229	0.112	*
Fath. Ed: More than Bach.	-0.326	0.120	**	-0.301	0.118	*	-0.300	0.118	*	-0.321	0.121	**	-0.331	0.121	**	-0.292	0.120	*
Moth. Ed: Some College	0.070	0.089		0.107	0.088		0.107	0.088		0.070	0.088		0.062	0.088		0.065	0.089	
Moth. Ed: Bachelor's	0.194	0.106		0.227	0.108	*	0.225	0.108	*	0.210	0.108		0.198	0.108		0.210	0.116	
Moth. Ed: More than Bach.	0.253	0.115	*	0.293	0.118	*	0.295	0.118	*	0.283	0.117	*	0.275	0.117	*	0.273	0.118	*
Income Q1	-0.316	0.140	*	-0.341	0.144	*	-0.344	0.145	*	-0.275	0.153		-0.251	0.157		-0.225	0.160	
Income Q2	-0.369	0.140	**	-0.344	0.142	*	-0.346	0.143	*	-0.290	0.150		-0.272	0.152		-0.242	0.154	
Income Q3	-0.263	0.133	*	-0.241	0.134		-0.243	0.135		-0.181	0.145		-0.170	0.144		-0.156	0.149	
High School Grades				-0.203	0.028	***	-0.202	0.029	***	-0.187	0.029	***	-0.180	0.029	***	-0.189	0.028	***
SAT				-0.008	0.003	**	-0.009	0.003	**	-0.010	0.003	**	-0.011	0.003	**	-0.011	0.003	**
Credit from CC				0.053	0.136		0.053	0.136		0.027	0.134		0.002	0.135		-0.007	0.146	
Credit from Four-Year				0.347	0.177	*	0.346	0.177	*	0.346	0.179		0.347	0.177	*	0.362	0.185	*
Time Management				-0.091	0.039	*	-0.090	0.039	*	-0.070	0.040		-0.072	0.040		-0.076	0.041	
Hours/week: Student Clubs				-0.019	0.021		-0.019	0.021		-0.022	0.021		-0.029	0.022		-0.033	0.023	
Academic Undermatch							0.122	0.112		0.114	0.112		0.116	0.112		0.130	0.115	
Reason: Relatives										-0.112	0.044	*	-0.100	0.046	*	-0.118	0.049	*
Reason: Cost										-0.131	0.044	**	-0.131	0.045	**	-0.126	0.046	**
Choice of Institution										-0.060	0.044		-0.053	0.044		-0.045	0.044	
Likelihood of Transferring										0.333	0.036	***	0.328	0.037	***	0.354	0.037	***
Deg. Asp: Less than Bach.										-0.438	0.296		-0.452	0.293		-0.609	0.334	
Deg. Asp: More than Bach.										0.045	0.079		0.043	0.078		0.031	0.083	
Hrs/wk: Household/childcare													0.029	0.023		0.037	0.024	
Distance: College to home													0.124	0.029	***	0.105	0.029	**
Likelihood of working FT													0.034	0.037		0.023	0.038	
Financial concerns													-0.028	0.052		-0.035	0.054	
Live Off-Campus																0.026	0.101	
College Involvement																0.004	0.005	
Major: STEM																0.019	0.088	
Major: Professional Fields																-0.076	0.098	
Major: Arts and Humanities																-0.058	0.130	
Major: Undecided																-0.181	0.127	
Stopout																		
Supplemental Enrollment																		
Summer School																		
Percent URM																		
Percent Pell																		
Selectivity																		
Institutional Control: Private																		
Region: East																		
Region: Midwest																		
Region: South																		
Core Expenditures per FTE																		
HSI																		
Emerging HSI																		
Size (FTE undergrad enroll)																		
Peer: College Involve.																		
Peer: Live Off-Campus																		
Peer: Likelihood of Transfer																		
Peer: Distance to home																		
Peer: Financial Concerns																		
Percent Part-Time Students																		

*p<.05, **p<.01, ***p<.001

Step by Step Results for Model Predicting Lateral Transfer (Relative to No Departure), continued

	Enrollment			Institutional:			Institutional:			Institutional:			Institutional:					
	Measures			Peer Character.			Structural-Demog.			Agg. Peer Exp.			Agg. Peer Attit.			Agg. Environ. Pull		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Intercept	0.841	1.016		1.177	1.019		0.909	1.491		0.597	1.514		0.450	1.515		0.173	1.465	
Sex: Female	-0.056	0.087		-0.050	0.087		-0.060	0.088		-0.048	0.088		-0.047	0.088		-0.049	0.088	
Puerto Rican	0.132	0.111		0.124	0.111		0.081	0.123		0.088	0.123		0.089	0.123		0.094	0.124	
Other Latina/o	-0.011	0.087		-0.007	0.087		-0.050	0.093		-0.047	0.093		-0.048	0.093		-0.041	0.093	
Native English Speaker	0.165	0.092		0.156	0.092		0.132	0.093		0.129	0.093		0.130	0.093		0.130	0.093	
Fath. Ed: Some College	-0.173	0.093		-0.171	0.093		-0.184	0.094 *		-0.186	0.094 *		-0.186	0.094 *		-0.188	0.094 *	
Fath. Ed: Bachelor's	-0.230	0.123		-0.212	0.123		-0.239	0.125		-0.239	0.125		-0.239	0.125		-0.241	0.125	
Fath. Ed: More than Bach.	-0.192	0.130		-0.171	0.131		-0.189	0.132		-0.191	0.131		-0.186	0.131		-0.189	0.132	
Moth. Ed: Some College	0.055	0.095		0.048	0.094		0.041	0.094		0.040	0.094		0.038	0.094		0.037	0.094	
Moth. Ed: Bachelor's	0.229	0.128		0.217	0.129		0.205	0.128		0.202	0.128		0.204	0.128		0.210	0.128	
Moth. Ed: More than Bach.	0.195	0.132		0.191	0.133		0.174	0.133		0.171	0.133		0.168	0.133		0.167	0.132	
Income Q1	-0.360	0.165 *		-0.397	0.166 *		-0.416	0.165 *		-0.417	0.165 *		-0.421	0.166 *		-0.423	0.166 *	
Income Q2	-0.315	0.156 *		-0.353	0.158 *		-0.381	0.158 *		-0.380	0.158 *		-0.384	0.158 *		-0.383	0.159 *	
Income Q3	-0.160	0.163		-0.184	0.164		-0.218	0.164		-0.218	0.165		-0.221	0.165		-0.217	0.166	
High School Grades	-0.184	0.029 ***		-0.176	0.029 ***		-0.168	0.030 ***		-0.167	0.030 ***		-0.166	0.030 ***		-0.167	0.030 ***	
SAT	-0.015	0.003 ***		-0.011	0.003 **		-0.008	0.004 *		-0.008	0.004 *		-0.008	0.004 *		-0.008	0.004 *	
Credit from CC	0.024	0.156		0.026	0.156		0.041	0.158		0.034	0.158		0.035	0.158		0.023	0.158	
Credit from Four-Year	0.424	0.188 *		0.434	0.188 *		0.467	0.189 *		0.469	0.189 *		0.466	0.188 *		0.462	0.187 *	
Time Management	-0.048	0.045		-0.046	0.045		-0.049	0.045		-0.051	0.045		-0.050	0.045		-0.051	0.045	
Hours/week: Student Clubs	-0.021	0.024		-0.017	0.024		-0.012	0.024		-0.014	0.024		-0.013	0.024		-0.014	0.024	
Academic Undermatch	0.138	0.127		0.024	0.129		-0.086	0.137		-0.088	0.137		-0.097	0.137		-0.107	0.137	
Reason: Relatives	-0.089	0.051		-0.086	0.050		-0.082	0.050		-0.084	0.050		-0.082	0.050		-0.083	0.051	
Reason: Cost	-0.130	0.053 *		-0.142	0.053 **		-0.149	0.053 **		-0.149	0.053 **		-0.149	0.053 **		-0.147	0.053 **	
Choice of Institution	-0.053	0.046		-0.039	0.047		-0.043	0.047		-0.040	0.047		-0.037	0.047		-0.039	0.047	
Likelihood of Transferring	0.359	0.041 ***		0.354	0.041 ***		0.343	0.041 ***		0.344	0.041 ***		0.339	0.041 ***		0.338	0.041 ***	
Deg. Asp: Less than Bach.	-0.619	0.348		-0.598	0.349		-0.558	0.349		-0.551	0.350		-0.546	0.349		-0.543	0.349	
Deg. Asp: More than Bach.	0.088	0.092		0.098	0.093		0.115	0.093		0.115	0.093		0.114	0.093		0.120	0.093	
Hrs/wk: Household/childcare	0.030	0.027		0.025	0.027		0.022	0.027		0.023	0.027		0.023	0.027		0.023	0.027	
Distance: College to home	0.103	0.034 **		0.093	0.034 **		0.093	0.034 **		0.097	0.034 **		0.097	0.034 **		0.098	0.034 **	
Likelihood of working FT	-0.008	0.047		-0.010	0.047		-0.013	0.047		-0.013	0.047		-0.014	0.047		-0.015	0.047	
Financial concerns	-0.038	0.057		-0.036	0.057		-0.022	0.058		-0.021	0.058		-0.021	0.058		-0.020	0.058	
Live Off-Campus	0.015	0.110		-0.045	0.114		-0.053	0.113		-0.016	0.118		-0.019	0.118		-0.014	0.119	
College Involvement	0.004	0.006		0.006	0.006		0.007	0.006		0.008	0.006		0.008	0.006		0.009	0.006	
Major: STEM	0.100	0.096		0.095	0.096		0.090	0.097		0.084	0.097		0.088	0.097		0.096	0.097	
Major: Professional Fields	-0.113	0.104		-0.122	0.104		-0.142	0.105		-0.150	0.105		-0.149	0.105		-0.135	0.105	
Major: Arts and Humanities	-0.088	0.138		-0.085	0.138		-0.075	0.138		-0.078	0.138		-0.079	0.138		-0.087	0.139	
Major: Undecided	-0.159	0.125		-0.148	0.125		-0.157	0.125		-0.157	0.126		-0.157	0.126		-0.148	0.126	
Stopout	1.707	0.140 ***		1.699	0.141 ***		1.714	0.144 ***		1.713	0.144 ***		1.714	0.144 ***		1.708	0.144 ***	
Supplemental Enrollment	-0.302	0.101 **		-0.293	0.101 **		-0.288	0.102 **		-0.287	0.102 **		-0.285	0.102 **		-0.290	0.102 **	
Summer School	-2.491	0.096 ***		-2.507	0.093 ***		-2.514	0.098 ***		-2.517	0.097 ***		-2.513	0.097 ***		-2.517	0.098 ***	
Percent URM				-0.010	0.006		-0.006	0.006		-0.002	0.006		-0.002	0.006		-0.004	0.006	
Percent Pell				0.033	0.008 ***		0.027	0.009 **		0.024	0.009 *		0.024	0.009 *		0.022	0.009 *	
Selectivity							0.013	0.010		0.006	0.011		0.009	0.011		0.011	0.012	
Institutional Control: Private							0.077	0.186		0.191	0.186		0.283	0.194		0.195	0.192	
Region: East							-0.108	0.180		-0.148	0.186		-0.121	0.186		0.006	0.181	
Region: Midwest							0.137	0.193		0.112	0.205		0.124	0.204		0.136	0.205	
Region: South							0.814	0.209 ***		0.811	0.207 ***		0.828	0.210 ***		0.856	0.214 ***	
Core Expenditures per FTE							-0.650	0.184 **		-0.587	0.182 **		-0.559	0.182 **		-0.603	0.179 **	
HSI							-0.297	0.326		-0.171	0.315		-0.218	0.308		-0.131	0.292	
Emerging HSI							-0.074	0.215		-0.018	0.206		-0.051	0.210		0.050	0.202	
Size (FTE undergrad enroll)							0.034	0.095		0.030	0.096		0.076	0.099		0.044	0.099	
Peer: College Involve.										-0.088	0.042 *		-0.086	0.041 *		-0.105	0.042 *	
Peer: Live Off-Campus										-0.662	0.369		-0.733	0.357 *		0.118	0.510	
Peer: Likelihood of Transfer													0.745	0.399		0.433	0.408	
Peer: Distance to home																0.476	0.178 **	
Peer: Financial Concerns																0.966	0.676	
Percent Part-Time Students																0.012	0.011	

*p<.05, **p<.01, ***p<.001

Step by Step Results for Model Predicting Reverse Transfer (Relative to Dropout)

	Background			High School Experiences			Academic Undermatch			Sense of Purpose and Inst. Alleg.			Environ. Pull Factors			Anticipated College Exp.		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Intercept	1.208	0.880		1.029	0.900		1.210	0.867		1.024	0.911		1.045	0.914		2.288	1.101	*
Sex: Female	0.162	0.075	*	0.153	0.074	*	0.153	0.074	*	0.159	0.075	*	0.161	0.080	*	0.180	0.097	
Puerto Rican	-0.256	0.124	*	-0.250	0.124	*	-0.245	0.123	*	-0.239	0.122	*	-0.225	0.121		-0.223	0.126	
Other Latina/o	-0.071	0.109		-0.061	0.109		-0.060	0.108		-0.050	0.107		-0.043	0.108		-0.018	0.114	
Native English Speaker	0.113	0.098		0.115	0.098		0.117	0.098		0.117	0.099		0.116	0.099		0.140	0.106	
Fath. Ed: Some College	-0.002	0.110		0.002	0.111		0.000	0.111		-0.001	0.112		-0.010	0.112		-0.003	0.117	
Fath. Ed: Bachelor's	0.118	0.140		0.134	0.141		0.135	0.140		0.132	0.141		0.108	0.143		0.159	0.143	
Fath. Ed: More than Bach.	-0.030	0.160		-0.020	0.159		-0.017	0.159		-0.023	0.159		-0.045	0.160		0.023	0.162	
Moth. Ed: Some College	0.268	0.104	*	0.271	0.104	*	0.270	0.104	*	0.260	0.105	*	0.266	0.105	*	0.269	0.108	*
Moth. Ed: Bachelor's	0.070	0.135		0.073	0.137		0.073	0.136		0.081	0.135		0.081	0.138		0.073	0.145	
Moth. Ed: More than Bach.	0.238	0.153		0.241	0.155		0.238	0.154		0.238	0.157		0.236	0.157		0.210	0.162	
Income Q1	-0.692	0.198	**	-0.689	0.199	**	-0.679	0.200	**	-0.645	0.207	**	-0.643	0.212	**	-0.667	0.224	**
Income Q2	-0.453	0.185	*	-0.441	0.185	*	-0.434	0.185	*	-0.406	0.192	*	-0.402	0.195	*	-0.395	0.205	
Income Q3	-0.275	0.183		-0.257	0.185		-0.249	0.184		-0.234	0.188		-0.235	0.187		-0.250	0.195	
High School Grades				-0.039	0.030		-0.041	0.030		-0.038	0.030		-0.038	0.030		-0.045	0.032	
SAT				-0.017	0.002		0.006	0.003		0.001	0.003		0.004	0.003		-0.002	0.003	
Credit from CC				0.326	0.128	*	0.330	0.128	*	0.322	0.125	*	0.294	0.122	*	0.258	0.134	
Credit from Four-Year				-0.264	0.289		-0.264	0.289		-0.267	0.293		-0.269	0.296		-0.336	0.279	
Time Management				0.034	0.042		0.034	0.042		0.038	0.042		0.041	0.042		0.029	0.043	
Hours/week: Student Clubs				0.005	0.023		0.003	0.023		0.004	0.023		0.000	0.024		0.017	0.026	
Academic Undermatch							-0.206	0.146		-0.214	0.147		-0.189	0.148		-0.158	0.168	
Reason: Relatives										0.061	0.056		0.067	0.054		0.067	0.058	
Reason: Cost										-0.071	0.045		-0.068	0.045		-0.054	0.049	
Choice of Institution										-0.030	0.058		-0.024	0.058		-0.016	0.062	
Likelihood of Transferring										0.042	0.045		0.046	0.045		0.065	0.047	
Deg. Asp: Less than Bach.										0.058	0.227		0.053	0.232		-0.024	0.259	
Deg. Asp: More than Bach.										0.020	0.078		0.022	0.079		-0.028	0.081	
Hrs/wk: Household/childcare													-0.002	0.027		-0.006	0.029	
Distance: College to home													0.072	0.028	*	0.079	0.030	**
Likelihood of working FT													-0.041	0.038		-0.005	0.039	
Financial concerns													0.032	0.057		0.029	0.058	
Live Off-Campus																-0.125	0.116	
College Involvement																-0.011	0.006	
Major: STEM																0.029	0.130	
Major: Professional Fields																-0.107	0.147	
Major: Arts and Humanities																-0.361	0.161	*
Major: Undecided																-0.194	0.175	
Supplemental Enrollment																		
Summer School																		
Percent URM																		
Percent Pell																		
Selectivity																		
Institutional Control: Private																		
Region: East																		
Region: Midwest																		
Region: South																		
Core Expenditures per FTE																		
HSI																		
Emerging HSI																		
Size (FTE undergrad enroll)																		
Peer: College Involve.																		
Peer: Live Off-Campus																		
Peer: Likelihood of Transfer																		
Peer: Distance to home																		
Peer: Financial Concerns																		
Percent Part-Time Students																		

*p<.05, **p<.01, ***p<.001

Step by Step Results for Model Predicting Reverse Transfer (Relative to Dropout), continued

	Enrollment Measures			Institutional: Peer Character.			Institutional: Structural-Demog.			Institutional: Agg. Peer Exp.			Institutional: Agg. Peer Attit.			Institutional: Agg. Environ. Pull		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Intercept	2.351	1.147	*	2.255	1.162		0.821	0.427		0.302	1.420		1.287	1.427		1.690	1.439	
Sex: Female	0.164	0.104		0.163	0.104		0.174	0.105		0.161	0.104		0.161	0.104		0.158	0.104	
Puerto Rican	-0.226	0.128		-0.213	0.128		-0.118	0.148		-0.127	0.148		-0.127	0.148		-0.126	0.148	
Other Latina/o	0.016	0.116		0.019	0.117		0.078	0.134		0.079	0.135		0.079	0.134		0.081	0.135	
Native English Speaker	0.141	0.109		0.142	0.110		0.158	0.109		0.168	0.109		0.168	0.109		0.171	0.109	
Fath. Ed: Some College	-0.018	0.120		-0.019	0.120		-0.008	0.120		-0.005	0.120		-0.005	0.120		-0.012	0.121	
Fath. Ed: Bachelor's	0.171	0.145		0.165	0.145		0.174	0.145		0.177	0.145		0.177	0.145		0.176	0.145	
Fath. Ed: More than Bach.	-0.005	0.164		-0.009	0.164		-0.012	0.162		-0.007	0.162		-0.007	0.162		-0.006	0.163	
Moth. Ed: Some College	0.263	0.111	*	0.264	0.111	*	0.261	0.111	*	0.266	0.112	*	0.266	0.112	*	0.267	0.112	*
Moth. Ed: Bachelor's	0.053	0.148		0.057	0.147		0.065	0.147		0.067	0.148		0.067	0.148		0.070	0.149	
Moth. Ed: More than Bach.	0.247	0.167		0.249	0.167		0.263	0.167		0.272	0.167		0.272	0.167		0.267	0.167	
Income Q1	-0.680	0.216	**	-0.668	0.216	**	-0.658	0.217	**	-0.648	0.218	**	-0.648	0.218	**	-0.650	0.219	**
Income Q2	-0.432	0.198	*	-0.417	0.199	*	-0.406	0.199	*	-0.402	0.200	*	-0.403	0.200	*	-0.407	0.201	*
Income Q3	-0.273	0.194		-0.269	0.194		-0.257	0.196		-0.259	0.196		-0.260	0.196		-0.265	0.197	
High School Grades	-0.037	0.033		-0.041	0.034		-0.046	0.035		-0.046	0.036		-0.046	0.036		-0.044	0.036	
SAT	-0.001	0.003		-0.002	0.003		-0.004	0.004		-0.005	0.004		-0.005	0.004		-0.005	0.004	
Credit from CC	0.224	0.136		0.219	0.137		0.229	0.138		0.238	0.138		0.239	0.138		0.240	0.138	
Credit from Four-Year	-0.293	0.274		-0.289	0.274		-0.300	0.276		-0.310	0.277		-0.309	0.277		-0.323	0.279	
Time Management	0.021	0.043		0.020	0.043		0.019	0.044		0.020	0.044		0.020	0.044		0.022	0.044	
Hours/week: Student Clubs	0.019	0.028		0.018	0.028		0.017	0.028		0.017	0.028		0.017	0.028		0.017	0.028	
Academic Undermatch	-0.155	0.171		-0.139	0.170		-0.090	0.174		-0.080	0.174		-0.082	0.172		-0.089	0.171	
Reason: Relatives	0.092	0.058		0.090	0.058		0.086	0.058		0.090	0.058		0.091	0.058		0.090	0.059	
Reason: Cost	-0.047	0.051		-0.045	0.050		-0.034	0.052		-0.034	0.052		-0.034	0.052		-0.031	0.053	
Choice of Institution	-0.021	0.061		-0.025	0.061		-0.027	0.061		-0.030	0.061		-0.030	0.061		-0.029	0.061	
Likelihood of Transferring	0.057	0.047		0.060	0.047		0.062	0.048		0.062	0.048		0.061	0.049		0.061	0.049	
Deg. Asp: Less than Bach.	-0.001	0.242		0.006	0.243		0.009	0.239		0.013	0.239		0.012	0.240		0.016	0.240	
Deg. Asp: More than Bach.	-0.007	0.080		-0.011	0.079		-0.017	0.079		-0.023	0.080		-0.023	0.080		-0.021	0.080	
Hrs/wk: Household/childcare	-0.007	0.030		-0.005	0.030		-0.005	0.030		-0.005	0.030		-0.005	0.030		-0.003	0.030	
Distance: College to home	0.068	0.031	*	0.067	0.031	*	0.068	0.031	*	0.084	0.032	**	0.084	0.032	**	0.085	0.032	**
Likelihood of working FT	-0.018	0.038		-0.017	0.038		-0.011	0.038		-0.013	0.038		-0.013	0.038		-0.014	0.038	
Financial concerns	0.022	0.057		0.022	0.056		0.014	0.057		0.012	0.058		0.012	0.058		0.008	0.058	
Live Off-Campus	-0.112	0.115		-0.106	0.113		-0.115	0.115		-0.115	0.117		-0.115	0.117		-0.113	0.117	
College Involvement	-0.011	0.006		-0.011	0.006		-0.012	0.006	*	-0.013	0.006	*	-0.013	0.006	*	-0.013	0.006	*
Major: STEM	0.049	0.130		0.050	0.130		0.050	0.131		0.047	0.131		0.047	0.131		0.046	0.131	
Major: Professional Fields	-0.070	0.148		-0.067	0.148		-0.056	0.149		-0.060	0.149		-0.060	0.149		-0.058	0.149	
Major: Arts and Humanities	-0.313	0.173		-0.313	0.173		-0.313	0.172		-0.305	0.173		-0.304	0.173		-0.318	0.173	
Major: Undecided	-0.165	0.180		-0.166	0.180		-0.175	0.179		-0.181	0.179		-0.180	0.179		-0.180	0.179	
Supplemental Enrollment	0.674	0.124	***	0.675	0.124	***	0.661	0.124	***	0.662	0.124	***	0.663	0.124	***	0.659	0.124	***
Summer School	-0.871	0.118	***	-0.868	0.118	***	-0.889	0.122	***	-0.889	0.124	***	-0.889	0.124	***	-0.883	0.122	***
Percent URM				0.004	0.005		-0.001	0.006		-0.003	0.006		-0.002	0.006		0.003	0.006	
Percent Pell				-0.010	0.007		-0.002	0.008		-0.003	0.008		-0.003	0.008		-0.008	0.008	
Selectivity							0.014	0.010		0.017	0.011		0.017	0.011		0.018	0.012	
Institutional Control: Private							0.167	0.179		0.089	0.189		0.097	0.192		-0.017	0.196	
Region: East							-0.180	0.184		-0.286	0.194		-0.285	0.195		-0.311	0.194	
Region: Midwest							0.146	0.192		0.083	0.196		0.083	0.196		0.103	0.192	
Region: South							-0.076	0.225		-0.027	0.222		-0.023	0.222		0.026	0.228	
Core Expenditures per FTE							-0.078	0.183		-0.111	0.188		-0.109	0.188		-0.200	0.195	
HSI							0.339	0.223		0.220	0.220		0.220	0.218		0.104	0.219	
Emerging HSI							0.562	0.163	**	0.466	0.167	**	0.464	0.166	**	0.382	0.165	*
Size (FTE undergrad enroll)							0.116	0.088		0.109	0.088		0.112	0.086		0.048	0.088	
Peer: College Involve.										0.046	0.037		0.046	0.037		0.042	0.037	
Peer: Live Off-Campus										-0.544	0.495		-0.558	0.494		-0.353	0.498	
Peer: Likelihood of Transfer													0.057	0.356		-0.100	0.355	
Peer: Distance to home																-0.467	0.182	*
Peer: Financial Concerns																0.866	0.681	
Percent Part-Time Students																-0.015	0.007	*

*p<.05, **p<.01, ***p<.001

Step by Step Results for Model Predicting Lateral Transfer (Relative to Dropout)

	Background			High School Experiences			Academic Undermatch			Sense of Purpose and Inst. Alleg.			Environ. Pull Factors			Anticipated College Exp.		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Intercept	0.134	0.761		-0.553	0.785		-0.261	0.797		0.274	0.901		-0.430	0.921		1.303	1.264	
Sex: Female	0.298	0.087	**	0.293	0.088	**	0.292	0.088	**	0.316	0.088	**	0.385	0.091	***	0.313	0.103	**
Puerto Rican	-0.037	0.127		0.030	0.126		0.034	0.127		0.068	0.125		0.137	0.121		0.143	0.127	
Other Latina/o	0.303	0.095	**	0.342	0.095	**	0.341	0.095	**	0.365	0.094	***	0.382	0.096	***	0.371	0.099	***
Native English Speaker	0.138	0.105		0.126	0.106		0.128	0.106		0.114	0.106		0.101	0.105		0.097	0.109	
Fath. Ed: Some College	-0.083	0.108		-0.130	0.112		-0.133	0.112		-0.150	0.113		-0.165	0.114		-0.134	0.116	
Fath. Ed: Bachelor's	0.253	0.166		0.187	0.171		0.189	0.171		0.176	0.175		0.088	0.177		0.096	0.188	
Fath. Ed: More than Bach.	0.074	0.184		-0.007	0.187		-0.001	0.187		-0.001	0.187		-0.096	0.189		-0.062	0.186	
Moth. Ed: Some College	0.201	0.105		0.186	0.107		0.184	0.107		0.141	0.106		0.128	0.107		0.116	0.112	
Moth. Ed: Bachelor's	0.242	0.132		0.238	0.133		0.239	0.133		0.253	0.135		0.236	0.137		0.228	0.143	
Moth. Ed: More than Bach.	0.641	0.157	***	0.640	0.159	***	0.635	0.159	***	0.625	0.162	***	0.600	0.161	***	0.565	0.162	**
Income Q1	-0.906	0.180	***	-0.812	0.187	***	-0.796	0.187	***	-0.721	0.197	***	-0.519	0.203	*	-0.497	0.210	*
Income Q2	-0.728	0.175	***	-0.670	0.178	***	-0.659	0.178	***	-0.587	0.187	**	-0.385	0.190	*	-0.348	0.193	
Income Q3	-0.321	0.179		-0.286	0.182		-0.276	0.182		-0.220	0.186		-0.110	0.192		-0.101	0.198	
High School Grades				0.110	0.027	***	0.106	0.027	***	0.114	0.027	***	0.114	0.027	***	0.113	0.029	***
SAT				0.011	0.003	**	0.015	0.004	***	0.015	0.004	***	0.013	0.004	**	0.011	0.004	**
Credit from CC				0.172	0.183		0.180	0.183		0.140	0.182		0.096	0.181		0.087	0.193	
Credit from Four-Year				0.325	0.286		0.326	0.285		0.327	0.291		0.339	0.289		0.259	0.272	
Time Management				0.122	0.049	*	0.123	0.049	*	0.151	0.049	**	0.149	0.051	**	0.136	0.053	*
Hours/week: Student Clubs				0.004	0.027		0.002	0.027		0.002	0.027		0.003	0.027		-0.002	0.027	
Academic Undermatch							-0.328	0.156	*	-0.362	0.154	*	-0.299	0.159		-0.256	0.167	
Reason: Relatives										-0.038	0.058		-0.027	0.057		-0.034	0.061	
Reason: Cost										-0.154	0.058	**	-0.132	0.058	*	-0.119	0.061	
Choice of Institution										-0.088	0.056		-0.069	0.056		-0.064	0.057	
Likelihood of Transferring										0.290	0.046	***	0.309	0.047	***	0.328	0.050	***
Deg. Asp: Less than Bach.										-0.700	0.328	*	-0.701	0.323	*	-0.889	0.362	*
Deg. Asp: More than Bach.										-0.013	0.094		-0.007	0.093		-0.007	0.101	
Hrs/wk: Household/childcare													-0.054	0.026	*	-0.056	0.028	*
Distance: College to home													0.184	0.036	***	0.144	0.036	***
Likelihood of working FT													-0.162	0.043	***	-0.157	0.044	**
Financial concerns													-0.158	0.065	*	-0.170	0.068	*
Live Off-Campus																-0.251	0.123	*
College Involvement																0.007	0.006	
Major: STEM																-0.209	0.145	
Major: Professional Fields																-0.122	0.143	
Major: Arts and Humanities																-0.341	0.173	*
Major: Undecided																-0.201	0.182	
Supplemental Enrollment																		
Summer School																		
Percent URM																		
Percent Pell																		
Selectivity																		
Institutional Control: Private																		
Region: East																		
Region: Midwest																		
Region: South																		
Core Expenditures per FTE																		
HSI																		
Emerging HSI																		
Size (FTE undergrad enrollment)																		
Peer: College Involve.																		
Peer: Live Off-Campus																		
Peer: Likelihood of Transfer																		
Peer: Distance college from home																		
Peer: Financial Concerns																		
Percent Part-Time Students																		

*p<.05, **p<.01, ***p<.001

Step by Step Results for Model Predicting Lateral Transfer (Relative to Dropout), continued

	Enrollment Measures			Institutional: Peer Character.			Institutional: Structural-Demog.			Institutional: Agg. Peer Exp.			Institutional: Agg. Peer Attit.			Institutional: Agg. Environ. Pull		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Intercept	1.698	1.392		1.675	1.402		0.626	1.596		-0.622	1.616		-0.637	0.617		-0.416	1.660	
Sex: Female	0.295	0.106	**	0.292	0.107	**	0.279	0.107	**	0.279	0.106	**	0.279	0.106	**	0.278	0.107	*
Puerto Rican	0.135	0.129		0.151	0.129		-0.048	0.144		-0.049	0.144		-0.049	0.143		-0.048	0.143	
Other Latina/o	0.409	0.102	***	0.416	0.102	***	0.236	0.113	*	0.235	0.113	*	0.234	0.113	*	0.235	0.113	*
Native English Speaker	0.095	0.108		0.094	0.110		0.104	0.110		0.102	0.110		0.102	0.111		0.103	0.111	
Fath. Ed: Some College	-0.150	0.120		-0.150	0.120		-0.127	0.120		-0.127	0.120		-0.127	0.120		-0.132	0.120	
Fath. Ed: Bachelor's	0.122	0.186		0.122	0.187		0.139	0.188		0.138	0.188		0.137	0.188		0.137	0.188	
Fath. Ed: More than Bach.	-0.073	0.189		-0.071	0.189		-0.088	0.190		-0.089	0.190		-0.089	0.190		-0.088	0.190	
Moth. Ed: Some College	0.095	0.116		0.094	0.117		0.101	0.115		0.100	0.114		0.100	0.114		0.101	0.114	
Moth. Ed: Bachelor's	0.189	0.144		0.194	0.144		0.167	0.144		0.171	0.144		0.172	0.144		0.173	0.144	
Moth. Ed: More than Bach.	0.596	0.168	**	0.600	0.168	**	0.573	0.170	**	0.571	0.169	**	0.571	0.169	**	0.567	0.170	**
Income Q1	-0.509	0.210	*	-0.505	0.212	*	-0.528	0.214	*	-0.532	0.215	*	-0.533	0.215	*	-0.534	0.215	*
Income Q2	-0.387	0.193	*	-0.377	0.195		-0.367	0.197		-0.368	0.198		-0.369	0.198		-0.373	0.199	
Income Q3	-0.115	0.204		-0.114	0.205		-0.098	0.207		-0.098	0.208		-0.098	0.208		-0.102	0.208	
High School Grades	0.123	0.030	***	0.121	0.030	***	0.117	0.031	***	0.117	0.031	***	0.118	0.032	***	0.119	0.032	***
SAT	0.012	0.004	**	0.012	0.004	**	0.007	0.004		0.007	0.004		0.007	0.004		0.007	0.004	
Credit from CC	0.049	0.190		0.041	0.190		0.080	0.196		0.078	0.196		0.079	0.196		0.078	0.196	
Credit from Four-Year	0.309	0.266		0.313	0.266		0.297	0.271		0.298	0.271		0.298	0.271		0.291	0.272	
Time Management	0.124	0.054	*	0.123	0.054	*	0.114	0.054	*	0.114	0.054	*	0.114	0.054	*	0.116	0.054	*
Hours/week: Student Clubs	-0.001	0.029		-0.003	0.029		-0.008	0.029		-0.007	0.029		-0.007	0.029		-0.007	0.029	
Academic Undermatch	-0.257	0.175		-0.275	0.176		-0.140	0.182		-0.146	0.182		-0.150	0.182		-0.152	0.181	
Reason: Relatives	-0.003	0.059		-0.004	0.059		-0.007	0.059		-0.007	0.059		-0.007	0.059		-0.008	0.059	
Reason: Cost	-0.109	0.064		-0.108	0.063		-0.088	0.065		-0.087	0.065		-0.087	0.065		-0.085	0.065	
Choice of Institution	-0.068	0.058		-0.067	0.058		-0.069	0.058		-0.069	0.058		-0.069	0.058		-0.068	0.058	
Likelihood of Transferring	0.320	0.051	***	0.320	0.051	***	0.327	0.052	***	0.325	0.052	***	0.324	0.052	***	0.324	0.052	***
Deg. Asp: Less than Bach.	-0.897	0.373	*	-0.893	0.372	*	-0.888	0.377	*	-0.890	0.376	*	-0.891	0.376	*	-0.888	0.377	*
Deg. Asp: More than Bach.	0.016	0.102		0.009	0.101		-0.001	0.102		0.003	0.103		0.003	0.103		0.005	0.103	
Hrs/wk: Household/childcare	-0.055	0.028		-0.054	0.028		-0.053	0.029		-0.052	0.029		-0.052	0.029		-0.051	0.029	
Distance: College to home	0.130	0.036	**	0.133	0.036	***	0.122	0.038	**	0.115	0.038	**	0.115	0.038	**	0.115	0.038	**
Likelihood of working FT	-0.172	0.044	***	-0.171	0.044	***	-0.157	0.044	**	-0.158	0.044	**	-0.158	0.044	**	-0.158	0.044	**
Financial concerns	-0.179	0.068	**	-0.179	0.068	**	-0.192	0.069	**	-0.187	0.069	**	-0.188	0.069	**	-0.189	0.068	**
Live Off-Campus	-0.235	0.120	*	-0.250	0.116	*	-0.261	0.122	*	-0.283	0.127	*	-0.283	0.127	*	-0.281	0.127	*
College Involvement	0.008	0.006		0.008	0.006		0.007	0.006		0.007	0.006		0.007	0.006		0.007	0.006	
Major: STEM	-0.182	0.146		-0.181	0.146		-0.184	0.149		-0.180	0.150		-0.179	0.149		-0.180	0.150	
Major: Professional Fields	-0.077	0.143		-0.075	0.143		-0.071	0.144		-0.065	0.145		-0.065	0.145		-0.065	0.146	
Major: Arts and Humanities	-0.282	0.176		-0.282	0.176		-0.294	0.179		-0.297	0.179		-0.296	0.179		-0.303	0.179	
Major: Undecided	-0.181	0.183		-0.178	0.183		-0.197	0.183		-0.193	0.184		-0.192	0.184		-0.194	0.184	
Supplemental Enrollment	0.708	0.128	***	0.706	0.128	***	0.741	0.128	***	0.740	0.127	***	0.741	0.128	***	0.740	0.128	***
Summer School	-1.206	0.189	***	-1.211	0.189	***	-1.210	0.192	***	-1.208	0.192	***	-1.206	0.194	***	-1.200	0.194	***
Percent URM				0.008	0.005		0.015	0.006	**	0.015	0.006	**	0.015	0.006	*	0.016	0.006	*
Percent Pell				-0.006	0.007		0.006	0.007		0.006	0.008		0.006	0.008		0.004	0.008	
Selectivity							0.021	0.010	*	0.020	0.011		0.020	0.011		0.020	0.012	
Institutional Control: Private							0.509	0.171	**	0.507	0.180	**	0.516	0.184	**	0.462	0.189	*
Region: East							0.534	0.160	**	0.567	0.170	**	0.568	0.170	**	0.548	0.179	**
Region: Midwest							0.294	0.184		0.294	0.199		0.295	0.199		0.306	0.199	
Region: South							0.904	0.196	***	0.870	0.198	***	0.874	0.198	***	0.891	0.211	***
Core Expenditures per FTE							-0.134	0.165		-0.133	0.166		-0.130	0.168		-0.179	0.180	
HSI							-0.385	0.235		-0.385	0.243		-0.389	0.243		-0.449	0.252	
Emerging HSI							0.126	0.172		0.149	0.170		0.144	0.170		0.102	0.178	
Size (FTE undergrad enrollment)							0.129	0.091		0.109	0.097		0.113	0.097		0.079	0.101	
Peer: College Involve.										-0.002	0.041		-0.001	0.041		-0.001	0.042	
Peer: Live Off-Campus										0.544	0.488		0.519	0.481		0.603	0.493	
Peer: Likelihood of Transfer													0.095	0.351		0.023	0.371	
Peer: Distance college from home																0.146	0.169	
Peer: Financial Concerns																0.334	0.712	
Percent Part-Time Students																-0.008	0.007	

*p<.05, **p<.01, ***p<.001

Step by Step Results for Model Predicting Lateral Transfer (Relative to Reverse Transfer)

	Background			High School Experiences			Academic Undermatch			Sense of Purpose and Inst. Alleg.			Environ. Pull Factors			Anticipated College Exp.		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Intercept	-0.968	0.695		-1.398	0.700	*	-1.282	0.689		-0.660	0.757		-1.354	0.788		-0.894	1.006	
Sex: Female	0.107	0.071		0.105	0.074		0.104	0.074		0.116	0.074		0.190	0.079	*	0.104	0.085	
Puerto Rican	0.176	0.111		0.233	0.112	*	0.236	0.112	*	0.267	0.109	*	0.342	0.113	**	0.351	0.116	**
Other Latina/o	0.333	0.082	***	0.369	0.081	***	0.370	0.081	***	0.384	0.082	***	0.398	0.084	***	0.370	0.086	***
Native English Speaker	0.016	0.088		0.003	0.091		0.002	0.091		-0.012	0.092		-0.027	0.090		-0.060	0.095	
Fath. Ed: Some College	-0.075	0.089		-0.137	0.094		-0.138	0.094		-0.155	0.093		-0.165	0.096		-0.145	0.096	
Fath. Ed: Bachelor's	0.166	0.106		0.108	0.111		0.110	0.111		0.097	0.114		0.030	0.117		-0.006	0.126	
Fath. Ed: More than Bach.	0.137	0.145		0.055	0.149		0.056	0.149		0.060	0.151		-0.025	0.153		-0.049	0.154	
Moth. Ed: Some College	-0.074	0.086		-0.113	0.093		-0.114	0.093		-0.144	0.092		-0.149	0.092		-0.153	0.096	
Moth. Ed: Bachelor's	0.151	0.120		0.131	0.122		0.134	0.123		0.134	0.125		0.136	0.126		0.138	0.128	
Moth. Ed: More than Bach.	0.371	0.119	**	0.369	0.123	**	0.371	0.123	**	0.364	0.123	**	0.360	0.125	**	0.337	0.127	**
Income Q1	-0.197	0.150		-0.122	0.153		-0.117	0.153		-0.066	0.156		0.122	0.161		0.156	0.167	
Income Q2	-0.258	0.140		-0.238	0.142		-0.235	0.142		-0.175	0.144		0.002	0.149		0.027	0.156	
Income Q3	-0.028	0.160		-0.010	0.167		-0.007	0.167		0.038	0.169		0.138	0.172		0.161	0.175	
High School Grades				0.141	0.028	***	0.140	0.028	***	0.145	0.029	***	0.150	0.029	***	0.156	0.029	***
SAT				0.013	0.003	***	0.014	0.003	***	0.013	0.003	***	0.013	0.003	***	0.013	0.003	***
Credit from CC				-0.134	0.145		-0.130	0.145		-0.163	0.144		-0.204	0.148		-0.191	0.160	
Credit from Four-Year				0.595	0.283	*	0.593	0.282	*	0.624	0.280	*	0.633	0.270	*	0.539	0.301	
Time Management				0.096	0.043	*	0.096	0.043	*	0.115	0.045	*	0.112	0.045	*	0.111	0.047	*
Hours/week: Student Clubs				0.005	0.022		0.005	0.022		0.001	0.023		0.007	0.024		-0.014	0.025	
Academic Undermatch							-0.132	0.128		-0.152	0.128		-0.116	0.129		-0.114	0.134	
Reason: Relatives										-0.068	0.047		-0.064	0.049		-0.064	0.054	
Reason: Cost										-0.083	0.049		-0.067	0.051		-0.066	0.055	
Choice of Institution										-0.074	0.047		-0.059	0.048		-0.060	0.048	
Likelihood of Transferring										0.213	0.039	***	0.232	0.039	***	0.226	0.041	***
Deg. Asp: Less than Bach.										-0.713	0.292	*	-0.720	0.293	*	-0.867	0.351	*
Deg. Asp: More than Bach.										-0.028	0.088		-0.019	0.088		0.031	0.094	
Hrs/wk: Household/childcare													-0.050	0.029		-0.047	0.031	
Distance: College to home													0.122	0.033	***	0.084	0.034	*
Likelihood of working FT													-0.101	0.038	**	-0.129	0.040	**
Financial concerns													-0.188	0.061	**	-0.193	0.064	**
Live Off-Campus																-0.106	0.097	
College Involvement																0.016	0.005	**
Major: STEM																-0.195	0.101	
Major: Professional Fields																-0.019	0.124	
Major: Arts and Humanities																0.060	0.175	
Major: Undecided																0.019	0.156	
Stopout																		
Supplemental Enrollment																		
Summer School																		
Years of transfer																		
Percent URM																		
Percent Pell																		
Selectivity																		
Institutional Control: Private																		
Region: East																		
Region: Midwest																		
Region: South																		
Core Expenditures per FTE																		
HSI																		
Emerging HSI																		
Size (FTE undergrad enrollment)																		
Peer: College Involve.																		
Peer: Live Off-Campus																		
Peer: Likelihood of Transfer																		
Peer: Distance college from home																		
Peer: Financial Concerns																		
Percent Part-Time Students																		

*p<.05, **p<.01, ***p<.001

Step by Step Results for Model Predicting Lateral Transfer (Relative to Reverse Transfer), continued

	Enrollment			Institutional:			Institutional:			Institutional:			Institutional:					
	Measures			Peer Character.			Structural-Demog.			Agg. Peer Exp.			Agg. Peer Attit.			Agg. Environ. Pull		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
Intercept	-0.093	1.028		-0.022	1.028		-1.049	1.445		-1.175	1.490		-1.242	1.500		-1.750	1.488	
Sex: Female	0.098	0.083		0.099	0.083		0.090	0.093		0.098	0.092		0.098	0.092		0.108	0.093	
Puerto Rican	0.364	0.118	**	0.366	0.119	**	0.100	0.143		0.106	0.143		0.108	0.143		0.110	0.143	
Other Latina/o	0.351	0.085	***	0.351	0.085	***	0.145	0.093		0.146	0.093		0.144	0.093		0.140	0.094	
Native English Speaker	-0.055	0.095		-0.054	0.095		-0.052	0.107		-0.055	0.107		-0.056	0.107		-0.071	0.109	
Fath. Ed: Some College	-0.155	0.097		-0.154	0.096		-0.154	0.105		-0.156	0.105		-0.156	0.105		-0.154	0.106	
Fath. Ed: Bachelor's	0.000	0.124		0.005	0.124		0.005	0.135		0.005	0.136		0.004	0.136		0.003	0.138	
Fath. Ed: More than Bach.	-0.060	0.150		-0.057	0.150		-0.099	0.162		-0.102	0.163		-0.100	0.163		-0.105	0.166	
Moth. Ed: Some College	-0.151	0.095		-0.154	0.094		-0.157	0.103		-0.160	0.103		-0.162	0.103		-0.168	0.104	
Moth. Ed: Bachelor's	0.140	0.128		0.140	0.128		0.111	0.138		0.111	0.137		0.112	0.137		0.110	0.139	
Moth. Ed: More than Bach.	0.372	0.130	**	0.372	0.129	**	0.369	0.140	**	0.366	0.141	*	0.365	0.140	*	0.361	0.141	*
Income Q1	0.200	0.166		0.193	0.165		0.169	0.177		0.169	0.177		0.168	0.177		0.163	0.180	
Income Q2	0.048	0.154		0.043	0.154		0.033	0.165		0.035	0.165		0.033	0.165		0.035	0.168	
Income Q3	0.169	0.176		0.166	0.176		0.174	0.188		0.174	0.189		0.175	0.189		0.185	0.191	
High School Grades	0.152	0.030	***	0.153	0.030	***	0.167	0.032	***	0.168	0.032	***	0.168	0.032	***	0.167	0.032	***
SAT	0.014	0.003	***	0.014	0.003	***	0.013	0.004	**	0.013	0.004	**	0.013	0.004	**	0.013	0.004	**
Credit from CC	-0.204	0.160		-0.206	0.159		-0.182	0.181		-0.185	0.181		-0.182	0.180		-0.199	0.178	
Credit from Four-Year	0.563	0.306		0.561	0.306		0.588	0.318		0.589	0.318		0.587	0.318		0.599	0.322	
Time Management	0.106	0.046	*	0.107	0.046	*	0.109	0.050	*	0.109	0.050	*	0.109	0.050	*	0.106	0.050	*
Hours/week: Student Clubs	-0.015	0.025		-0.015	0.025		-0.021	0.028		-0.021	0.028		-0.021	0.028		-0.021	0.028	
Academic Undermatch	-0.133	0.137		-0.159	0.140		-0.083	0.159		-0.085	0.158		-0.093	0.159		-0.096	0.160	
Reason: Relatives	-0.066	0.054		-0.066	0.054		-0.078	0.060		-0.079	0.060		-0.078	0.060		-0.082	0.061	
Reason: Cost	-0.069	0.056		-0.070	0.056		-0.068	0.062		-0.070	0.062		-0.069	0.061		-0.068	0.062	
Choice of Institution	-0.060	0.048		-0.055	0.048		-0.058	0.052		-0.056	0.052		-0.053	0.053		-0.054	0.053	
Likelihood of Transferring	0.230	0.040	***	0.228	0.040	***	0.248	0.044	***	0.248	0.044	***	0.246	0.045	***	0.248	0.045	***
Deg. Asp: Less than Bach.	-0.834	0.361	*	-0.833	0.352	*	-0.838	0.408	*	-0.844	0.407	*	-0.845	0.405	*	-0.846	0.415	*
Deg. Asp: More than Bach.	0.031	0.092		0.029	0.092		0.029	0.103		0.032	0.103		0.033	0.103		0.042	0.105	
Hrs/wk: Household/childcare	-0.050	0.031		-0.050	0.031		-0.057	0.033		-0.056	0.033		-0.055	0.033		-0.056	0.034	
Distance: College to home	0.082	0.035	*	0.086	0.035	*	0.081	0.038	*	0.080	0.039	*	0.080	0.039	*	0.060	0.041	
Likelihood of working FT	-0.118	0.040	**	-0.119	0.040	**	-0.119	0.043	**	-0.120	0.043	**	-0.120	0.043	**	-0.119	0.044	**
Financial concerns	-0.198	0.065	**	-0.199	0.065	**	-0.221	0.071	**	-0.220	0.071	**	-0.221	0.072	**	-0.214	0.072	**
Live Off-Campus	-0.080	0.098		-0.097	0.098		-0.110	0.105		-0.101	0.111		-0.103	0.110		-0.125	0.113	
College Involvement	0.015	0.005	**	0.016	0.005	**	0.016	0.005	**	0.017	0.005	**	0.017	0.005	**	0.017	0.005	**
Major: STEM	-0.184	0.104		-0.184	0.104		-0.210	0.116		-0.218	0.117		-0.214	0.117		-0.199	0.118	
Major: Professional Fields	0.000	0.126		-0.003	0.126		-0.018	0.138		-0.026	0.139		-0.024	0.139		-0.002	0.140	
Major: Arts and Humanities	0.067	0.176		0.065	0.176		0.058	0.187		0.053	0.187		0.054	0.187		0.064	0.188	
Major: Undecided	0.019	0.156		0.021	0.155		-0.006	0.165		-0.009	0.165		-0.007	0.165		0.001	0.166	
Stopout	-0.443	0.099	***	-0.441	0.098	***	-0.466	0.107	***	-0.471	0.107	***	-0.469	0.108	***	-0.472	0.109	***
Supplemental Enrollment	-0.047	0.112		-0.048	0.112		0.012	0.125		0.011	0.125		0.014	0.125		0.011	0.126	
Summer School	-0.332	0.148	*	-0.339	0.146	*	-0.325	0.163	*	-0.326	0.163	*	-0.325	0.162	*	-0.329	0.166	*
Years of transfer	0.123	0.047	**	0.123	0.047	**	0.130	0.051	*	0.131	0.051	*	0.131	0.051	*	0.129	0.051	*
Percent URM				0.003	0.005		0.015	0.006	*	0.017	0.006	**	0.016	0.006	*	0.012	0.006	
Percent Pell				0.003	0.007		0.009	0.007		0.007	0.008		0.007	0.008		0.012	0.008	
Selectivity							0.007	0.010		0.010	0.011		0.011	0.011		0.002	0.012	
Institutional Control: Private							0.339	0.187		0.427	0.191	*	0.459	0.192	*	0.499	0.202	*
Region: East							0.748	0.183	***	0.718	0.192	***	0.727	0.191	***	0.883	0.188	***
Region: Midwest							0.128	0.197		0.096	0.209		0.101	0.209		0.175	0.204	
Region: South							0.966	0.205	***	0.960	0.205	***	0.964	0.208	***	0.848	0.211	***
Core Expenditures per FTE							-0.025	0.200		0.013	0.200		0.024	0.202		0.071	0.207	
HSI							-0.674	0.291	*	-0.616	0.296	*	-0.626	0.294	*	-0.518	0.278	
Emerging HSI							-0.396	0.208		-0.365	0.207		-0.376	0.206		-0.246	0.189	
Size (FTE undergrad enrollment)							0.002	0.091		0.005	0.092		0.020	0.091		0.025	0.095	
Peer: College Involve.										-0.055	0.038		-0.053	0.038		-0.051	0.039	
Peer: Live Off-Campus										-0.233	0.364		-0.254	0.362		0.911	0.506	
Peer: Likelihood of Transfer													0.276	0.393		0.175	0.390	
Peer: Distance college from home																0.597	0.172	**
Peer: Financial Concerns																-0.615	0.700	
Percent Part-Time Students																0.008	0.008	

*p<.05, **p<.01, ***p<.001

Appendix E: Results from Post-Hoc HGLM Model Predicting Academic Undermatch

Results from Post-Hoc HGLM Model Predicting Academic Undermatch

	Coeff.	S.E.	Sig.
<i>Background</i>			
Sex: Female	-0.060	0.049	
Puerto Rican	0.034	0.104	
Other Latina/o	-0.087	0.057	
Native English Speaker	0.087	0.063	
Father's Ed: Some College	-0.115	0.083	
Father's Ed: Bachelor's	0.063	0.074	
Father's Ed: More than Bachelor's	0.020	0.095	
Mother's Ed: Some College	0.079	0.058	
Mother's Ed: Bachelor's	0.036	0.078	
Mother's Ed: More than Bachelor's	-0.204	0.093	*
Income Q1	0.111	0.110	
Income Q2	0.115	0.097	
Income Q3	0.032	0.094	
<i>High School Experiences/Academic Prep.</i>			
HS Grades	0.054	0.027	*
SAT	1.070	0.132	***
Credit from Community College	0.053	0.081	
Credit from Four-Year	0.067	0.166	
Self-Rating: Time Management	-0.069	0.030	*
Hrs/Wk: Student Clubs	-0.019	0.020	

*p<.05, **p<.01, ***p<.001

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