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Improving the community college transfer function has become increasingly important over the past two decades in an effort to save states considerable money in a time of increasing university enrollments and decreasing state finances (Dougherty, 2002). Many states have established articulation agreements as policy instruments to support students in transferring from a two-year to a four-year institution—referred to as vertical transfer. However, students in states with such agreements do not necessarily transfer at higher rates, controlling for critical student demographic, educational, and enrollment characteristics (Anderson, Alfonso, & Sun, 2006; Roksa, 2009). In fact, it has been estimated that, although up to 80% of community college

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students intend to transfer to a four-year institution, a mere 23% successfully do so within six academic years (U.S. Department of Education, 2005).

Transfer may be regarded as a matter of outcome equity and educational opportunity (Chase, Dowd, Pazich, & Bensimon, 2012). Increasing the percentage of community college students who transfer to a four-year institution is therefore critical to national progress in closing the educational attainment gaps among racial groups and to sustaining a well-educated labor force for the country (Gandara, Alvarado, Driscoll, & Orfield, 2012; Melguizo, 2009; Wellman, 2002). Community colleges serve as a key gateway for historically underrepresented groups in higher education, enrolling 51% of all Latino and 41% of African American college students across the United States (Chronicle of Higher Education, 2012). In California, the state with the nation's largest postsecondary system, one estimate indicates that 69% of Latinos and 65% of African Americans, compared with 60% of White and 42% of Asian American students, begin their postsecondary education at a community college (Gandara et al., 2012).

There are significant policy concerns related to equity in transfer for African American and Latino students, hereafter referred to as historically underrepresented minorities (URMs) (Smith, 2009). Although URM students perceive community college education as a viable pathway to the baccalaureate degree (e.g., Arbona & Nora, 2007), large gaps exist in educational attainment (including transfer rates) when compared to other racial/ethnic groups (Bailey, Jenkins, & Leinbach, 2005; Gandara et al., 2012). For instance, recent national data show that, among first-time students in 2003–2004, only 40% of African American and 35% of Latino students, compared with 49% of White students and 61% of Asian American students, successfully earned a degree or certificate and/or transferred to a four-year institution within six years (U.S. Department of Education, 2012). These figures reveal a "racial transfer gap" (Martinez-Wenzl & Marquez, 2012, p. 6) between URMs and students from other racial/ethnic groups.

The current investigation is aimed at advancing research and theory regarding the racial transfer gap. Specifically, we seek to identify student and contextual variables influencing vertical transfer that are both similar and different among Whites and URMs. The sections preceding the analysis provide context for the study. We begin with a conceptualization of vertical transfer and its relationship to student persistence. Next, we provide a synthesis and critique of studies to date focused on predicting vertical transfer. We then highlight the need to model vertical transfer separately for both groups by providing a comparison of White and URM students' socio-demographic and educational experiences. The remainder of the article focuses on a hierarchical generalized linear modeling (HGLM) analysis to examine predictors of transfer for these two groups.

Conceptualizing Vertical Transfer

Persistence theory provides a logical and appropriate lens for examining vertical transfer. According to Dougherty (1992), bachelor's-degree-seeking students who begin postsecondary education at a community college encounter obstacles in three stages: (a) persisting in college (i.e., reenrollment at an institution beyond the first semester), (b) transferring to a four-year institution, and (c) completion of a four-year degree. Although persistence, transfer, and degree completion may be viewed as distinct stages in community college students' undergraduate academic careers, tremendous overlap exists between the stages both temporally and conceptually. For instance, at the time a student applies to and formally transfers to a four-year institution, he or she is also simultaneously persisting in college and working toward completion of a degree. Moreover, transfer from a community college to a four-year institution may be understood broadly as a form of persistence in the system of higher education (Hagedorn, Cypers, & Lester, 2009).

With a few exceptions (i.e., Bensimon & Dowd, 2009; Kraemer, 1995; Surette, 2001) conceptual models used in the transfer literature have been developed from existing findings or have been grounded by Tinto's (1993) student integration model, which emphasizes the role of social and academic integration in molding students' commitments and decisions to persist in college. Tinto's model has been widely criticized for not being relevant for underrepresented minority students (e.g., Rendón, Jalomo, & Nora, 2004; Tierney, 1992) and has been applied to community college students with mixed findings (e.g., Deil-Amen, 2011; Schuetz, 2005). As such, persistence and transfer studies utilizing two-year and/or URM samples have increasingly drawn upon alternative frameworks including Nora's (2004) student/institution engagement model (e.g., Arbona & Nora, 2007; Kraemer, 1995; Crisp & Nora, 2010) to understand student persistence and/or transfer pathways.

Nora's model (2004) emphasizes the interaction between the student and the institution and the influence of this interaction on transfer and related outcomes. College students are thought to bring several precollege characteristics that influence their transition, including high school experiences, financial circumstances, and psychosocial factors. Once students enroll in college, "environmental pull" factors, such as working off-campus and family responsibilities, are thought to draw students (URM and community college populations in particular) away from immersion in the academic and social college environment. Educational aspirations and degree commitments are assumed to provide students with a sense of purpose and direction. Further, Nora's model explains that college academic and social experiences serve to solidify students' educational goals and commitments.

STUDENT AND CONTEXTUAL INFLUENCES ON VERTICAL TRANSFER

Our inquiry was informed by the growing line of work to predict vertical transfer. Our review identified an abundance of research to explain the factors related to successful degree completion among students who have already successfully transferred (e.g., Ishitani & McKitrick, 2010; Melguizo, 2009; Melguizo, Kienzl, & Alfonso, 2011; Townsend & Wilson, 2006; Wang, 2009). However, given our interest in understanding the behaviors and experiences that contribute to White and URM students' pathway from a two- to a four-year institution, we did not consider studies focused on predicting persistence or degree outcomes after students successfully transfer to a four-year institution.

In sum, the vertical transfer literature demonstrates that a combination of socio-demographic, precollege, pull factors, degree expectations, and college experiences influence vertical transfer. To begin with, being female has consistently been shown to reduce the probability of transfer, even after controlling for a wide range of factors (Dougherty & Kienzl, 2006; Eddy, Christie, & Rao, 2006; Lee & Frank, 1990; Surette, 2001; Velez & Javalgi, 1987). There is also evidence to suggest a positive relationship between transfer and parents' education levels (Anderson, Alfonzo, & Sun, 2006; Porchea, Allen, Robbins, & Phelps, 2010) and related socioeconomic status (Eddy, Christie & Rao, 2006; Lee & Frank, 1990; Roksa, 2006; Velez & Javalgi, 1987; Wang, 2012). Additionally, findings by Anderson, Alfonso, and Sun (2006) suggest that financial aid support may be positively related to vertical transfer.

Several environmental pull factors (Nora, 2004) have also been shown to negatively impact community college transfer including dependency status (Anderson, Alfonso, & Sun, 2006), having a spouse and/or children (Dougherty & Kienzl, 2006; Roksa, 2006; Wang, 2012) and work commitments (Anderson, Alfonso, & Sun, 2006; Dougherty & Kienzl, 2006). There is also a substantial amount of evidence to suggest that enrolling full-time versus part-time for one or more semesters increases students' probability of transfer (Anderson, Alfonso, & Sun, 2006; Dougherty & Kienzl, 2006; Doyle, 2009; Eagan & Jaeger, 2009; Eddy, Christie, & Rao, 2006; Lee & Frank, 1990; Porchea et al., 2010; Wang, 2012).

Existing findings suggest that students' degree aspirations or expectations are meaningfully related to vertical transfer. For instance, McCormick and Carroll (1997) found that students who intended to earn a bachelor's degree or higher were up to three times as likely to transfer when compared to those not aspiring to earn a four-year degree. The value of degree aspirations in explaining transfer has also been demonstrated by research conducted by Dougherty and Kienzl (2006), Roksa (2006), and Porchea et al., (2010). Findings by Lee and Frank (1990) further indicate that the age that a student

expects to begin working (potentially a proxy for degree aspirations) may influence students' transfer pathways.

Students' transfer pathways have been found to be influenced by academic performance prior to and during college including high school grade point average (GPA) (Eddy, Christie, & Rao, 2006; Lee & Frank, 1990; Porchea et al., 2010; Velez & Javalgi, 1987), high school mathematics courses (Lee & Frank, 1990) and test scores (Wang, 2012), and college GPA (Eagan & Jaeger, 2009; Eddy, Christie, & Rao, 2006; Hagedorn, Cypers, & Lester, 2009; Velez & Javalgi, 1987). Similarly, limited research specific to Latino students reveals that vertical transfer may be uniquely related to mathematics ability, academic achievement, and students' intent to transfer (Kraemer, 1997).

Academic pathways to transfer include pursuing a credential in various program types, such as: (a) taking any number of transferable courses that are part of a general education or liberal arts curriculum, as specified by an articulation agreement with a student's desired transfer institution; (b) enrolling in and completing the requirements for a transfer, general education, or liberal arts associate's degree (hereinafter referred to as "transfer") program that will qualify the student to transfer as a junior; or (c) enrolling in a vocational or technical (hereinafter referred to as "vocational") certificate or degree program that includes transferable general education courses (Grubb, 1991). The limited research on program type suggests that a student's decision to enroll in a vocational (versus a transfer) degree or certificate program may negatively influence the odds of transfer (Alfonso, Bailey, & Scott, 2005; Dougherty & Kienzl, 2006; Eagan & Jaeger, 2009; Grubb, 1991). However, it is notable that no study to date has examined whether this influence varies among different racial groups.

Relatively less is known regarding the impact of students' college experiences on vertical transfer. Findings by Bahr (2008) suggest that students who remediate successfully are equally likely to transfer when compared to students who complete college level math without remediation. In addition, there is some evidence to indicate that transfer may be influenced by the degree to which students are academically integrated (Nora & Rendón, 1990) including participation in study groups (Dougherty & Kienzl, 2006). Furthermore, recent findings suggest that taking an online class may decrease students' odds of transferring (Xu & Jaggars, 2011). However, much more research is needed to understand the role of college experiences in promoting or hindering vertical transfer.

Researchers have also only begun to untangle the student and institutional characteristics influencing transfer. Findings by Bailey, Jenkins, and Leinbach (2005) suggest that institutional size, the proportion of part-time faculty, and the percentage of the student population from URM backgrounds may

predict success among community college students enrolled in a transfer degree program. However, it should be noted that the researchers did not account for student-level influences in their modeling. Recent work by Porchea et al. (2010) indicates that, after controlling for student-level influences, total enrollment, tuition, and the percent of full-time faculty may be related to vertical transfer. Although no relationship was found between an institution's enrollment size and the percentage of part-time faculty, results by Eagan and Jaegar (2009) identified a negative relationship between the odds of vertical transfer and two institutional variables: a college's urbanicity and the percentage of students receiving financial aid. Findings from a recent study would also suggest that, regardless of racial/ethnic background, students in community colleges benefit from being taught by a same-race instructor (Fairlie, Hoffman, & Oreopoulos, 2011).

Several methodological and theoretical weaknesses should be taken into consideration in interpreting current research findings. Most notably, findings are predominantly based on data from the 1980s and 1990s, including the High School and Beyond (HS&B), the National Education Longitudinal Study (NELS:88), or prior cohorts of the Beginning Postsecondary Students Study (BPS:90/94), which may not accurately represent the characteristics (including racial/ethnic diversity) or experiences of current community college students. Second, although national databases allow for tracking vertical transfer, with the exception of BPS, data do not contain any information about students' experiences during college. Therefore, with the exception of Porchea et al. (2010), key studies on vertical transfer have exclusively relied on precollege characteristics and experiences to explain student transfer pathways (i.e., Dougherty & Kienzl, 2006; Eddy, Christie, & Rao, 2006; Roksa, 2006; Wang, 2012).

What is more, there is a notable absence of theory guiding the conceptual models used in the majority of research on college transfer, with the majority of studies exclusively supporting the selection of predictor variables on select empirical findings rather than using a holistic conceptual framework. Finally, although studies have shown considerable variation between community colleges in terms of transfer rates (Palmer, 2011), with a few notable exceptions (i.e., Bailey, Jenkins, & Leinbach, 2005; Porchea et al., 2010; Wassmer, Moore, & Shulock, 2004), work is underdeveloped with regard to the institutional-level variables that influence vertical transfer. Failing to account for institutional characteristics overlooks the role of community colleges in affecting transfer, leaving less potential to inform policies and practices to improve transfer rates (Chase et al., 2012).

Modeling Transfer for URM and White Students

Despite the inequity in transfer rates between Latinos and African Americans when compared to students from other racial/ethnic groups, studies tracking community college transfer outcomes have not typically been disaggregated by race (Chase et al., 2012). Although race/ethnicity is routinely included as a control variable in multivariate models predicting transfer (e.g., Anderson, Alfonso, & Sun, 2006; Dougherty & Kienzl, 2006; Porchea et al., 2010), only limited research explains how African American students engage in the transfer process (Sutherland, 2011) with the exception of work by Blau (2010). Similarly, a recent literature review by Crisp, Taggart and Nora (2012) highlights the dearth of transfer work specific to Latino students. With the exception of previously cited work by Kraemer (1997), little attempt has been made to identify the factors influencing Latino students' transfer success. Further, no study to date has sought to understand how the variables influencing vertical transfer among URMs may be similar or unique when compared to other racial/ethnic groups.

At the same time, a good deal of evidence demonstrates meaningful differences between White and URM students' socio-demographic and educational experiences. Specifically, URM students who begin postsecondary education at a community college are more likely than White students to have characteristics and experiences that may serve as barriers to transfer or degree completion (Gandara et al., 2012; Martinez-Wenzl & Marquez, 2012; Nuñez, Sparks, & Hernandez, 2011). Compared with White students, URM students are more likely to be male, older, first-generation immigrant, the first in their families to attend college, and lower income (Nuñez, Sparks, & Hernandez, 2011). In terms of high school experiences, URM community college students tend to attend less well-resourced high schools, are less likely to take advanced high school math courses, and are less likely to receive college guidance (Gandara et al., 2012; Nuñez, Sparks, & Hernandez, 2011).

Likewise, URM students are more likely than other groups to have factors pulling them away from academic and social engagement in community college life including working full-time, being financially independent, and having children or other dependents (Nuñez, Sparks, & Hernandez, 2011). Even when URM students have the time to engage more deeply in their studies, putting in the same quantity and quality of academic and social engagement in their postsecondary education as White students may not yield as many academic benefits, including transfer (Greene, Marti, & McClenney, 2008). The college campuses that Latino and African American students attend are more likely to be segregated racially/ethnically and receive less funding when compared to other two-year institutions (Gandara et al., 2012). In turn, URM students may also find college campuses less welcoming to them than to White students (Harper & Hurtado, 2007). Gandara et al. (2012) suggest a

relationship between institutional characteristics and transfer among White and URM students, as the characteristics of community colleges that have high transfer rates for all students appear to differ from institutional characteristics of community colleges that have high transfer rates for URMs, particularly URMs who attended under-resourced high schools.

PURPOSE OF THE STUDY

Taking these issues into consideration, our study contributes to the vertical transfer literature in four ways. First, it examines the transfer rates of Whites and URMs using a recent national sample of students who began postsecondary education in the 2003–2004 academic year. Second, it responds to calls for conceptual models of understanding transfer that account for context-specific student characteristics, behaviors, and experiences of community college students (Bailey, Jenkins, & Leinbach, 2005; Wild & Ebbers, 2002). Third, the study adds to current understanding regarding the college experiences and institutional characteristics influencing transfer. Finally, and most importantly, our inquiry is the first to disaggregate and compare the student and contextual variables influencing vertical transfer among White and URM students.

We address the following questions: (a) How do the vertical transfer rates of Whites and URMs compare? and (b) What socio-demographic, precollege, college experiences, and institutional characteristics are related to the odds of vertical transfer among White and URM students?

METHOD

Dataset and Sample

We drew student-level data from the Beginning Postsecondary Students Longitudinal Study (BPS: 04/09), which is appropriate for examining student-level transfer behavior. The BPS Study collects data specific to transfer patterns, enrollment, persistence, and degree attainment over six academic years (2003–2004 to 2008–2009). We drew institutional-level data from the Integrated Postsecondary Education Data System (IPEDS) surveys. We used IPEDS data from fall 2003 to be consistent with the BPS survey administered in the 2003–2004 academic year.

Our analytic sample included 1,360 students, rounding all raw data to the nearest 10 as per IES guidelines. These students were drawn from 260 institutions and all of them: (a) began their postsecondary education at a community college in 2003–2004; (b) reported that they intended to transfer and earn a bachelor's degree or higher, (c) were younger than age 24, (d) were either White, African American, or Latino, and (e) had complete insti-

tutional IPEDS data. It was important to focus our analysis on bachelor's-degree-seeking students, as student intentions have been shown to strongly influence the rate of vertical transfer (e.g., Palmer, 2011). We limited our sample to younger students, because certain data elements thought to be critical to the model (including high school GPA) were not available in the BPS dataset for students over age 24. Finally, we excluded cases with missing institutional-level data.

Conceptual Model

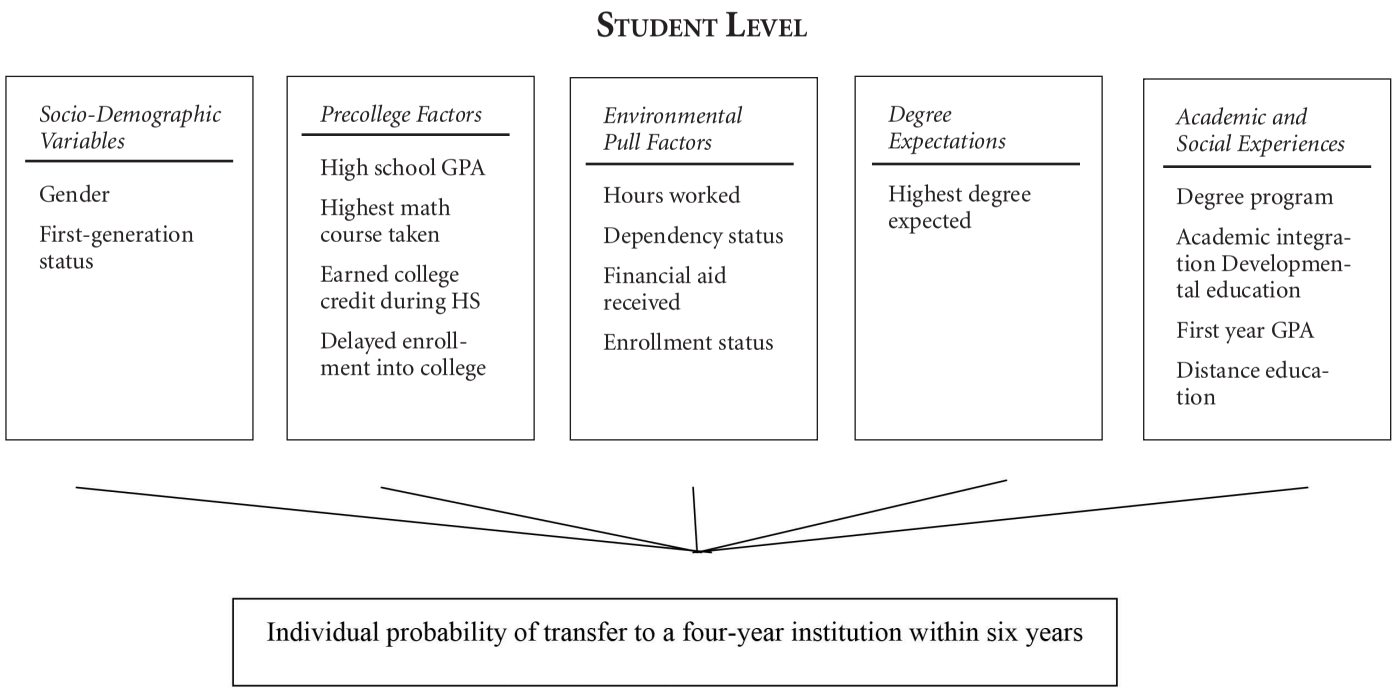
Figure 1 shows the conceptual framework that guided our inquiry. Consistent with Nora's model (2004) and the findings specific to vertical transfer, our model hypothesizes that a combination of socio-demographic, precollege, environmental pull factors, educational expectations, and college experiences predict White and URM students' transfer success. Extending Nora's model, our study also posits that a variety of institutional characteristics influence individual students' transfer outcomes. Based on the reviewed literature, we hypothesized that URM students' vertical transfer rates would be lower than those of White students, and that differences could be largely explained by socio-demographic and educational inequities (Gandara et al., 2012; Nuñez, Sparks, & Hernandez, 2011).

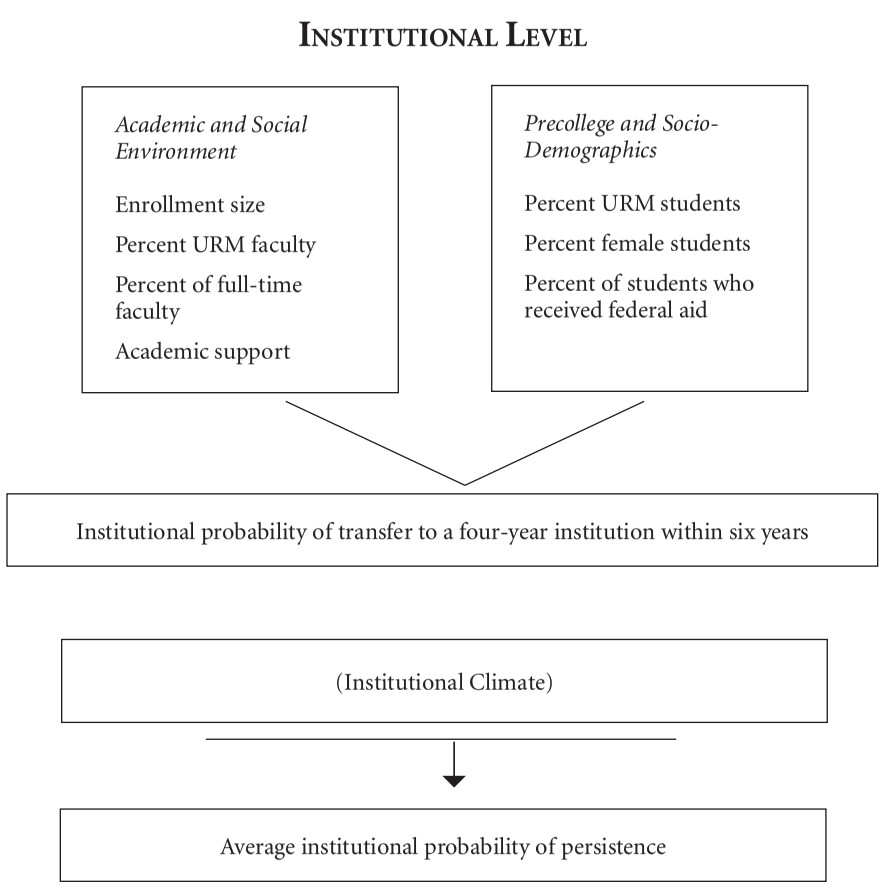
One unknown is whether URMs are more or less likely than White students to enroll in vocational programs. However, based on the K-12 literature on tracking (e.g., Oakes, 2005), we hypothesized that URMs would be disproportionately tracked into vocational programs, which in turn would contribute to URMs' lower transfer rates. We also expected that differences in the characteristics of institutions that URMs and Whites attended would help explain the racial transfer gap.

Variables

Collectively, the BPS and IPEDS data provide a wide range of variables specific to students' socio-demographic, precollege, environmental pull factors, educational expectations, college experiences, and institutional characteristics. Students' gender and first-generation status (defined as whether a student's parents had earned a four-year degree or not) were included as socio-demographic variables. Several precollege factors were also thought to influence transfer, including students' high school grade point average (GPA), mathematics courses taken during high school, earning dual credit or Advanced Placement (AP) credit, and delaying entry into college immediately following high school. We also used such environmental pull variables as students' work commitments, financial aid support, and enrollment status. It should be noted that, in contrast to prior research that has limited the measurement of enrollment status to one or two semesters, our model attempted to provide a more longitudinal measure of enrollment status by measuring

Figure 1. Conceptual model.




Institutional Level
Academic and Social Environment
Enrollment size
Percent URM faculty
Percent of full-time faculty
Academic support
Precollege and Socio-Demographics
Percent URM students
Percent female students
Percent of students who received federal aid
Institutional probability of transfer to a four-year institution within six years
(Institutional Climate)
Average institutional probability of persistence

the impact of exclusively enrolling full-time throughout the student's time in college, as compared to a combination of part and full-time enrollment.

We also included in the model students' educational expectations, defined as whether a student expected to earn a bachelor's, master's, or doctoral degree upon enrolling in college. We accounted for various college experiences, including program type, academic integration, first-year grade point average, and enrollment in developmental and/or distance education courses. Consistent with prior work, academic integration was measured as a reliable index of: (a) participation in study groups, (b) contact with faculty, (c) meeting with an academic advisor, and (d) talking with faculty outside of class.

We included seven institutional-level variables as predictors of individual student transfer: total institutional enrollment, the percentage of Latino and African American faculty, the percentage of full-time instructional staff, and the total dollar amount spent per student on academic support. These factors constituted our academic and social environmental measures. Aggregated socio-demographic variables consisted of the percentage of URM students, female students, and students who received federal grant aid.

Given the prevalence of part-time students who may not be able to complete their core courses and transfer within two or even four academic years (Cohen & Brawer, 2008), the dependent variable, vertical transfer, was measured as a dichotomous variable indicating whether students successfully transferred to a four-year institution within six academic years. A detailed description of all variables is provided in Appendix A.

Data Analysis

We used hierarchical generalized linear modeling (HGLM) techniques to account for the impact of student and institutional characteristics on White and URM students' transfer behavior. HGLM was the appropriate analytic technique to use, given the binary outcome variable and the nested nature of students within postsecondary institutions (Raudenbush & Bryk, 2002). An unconditional model was run separately for White and URM students to provide a measure of estimated transfer rates for the sample of institutions. The dichotomous nature of the outcome made calculating the intra-class correlation (ICC) non-instructive (Raudenbush & Bryk, 2002). Therefore, following practice by Rumberger and Thomas (2000), we evaluated box plots showing the variation in the average chance of transfer using estimates derived from empirical Bayes residuals.

We added student-level predictors to both groups' within-institution models to estimate the impact of student-level variables on transfer. All equations were fixed to constrain the effect of the within-institutional predic-

tors to be the same for all institutions. Variables were grand-mean centered to aid in interpreting parameter estimates and to control for differences in student characteristics and experiences between institutions (Raudenbush & Bryk, 2002). Level 2 predictors were then added to the model to measure hypothesized contextual influences on transfer. Following recent practice by Porchea and colleagues (2010), only institution-specific random intercepts were specified. Student composition variables were grand mean centered.

We estimated models using a high-order Laplace approximation of maximum likelihood (ML), as this approach produces accurate approximations to ML for all parameters (Raudenbush, Yang, & Yosef, 2000). We compared unit-specific model-based and robust standard errors to identify possible misspecification of the distribution of random effects (Raudenbush & Bryk, 2002). Logit coefficients were interpreted using odds-ratios, representing the change in the odds of transfer associated with a one-unit change in the independent variable, holding all others constant (Peng, So, Stage, & St. John, 2002). The HGLM analyses were run using HLM 6.0.

Limitations

Several limitations should be taken into consideration when interpreting the results. First, sample sizes limited our ability to run separate models for Latino and African American students. This is important given that studies have found that the transfer rates between Latino and African American may vary (e.g., Hagedorn, Moon, Cypers, Maxwell, & Lester, 2006). Our study also excludes American Indians and other groups who are also underrepresented in higher education, including members of certain Asian American subgroups (Teranishi, Ceja, Antonio, Allen, & McDonough, 2004). Missing data in the BPS dataset limited our analysis to students age 24 or younger. As a result, the findings may not generalize to older community college students.

Though the BPS data provided us with a large national sample of community college students, use of the dataset limited our selection of variables. For instance, our model does not control for factors such as mentoring experiences and individual course completion. Similarly, finding comparable institutional indicators to explore broader contextual influences was difficult. Consequently, we presume that institutional-level variables that could not be accounted for (e.g., aggregated precollege variables such as high school GPA) may have also influenced transfer. Additionally, we were not able to control for state-level variables thought to impact transfer, such as articulation policies (e.g., Hagedorn, 2010).

RESULTS

Of the 1,360 students in the sample who expected to transfer and earn a bachelor's degree or higher, only 39% successfully transferred to a four-year institution within six academic years. The majority (59%) of the sample was female, and 39% of students were Latino or African American. Nearly three-fourths of the students were first-generation college students (71%) and only a fifth (21%) took a precalculus or calculus course during high school. The majority of students (58%) worked an average of 20 or more hours per week, and only half attended college exclusively full-time. Twenty percent of students were enrolled in a vocational program at the community college. A sizable percentage (37%) enrolled in one or more developmental courses during the first year of college.

Differences between White and URM Students

Cross-tabulations revealed several meaningful differences between the characteristics and experiences of White and URM students (Appendix B). As hypothesized, a racial transfer gap was shown between URM and White students. Forty-five percent of White students successfully transferred, compared to only 31 percent of African American and Latino students. URM students were overrepresented among first-generation college-goers. URM students were also less likely to be classified as a dependent and on average received higher levels of financial aid when compared to White students. Interestingly, URM students were slightly more likely to attend college exclusively full-time and were less likely to work 20 or more hours per week.

Degree expectations for both groups were nearly identical, although a much higher percentage of African American and Latino students enrolled in a vocational program (25% of URMs, 16% of Whites). Nearly half (43%) of URM students enrolled in a developmental course in the first year of college, compared to only 30% of White students. URM students also had lower GPAs than White students at the end of the first year of college.

We also identified differences at the institutional level. On average, African American and Latino students attended community colleges with higher enrollment sizes, more URM faculty and students, and a higher percentage of students receiving federal grant aid.

HIERARCHICAL GENERALIZED LINEAR MODELING (HGLM) FINDINGS

The results of the unconditional models for both White and URM students indicated that the odds of transfer varied significantly across institutions ($p < .05$). Moreover, an inspection of the plots suggested variation among institutions in the estimated chance of transfer, indicating that the use of within- and

between-institution models was appropriate. As such, we proceeded to use HGLM to examine the student- and institutional-level variables related to transfer among White and URM community college students.

As detailed in Table 1, the models for White and URM students revealed a great deal of variation in the predictors of transfer for both groups, controlling for various (a) precollege experiences, (b) environmental pulls, (c) degree expectations, (d) college experiences, and (e) institutional-level influences. In fact, the number of hours worked and degree expectations were the only two variables, on the whole, that significantly increased the odds of transfer for both White and URM students. High school grade point average, delaying enrollment into college, being classified as a dependent, enrollment status, academic integration, and two institutional variables (i.e., percentage of underrepresented minority faculty and students receiving federal aid) were found to be important factors contributing to transfer for White students but were not significantly associated with the odds of transfer for URM students. Specifically, White students who earned a grade point average of 3.5 or higher were approximately three times more likely to transfer when compared to students who earned a grade point average of 2.0 or lower. White students who did not delay enrollment into college were nearly three times more likely to transfer. Although no institutional-level variables significantly contributed to community college transfer for URM students, two variables were shown to be significantly related to transfer in the White student transfer model. The percentage of minority faculty was found to decrease White students' odds of transfer. Additionally, the percentage of students receiving federal aid at an institution was found to significantly increase White students' odds of transferring to a four-year institution.

In contrast, being a continuing-generation student, taking rigorous mathematics courses during high school, and program type were unique factors that positively influenced successful transfer for URM students, while being shown as not related to transfer among White students. Having one or more parents who had earned a college degree increased the odds of successful transfer for minority students (odds ratio 1.71). Taking high school calculus was also related to transfer for URM students (odds ratio 2.53). The most notable finding for URM students however, was the relationship between program type and students' likelihood of transferring. In particular, URM students who did not enroll in a degree or certificate program were found to be nearly five times more likely to transfer relative to students who enrolled in a vocational program. Compared with enrolling in a vocational program, enrolling in a transfer program was also shown to increase student's odds of transfer (odds ratio 1.65).

TABLE 1

PREDICTORS OF TRANSFER AMONG WHITE AND URM STUDENTS

	White Students		URM Students	
	Coef. (Robust S.E.)	*Odds Ratio*	*Coef. (Robust S.E.)*	*Odds Ratio*
Student-Level Variables				
Female	-.130(.160)	--	-.105(.226)	--
Continuing generation	.073(.178)	--	.536*(.229)	1.710
Precollege Factors				
High school GPA (less than 2.0)				
2.0 to 2.4	.562(.485)	--	.030(.486)	--
2.5 to 2.9	.789(.439)	--	-.598(.534)	--
3.0 to 3.4	.816(.427)	--	-.061(.484)	--
3.5 to 4.0	1.22*(.486)	3.393	-.143(.606)	--
Highest math course taken (algebra II)				
Trigonometry and algebra II	.141(.198)	--	-.385(.225)	--
Precalculus	.313(.267)	--	-.486(.373)	--
Calculus	.394(.336)	--	.926*(.428)	2.526
Earned college credit during HS	.136(.187)	--	.235(.258)	--
Did not delay enrollment into college	1.09***(.220)	2.983	.005(.265)	--
Environmental Pull Factors				
Hours worked (20 or more hours)				
Less than 20 hours	.672**(.223)	1.959	.786**(.270)	2.196
Did not work	-.351(.195)	--	.149(.246)	--
Dependent	.747**(.277)	2.112	.255(.310)	--
Total financial aid (did not receive aid)				
Less than $2,500	.183(.240)	--	-.271(.370)	--
Between $2,500 and $4,999	-.107(.254)	--	.069(.322)	--
Between $5,000 and $9,999	-.015(.286)	--	.619(.429)	--
$10,000 or more	.111(.413)	--	.305(.552)	--
Enrolled exclusively full-time	-.343*(.169)	.708	.067(.254)	--
Degree Expectations (bachelor's degree)				
Master's degree	.390*(.172)	1.478	.646*(.257)	1.909
Doctoral or professional degree	.581*(.250)	1.789	.552(.291)	--
College Experiences				
Program type (vocational)				
Not enrolled in an associate's degree or certificate program	.004(.452)	--	1.56**(.528)	4.768

Table 1, cont.

	White Students		*URM Students*	
	Coef. (Robust S.E.)	*Odds Ratio*	*Coef. (Robust S.E.)*	*Odds Ratio*
Transfer program	.238(.244)	--	.497*(.240)	1.645
Academic integration	.004*(.001)	1.004	.003(.002)	--
No developmental education	.252(.177)	--	.301(.217)	--
First year GPA	.005***(.001)	1.006	.004**(.001)	1.004
Distance education	-.065(.229)	--	-.094(.324)	--
Institutional-Level Variables				
Academic and Social Environment				
Enrollment size	.000(.000)	--	-.000(.000)	--
% URM faculty	-.035*(.016)	.965	.001(.010)	--
% Full-time faculty	-.001(.006)	--	-.008(.007)	--
Academic support	-.000(.000)	--	-.000(.000)	--
Socio-Demographic Characteristics				
% URM students	.006(.008)	--	.004(.009)	--
% Female students	-.000(.013)	--	.009(.015)	--
% Students received federal aid	.011*(.004)	1.012	-.000(.000)	--

* p < .05, ** p < .01, *** p < .001
Note: Sample includes 830 White students attending 216 community colleges and 530 Black and Hispanic students attending 163 community colleges.
Source: BPS:04/09 and IPEDS survey data

Discussion

The results of our study contribute to research and theory regarding the racial transfer gap between White and URM students. The findings of our inquiry, using a recent national sample of first-time students, highlight inequities in transfer success and reveal important descriptive differences between the characteristics and experiences of White and URM students. Findings suggest that the factors that promote or hinder vertical transfer may be very different for White and URM students, as many more differences than similarities were identified in predicting transfer. Collectively, these results support assertions that disaggregating data for different racial/ethnic groups is important when examining the dynamics of transfer and other college outcomes (e.g., Chase et al., 2012; Hagedorn, 2010).

Although a great deal of work remains to be done, our multilevel modeling approach adds to conceptual and theoretical understanding regarding the college experiences and institutional characteristics influencing transfer for White and URM students. In particular, our findings suggest that, although the specific variables may be more different than similar for White and URM students, a combination of precollege factors, environmental pull factors, degree expectations, and college experiences collectively contribute to the successful transition to a four-year institution for both White and URM students. At the same time, results support arguments that existing theory predicting student outcomes for White students may not be as relevant for URM students (e.g., Hurtado & Carter, 1997; Tierney, 1992), highlighting the need for theory development and testing specific to URM students.

For instance, findings indicate that academic integration, as measured by experiences such as participating in study groups and talking with faculty outside of class, was shown to be a significant predictor of transfer for Whites, but not URMs. Critical assessments of Tinto's (1993) persistence theory often focus on integration as a construct inapplicable to URMs (Melguizo, 2011). As such, we recommend research to examine the relevance of potentially relevant concepts such as validation (Barnett, 2011; Rendón, 1994), sense of belonging (Allison, 1999; Hurtado & Carter, 1997), and "socio-academic integrative moments" (Deil-Amen, 2011, p. 15) in predicting transfer for URM students. Additional study of how the campus climate for diversity impacts URM students' college experiences may also identify organizational factors that are salient to transfer (Jain, Herrera, Bernal, & Solorzano, 2011). Likewise, because we were unable to identify many institutional factors significantly related to transfer for either Whites or URMs, more work is needed to identify institutional characteristics that may be meaningfully related to transfer for both groups.

Arguably the most important finding in this study is the negative relationship identified between enrolling in a vocational program and transfer among URM students. This finding is particularly significant, given that enrolling in a vocational program did not negatively impact odds of transfer for White students. Descriptive findings suggest that URMs may have been disproportionately tracked into vocational programs (25% of URMs, versus 16% of Whites). These disparities warrant additional attention from equity-minded policymakers and researchers. Results support the argument that enrolling in vocational programs may have long-term negative consequences for baccalaureate attainment among URM students (e.g., Brint & Karabel, 1989; Grubb, 1989; Jenkins, 2011). This could be an extension of the tracking patterns well documented in public schools that direct White students toward and URM students away from college preparatory (non-vocational) courses (Oakes, 2005; Oakes et al., 2006).

Although findings from the present study are, for the large part, consistent with prior research, the limited number of divergent findings is noteworthy. While full-time enrollment status has been previously found to be positively related to transfer (e.g., Dougherty & Kienzl, 2006; Eagan & Jaeger, 2009; Wang, 2012), our findings indicate a significant negative relationship for White students. This difference may be explained by variation across studies in how enrollment status is operationalized. In contrast to prior work that has limited the measurement of full-time enrollment to the first semester or first academic year, we defined full-time status as exclusive full-time enrollment across six academic years. We speculate that the negative relationship between full-time enrollment and transfer may be understood by the other significant environmental pull-factors in the model—working and financial independence. We expect that exclusive full-time enrollment may place an excessive burden or commitment on White students who are also working full-time and/or have a family of their own.

Second, in contrast to prior findings (i.e., Eagan & Jaeger, 2009), we found a positive relationship between the percentage of students receiving financial aid on campus and an individual student's odds of transfer. Although the percentage of students receiving financial aid may be assumed to be a proxy for the socioeconomic status of the student body, this variable also represents institutional, state, and/or federal financial support provided to students—support that is expected to positively contribute to student outcomes. However, it is unclear why this finding was found to be significant for Whites but not URM students. The inconsistency in findings across studies may result from differences in the sample used in prior research by Eagan and Jaeger (2009), which was limited to students in California who had earned at least eight transferable credits at a single institution.

Further research is needed to make meaning of many of the differences between White and URM students in predicting transfer. We speculate that persistence and transfer models or the ways that different capitals are leveraged may work differently for White and URM students (e.g., Gandara et al., 2012; Perna, 2000; Nuñez & Elizondo, 2013). We therefore recommend qualitative research to better understand how both White and URM students access and convert various forms of capital (e.g., cultural, social) in the transfer process. Many of the identified differences between the White and URM students may also be explained by the literature specific to URM students attending four-year institutions. Findings from this line of work suggest that the college environment and experiences (rather than precollege factors) influence first-generation and URM students' outcomes to a greater extent than for continuing-generation or White students (e.g., Hurtado & Carter, 1997; Pascarella, Pierson, Wolniak, & Terenzini, 2004; Perna, 2000). Additional research is needed to document the lived experiences and percep-

tions of different groups of community college students to better understand the meaning of these differences.

While the primary contribution of this study is to research and theory, the results also have implications for advising and teaching practices at both the high school and collegiate level. To begin with, findings underscore the importance of advising URM students to take advanced math courses during high school and extends the salience of high school mathematics rigor from college access and persistence outcomes (Adelman, 2006) to URM students' vertical transfer patterns. These results also have implications for advising students who may aspire to earn a four-year degree but who instead enroll in an occupational program. Findings suggest that this decision may negatively impact URM students in particular, who may not have access to the capital to leverage vocational coursework towards transfer and/or earning a four-year degree. Findings also demonstrate the consequences of advising practices that may (intentionally or unintentionally) track URM students into vocational programs and/or promote a "cooling-out" effect (Clark, 1960). As such, results highlight the importance of high educational expectations for URM students in both teaching and advising practices. In particular, it is critical that community college faculty and advisors are able to assist students in developing and/or actualizing their academic goals.

Intensive academic advising (Bensimon & Dowd, 2009; Hagedorn, 2010) through agents such as "transfer champions" (Dowd et al., 2006) may help to steer URM students toward transfer programs. Creating "transfer cultures" to support and promote transfer are also thought to be of particular importance for URM students (Jain et al., 2011; Wassmer, Moore, & Shulock, 2004). Our study's findings that there are substantial differences in factors associated with transfer for White and URM students imply that the norms, behaviors, and supports involved in "transfer culture" may not mean the same thing for students from different racial/ethnic backgrounds. Therefore, creating cultures and programs that respond to specific cultural needs of an institution's URM groups, such as the Puente program for Latino students (Gandara, 2002) can have positive influences on their likelihood of transfer (Gandara et al., 2012; Hagedorn, 2010; Nuñez & Elizondo, 2013; Rendón, 2002). Institutional personnel should make articulation agreements both accessible and understandable in guiding students toward transfer (Bensimon & Dowd, 2009; Hagedorn, 2010; Yoshimi & Nuñez, 2011).

As a final note, this research raises important questions about transfer equity for URMs. We hope that our study inspires investigations to better understand the racial transfer gap and inform ways in which institutional personnel, state legislators, and federal policymakers can positively influence this critical pathway toward baccalaureate and post-baccalaureate attainment.

Appendix A
Description of Variables and Measures

Variable Name	*Description and Coding*
Student-Level Variables	
Socio-Demographic Variables	
Gender	Binary variable coded 0 as male, 1 as female
First-generation status	Binary variable coded 0 when neither parent earned a college degree and 1 for continuing-generation college students
Precollege Factors	
High school GPA	4-category dummy variable representing a range of high school GPA (less than 2.0*, 2.0 to 2.4, 2.5 to 2.9, 3.0 to 3.4, 3.5 to 4.0)
Highest math course taken	3-category dummy variable indicating the highest mathematics course taken during high school (algebra II*, trigonometry and algebra, precalculus, calculus)
Earned college credit	Binary variable coded 0 = did not earn college level or Advanced Placement credits during high school, or 1 = earned college credits during high school
Delayed enrollment	Binary variable coded 0 = delayed enrolling in college following high school, and 1 = enrolled in college immediately following high school
Environmental Pull Factors	
Hours worked	2-category dummy variable representing the average number of hours worked during the first year of college (worked more than 20 hours per week*, worked less than 20 hours per week, did not work)
Dependency status	Binary variable coded 0 when student was classified as independent in 2003-2004 and 1 when student was classified as a dependent
Amount of financial aid	4-category dummy variable representing a range of financial aid received from all sources in 2003-2004 (no aid received*, less than $2,500, between $2,500 and $4,999, between $5,000 and $9,9999. more than 10,000 dollars)
Enrollment intensity	Binary variable coded 0 = enrolled college part-time or a mix of part- and full-time through 2009, and 1 = enrolled exclusively full-time
Educational Expectations	2-category dummy variable representing student's highest degree expectation in 2003-2004 (expected to earn a bachelor's degree*, expected to earn a master's degree, expected to earn a doctoral or professional degree)
College Experiences	
Program type	2-category dummy variable representing the type of community college degree plan student enrolled in for the 2003-2004 academic year (enrolled in a technical or vocational program*, did not enroll in any program, enrolled in transfer program)

Appendix A, cont.

Variable Name	*Description and Coding*
Academic integration	Continuous variable representing the level of academic integration for 2003-2004 year. Index from the BPS dataset calculated from an average of student's frequency in participating in study groups, social contact with faculty, meeting with an academic advisor, talking with faculty outside of class (range 0 to 200)
Developmental course	Binary variable coded 0 = did not enroll in remedial/ developmental coursework in 2003-2004, or 1 = enrolled in one or more developmental courses
First year GPA	Continuous variable representing the student's cumulative grade point average in 2003-2004 academic year (range 0 to 4.0)
Distance education courses	Binary variable coded 0 did not enroll in distance education classes in 2003-2004 or 1 enrolled in distance education courses
Institutional-Level Variables	
Academic and Social Environment	
Enrollment size	Average total enrollment at the institution (range 129 to 40,929)
% URM faculty	Percent of African American and Hispanic faculty (range 0 to 100)
% Full-time faculty	Percent of instructional staff who are classified as full-time (range 10 to 100)
Academic support	In $1000s per FTE undergraduate (range 0 to 6,254)
Aggregate Socio-Demographics	
% URM students	Percent enrollment in 2003-2004 who were African American or Latino (range 0 to 100)
% Female students	Percent of enrollment in 2003-2004 who were female (range 1 to 98)
% Students received federal aid	Percent of students who received federal aid in 2003-2004 (range 0 to 100)
Outcome – Transfer	0 = successfully transferred to a four-year institution within six years, 1 = did not transfer to a four-year institution within six years

*Reference category
Source: BPS:04/09 survey and IPEDS data

Appendix B
Descriptive Statistics

Variable Name	*Entire Sample (n = 1,3601)*	*White (n = 830)*	*Underrepresented Minority (n = 530)*
Transfer to a Four-Year Institution	39%	45%	31%
Student-Level Variables			
Socio-Demographic Variables			
Female	59%	58%	59%
First-generation college student	71%	67%	78%
Precollege Factors			
High school GPA			
Less than 2.0	5%	5%	6%
2.0 to 2.4	16%	13%	18%
2.5 to 2.9	23%	21%	27%
3.0 to 3.4	38%	38%	40%
3.5 to 4.0	17%	23%	10%
Highest math course taken			
Algebra II	38%	35%	42%
Trig and algebra II	41%	42%	39%
Precalculus	14%	17%	13%
Calculus	7%	7%	6%
Earned college credit during HS	22%	24%	17%
Delayed enrollment into college	19%	17%	21%
Environmental Pull Factors			
Hours worked			
20 or more hours per week	58%	61%	53%
Less than 20 hours per week	17%	19%	15%
Did not work	25%	20%	32%
Dependent: student classification	88%	92%	83%
Financial aid amount received	3,743(4,294)	3,424(4,121)	4,248(4,513)
Did not receive aid	18%	20%	15%
Less than $2,500	26%	28%	23%
Between $2,500 and $4,999	31%	30%	34%
Between $5,000 and $9,999	18%	17%	21%
More than $10,000	7%	6%	8%
Attended full-time	50%	48%	55%
Highest Degree Expected to Earn			
Bachelor's degree	43%	42%	42%
Master's degree or certificate	43%	44%	42%
Doctoral or professional degree	14%	14%	16%

Appendix B, cont.

Variable Name	*Entire Sample (n = 1,3601)*	*White (n = 830)*	*Underrepresented Minority (n = 530)*
College Experiences			
Program type			
Vocational program	20%	16%	25%
Not enrolled in an associate's degree or certificate program	4%	4%	4%
Transfer program	77%	80%	71%
Academic integration	67(42)	67(41)	72(47)
Developmental education in first year	37%	30%	43%
First year GPA	2.81(81)	2.90(80)	2.70(81)
Took distance education course	11%	12%	8%
Institutional-Level Variables			
Academic and Social Environment			
Enrollment size	8,870(7,692)	7,616(6,737)	10,858(8,641)
% URM faculty	12(14)	7(7)	21(19)
% Full-time faculty	37(17)	36(17)	38(18)
Academic support in $1,000's (per FTE undergraduate)	947(733)	931(733)	974(735)
Aggregate Socio-Demographics			
% URM students	27(22)	17(14)	43(23)
% Female students	60(7)	59(6)	60(7)
% Students received federal aid	41(17)	39(16)	44(20)

1Data are rounded to the nearest 10th per IES guidelines.
Source: BPS:04/09 and IPEDS survey data

References

Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college*. Washington, DC: National Center for Education Statistics.

Alfonso, M., Bailey, T. R., & Scott, M. (2005). The educational outcomes of occupational sub-baccalaureate students: Evidence from the 1990s. *Economics of Education Review, 24*, 197–212.

Allison, L. M. (1999). *The impact of integrative experiences on persistence: A study of non-traditional students*. Ph.D. dissertation, Department of Education, University of Michigan, Ann Arbor.

Anderson, G. M., Alfonso, M., & Sun, J. C. (2006). Rethinking cooling out at public community colleges: An examination of fiscal and demographic trends in higher education and the rise of statewide articulation agreements. *Teachers College Record, 108*(3), 422–451.

Arbona, C., & Nora, A. (2007). The influence of academic and environmental factors on Hispanic college degree attainment. *The Review of Higher Education, 30*(3), 247–270.

Bahr, P. R. (2008). Does mathematics remediation work?: A comparative analysis of academic attainment among community college students. *Research in Higher Education, 49*, 420–450.

Bailey, T., Jenkins, D., & Leinbach, T. (2005). *What we know about community college low income and minority student outcomes: Descriptive statistics from national surveys.* New York: Columbia University, Teachers College, Community College Research Center.

Barnett, E. (2011). Faculty validation and persistence among nontraditional community college students. *Enrollment Management Journal, 5*(2), 97–117.

Bensimon, E. M., & Dowd, A. (2009). Dimensions of the transfer choice gap: Experiences of Latina and Latino students who navigated transfer pathways. *Harvard Educational Review, 79*(4), 632–658.

Blau, J. R. (2010). Two year college transfer rates of Black American students. *Community College Journal of Research and Practice, 23*(5), 525–531.

Brint, S., & Karabel, J. (1989). *The diverted dream: Community colleges and the promise of educational opportunity in America, 1900–1985.* New York: Oxford University Press.

Chase, M. M., Dowd, A. C., Pazich, L. B., & Bensimon, E. M. (2012). Transfer equity for "minoritized" students: A critical policy analysis of seven states. *Educational Policy.* Retrieved on September 2, 2013, from http://epx.sagepub.com/content/early/2012/12/06/0895904812468227.

Chronicle of Higher Education. (2012). *Almanac of Higher Education: 2012–2013.* Retrieved on September 4, 2013, from http://chronicle.com/almanac.

Clark, B. R. (1960). The "cooling-out" function in higher education. *The American Journal of Sociology, 65*(6), 569–576.

Cohen, A. M., & Brawer, F. B. (2008). *The American community college* (5th ed.). San Francisco: Jossey-Bass.

Crisp, G., & Nora, A. (2010). Hispanic student success: Factors influencing the persistence and transfer decisions of Latino community college students enrolled

in developmental education. *Research in Higher Education, 51*(2), 175–194. DOI: 10.1007/s11162-009-9151-x.

Crisp, G., Taggart, A., & Nora, A. (2012, November). *Research on Hispanic students: What do we know? What have we yet to learn? And what new and diverse perspectives are needed to examine Latino/a success in higher education?* Paper presented at the 2012 conference of the Association for the Study of Higher Education, Las Vegas, NV.

Deil-Amen, R. (2011). Socio-academic integrative moments: Rethinking academic and social integration among two-year college students in career-related programs. *Journal of Higher Education, 82*(1), 54–91.

Dougherty, K. J. (1992). Community colleges and baccalaureate attainment. *Journal of Higher Education, 63*(2), 188–214.

Dougherty, K. J. (2002). The evolving role of community college: Policy issues and research questions. In J. C. Smart & W. G. Tierney (Eds.), *Higher education: Handbook of theory and research* (Vol. 17, pp. 295–348). New York: Agathon Press.

Dougherty, K. J., & Kienzl, G. S. (2006). It's not enough to get through the open door: Inequalities by social background in transfer from community colleges to four-year colleges. *Teachers College Record, 108*(3), 452–487.

Dowd, A. C., Bensimon, E. M., Gabbard, G., Singleton, S., Macias, E., Dee, J., Melguizo, T., Cheslock, J., & Giles, D. (2006). *Transfer access to elite colleges and universities in the United States: Threading the needle of the American dream.* Boston: University of Massachusetts Boston/Los Angeles: University of Southern California.

Doyle, W. R. (2009). Impact of increased academic intensity on transfer rates: An application of matching estimators to student-unit record data. *Research in Higher Education, 50*, 52–72.

Eagan, M. K., & Jaeger, A. J. (2009). Effects of exposure to part-time faculty on community college transfer. *Research in Higher Education, 50*, 168–188.

Eddy, P. L., Christie, R., & Rao, M. (2006). Factors affecting transfer of "traditional" community college students. *The Community College Enterprise, 12*(1), 73–92.

Fairlie, R., Hoffman, F., & Oreopoulos, P. (2011). *A community college instructor like me: Race and ethnicity interactions in the classroom.* Cambridge, MA: National Bureau of Economic Research.

Gandara, P. (2002). A study of high school Puente: What have we learned about preparing Latino youth for postsecondary education. *Educational Policy, 16,* 474–495.

Gandara, P., Alvarado, E., Driscoll, A., & Orfield, G. (2012). *Building pathways to transfer: Community colleges that break the chain of failure for students of color.* Los Angeles, CA: The Civil Rights Project.

Greene, T. G., Marti, C. N., & McClenney, K. (2008). The effort-outcome gap: Differences for African American and Hispanic community college students in student engagement and academic achievement. *Journal of Higher Education, 79*(5), 513–539.

Grubb, W. N. (1989). The effects of differentiation on educational attainment: The case of community colleges. *Review of Higher Education, 12*, 349–374.

Grubb, N. W. (1991). The decline of community college transfer rates: Evidence from national longitudinal surveys. *Journal of Higher Education, 62*(2), 194–222.

Hagedorn, L. S. (2010). The pursuit of student success: The directions and challenges facing community colleges. In J. C. Smart (Ed.) *Higher education: Handbook of theory and research* (Vol. 24, pp. 321–358). Dordrecht, The Netherlands: Springer Publishing.

Hagedorn, L. S., Cypers, S., & Lester, J. (2009). Looking in the review mirror: Factors affecting transfer for urban community college students. *Community College Journal of Research and Practice, 32,* 643–664.

Hagedorn, L. S., Moon, H. S., Cypers, S., Maxwell, W. E., & Lester, J. (2006). Transfer between community colleges and four-year colleges: The all-American game. *Community College Journal of Research and Practice, 30*(3), 223–242.

Harper, S. R., & Hurtado, S. (2007). Nine themes in campus racial climates and implications for institutional transformation. *New Directions for Student Services, 120,* 7–24.

Hurtado, S., & Carter, D. F. (1997). Effects of college transition and perceptions of the campus racial climate on Latino college students' sense of belonging. *Sociology of Education, 70*(1), 342–345.

Ishitani, T. T., & McKitrick, S. A. (2010). After transfer: The engagement of community college students at a four-year collegiate institution. *Community College Journal of Research and Practice, 34*(7), 576–594.

Jain, D., Herrera, A., Bernal, S., & Solorzano, D. (2011). Critical race theory and the transfer function: Introducing a transfer receptive culture. *Community College Journal of Research and Practice, 35*(3), 252–266.

Jenkins, D. (2011). *Get with the program: Accelerating community college students' entry into and completion of programs of study.* CCRC Working Paper No. 32. Community College Research Center.

Kraemer, B. A. (1995). Factors affecting Hispanic student transfer behavior. *Research in Higher Education, 36*(3), 303–322.

Kraemer, B. A. (1997). The academic and social integration of Hispanic students into college. *Review of Higher Education, 20*(2), 163–179.

Lee, V. E., & Frank, K. A. (1990). Students' characteristics that facilitate the transfer from 2-year to 4-year colleges. *Sociology of Education, 63*(3), 178–193.

Martinez-Wenzl, M., & Marquez, R. (2012). *Unrealized promises: Unequal access, affordability, and excellence at community colleges in Southern California.* Los Angeles, CA: The Civil Rights Project.

McCormick, A. C., & Carroll, C. D. (1997). *Transfer behavior among beginning postsecondary students, 1989–94.* Washington, DC: U.S. Department of Education (ED 408 929).

Melguizo, T. (2009). Are community colleges an alternative path for Hispanic students to attain a bachelor's degree? *Teachers College Record, 111*(1), 90–123.

Melguizo, T. (2011). A review of the theories developed to describe the process of persistence and attainment. In J. C. Smart (Ed.) *Higher education: Handbook of theory and research* (Vol. 24, pp. 321–358). Dordrecht, The Netherlands: Springer Publishing.

Melguizo, T., Kienzl, G. S., & Alfonso, M. (2011). Comparing the educational attainment of community college transfer students and four-year college rising juniors using propensity score matching methods. *Journal of Higher Education, 82*(3), 265–291.

Nora, A. (2004). The role of habitus and cultural capital in choosing a college: Transitioning from high school to higher education, and persisting in college among minority and non-minority students. *Journal of Hispanic Higher Education, 3*(2), 180–208.

Nora, A., & Rendón, L. I. (1990). Determinants of predisposition to transfer among community college students: A structural model. *Research in Higher Education, 31*(3), 235–255.

Nuñez, A.-M., & Elizondo, D. (2013). *Closing the Latino/a transfer gap: Creating pathways to the baccalaureate.* San Antonio, TX: American Association of Hispanics in Higher Education, Educational Testing Service, and University of Texas at San Antonio.

Nuñez, A.-M., Sparks, J., & Hernandez, E. (2011). Latino access to community colleges and Hispanic-serving institutions. *Journal of Hispanic Higher Education, 10*(1), 18–40. DOI: 10.1177/1538192710391801.

Oakes, J. (2005). *Keeping track: How schools structure inequality* (2nd ed.). New Haven, CT: Yale University Press.

Oakes, J., Rogers, J., Silver, D., Valladares, S., Terriquez, V., McDonough, P., et al. (2006). *Removing the roadblocks: Fair college opportunities for all California students.* Los Angeles, CA: UC All Campus Consortium for Research on Diversity and UCLA Institute for Democracy, Education, and Access.

Palmer, J. C. (2011). *What do we know about student transfer? An overview.* Association of American Colleges and Universities. Retrieved on September 3, 2013, from http://www.aacu.org/transfer/student_mobility/whatdoweknow.cfm.

Pascarella, E., Pierson, C. T., Wolniak, G. C., & Terenzini, P. (2004). First-generation college students: Additional evidence on college experiences and outcomes. *Journal of Higher Education, 75*(3), 249–284.

Peng, C. J., So, T. H., Stage, F. K., & St. John, E. P. (2002). The use and interpretation of logistic regression in higher education journals: 1988–1999. *Research in Higher Education, 43*(3), 259–293.

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

Porchea, S. F., Allen, J., Robbins, S., & Phelps, R. P. (2010). Predictors of long-term enrollment and degree outcomes for community college students: Integrating academic, psychosocial, socio-demographic and situational factors. *Journal of Higher Education, 81*(6), 750–778.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Newbury Park, CA: Sage.

Raudenbush, S. W., Yang, M., & Yosef, M. (2000). Maximum likelihood for generalized linear models with nested random effects via high-order, multivariate Laplace approximation. *Journal of Computational and Graphical Statistics, 9*(1), 141–157.

Rendón, L. I. (1994). Validating culturally diverse students: Toward a new model of learning and student development. *Innovative Higher Education, 19*(1), 33–51.

Rendón, L. I. (2002). Community college Puente: A validating model of education. *Educational Policy, 16*(4), 642–667.

Rendón, L., Jalomo, R., & Nora, A. (2004). Theoretical considerations in the study of minority student retention in higher education. In J. M. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 127–156). Nashville, TN: Vanderbilt University Press.

Roksa, J. (2006). Does the vocational focus of community colleges hinder students' educational attainment? *Review of Higher Education, 29*(4), 499–526.

Roksa, J. (2009). Building bridges for student success: Are higher education articulation policies effective? *Teachers College Record, 111*(10), 2444–2478.

Rumberger, R. W., & Thomas, S. L. (2000). The distribution of dropout and turnover rates among urban and suburban high schools. *Sociology of Education, 73*(1), 39–67.

Schuetz, P. (2005). UCLA community college review: Campus environment: A missing link in studies of community college attrition. *Community College Review, 32*(4), 60–82.

Smith, D. G. (2009). *Diversity's promise for higher education*. Baltimore, MD: Johns Hopkins University Press.

Surette, B. J. (2001). Transfer from 2-year to 4-year college: An analysis of gender differences. *Economics of Education Review, 20*(2), 151–163.

Sutherland, J. A. (2011). Building an academic nation through social networks: Black immigrant men in community colleges. *Community College Journal of Research and Practice, 35*, 267–279.

Teranishi, R. T., Ceja, M., Antonio, A. L., Allen, W. R., & McDonough, P. M. (2004). The college choice process for Asian Pacific Americans: Ethnicity, socioeconomic class in context. *Review of Higher Education, 27*(4), 527–555.

Tierney, W. G. (1992). An anthropological analysis of student participation in college. *Journal of Higher Education, 63,* 604–618.

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

Townsend, B. K. & Wilson, K. (2006). A hand hold for a little bit: Factors facilitating the success of community college transfer students to a large research university. *Journal of College Student Development, 47*(4), 439–456.

U.S. Department of Education (2005). *Beginning postsecondary students: Data analysis system.* Technical report, National Center for Education Statistics.

U.S. Department of Education (2012). *Community college student outcomes: 1994–2009.* Technical report, National Center for Education Statistics (NCES 2012–253).

Velez, W., & Javalgi, R. G. (1987). Two-year college to four-year college: The likelihood of transfer. *American Journal of Education, 96*(1), 81–94.

Wang, X. (2009). Baccalaureate attainment and college persistence of community college transfer students at four-year institutions. *Research in Higher Education, 50,* 570–588.

Wang, X. (2012). Factors contributing to the upward transfer of baccalaureate aspirants beginning at community colleges. *Journal of Higher Education, 83*(6), 851–875.

Wassmer, R., Moore, C., & Shulock, N. (2004). Effect of racial/ethnic composition on transfer rates in community colleges: Implications for policy and practice. *Research in Higher Education, 45*(6), 651–672.

Wellman, J. V. (2002). *State policy and community college baccalaureate transfer.* The National Center for Public Policy and Higher Education and the Institute for Higher Education Policy. National Center Report #02–6. Washington DC.

Wild, L., & Ebbers, L. (2002). Rethinking student retention in community colleges. *Community College Journal of Research and Practice, 26*(6), 503–519.

Xu, D., & Jaggars, S. S. (2011). The effectiveness of distanced education across Virginia's community colleges: Evidence from introductory college-level math and English courses. *Educational Evaluation and Policy Analysis, 33*(3), 306–377.

Yoshimi, J., & Nuñez, A.-M. (2011). *A phenomenology of transfer.* A paper presented at the annual meeting of the Association for the Study of Higher Education, Charlotte, NC.