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Characteristics and Predictors of Transfer and Withdrawal Among Students Who Begin College at Bachelor's Granting Institutions

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Abstract
This study models reverse transfer, lateral transfer, and college withdrawal behavior for a national sample of students who began college at bachelor's granting institutions. Descriptive data illustrate statistical differences in the characteristics, habitus, early college experiences and supports, and institutional characteristics of students who do not transfer when compared to students who reverse transfer, laterally transfer, or drop out before the third year of college. Additionally, multi-level regression findings advance theoretical understanding of the ways in which predictors of reverse transfer, lateral transfer, and withdrawal from bachelor's granting institutions are both similar and different. Implications for research, theory, and practice are offered.

Keywords Transfer · College students · HGLM · Equity

Introduction

Although once infrequent, it has become increasingly common over the past 20 years for college students to move in and out of institutions on the path to degree completion (Goldrick-Rab, 2006; Li, 2010; Millard, 2014). The traditional image that most administrators and policy makers have of mobility as one-way vertical transfer from a community college to a bachelor's granting college or university after two years of coursework is now incomplete, as students are increasingly utilizing complex enrollment patterns in an effort to progress toward a bachelor's degree (Andrews et al., 2014; Hillman et al., 2008). Today,

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more than a third of first-time students transfer at least once while enrolled in college (Shapiro et al., 2015), and it is now equally common for students to transfer from community colleges and bachelor's granting colleges and universities.[1] Moreover, among those who initially enroll at bachelor's granting institutions, nearly an equal percentage of students are transferring "in reverse" to a community college as are transferring "laterally" to another bachelor's institution (Hossler et al., 2012; Shapiro et al., 2015). At the same time, we currently know very little about the transfer behaviors and outcomes of students who initially enroll at bachelor's granting institutions (Hillman et al., 2008), as this group of transfer students has received relatively little attention to date from policymakers, scholars, or practitioners (Li, 2010; Taylor & Jain, 2017). The present study attempts to fill this gap.

It is important to examine student transfer in context (Hossler et al., 2012). Unlike students who begin their postsecondary education at a community college, students who initially enroll at bachelor's granting institutions do not ever need to transfer to earn a bachelor's degree. In this way, moving from a bachelor's institution to a community college (referred to as reverse transfer) turns the traditional transfer concept on its head (Hillman et al., 2008). Reverse transfer is not well researched, and the predictors of mobility have yet to be fully studied (Hossler et al., 2012). Prior research suggests that students who transfer from bachelor's granting institutions are not a homogeneous group (Goldrick-Rab & Pfeffer, 2009; Kalogrides & Grodsky, 2011).

Although not well understood, researchers speculate that students may reverse transfer for a variety of reasons, including a need to move closer to home or lack information, resources, and/or academic preparation (Goldrick-Rab & Pfeffer, 2009). It is expected that, in some cases, reverse transfer may improve students' odds of degree completion when transfer is short term and helps students complete needed degree requirements at a lower cost (Hossler et al., 2012). In other cases, reverse transfer may "cool out" students (Clark, 1960) and decrease their odds of earning a bachelor's degree. Similarly, the reasons for lateral transfer, or why students choose to move to another bachelor's granting institution, are not well documented. Some researchers suggest that students may laterally transfer in order to find an institution with different major options, or they may transfer due to a lack of perceived fit at the first institution (Hossler et al., 2012).

Additional research is needed to better understand the reasons for mobility and transfer outside of traditional transfer patterns (Taylor & Jain, 2017). In particular, there is a need for methodologically rigorous and theoretically grounded work that can identify the salient characteristics and early college experiences of students who are likely to transfer from a bachelor's granting institution. Moreover, research to date has not given adequate attention to conceptually and analytically distinguishing students' decisions to transfer from a bachelor's granting institution to another college from decisions to withdrawal from college altogether (Johnson & Muse, 2012). Further, more information is needed to understand if/how various aspects of the institutional context may be related to transfer or withdrawal from bachelor's granting institutions.

Andrews et al. (2014) note that scholarship on student transfer has been constrained by datasets with insufficient size and details to allow for a full examination of the various forms of transfer and the types of students who are making different transfer decisions.

[1] We intentionally use the language "bachelor's granting" in place of "4 year" throughout this paper in recognition that the majority of students do not graduate in 4-years due to factors outside students' control, including a need to work and/or attend part-time, enrolling in developmental courses, and transfer credit loss.

Our research contributes to the conversation on reverse and lateral transfer and overcomes many sampling limitations by leveraging the Beginning Postsecondary Students Longitudinal Study (BPS: 12/14). This largely untapped dataset provides a national sample of beginning college students who were retained, transferred, or withdrew from bachelor's granting institutions before the third year. It offers a comprehensive set of variables to study student characteristics, college experiences, and institutional characteristics that can help put the complexity of transfer and college withdrawal in context and offers direct implications for bachelor's granting colleges and universities seeking to retain students who are likely to transfer. Specifically, we use BPS data to model predictors of reverse transfer, lateral transfer, and college withdrawal decisions among beginning college students at bachelor's granting institutions and extend the work of Kalogrides and Grodsky (2011) by using a more current dataset and focusing equally on both reverse and lateral transfer.

Research Questions

This study addressed the following two questions:

1. In what ways do the characteristics, habitus, early college experiences and supports, and institutional characteristics vary among students enrolled at a bachelor's granting institution who (a) persist and do not transfer, (b) reverse transfer, (c) laterally transfer, and (d) withdrawal from postsecondary education before the third year?
2. What characteristics and experiences serve to significantly increase or decrease the odds students will (a) reverse transfer, (b) laterally transfer, or (c) withdrawal from college before the third year among a national sample of students enrolled at bachelor's granting institutions?

Relevant Literature and Frameworks

A review of the literature revealed only a handful of studies to inform a multilevel analysis of transfer from bachelor's granting institutions (i.e., Aulck & West, 2017; Goldrick-Rab, 2006; Goldrick-Rab & Pfeffer, 2009; Hillman, et al., 2008; Ishitani & Flood, 2018; Kalogrides & Grodsky, 2011; Sujitparapitaya, 2006). Moreover, we were unable to find theory that specifically explains the individual or contextual conditions influencing students' transfer behavior from bachelor's granting institutions. Rather, nearly all transfer studies to date have modeled transfer from a community college to a bachelor's institution (e.g., Alfonso et al., 2005; Crisp & Núñez, 2014; Crosta, 2014; Dougherty & Kienzl, 2006; Eagan & Jaeger, 2009; Porchea et al., 2010; Wang et al., 2017; Wood & Palmer, 2013). In contrast to vertical transfer, which can be understood rationally and explained by community college students' desire to earn a bachelor's degree, the reasons why students choose to transfer after initially enrolling at a bachelor's granting institution are much less clear and are harder for institutions to predict. Recent research suggests that transfer students who first attend a bachelor's granting institution may be very different from students who transfer from a community college. For instance, findings by Crisp (2017) suggest that students transferring from a bachelor's granting institution are less likely to be African American or Latinx, low-income, and first-generation students when compared to community college transfers. Additionally, when compared to community college transfer students, students transferring from bachelor's granting institutions have been found to be

less likely to delay enrollment into college and more likely to enroll exclusively full-time (Crisp, 2017). Further, recent findings by Aulck and West (2017) show that students who transferred to a college or university from other bachelor's granting institutions had higher grades but also higher attrition rates than students who transferred from community colleges. These descriptive findings suggest that existing vertical transfer theory and research may have limited usefulness in modeling students' decisions to transfer from bachelor's granting institutions.

Persistence and college choice theories and research may provide an appropriate starting place for modeling students' decisions to transfer from a bachelor's granting institution. We speculate that students' decisions to transfer from the bachelor's granting institution where they initially chose to attend can be conceptualized as two interrelated decisions: (1) whether or not to persist at the first institution, and (2) whether to transfer to a community college, to another bachelor's granting institution, or to withdrawal from college altogether. Although there are several persistence theories (e.g., Milem & Berger, 1997; Tinto, 1993), Nora et al.'s model (2006) is one of the most comprehensive models of student persistence. In sum, Nora et al.'s framework explains that a combination of pre-college and financial factors, sense of purpose and allegiance to a specific institution, social and academic experiences, intermediate outcomes (e.g., grade point average [GPA]), and goals and commitments collectively serve to influence students' decisions to re-enroll at a particular institution. However, current persistence theory assumes that students will remain enrolled at a single institution through graduation and does not allow space for co-enrollment and transfer between institutions (Goldrick-Rab, 2006) or distinguish between dropping out and transferring (Li, 2010). Regardless, we posit that Nora et al.'s (2006) model may be useful in identifying student characteristics and early college experiences that help to explain their decisions to persist (rather than to transfer or withdrawal) at their first bachelor's granting institution. Similarly, we argue that the decision to transfer to a community college or to another bachelor's granting institution might be conceptualized as a second college "choice" that is guided by a combination of individual, institutional, and contextual factors outlined by Hossler and Gallagher (1987) and, more recently, by Perna's college access and choice model (2006). Building upon these theoretical observations, the remainder of this section outlines connections between persistence and college choice theory and the scant amount of literature that has been conducted specific to describing and/or predicting student transfer and/or withdrawal from a bachelor's granting institution.

Although conceptualized somewhat differently, both persistence and college choice theory acknowledge the role that students' socio-demographic and pre-college experiences play in shaping students' motivations, behaviors, and experiences prior to and/or during college. Nora et al.'s framework (2006) explains that a variety of factors, from students' home and high school environments, financial needs, encouragement and support from family and friends to financial and support factors (e.g., friends, work responsibilities, financial aid) serve to influence students' educational aspirations and commitment to attending a particular institution. Comparably, Perna's college choice framework (2006) assumes that enrollment decisions reflect students' situated context or habitus, including student beliefs and values that shape decision making. Similar to persistence and college choice research (e.g., Lopez Turley, 2009; Núñez & Crisp, 2012), the very limited amount of research focused on transfer from bachelor's granting institutions suggests that students' transfer decisions are shaped by socio-demographic characteristics including gender, socioeconomic status (SES), and parental education.

Concerning gender, previous research has shown conflicting results on the likelihood of transfer from bachelor's granting institutions overall (Ishitani & Flood, 2018;

Sujitparapitaya, 2006), though work that has focused specifically on reverse transfer has shown that females are more likely to do so (Hillman et al., 2008). In regard to SES, there is some evidence that students who laterally transfer come from higher income backgrounds than those of students who reverse transfer (Goldrick-Rab & Pfeffer, 2009). Though work on the SES of students who reverse transfer are decidedly mixed, the most recent research on the subject used a national, longitudinal dataset and showed that family income was not related to reverse transfer (Kalogrides & Grodsky, 2011). Prior work on the influence of parental education levels on transfer has shown that students whose parents have lower levels of education (i.e., no high school diploma or no bachelor's degree) are more likely to transfer in general (Sujitparapitaya, 2006) and to reverse transfer in particular (Kalogrides & Grodsky, 2011).

Also consistent with existing persistence and college choice research and theory (e.g., Núñez & Crisp, 2012), research predicting transfer from a bachelor's granting institution suggests that students' pre-college experiences, motivations and expectations, social capital, and financial needs and concerns may serve to directly or indirectly influence students' decisions to transfer. In regard to pre-college experiences, students who left high school less academically prepared, as measured by GPA, test scores, rigor of coursework, class rank, and college admissions test scores, were more likely to transfer from their initial bachelor's granting institution, particularly in the form of reverse transfer (Goldrick-Rab & Pfeffer, 2009; Hillman et al., 2008; Ishitani & Flood, 2018; Kalogrides & Grodsky, 2011; Sujitparapitaya, 2006). Concerning motivation and social capital, Ishitani and Flood (2018) found that increased social integration reduced the probability of transfer, while the results of a study by Goldrick-Rab and Pfeffer (2009) showed that having high school friends with greater college degree expectations decreased the likelihood of reverse transfer. Additionally, previous research has examined students' financial needs and concerns as they related to their transfer decisions. On this topic, a nationwide study showed that increased amounts of financial aid in the form of grants or loans reduced transfer of any type (Ishitani & Flood, 2018), while a statewide study in Indiana found that students who had received any form of financial aid were less likely to reverse transfer (Hillman et al., 2008).

Nora et al.'s framework (2006) posits that many academic and social experiences, such as involvement in activities and learning communities (Astin, 1999), as well as encouragement, counseling, and advising from faculty and staff, may validate and engage students (Kuh et al., 2008; Rendon, 1994) and promote a sense of belonging (Hurtado & Carter, 1997) on campus that are positively related to students' intermediate outcomes (e.g., grades). In turn, this serves to strengthen students' goals and commitment to the institution (Tinto, 1993). Unfortunately, empirical work to date that has focused on transfer from bachelor's granting institutions has yet to meaningfully explore the influence of early college experiences and institutional supports on students' transfer decisions. There is some evidence to suggest that enrolling less than full-time may increase the odds of transfer and that students were more likely to reverse transfer if they had not completed at least 30 or more credit hours in the first college year (Goldrick-Rab & Pfeffer, 2009), though Kalogrides and Grodsky (2011) found that students who reverse transferred earned fewer credits than those who transferred laterally. In addition, the results of two studies showed that students who enrolled at an in-state college were more likely to transfer laterally (Goldrick-Rab & Pfeffer, 2009; Hillman et al., 2008). There is a good amount of evidence to suggest that students' academic performance early in college is related to their decisions to laterally or reverse transfer from a bachelor's granting institution, as students with lower first-year GPAs were more likely to transfer (Goldrick-Rab & Pfeffer, 2009; Hillman et al., 2008; Ishitani & Flood, 2018; Kalogrides & Grodsky, 2011; Sujitparapitaya, 2006). For

example, Hillman et al. (2008) found that students with a "C" average GPA were five times more likely to reverse transfer than students with a "B" average GPA. Beyond enrollment intensity and academic performance, however, scholars have not considered the role of early college experiences in predicting transfer from bachelor's granting institutions. This is a notable hole in the research, as college experiences and institutional supports make up the majority of malleable variables an institution can control in retaining students who are likely to transfer.

In addition to college experiences and supports, the persistence literature over the past 10 to 15 years has increasingly focused on the role of the broader institutional context in modeling students' enrollment decisions (e.g., Chen, 2012; Titus, 2004). Overall, findings suggest that a combination of institutional characteristics, including control, enrollment size, cost, and urbanicity, as well as aggregated student body characteristics such as selectivity and the diversity of the student population (Ishitani, 2006), may influence students' individual odds of persisting in college. Goldrick-Rab (2006) noted that there are differences among bachelor's granting institutions assumed to influence students' mobility, including characteristics associated with selectivity and control. For instance, her 2009 study with Pfeffer found that students who first attended selective colleges were less likely to transfer laterally. However, additional research is needed to understand the role of the institutional context in predicting lateral and reverse transfer and the ways to which this may be similar or different from predicting college withdrawal from bachelor's granting institutions.

Method

Dataset and Sample

Data were drawn from the first follow-up of the current cohort of the Beginning Postsecondary Students Longitudinal Study (BPS: 12/14). The BPS cohort draws from the 2011–12 National Postsecondary Student Aid Study (NPSAS:12), Integrated Postsecondary Education Data System (IPEDS:10–11), and administrative data sources (Hill et al., 2016). This dataset improves upon the previous dataset (i.e., BPS 04/09) in a few key ways that are advantageous to our work by including a broader set of institutional characteristics, more comprehensive data regarding enrollment behaviors, and information that captures students' participation in support services. The BPS: 12/14 cohort was sampled from the NPSAS:12 sampling frame and includes a nationally representative sample of first-time beginning (FTB) students who began college during the 2011–2012 academic year at a Title IV eligible college or university in the U.S. (Hill et al., 2016). The analytic sample for the study included 11,170[2] students who initially enrolled at what NCES terms a bachelor's granting institution. Of these, we differentiated between students who persisted and did not formally transfer by the third academic year (n = 6110), withdrew from college altogether (n = 2040), laterally transferred to another bachelor's granting institution (n = 1040), and reverse transferred to a technical or community college (n = 980). The sample included students who co-enrolled at more than one institution during a given term (e.g., took an online class at a community college while also enrolling in in-person courses at their home

[2] All data and sample sizes are rounded to the nearest 10 per IES guidelines.

institution). However, we excluded students who indicated that they only took courses at another institution to transfer credit back to their home institution (e.g., summer transfers). Non-traditional age students (9%) were also excluded because certain data elements thought to be critical to the model (i.e., high school experiences and grades) are not available for students 24 years or older in the BPS dataset.

Conceptual Model and Variables

Our conceptual model, shown in Fig. 1, outlines the variables hypothesized to predict student transfer and/or withdrawal from college. Drawing from Nora et al.'s model (2006), Perna's college access and choice framework (2006), and the limited amount of empirical work specific to transfer from a student's first bachelor's granting institution, our conceptual model posits that a combination of socio-demographic characteristics, pre-college experiences, financial and support factors, motivations, early college experiences and institutional supports, and the institutional context can reliably predict withdrawal, reverse transfer, and lateral transfer from a bachelor's granting institution before the third year of college. We used several variables as measures of student *socio-demographic characteristics* including race/ethnicity, SES, gender, age, and parental education level (defined as whether or not a student's parent has earned a bachelor's degree). Although all of these characteristics were assumed to be related to transfer and/or withdrawal from college, they were hypothesized to be related in different directions for lateral and reverse transfer (Goldrick-Rab, 2006). In particular, we expected that students who are members of a non-dominant population (e.g., students of color, low income, first generation) would be more likely to reverse transfer or withdrawal. In contrast, members of privileged groups (e.g., White, high income) were expected to be more likely to not transfer or to transfer laterally (Goldrick-Rab & Pfeffer, 2009).

We also included several *pre-college experiences* (comprising high school GPA and highest mathematics course taken during high school), *financial and support factors,* and *motivations* in our model. Similar to the socio-demographic characteristics, we posited that students' pre-college experiences would be related in different ways to students' decisions to laterally transfer, reverse transfer, or withdrawal from college. Namely, students who were more academically prepared for college were expected to be more likely to laterally transfer (possibly to a more selective institution), whereas students who were less academically prepared for college-level work were expected to be more likely to reverse transfer or to withdrawal (Hillman et al., 2008). We also included several financial concerns/needs and support factors (Nora et al., 2006), including the average hours a student worked per week, the net cost of college after grants and loans as a percent of income, distance of the first institution from students' home, financial support from family or friends, and social capital (defined as support from friends about pursuing postsecondary education). In particular, students who worked more hours per week, had a higher college cost as a percentage of income, did not receive financial support from friends or family, and/or who did not receive social capital support from friends were hypothesized to be more likely to reverse transfer or to withdrawal (St. John et al., 2000). Moreover, we expected that students' educational motivation and degree intentions (namely, the highest degree a student expected to earn and a student's academic self-concept at the beginning of college) would be related to students' decisions to transfer.

Drawing from persistence theory and literature, our model additionally hypothesized that *early college experiences* and *institutional supports* would reduce students' odds of

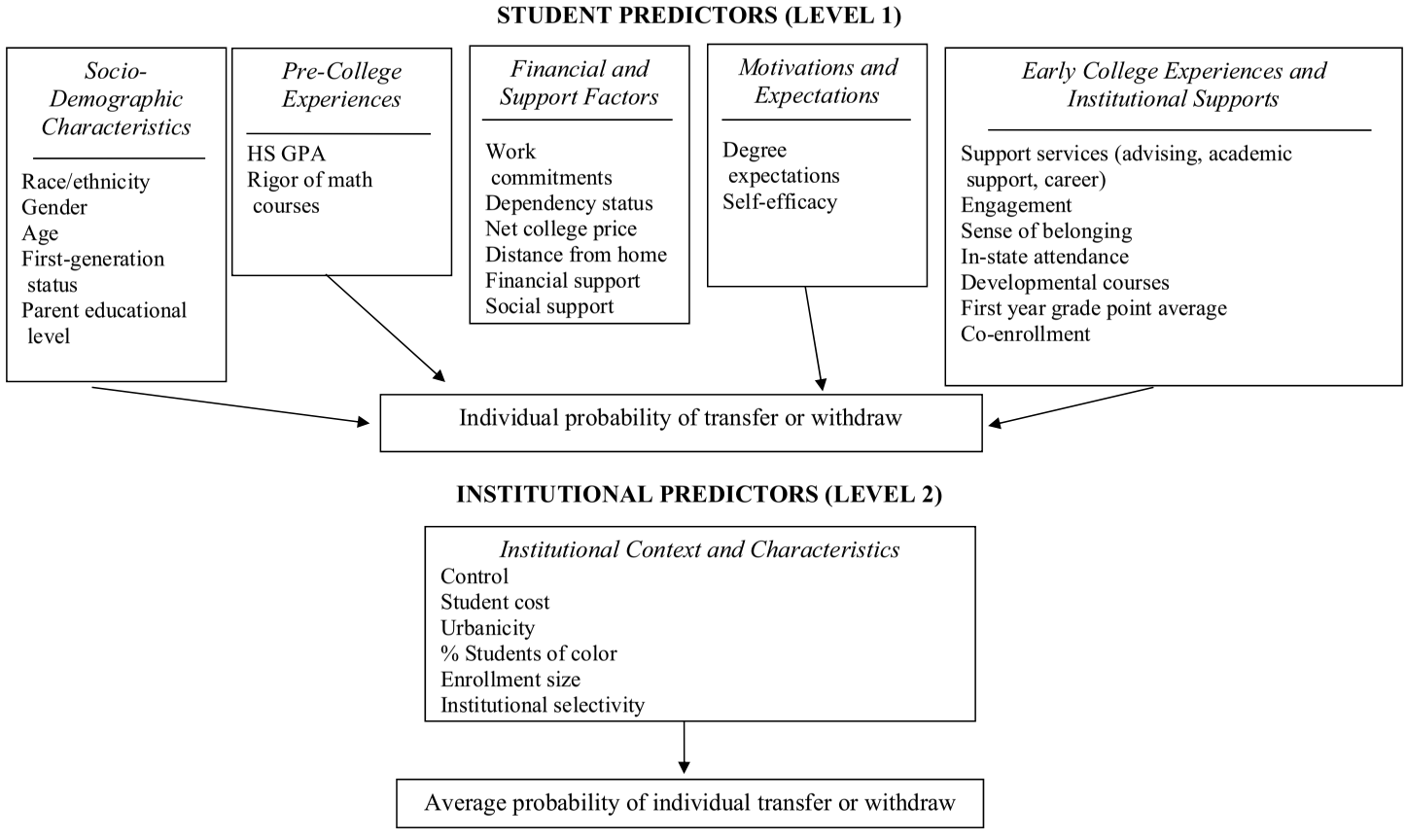

Fig. 1 Conceptual model predicting transfer and withdrawal from bachelor's granting institutions

transfer and withdrawal. In particular, we considered three types of support services (i.e., academic advising, academic services, and career services) included in the BPS dataset. We also included a measure of engagement (Hu, 2011; Kuh et al., 2008), defined as students' satisfaction with social experiences at the first institution, and students' sense of belonging (Hurtado & Carter, 1997). We included five college experiences and enrollment behaviors in modeling transfer and withdrawal, including enrollment intensity (full- or part-time), whether or not the student attended an in-state institution (Goldrick-Rab & Pfeffer, 2009; Hillman et al., 2008), whether or not the student enrolled in developmental coursework in the first year (Crisp & Delgado, 2014), first-year college GPA (Hillman et al., 2008; Sujitparapitaya, 2006), and whether or not the student simultaneously enrolled at more than one institution (Crisp, 2013). Consistent with the persistence literature, we hypothesized that attending less than full-time would increase students' odds of reverse transfer or withdrawal. We also posited that enrollment in developmental coursework would be specifically and positively related to reverse transfer and withdrawal (Crisp & Delgado, 2014). Further, we expected there to be a positive relationship between co-enrollment and both types of transfer (Crisp, 2013).

Finally, at the institutional level, we included several institutional characteristics of the first college attended as predictors of transfer or withdrawal from college: institutional control (defined as the institution being public, private not-for-profit, or private for-profit), the cost of attendance, the institution's urbanicity (e.g., urban, rural), the percentage of students of color enrolled, enrollment size, and institutional selectivity (Chen, 2012; Goldrick-Rab, 2006; Ishitani, 2006; Titus, 2004). Students were expected to be more likely to transfer from public institutions, from institutions that had relatively high costs, and to institutions that were more selective (Goldrick-Rab). Our model also posited that students would have more mobility in large institutions as well as in urban or suburban areas and would therefore be more likely to transfer from large institutions and/or colleges located in those locations. Also consistent with the broader persistence literature, students, and particularly White students, were expected to be more likely to transfer to less diverse institutions (Crisp, 2017; Ishitani, 2006; Titus, 2004).

As the majority of both transfer and withdrawal behavior previously has been shown to occur during the first 2 years of college (Hossler et al., 2012), our outcomes of interest were: (1) lateral transfer to another bachelor's granting institution before the third year of college, (2) reverse transfer to a community or technical college before the third year of college, and (3) withdrawal from all postsecondary education before the third year of college. The comparison group for all outcomes consisted of students who persisted and did not transfer from their initial bachelor's granting institution. A detailed description of all variables is included in "Appendix 1".

Data Analysis

All analyses were run using STATA 13 apart from the minimal amount of missing data (.7% across all variables) which were handled using multiple imputations (MI) with LISREL (Manly & Wells, 2015). Only two variables (i.e., net price and student cost) had more than 5% of cases missing, and most variables had no missing data. Prior to analysis, data were cleaned and variance inflation factors (VIF) were examined to identify multicollinearity among the predictor variables. All variables were shown to have VIF values less than 5 (Warner, 2012). We used descriptive statistics to identify the salient characteristics and behaviors of students who first enrolled at a bachelor's granting institution and

subsequently did not transfer, reverse transferred, laterally transferred, and withdrew from college before the third year of college. Chi-square and ANOVA tests were run to identify significant differences in students' characteristics and behaviors across outcomes (ref: RQ1).

We then used multilevel regression techniques to identify student and institutional level characteristics related to the odds of (1) reverse transfer, (2) lateral transfer, and (3) withdrawal from college (ref: RQ2). Although we would have preferred to run a single, multinomial, multi-level model, we were unable to get a multinomial model to converge, likely due to the complexity in specification required for multinomial modeling and/or a lack of variation in slopes across the outcome groups (Heck et al., 2013). As an alternative, we ran three separate hierarchical generalized linear models (HGLM) coding our outcomes as dichotomous (i.e., did not transfer as the comparison/reference group). HGLM was an appropriate analytic technique to use given the nested nature of students within bachelor's granting institutions and categorical outcomes (Raudenbush & Bryk, 2002). We used the BPS:12/14 panel weight (i.e., WTA000) to account for the survey's complex sampling design. In addition, balanced repeated replication (BRR) estimation was used to adjust standard errors for all HGLM analyses. For all three models, an unconditional model was run to provide a measure of estimated transfer rates for the sample of bachelor's granting institutions. Since the dichotomous nature of the outcomes makes calculating the intraclass correlation (ICC) non-instructive (Raudenbush & Bryk, 2002), we used box plots to evaluate the variation in the average chance of transfer using estimates derived from empirical Bayes residuals. Student-level predictors were added to the within-institution models to estimate the relationship between student-level variables and transfer. All equations were fixed to constrain the effect of the within-institutional predictors to be the same for all institutions. Odds ratios were interpreted as a measure of effect size.

Limitations

Several limitations should be taken into consideration when interpreting our findings. First, missing high school data in the BPS dataset limited our analysis to students aged 24 or younger. As a result, the findings cannot be assumed to be generalizable to older adult college students. In addition, separate models were not run for different groups of students (e.g., race/ethnicity, age groups) and it is unclear to what degree the models might vary between groups. Furthermore, we were not able to control for state-level variables thought to impact transfer, such as articulation policies. Although the BPS 12:14 data include an expanded set of college experiences, many college experiences were not captured and therefore could not be controlled for in our work. For example, we were not able to include students' classroom experiences or relationships with faculty or peers. Finally, the non-experimental design did not allow for an examination of cause and effect relationships and it was not possible to establish temporal antecedence for many of the BPS variables. For instance, we do not know if students co-enrolled at more than one institution before and/or after they formally transferred to another institution. As such, findings are limited to identifying (non-causal) relationships between variables and outcomes.

Table 1 Salient characteristics of students by outcome

Variable	Did not transfer, still enrolled (n = 6110)[a]	Withdrew from college (n = 2040)	Laterally transferred (n = 1040)	Reverse transferred (n = 980)
	% or *M*	% or *M*	% or *M*	% or *M*
Socio-demographic characteristics				
Race/ethnicity				
White	61.8	45.5	59.8	50.0
African American	9.3	22.4	17.9	18.9
Latinx	15.7	22.1	14.6	21.4
Asian American	7.9	3.0	4.1	4.2
Am. Indian, Hawaiian, Pacific Islander	< 1	1.9	< 1	1.1
Biracial	4.4	5.2	2.9	4.4
Socioeconomic status (SES)				
High	35.3	12.7	28.8	17.2
High middle	25.6	20.2	23.7	23.3
Low middle	20.9	28.3	23.3	28.2
Low	18.1	38.8	24.1	31.3
Gender				
Male	41.9	52.1	40.1	40.4
Female	58.1	47.9	59.9	59.6
Age	18.4 (*SD* .76)	19.1 (*SD* .1.38)	18.4 (*SD* .81)	18.6 (*SD* .92)
First-generation student	10.7	24.0	13.7	18.6
Parental education level				
Graduate school	30.7	12.2	25.5	15.0
Bachelor's degree	28.0	17.6	27.2	20.5
Some college	23.4	31.7	25.9	34.3
High school	13.4	30.7	16.8	24.8
Less than high school	4.6	7.8	4.6	5.4

Table 1 (continued)

Variable	Did not transfer, still enrolled (n = 6110)[a]	Withdrew from college (n = 2040)	Laterally transferred (n = 1040)	Reverse transferred (n = 980)
	% or *M*	% or *M*	% or *M*	% or *M*
Pre-college experiences				
High school GPA				
3.5 to 4.0	36.1	16.6	23.7	14.6
3.0 to 3.4	41.5	32.4	42.5	38.0
2.5 to 2.9	11.3	15.7	15.8	20.2
2.0 to 2.4	9.4	24.9	14.6	21.3
Less than 2.0	1.8	10.4	3.5	6.0
Highest math class in high school				
Pre-calculus or calculus	64.5	39.2	52.3	46.3
Trigonometry	11.5	7.2	14.1	11.6
Algebra II	17.5	35.7	23.5	29.7
Less than Algebra II	6.5	17.9	10.1	12.3
Financial and support factors				
Work commitments				
Did not work	65.6	67.1	70.6	66.5
20 hr per week or less	22.8	9.4	14.2	11.2
More than 20 h	11.6	23.5	15.2	22.3
Distance from home	216.9 (*SD* 447)	214.9 (*SD* = 480)	232.9 (*SD* 507)	179.0 (*SD* 390)
Dependency status				
Dependent	96.0	81.0	93.5	90.1
Independent	4.0	19.0	6.5	9.9
Net price as % of income	26.4 (*SD* 27.9)	40.9 (*SD* 37.2)	29.3 (*SD* 28.2)	34.8 (*SD* 31.4)
Other financial support	17.4	13.8	16.0	16.6
Social capital	4.5 (*SD* .84)	4.2 (*SD* 1.07)	4.4 (*SD* .94)	4.3 (*SD* 1.1)

Table 1 (continued)

Variable	Did not transfer, still enrolled (n = 6110)[a]	Withdrew from college (n = 2040)	Laterally transferred (n = 1040)	Reverse transferred (n = 980)
	% or *M*	% or *M*	% or *M*	% or *M*
Motivation				
Highest degree expected				
Doctoral or professional degree	25.2	13.7	22.1	16.9
Master's degree	41.8	32.5	39.7	30.8
Bachelor's degree	33.1	53.8	38.2	52.3
Self-efficacy	4.5 (*SD* .76)	4.0 (*SD* 1.18)	4.2 (*SD* 1.10)	3.8 (*SD* 1.24)
Institutional supports				
Advising services in first year	80.4	57.4	73.2	64.4
Academic services in first year	45.0	32.7	41.8	36.7
Career services in first year	20.7	18.5	18.4	16.5
Early college experiences				
Engagement	4.1 (*SD* 1.04)	3.9 (*SD* 1.25)	3.5 (*SD* 1.37)	3.6 (*SD* 1.36)
Sense of belonging	4.3 (*SD* .94)	3.9 (*SD* 1.26)	3.6 (*SD* 1.30)	3.7 (*SD* 1.31)
Enrollment intensity				
Always full-time	77.5	63.8	71.1	51.6
Mixed	22.1	26.4	28.3	45.8
Always part-time	< 1	9.8	< 1	2.5
In-state attendance	69.8	75.5	66.2	76.2
Took developmental courses	13.2	20.7	15.8	21.3
First-year GPA	3.1 (*SD* .65)	2.5 (*SD* .97)	2.8 (*SD* .80)	2.4 (*SD* .95)
Co-enrollment	7.8	2.9	16.0	12.3
Institutional context and characteristics				
Control				
Public	43.9	25.1	35.6	33.4

Table 1 (continued)

Variable	Did not transfer, still enrolled (n = 6110)[a]	Withdrew from college (n = 2040)	Laterally transferred (n = 1040)	Reverse transferred (n = 980)
	% or *M*	% or *M*	% or *M*	% or *M*
Private not-for-profit	43.2	17.5	41.4	29.4
Private for-profit	12.8	57.4	23.0	37.2
Student cost	$34,022.49 (*SD* 12,145.64)	$23,840.63 (*SD* 12,578.47)	$31,316.22 (*SD* 12,859.12)	$27,409.06 (*SD* 11,587.71)
Urbanicity				
City	61.2	60.2	58.1	59.8
Suburb	20.5	23.9	22.3	21.0
Town	14.5	9.3	13.5	12.4
Rural	3.9	6.6	6.1	6.8
% Students of color	19.9 (*SD* 18.3)	29.7 (*SD* 21.5)	24.4 (*SD* 22.6)	27.1 (*SD* 21.5)
Enrollment size	15,034 (*SD* 21,516)	20,417 (*SD* 57,678)	14,321 (*SD* 35,362)	15,566 (*SD* 42,722)
Institutional selectivity				
Very selective	35.5	8.7	23.2	11.9
Moderately selective	41.7	17.1	39.1	38.8
Minimally selective	16.2	44.4	24.8	34.8
Open admission	6.7	29.9	12.9	14.5

**Source* U.S. Department of Education, National Center for Education Statistics, 2011–2012 Beginning Postsecondary Students Longitudinal Study (BPS:12/14)

Sample includes 11,170 students who began their college experiences at 930 bachelor's granting institutions

[a]Data are rounded to the nearest 10th per IES guidelines

Table 2 Predictors of reverse transfer, lateral transfer and withdrawal among students who began college at a bachelor's granting institution (*weighted)

	Reverse transfer		Lateral transfer		Withdrew from college	
	Coef. (SE[a])	Odds ratio	Coef. (SE)	Odds ratio	Coef. (SE)	Odds ratio
African American	− .026 (.136)	–	.181 (.130)	–	.156 (.114)	–
Latinx	− .238 (.127)	–	− .294* (.124)	.745	− .189 (.108)	–
Asian American	− .283 (.196)	–	− .644*** (.186)	.525	− .439** (1.78)	.645
Native Indian, Hawaiian or Pacific Islander	.068 (.383)	–	− .156 (.417)	–	.152 (.293)	–
Biracial	− .501* (.217)	.606	− 592** (.217)	.553	− .023 (.165)	–
High middle income	.135 (.127)	–	− .069 (.106)	–	.075 (.112)	–
Low middle income	.295* (.133)	1.342	.031 (.117)	–	.204 (.116)	–
Low income	.252 (.158)	–	.152 (.141)	–	.291* (.134)	1.338
Female	.181* (.087)	1.198	.097 (.080)	–	− .262*** (.073)	.769
Age	− .124* (.052)	.883	− .115* (.053)	.891	.098** (.037)	1.103
First generation	.003 (.161)	–	− .226 (.173)	–	.042 (.130)	–
Parents bachelor's degree	.018 (.133)	–	.012 (.104)	–	− .013 (.113)	–
Parents some college	.368** (.130)	1.444	− .119 (.114)	–	.139 (.112)	–
Parents completed HS	.424* (.174)	1.528	− .203 (.172)	–	.238 (.145)	–
Parents did not graduate HS	− .262 (.240)	–	− .443 (.234)	–	− .098 (.187)	–
3.0 to 3.4 HS GPA	.285* (.119)	1.330	.187 (.097)	–	− .023 (.098)	–
2.5 to 2.9 HS GPA	.517*** (.142)	1.677	.340** (.13)	1.404	− .017 (.125)	–
2.0 to 2.4 HS GPA	.249 (.150)	–	.030 (.146)	–	− .010 (.123)	–
Less than 2.0 HS GPA	.308 (.234)	–	.260 (.245)	–	.389* (.178)	1.476
Trigonometry	.066 (.133)	–	.278* (.115)	1.320	− .204 (.125)	–
Algebra II	.125 (.104)	–	.144 (.101)	–	.142 (.088)	–
Less than Algebra II	.075 (.149)	–	.279 (.143)	–	.036 (.119)	–
Worked 20 h or less	− .492*** (.124)	.611	− .499*** (.112)	.607	− .343*** (.104)	.710
Worked more than 20 h	.221* (.108)	1.247	− .106 (.112)	–	.049 (.092)	–
Dependent	− .135 (.188)	–	− .224 (.197)	–	− .109 (.143)	–

Table 2 (continued)

	Reverse transfer		Lateral transfer		Withdrew from college	
	Coef. (SE[a])	Odds ratio	Coef. (SE)	Odds ratio	Coef. (SE)	Odds ratio
Distance from home	− .000 (.000)	–	–	–	.000 (.000)	–
Net price	.002 (.002)	–	− .001 (.002)	–	.003* (.001)	1.003
Family financial support	− .083 (.111)	–	.102 (.103)	–	− .060 (.096)	–
Social capital	.035 (.045)	–	.022 (.043	–	− .053 (.038)	–
Expects graduate degree	− .089 (.120)	–	− .002 (.100)	–	− .006 (.102)	–
Expects bachelor's degree	.235* (.118)	1.265	− .058 (.107)	–	.043 (.104)	–
Self-efficacy	− .324*** (.045)	.723	− .098* (.045)	.907	− .214*** (.041	.807
Advising services	− .351*** (.095)	.704	− .106 (.093)	–	− .286*** (.080)	.751
Academic services	− .016 (.089)	–	.028 (.080)	–	-.002 (.076)	–
Career services	.017 (.110)	–	− .005 (.098)	–	.080 (.091)	–
Engagement	− .099 (.051)	–	− .222*** (.046)	.801	.060 (.047)	–
Sense of belonging	− .187*** (.055)	.829	− .288*** (.050)	.750	− .215*** (.049)	.807
Mixed enrollment	.768*** (.091)	2.156	.007 (.092)	–	− .140 (.086)	
Part-time enrollment	1.176*** (.346)	3.241	− .552 (.532)	–	1.653*** (.261)	5.224
Instate enrollment	.141 (.116)	–	.331*** (.099)	1.392	.012 (.104)	–
Developmental courses	.085 (.107)	–	.094 (.110)	–	.073 (.092)	–
First-year GPA	− .001*** (.001)	.991	− .003*** (.001)	.997	− .009*** (.000)	.992
Co-enrolled	.420** (.136)	1.521	.986*** (.117)	2.680	− .216 (.173)	–
Private not-for-profit	.887*** (.133)	2.427	.728*** (.134)	2.070	.891*** (.134)	2.440
Private for-profit	.934*** (.167)	2.544	.615*** (.180)	1.850	1.520*** (.154)	4.573
Student cost	− .000*** (.000)	.999	− .000*** (.000)	.999	− .000*** (.000)	.999
Enrollment size	.000 (.000)	–	.000 (.000)	–	.000 (.000)	–
Suburb	.058 (.116)	–	.061 (.117)	–	.062 (.110)	–
Town	.090 (.139)	–	.06 (.139)	–	.082 (.136)	–

Table 2 (continued)

	Reverse transfer		Lateral transfer		Withdrew from college	
	Coef. (SE[a])	Odds ratio	Coef. (SE)	Odds ratio	Coef. (SE)	Odds ratio
Rural	.185 (.191)	–	.314 (.199)	–	− .156 (.188)	–
Exposure to diversity	.000 (.002)	–	.001 (.003)	–	− .000 (.002)	–
Moderately selective	.601*** (.140)	1.824	.223 (.127)	–	.041 (.138)	–
Minimally selective	.653*** (.183)	1.922	.588*** (.173)	1.800	.698*** (.170)	2.009
Open admission	.561** (.204)	1.753	.772*** (.196)	2.165	1.205*** (.177)	3.336

*BPS panel weights used to account for complex survey design

***Source* U.S. Department of Education, National Center for Education Statistics, Beginning Postsecondary Students Longitudinal Study (BPS:12/14)

[a]Standard errors adjusted using balanced repeated replication (BRR) methods

*p < .05; **p < .01; ***p < .001

Results

The following section provides a summary of findings. We begin by describing the salient characteristics and college experiences of students who initially enrolled at a bachelor's granting institution who subsequently persisted and did not transfer, reverse transferred to a technical/community college, laterally transferred to another baccalaureate-granting institution, or withdrew from college altogether before the third year (RQ1). Next, we provide HGLM findings for our model predicting withdrawal, reverse transfer, and lateral transfer (RQ2). The full sets of descriptive and regression findings are presented in Tables 1 and 2.

Salient Student Characteristics and Experiences by Outcome

As shown in Table 1, meaningful and often significant differences were shown between the socio-demographic and pre-college characteristics of a national sample of students who (1) did not transfer, (2) withdrew from college, (3) laterally transferred, and (4) reverse transferred before the third year of college. To begin, female-identifying students represented a higher proportion of students who did not transfer and who reverse and laterally transferred (about 60% of each group). At the same time, a slightly higher percentage of males (52%) were shown to withdrawal from college [X^2 (3, *10,163*) = 76.13, $p = .001$]. As hypothesized, students who did not transfer or who laterally transferred were disproportionately White, as compared to students who withdrew from college or transferred and were more likely to identify as non-White [X^2 (15, *10,163*) = 459.56, $p = .001$]. For instance, 44% of students who withdrew, 40% who reverse transferred, and 33% who laterally transferred were African American or Latinx compared to only 24% of students who did not transfer. Similar and expected differences also were shown in outcomes between students of different socio-economic status [X^2 (9, *10,163*) = 682.68, $p = .001$], with higher percentages of low-middle or low-income and first-generation college students reverse transferring (59%), laterally transferring (47%), or withdrawaling (67%) than students who did not transfer (39%). Sizable differences were also found with regard to students' pre-college academic experiences and grades across the four outcome groups. For instance, a disproportionately high percentage of students who withdrew from college or who reverse transferred had high school GPAs lower than 2.5 (i.e., 35% of students who withdrew and 27% of reverse transfers compared to just 11% of students who did not transfer) [X^2 (12, *10,163*) = 982.49, $p = .001$]. Likewise, students who had taken less advanced mathematics coursework during high school were shown to be disproportionately likely to withdrawal or transfer, with the highest proportion of students who completed Algebra II or lower being shown to withdrawal and reverse transfer [X^2 (9, *10,163*) = 693.96, $p = .001$]. As expected, students who withdrew from college or reverse transferred enrolled in developmental coursework at greater rates in college [X^2 (3, *10,163*) = 89.79, $p = .001$] and had lower mean first-year college GPAs than students who did not transfer or who laterally transferred [F (3, 10,159) = 529.35, $p = .001$].

Descriptive findings specific to students' financial and support factors told a similar story. As hypothesized, among students who reverse transferred or withdrew from college, a higher percentage of students who worked did so more than 20 hr per week (22% and 25%) when compared to students who did not transfer (12%) or who laterally transferred (15%) [X^2 (6, *10,163*) = 368.93, $p = .001$]. Unexpectedly, however, around two thirds of students in all outcome groups did not work (range = 66 to 71%). In addition, students who withdrew from college were less likely to receive financial support from family or

friends but also had the highest net cost (as a percentage of students' income; 41%), on average, when compared to students who reverse (35%) or laterally (29%) transferred [F (3, 10,159) = 316.83, $p = .001$].

In terms of familial and peer support, students who did not transfer were shown to live a similar distance from home compared to students who withdrew. However, on average, students who reverse transferred enrolled at a college closer to home ($M = 179$, $SD = 390$ miles) and students who laterally transferred first enrolled at an institution that was further from home ($M = 232$, $SD = 507$ miles). This difference was not statistically significant though [F (3, 10,159) = 2.604, $p = .050$]. Interestingly, all outcome groups reported similar amounts of social capital (i.e., support from friends), with students who did not transfer reporting higher levels of social capital when compared to other outcome groups [X^2 (12, *10,163*) = 206.49, $p = .001$].

Regarding educational motivation and degree expectations, approximately two-thirds (67%) of students who did not transfer or who laterally transferred expected to earn a graduate degree compared to less than half of students who reverse transferred or withdrew [X^2 (6, *10,163*) = 364.44, $p = .001$]. Significant differences were also found across outcomes with regard to students' self-efficacy [X^2 (12, *10,163*) = 672.67, $p = .001$]. On average, students who did not transfer had higher levels of self-efficacy when compared to all other groups ($M = 4.5$, $SD = .76$), while students who reverse transferred were shown to have the lowest levels of self-efficacy ($M = 3.8$, $SD = 1.24$), even when compared to students who withdrew from college ($M = 4.0$, $SD = 1.18$).

Concerning early college experiences and institutional supports, a higher percentage of (80%) of students who did not transfer reported receiving advising services in the first year compared to students who laterally (73%) or reverse (64%) transferred or to students who withdrew (57%) [X^2 (3, *10,163*) = 464.56, $p = .001$]. However, a relatively small percentage of students across all outcome groups were shown to receive career services during the first year, with similar proportions of students in each group receiving services (17% to 21%) [X^2 (3, *10,163*) = 13.093, $p = .004$]. As predicted, greater rates of students who reverse transferred or who withdrew enrolled exclusively full time, with withdrawn students having the highest percentage of exclusively part-time enrollment and students who reverse transferred having the highest percentage of students enrolled in a combination of full- and part-time enrollment [X^2 (6, *10,163*) = 854.65, $p = .001$]. Two of the most notable differences were found with regard to students' self-reported engagement [X^2 (12, *10,163*) = 449.56, $p = .001$] and sense of belonging [X^2 (12, *10,163*) = 549.95, $p = .001$]. Unsurprisingly, students who did not transfer reported, on average, higher levels of engagement and belonging on campus when compared to students who transferred or withdrew. Furthermore, a higher percentage of students who transferred were shown to enroll in more than one institution during a given term (i.e., 16% of lateral transfers and 12% of reverse transfers) when compared to students who did not transfer (8%) or among those who withdrew (3%) [X^2 (3, *10,163*) = 184.02, $p = .001$].

Differences also were found in the context and characteristics of the bachelor's granting institutions attended by students. The most striking difference was among students who withdrew, with 57% of those students withdrawaling from a private, for-profit institution (compared to only 13% of students who persisted and did not transfer) [X^2 (6, *10,163*) = 1720.02, $p = .001$]. On average, students who did not transfer or who transferred laterally enrolled at more expensive institutions ($M =$ \$34,022 and \$31,316 respectively) when compared to students who reverse transferred ($M =$ \$27,409) or who withdrew ($M =$ \$23,841), though there was large variation across all groups [F (3, 10,159) = 316.83, $p = .001$]. Relatedly, the large majority (77%) of students who did not transfer first enrolled

at very or moderately selective institutions compared to just 25% of students who withdrew, 51% who reverse transferred, and 62% who laterally transferred [X^2 (9, *10,163*) = 1963.41, $p = .001$]. Finally, it is notable that, compared to students who did not transfer, students in the transfer and withdrawal groups were found to attend institutions that enrolled a higher percentage of African American and Latinx students [F (3, 10,159) = 143.60, $p = .001$]. Students who withdrew also attended, on average, the largest institutions ($M = 20{,}417$) as compared to other groups who attended somewhat smaller institutions that enrolled around 15,000 students [F (3, 10,159) = 12.94, $p = .001$].

Predictors of Reverse Transfer, Lateral Transfer and Withdrawal

Findings from the unconditional model indicated that the odds of reverse transfer, lateral transfer, and withdrawal from postsecondary education varied significantly across institutions ($p < .001$), verifying the appropriateness of the HGLM analysis. Results from each model are outlined in the following sub-sections.

Predictors of Reverse Transfer

As hypothesized, a combination of socio-demographic characteristics, pre-college experiences, supports, motivations, college experiences, and institutional variables were shown to be significantly related to the odds of students reverse transferring to a technical or community college before the third year of college. To begin with, identifying as biracial, low-middle income, and/or female were all shown to significantly increase students' odds of reverse transfer. Specifically, biracial students had lower odds of reverse transfer when compared to White students ($p < .05$) and female students had higher odds of reverse transfer when compared to males ($p < .05$, odds ratio = 1.198). Also, low-middle income students were found to have significantly higher odds of reverse transfer when compared to high-income students ($p < .05$, odds ratio = 1.342). Age was shown to be significantly and inversely related to reverse transfer, meaning that students who were older had decreased odds of reverse transfer ($p < .05$). Additionally, parental education was shown to be positively related to reverse transfer as students who had parents with a high school diploma ($p < .05$, odds ratio = 1.528) or some college ($p < .01$, odds ratio = 1.444) had higher odds of reverse transfer when compared to students with parents who held a graduate degree.

In terms of pre-college and college experiences and financial supports and motivations, students who had high school GPAs between 2.5 and 2.9 ($p < .001$, odds ratio = 1.677) and 3.0 to 3.4 ($p < .01$, odds ratio = 1.330) had increased odds of reverse transfer when compared to students with top high school grades (i.e., GPA 3.5 or higher). Working less than 20 hr per week was shown to be related to lower odds of reverse transfer ($p < .001$) but working more than 20 hr per week increased these odds ($p < .05$, odds ratio = 1.247). Importantly, having lower degree expectations also significantly increased the odds of reverse transfer ($p < .05$, odds ratio = 1.265). Self-efficacy, sense of belonging, and advising were all shown to be significantly related to reverse transfer. Specifically, students with higher self-efficacy ($p < .001$) and/or sense of belonging ($p < .001$) and students who received academic advising support had significantly lower odds of reverse transfer ($p < .001$). Mixed enrollment ($p < .001$, odds ratio = 2.156) and part-time enrollment ($p < .001$, odds ratio = 3.241) were shown to increase students' odds of reverse transfer when compared to enrolling exclusively full-time. As expected, academic performance as measured by GPA in the first year was also related to reverse transfer, with students with

higher grades being less likely to reverse transfer ($p < .001$). Also students who co-enrolled at more than one institution in a given term at some point before the third year of college had significantly higher odds of reverse transfer ($p < .01$, odds ratio = 1.521).

Finally, in terms of institutional characteristics, control, cost, and selectivity were shown to be significantly related to reverse transfer. Students who enrolled at for-profit ($p < .001$, odds ratio = 2.544) or private not-for-profit ($p < .001$, odds ratio = 2.427) institutions had higher odds of reverse transfer when compared to students who enrolled at public institutions. Higher college costs were shown to be related to reverse transfer, with students attending more expensive institutions being less likely to reverse transfer ($p < .001$). Finally, when compared with students attending selective colleges, students attending moderately selective ($p < .001$, odds ratio = 1.824), minimally selective ($p < .001$, odds ratio = 1.922), and open admission ($p < .01$, odds ratio = 1.753) colleges had higher odds of reverse transfer.

Predictors of Lateral Transfer

Numerous demographic characteristics, experiences, supports, motivational factors, and institutional variables were found to be significantly related to lateral transfer (compared to students who remain enrolled but who did not transfer). Asian American ($p < .001$), biracial ($p < .01$), and/or Latinx students ($p < .05$) were all less likely than White-identifying students to laterally transfer to another bachelor's granting institution before the third year of college. Similar to the reverse transfer model, students' age was shown to be inversely related to lateral transfer ($p < .05$). When compared to students who had a high school GPA of 3.5 or higher, students who had a GPA between 2.5 and 2.9 were shown to have increased odds of lateral transfer ($p < .01$, odds ratio = 1.404). Similarly, students who took trigonometry as their highest math course in high school were shown to have higher odds of lateral transfer when compared to students who completed pre-calculus or calculus ($p < .05$, odds ratio = 1.320).

In terms of financial and other supports, working 20 or fewer hours per week was shown to decrease the odds of lateral transfer ($p < .001$) when compared to not working at all. Students' self-efficacy was found to decrease the odds of lateral transfer ($p < .05$), while students who reported feeling engaged and who reported a strong sense of belonging also showed decreased odds of lateral transfer ($p < .001$). Students who attended in-state colleges were shown to have higher odds of lateral transfer ($p < .001$, odds ratio = 1.392). In contrast, having a higher first year college GPA was found to decrease students' odds of lateral transfer ($p < .001$). As expected, students who co-enrolled at some point before year three had higher odds of lateral transfer ($p < .001$, odds ratio = 2.680). Similarly, students who began college at private non-profit institutions ($p < .001$, odds ratio = 2.070) and for-profit institutions ($p < .001$, odds ratio = 1.850) had higher odds of lateral transfer. Similar to the reverse transfer model, higher college costs were shown to be inversely related to lateral transfer, with students attending more expensive institutions being less likely to laterally transfer ($p < .001$). Compared with students attending selective colleges, students attending minimally selective ($p < .001$, odds ratio = 1.800) and open admission ($p < .01$, odds ratio = 2.165) colleges had higher odds of lateral transfer.

Predictors of Withdrawal from College

A somewhat similar and yet meaningfully different set of variables were shown to be significantly related to students' decisions to withdrawal from all postsecondary education (compared to persisting and not transferring before the third year). When compared to White students, Asian-American students were found to have lower odds of withdrawaling ($p < .01$). Similarly, compared to high-income students, low-income students had significantly higher odds of withdrawaling from college ($p < .05$, odds ratio = 1.338). In contrast to the transfer models, female-identifying students were shown to have lower odds of withdrawal ($p < .001$) when compared to male students. Also, different from the transfer models, students' age was shown to be positively related to the odds of withdrawal ($p < .01$, odds ratio = 1.103). Students who had a high school GPA lower than 2.0 were also shown to have increased odds of withdrawaling ($p < .05$, odds ratio = 1.476). Notably, first generation status and parental education were not significantly related to withdrawal from college.

In terms of supports, when compared to not working, students who worked part-time were found to be less likely to withdrawal from college ($p < .001$). In contrast to the transfer models, the net price of college was shown to increase students' odds of withdrawaling ($p < .05$, odds ratio = 1.003). However, similar to the transfer models, both students' self-efficacy and academic advising services were found to be inversely related to dropout behavior ($p < .001$). Additionally, students who reported a higher sense of belonging in college were less likely to withdrawal ($p < .001$). Importantly, part-time attendance (in comparison to enrolling exclusively full-time) was shown to significantly increase the odds of withdrawaling from college ($p < .001$, odds ratio = 5.224). Consistent with the transfer models, students' first year GPA was found to be inversely related to withdrawal, with students with higher GPAs having lower odds of dropping out ($p < .001$). Attendance at private institutions, including for-profits, was also associated with significantly higher odds of withdrawal ($p < .001$, odds ratio = 2.440 for non-profits and $p < .001$, odds ratio = 4.573 for for-profit institutions). Aligned with the transfer models, higher college costs were shown to be inversely related to withdrawal, with students attending more expensive institutions being less likely to withdrawal ($p < .001$). Finally, attending a minimally selective or open admissions college was shown to increase the odds that students would withdrawal from college before the third year ($p < .001$, odds ratio = 2.009 for minimally selective, $p < .001$, odds ratio = 3.336 for open admissions).

Discussion and Conclusions

An understanding of transfer behaviors among students who first enroll at a bachelor's granting institution is of critical importance to retention and graduation rates at bachelor's granting colleges and universities across the country. Unfortunately, with few exceptions, retention research has failed to distinguish between students who transfer to another college from those who drop out of college altogether (Johnson & Muse, 2012), leaving higher education institutions without evidence or best practices to guide efforts to identify and retain students who are likely to transfer. Colleges and universities are facing mounting pressure to increase retention and graduation rates to meet national and state degree-completion goals (DeAngelo et al., 2011). In many states, this pressure is tied directly to performance funding that in some cases penalizes or withholds funding from institutions that are not able to retain and/or graduate a sufficient number of students (McLendon & Hearn,

2013). Moreover, retaining students at bachelor's granting institutions may be interrelated with an institution's values and goals related to equity and social justice, as research has shown that underserved student groups are more likely to withdrawal or to reverse transfer (Goldrick-Rab & Pfeffer, 2009).

Our study is one of the first to identify and compare the salient characteristics and college experiences of students who reverse transfer, laterally transfer, or withdrawal from college after first enrolling at a bachelor's granting institution. Descriptive findings bring attention to systemic inequities related to transfer that are present that align with the college persistence literature (e.g., Núñez & Crisp, 2012, 2012Goldrick-Rab & Pfeffer, 2009; Ishitani, 2006; Lopez Turley, 2009; Núñez & Crisp, 2012; Titus, 2004). For example, the descriptive profile of students who withdrew from postsecondary education was shown to look similar in many ways to students who reverse transferred. African American, Latinx, low-income, and first-generation students were overrepresented in both outcome groups when compared to the students who did not transfer or who laterally transferred. Our findings align with previous research noting the disparities in reverse transfer outcomes for these demographic groups (Crisp et al., 2020) and underscore previous studies that found low-income students to withdrawal at inequitable rates (Xu, 2015). Because previous research has shown that students who begin their college careers at bachelor's granting institutions are more likely to complete bachelor's degrees than students who begin at a community college (Lockwood Reynolds, 2012), it is especially concerning to note that African American, Latinx, and low-income students in this study reverse transferred from bachelor's granting institutions at higher rates than more privileged groups.

Likewise, students who reverse transferred and those who withdrew from college were found to be descriptively more likely to enroll in college having taken less rigorous math courses, to enroll in developmental education courses at higher levels, and/or to have lower high school grades when compared to students who did not transfer or who laterally transferred. In terms of financial supports, both students who dropped out and reverse transferred worked more hours and had a higher financial burden placed on them to pay for college (i.e., net college price) when compared to students in more favorable outcome groups. Moreover, students who reverse transferred or withdrew were both shown to enroll at institutions with a higher proportion of students of color and also disproportionately first enrolled at accessible colleges and universities when compared to students who did not transfer or who laterally transferred. These findings are both consistent with and add to previous research on transfer from bachelor's granting institutions (e.g., Goldrick-Rab & Pfeffer, 2009) as well as the broader persistence literature (e.g., Radford & Horn, 2013).

Findings also add to current understanding regarding the similarities and differences in the characteristics and experiences of students who do not transfer when compared to students who decide to laterally transfer to another bachelor's granting institution. Importantly, students who laterally transferred were shown to look in many ways descriptively similar to students who did not transfer. For example, both non-transfer and lateral transfer students were represented by a comparable percentage of White and female students. Also, both groups had comparable parental education levels, financial supports, social capital, and degree aspirations. On the other hand, it is notable that African American students were shown to be overrepresented among lateral transfers (i.e., only 9% of non-transfers and 18% of lateral transfers). Lateral transfer students were also found to attend colleges that are further from home when compared to both students who did not transfer as well as students who reverse transferred and withdrew. Relatedly, students who laterally transferred were found to be underrepresented among in-state students when compared to all other outcome groups.

Finally, and arguably most importantly, descriptive findings contribute by identifying salient characteristics of students who engage in both reverse and lateral transfer. On average, both reverse and lateral transfer students were found to have lower levels of engagement and belonging on campus when compared to students who did not transfer as well as to those who withdrew from college. Additionally, although the timing of co-enrollment is not known, it is interesting to note that students who transferred co-enrolled at higher rates when compared to both non-transfer groups.

Current findings are the first to test a conceptual model that brings together persistence and college choice theory and considers early college experiences in separately modeling both transfer and withdrawal from bachelor's granting institutions. Findings of the HGLM models advance our theoretical understanding of the ways in which predictors of reverse transfer, lateral transfer, and withdrawal from bachelor's granting institutions may be both similar and different. Consistent with prior research (e.g., Goldrick-Rab & Pfeffer, 2009; Hillman et al., 2008; Ishitani & Flood, 2018; Kalogrides & Grodsky, 2011; Sujitparapitaya, 2006), several student-level factors were shown to be significant predictors of both types of transfer and withdrawal, including working 20 h or less, students' grades, self-efficacy, and age. Interestingly, students' age was found to be inversely related to both reverse and lateral transfer but was positively related to withdrawal. In other words, as students' age increased, their odds of both reverse and lateral transfer decreased, whereas an increase in age (e.g., older students) was shown to increase the odds of students' withdrawaling from college. It should be noted that all students in this study were younger than 24 years old. As such, it is not clear whether this finding is generalizable to older students. Regardless, we feel that the finding is potentially important and warrants further exploration. In addition, we found students' sense of belonging to be positively related to all three outcomes. Although sense of belonging has been consistently shown to be predictive of persistence (e.g., Hu, 2011; Hurtado & Carter, 1997; Kuh et al., 2008), findings suggest that sense of belonging may also be meaningful to students' decisions to reverse and laterally transfer from bachelor's granting institutions.

The present study puts the complexity of transfer from bachelor's granting institutions in context by considering the role of institutional characteristics in explaining differences between bachelor's granting institutions in the chance of transfer or withdrawal. Three institutional variables that were shown to be significant across all models included selectivity, institutional control, and cost to students. Although prior research has identified a relationship between institutional exclusivity and lateral transfer (i.e., Goldrick-Rab & Pfeffer, 2009), our study is the first to identify selectivity as a predictor of reverse transfer. It is possible that elite colleges are able to offer additional resources and/or create a stronger sense of community, thereby reducing the odds of reverse transfer, lateral transfer, or withdrawal. Current findings also contribute by identifying a negative relationship between institutional control and transfer. Specifically, results of this study suggest that students attending private institutions have higher odds of withdrawal and transfer when compared to students who first enroll at public institutions. Given that the six-year bachelor's degree completion rate for first-time, full-time undergraduate students at bachelor's granting institutions has been shown to be around 25% at private for-profit institutions compared to a 61% graduation rate at public institutions (Hussar et al., 2020), this finding supports the idea that students who initially enroll at a for-profit institution have a greater likelihood of transfer or withdrawal before completing a bachelor's degree. Also, a college's price of attendance was shown to be negatively related to the odds of both forms of transfer and withdrawal. Although these findings may seem contradictory to expectations, we speculate that although students need to be able to afford their education (e.g., The Pell Institute,

2018), elite institutions may, on the whole, have more funding and resources available to students (e.g., scholarships, on-campus employment, comprehensive support services) that can help retain them. Additional research is needed to better understand the role of institutional characteristics in predicting transfer from bachelor's granting institutions.

Findings highlight the ways in which predicting reverse transfer may align with existing persistence models. Specifically, gender, advising services, and enrollment intensity were found to be significantly related to both reverse transfer and withdrawal from college (but not lateral transfer). Consistent with prior research (Hillman et al., 2008), females were shown to have increased odds of reverse transfer while males were shown to have higher chances of withdrawaling from college (U.S. Department of Education, 2020). Importantly, study findings suggest there is an inverse (albeit non-causal) relationship between receiving advising services and students' decisions to reverse transfer and withdrawal from college. Although the relationship between advising and persistence is well-documented (e.g., Kuh et al., 2008; Rendon, 1994), our study is the first to find a relationship between participating in advising services and students' decisions to transfer from a bachelor's granting institution to a community or technical college. Further, consistent with prior research (Goldrick-Rab & Pfeffer, 2009), findings indicate that students who attend college part-time are both more likely to reverse transfer and withdrawal from all postsecondary education.

Our study also makes theoretical contributions by identifying both unique and shared predictors of reverse and lateral transfer. To begin with, findings suggest that three factors, including parental education, working more than 20 hr per week, and students' degree aspirations, were uniquely related to reverse transfer. Although the relationship between degree aspirations and persistence is well-documented (e.g., Nora et al., 2006), it was still notable that students who aspired to earn a bachelor's degree (when compared to expecting to earn a graduate or professional degree) were shown to have increased odds of transferring from a bachelor's granting institution to a community or technical college. It is likely that some students may have identified a program or a certificate at a community college that offered the potential for a career with job security and high wages. However, we still feel that it is problematic that students (who were disproportionately students of color and low-income) would desire a bachelor's degree, start college at a bachelor's granting institution, and then decide to transfer to a college that does not award bachelor's degrees.

Finally, to our knowledge, our study is also the first to identify variables that uniquely predict lateral transfer, including in-state enrollment, net college cost, and students' level of engagement. Although prior research has documented the relationship between in-state enrollment and lateral transfer (Goldrick-Rab & Pfeffer, 2009; Hillman et al., 2008), we did not expect that college cost (as a percentage of students' income) would be found to be predictive of lateral transfer but not be related to reverse transfer, as previous research has shown financial aid to reduce any form of transfer (Ishitani & Flood, 2018). We also feel it is notable that engagement, defined as students' satisfaction with social experiences at the first institution, was shown to be inversely related to lateral transfer but was not significant in either of the other two models. Like our other findings, the relationship between engagement and lateral transfer is not necessarily causal. Regardless, we feel that this and other findings can offer implications for supporting retention efforts at bachelor's granting institutions.

Implications for Research and Practice

Findings from the present study offer several direct implications for scholars and bachelor's granting institutions seeking to identify and better serve students who have a high probability of transferring. First and foremost, findings highlight the complexity in predicting reverse and lateral transfer. Results suggest that transfer and withdrawal from college are conceptually different experiences and should be discussed, studied, and modeled separately. If bachelor's granting institutions want to retain students, they need to understand and be able to predict and distinguish between a student who is likely to drop out from one contemplating reverse or lateral transfer. As the findings of this study suggest, what is important or effective in supporting students will vary across students and groups. Institutions should be careful not to make assumptions about how and why students leave their institution. Specifically, we suggest that institutions utilize data from the National Student Clearinghouse to track students who transfer and to identify trends/patterns in characteristics and experiences of students who reverse or laterally transfer.

In particular, findings suggest that institutions would be well-served by giving more attention to identifying and learning from students who are likely to laterally transfer to another bachelor's granting institution. To be sure, lateral transfer is not necessarily a bad thing or an outcome to be avoided by all students. This is particularly true if/when students are not able to make a fully informed decision about their first institutional choice and/or when students find another bachelor's granting institution that is a better fit. However, lateral transfer, for whatever reason a student may choose it, represents a retention loss for institutions. For this reason alone, institutions should be aware as they admit students who may be more likely to laterally transfer. We argue that lateral transfer can also be problematic for both students and institutions in cases where students transfer because the institution does not make them feel valued and included. For instance, it is concerning that among a national sample, 18% of students who laterally transferred were African American compared to only 9% of African American students who did not transfer. Additionally, although the findings are not causal, it is notable that students' satisfaction with social experiences was found to predict lateral transfer but was not significant for reverse transfer or withdrawal. This finding underscores the ways in which institutional conditions may influence lateral transfer decisions; by improving student satisfaction with social experiences on campus, universities may be able to reduce the likelihood of lateral transfer.

Relatedly, although reverse transfer is certainly preferable to dropping out of college, we argue that, in most cases, transfer is likely to "cool out" students (Clark, 1960) and/or cost students who enroll in college with the explicit intention of earning a bachelor's degree time and money. Universities should consider reviewing student data on parental education, employment, and degree aspirations specifically in order to assess reverse transfer risks and to develop supportive programs and course offerings that match student needs. Additionally, institutions might consider the value of strong career-connected learning opportunities for students who seek to earn only a baccalaureate degree. Although additional study is needed, the findings presented here suggest that reverse transfer may be related to a student's decision to seek education with tangible, career-related outcomes. Institution- and state-level transparency about the career outcomes and return on investment for specific degrees may be helpful to student and university decision making.

With regard to both reverse and lateral transfer outcomes as well as attrition, researchers and practitioners need to give additional attention to conversations around credit loss.

For instance, according to a recent report by the U.S. Government Accountability Office (2017), students lose an average of 13 (or 43%) of credits when they transfer to another institution. This statistic has implications for institutional leaders who value diversity, equity, and inclusion, given descriptive findings that show students of color and low-income students reverse transfer at higher rates when compared to other groups. Additionally, transferring or withdrawaling students may leave "stranded credits" at an institution due to financial holds that prevent students from accessing transcripts. Issues related to stranded credits, which are estimated to affect 6.6 million Americans (Karon et al., 2020), result in credit loss for students and potential revenue loss for institutions. As with credit loss more generally, recent studies suggest that stranded credits impact adult learners, low-income students, and students of color disproportionately (Karon et al., 2020). Credit loss is especially complicated for students seeking to transfer from a for-profit institution, as fewer articulation agreements exist that enable transfer of for-profit credit. Findings from our study show that students who enroll at a for-profit institution have a greater likelihood of transfer or withdrawal before completing a bachelor's degree, and improvements to articulation of for-profit credits could prevent some of the consequences related to credit loss and stranded credits. Comprehensive hold reform at institutions would also support students who make the decision to reverse or laterally transfer, and larger systemic movements at the state and federal level to reduce student debt by making hold policies more equitable and reasonable are also likely to support students who choose to transfer.

Unfortunately, results of the present study seem to raise more questions than answers with regard to how and why students choose to reverse or laterally transfer. For instance, given descriptive inequities in race/ethnicity, in most cases racial/ethnic groups were not significant predictors in the models. We fully expect that some of the predictive power for groups (including African American students) was usurped by other variables in the model that had large effect sizes (e.g., part-time enrollment, institutional control, and selectivity). Additional research is warranted that can give more explicit attention to the role of race/ethnicity and other social identities including older adult students who could not be included in the current study in predicting lateral and reverse transfer. Similarly, findings point to an unexplored and potentially meaningful relationship between sense of belonging and transfer decisions that warrants the attention of both practitioners and transfer scholars.

In sum, we are hopeful that our study might provide a foundation for transfer scholars to begin developing separate yet related conceptual frameworks that can reliably predict how and why students decide to reverse and lateral transfer from bachelor's granting institutions. Advancing theoretical models will require a variety of methods and ideally bring together equity-minded researchers from related disciplines (e.g., psychology, sociology, economists) to address unanswered questions. As a starting place, we recommend qualitative research that documents reverse and lateral transfer students' voices and stories regarding early college experiences (e.g., engagement with social activities) that may have influenced students' decisions to transfer. We also recommend that, when possible, future research disaggregate transfer models by race/ethnicity, income, and age.

Appendix

Description of variables and measures

Construct/variable	Description and coding
Socio-demographic characteristics	
Race/ethnicity	RACE = student's race/ethnicity with Latinx origin as a separate category (0 = White*, 1 = African American, 2 = Latinx, 3 = Asian American, 4 = American Indian, Hawaiian and Pacific Islander, 5 = biracial)
Socioeconomic status (SES)	INCGRP = income group in 2012 (0 = high*, 1 = high middle, 2 = low middle, 3 = low)
Gender	GENDER = student's gender; Binary variable coded 0 as male*, 1 as female
Age	AGE = student's age as of 12/31/2011 (range 18–23, $M = 18.6$)
First generation status	FRSTCOL = indicates whether the respondent was first in immediate family to attend college (binary variable coded 0 for continuing-generation college students* and 1 when neither parent attended college)
Parent education level	PAREDUC = highest level of education achieved by either parent of the student as of 2011–2012 (0 = graduate school*, 1 = completed bachelor's degree, 2 = some college or technical training, 3 = completed high school, 4 = less than high school)
Pre-college experiences	
High school GPA	HSGPA = indicates the student's high school grade point average (GPA) as of the standardized test date; categorical variable representing a range of high school GPA (3.5 to 4.0* = 0, 3.0 to 3.4 = 1, 2.5 to 2.9 = 2, 2.0 to 2.4 = 3, less than 2.0 = 4)
Rigorous math courses	HCMATHHI = highest level of math completed or planned to take; 3-category variable indicating the highest mathematics course taken during high school (0 = pre-calculus or calculus*, 1 = trigonometry, 2 = Algebra II, 3 = less than Algebra II)
Financial and support factors	
Work commitments	HRSWK12 = average hours the respondent worked per week in all paid jobs; 2-category variable representing the average number of hours worked during the first year of college (0 = did not work*, 1 = 20 h or less working, 2 = worked more than 20 hr per week)
Dependency status	DEPEND = dependency status in 2011–2012; Binary variable coded 0 when student was classified as a dependent* and 1 when student was classified as independent in 2011–2012
Net price	EFFORT20 = Net price after grants and loans as percent of income 2011–2012 (range 0 to 100%, $M = 30.4$, $SD = 30.9$)

Construct/variable	Description and coding
Distance from home	Distance of first institution from student's home (in miles) in 2011–2012 ($M = 214$, $SD = 455$)
Financial support	FAMHELP = student's family or friends helped pay for education and living expenses in 2011–2012 (0 = yes*, 1 = no)
Social support	FHSUPP = friends from home 2011–2012 were supportive of postsecondary education (Likert scale item treated as a continuous variable 1 = strongly disagree, 2 = somewhat agree, 3 = neither disagree nor agree, 4 = somewhat agree, 5 = strongly agree) (range 1 to 5, $M = 4.4$)
Motivation	
Degree expectations	HIGHLVEX = highest level of education that the student ever expects to complete in 2011–2012; categorical variable representing student's highest degree expectation in 2011–2012 (0 = expected to earn a doctoral or professional degree*, 1 = expected to earn a post BA or master's degree, 2 = bachelor's degree)
Self-efficacy	CURCONF = respondent's confidence in academic success in 2012 (Likert scale item treated as a continuous variable 1 = strongly disagree, 2 = somewhat agree, 3 = neither disagree nor agree, 4 = somewhat agree, 5 = strongly agree) (range 1 to 5, $M = 4.3$)
Early college experiences and institutional supports	
Support services	USEACAD = whether the respondent used academic advising in 2011–2012 (0 = yes*, 1 = no) USEACSP = whether the respondent used academic services in 2011–2012 (0 = yes*, 1 = no) USECPP = whether the respondent used career services in 2011–2012 (0 = yes*, 1 = no)
Engagement	SOCSATIS = satisfaction with social experience at first institution in 2012 (Likert scale item treated as a continuous variable 1 = strongly disagree, 2 = somewhat agree, 3 = neither disagree nor agree, 4 = somewhat agree, 5 = strongly agree) (range 1 to 5, M = 3.9)
Sense of belonging	BELONG = degree to which student felt part of the institution in 2012 2012 (Likert scale item treated as a continuous variable 1 = strongly disagree, 2 = somewhat agree, 3 = neither disagree nor agree, 4 = somewhat agree, 5 = strongly agree) (range 1 to 5, M = 4.1)
Enrollment intensity	ENINPT3Y = pattern of enrollment intensity for all months enrolled between July 2011 and June 2014 (0 = always full-time*, 1 = mixed enrollment, 2 = always part-time)
In-state attendance	SAMESTAT = attend institution in state of legal residence in 2011–2012 (0 = in-state student*, 1 = international or out of state student)

Construct/variable	Description and coding
Developmental courses	REMETOOK = remedial courses took in 2011–2012; (0 = did not enroll in remedial/developmental coursework in 2011–2012* or 1 = enrolled in one or more developmental courses)
First-year GPA	GPA = student's cumulative grade point average in 2011–2012 (range 0 to 4.00, *M* = 2.90)
Co-enrollment	ENCOEN3Y = whether the respondent ever simultaneously enrolled at more than one institution for at least one month through June 2014 (0 = yes*, 1 = no)
Institutional context and characteristics	
Control	FCONTROL = indicates the control of first institution respondent attended in 2011–2012 (1 = public*, 2 = private not-for-profit, 3 = private for-profit)
Student cost	BUDGETAJ = price of attendance or total student budget (attendance adjusted) at the first institution in 2011–2012 (range = 2729 to 105,550, *M* = 31,067)
Urbanicity	LOCALE = degree of urbanization in which the first institution is located (1 = city*, 2 = suburb, 3 = town, 4 = rural)
% Students of color	Composite variable created from an average of PCTENRBK (percent of student body who identify as Black) and PCTENRHS (percent who identify as Latinx) in 2011–2012
Enrollment size	Enrollment size of first institution in fall 2011–2012 (*M* = 16,090, *SD* = 35,396)
Institutional selectivity	SELECTV2 = indicates the level of selectivity of the first institution attended in 2011–2012 (1 = very selective*, 2 = moderately selective, 3 = minimally selective, 4 = open admission
Outcome variables	
Reverse transferred	Dichotomous outcome with the following categories: (0) did not transfer and still enrolled until the third year of college*, (1) reverse transferred to a community college or technical college (used IPEDS variables TFTYPE3Y and PROUTF3Y)
Lateral transferred	Dichotomous outcome with the following categories: (0) did not transfer and still enrolled until the third year of college*, (1) laterally transferred to another bachelor's granting institution (used IPEDS variables TFTYPE3Y and PROUTF3Y)
Withdrawl from college	Dichotomous outcome with the following categories: (0) did not transfer and still enrolled until the third year of college*, (1) withdrew from college (used IPEDS variables TFTYPE3Y and PROUTF3Y)

*Reference category

***Source* U.S. Department of Education, National Center for Education Statistics, 2011–2012 beginning postsecondary students longitudinal study, First Follow-up (BPS:12/14)

***References: Astin (1999), Aulck and West (2017), Goldrick-Rab (2006), Goldrick-Rab and Pfeffer (2009), Hillman et al. (2008), Hurtado and Carter (1997), Ishitani (2006), Nora et al. (2006; Núñez & Crisp, 2012), Perna (2006), Sujitparapitaya (2006), Tinto (1993)

Declarations

Conflict of interest We have no known conflict of interest to disclose.

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