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Does Posttransfer Involvement Matter for Persistence of Community College Transfer Students?

Hyekyung Lee^a and Tetyana Schneider^b

^aInstitutional Research and Effectiveness, Community College of Aurora, Aurora, Colorado, USA; ^bStudent Advisement Center, International Student Services, University of Wisconsin-Madison, Madison, Wisconsin, USA

ABSTRACT

Because of increasing mobility among various college student populations, both the baccalaureate degree attainment of community college beginners and the role played by their receiving 4-year institution are growing in importance. In this study, we examined how the academic and social involvement of community college transfer students differs by the type of receiving institution, and how strongly their posttransfer involvement is associated with persistence. Results indicated that academic and social involvement were higher for students who transferred to private not-for-profit doctoral institutions, as compared to those who transferred to other types of institutions. Also, among the involvement variables, academic advising is the factor that is most positively associated with the persistence of these students. Our findings make the case for a comprehensive examination of persistence of community college transfer students, looking at both their level of involvement and the type of institution they move to.

Student mobility among postsecondary institutions has grown more prominent over the past few decades. In particular, students who move from 2-year to 4-year institutions have become a significant subpopulation: 37% of total enrollments in postsecondary education between 2008 and 2014 were transfer students, and 24% of these transfer students were community college transfer students (Shapiro, Dundar, Wakhungu, Yuan, & Harrell, 2015). The expansion of this student population is ascribed to numerous factors such as growing concerns about the educational and economic competitiveness of the United States. (e.g., Bahr, Toth, Thirolf, & Massé, 2013); increasing community college transfer students' social mobility through the attainment of an advanced degree (e.g., Dowd, 2007; Goldrick-Rab, 2010); and raising a pathway role for community colleges to 4-year institutions because of increasing higher educational costs (e.g., Dougherty & Kienzl, 2006; Townsend & Wilson, 2006).

Along with the increase in community college transfer students is a growth in emphasis on democratizing postsecondary education, including the accessibility to a baccalaureate degree among this student population. This is of particular importance under recent United States economic circumstances in which graduates with an advanced degree are more likely to secure a higher quality of economic and social life (Baum, Ma, & Payea, 2013). Therefore, policymakers and higher educational leaders that hope to increase degree attainment need to develop policies and practices that support 2-year college transfer students and prepare them for a successful experience in a new institution.

CONTACT Hyekyung Lee ✉ Hyekyung.Lee@ccaaurora.edu 📍 Institutional Research and Effectiveness, Community College of Aurora, 16000 E. CentreTech Pkwy., Aurora, CO 80011, USA.

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After analyzing various critical indicators that impact persistence efforts of community college transfer students, we infer that the quality of college experiences in a receiving institution encourages or discourages these students' enrollment decisions. Earlier research found that students experience frustration and difficulties in their academic and social integration after they transfer to a university (Laanan, Starobin, & Eggleston, 2010; Townsend & Wilson, 2006, 2009). Findings from several studies concluded that academic and social involvement in a new institution plays a critical role in helping community college transfer students' successful transition and persistence to degree completion (Bahr et al., 2012; Berger & Malaney, 2003; Jackson & Laanan, 2015; Starobin, Smith, & Laanan, 2016). The type of their new institution also plays an important role in their involvement and, consequently, their college completion. In their three-decade synthesis of college impact studies, Pascarella and Terenzini (2005) discovered that transfer students had become disadvantaged in reaching their goals compared to native students who had begun their postsecondary education in a 4-year institution. Townsend and Wilson (2006, 2009) further argued that the more that the institutions' structures, missions, and cultures differ, the more that transfer students struggle to fit into a new environment. Considering the influence of institutional characteristics on community college transfer students, it is important to examine how different types of receiving institutions influence students' involvement on campus and their decision to persist or depart.

We believe that understanding the role of student involvement in the transition of community college transfer students and exploring high-impact practices that increase academic and social involvement are critical for successful transition and persistence. Moreover, acknowledging the variance in student experiences and persistence behaviors by student pathway, as well as identifying the best approaches to improve students' sustainability in various kinds of 4-year institutions, will help policymakers, administrators, and practitioners implement policies and initiatives that are tailored for community college transfer students. Equally important, knowledge about the extent of opportunities for social and academic involvement offered by various types of institutions will allow community college students to make informed decisions about their transfer. Given the lack of knowledge on the relationship among academic and social involvement according to the types of receiving institutions and persistence of community college transfer students, and the needs of filling these research gaps, we ask the following research questions:

- (1) How does the academic and social involvement of community college transfer students differ by the institutional type of a receiving institution?
- (2) How do academic and social involvement and institutional type of receiving institutions predict persistence and degree attainment?
- (3) How does the institutional type of receiving institutions moderate the effect of involvement on persistence and degree attainment?

Relevant literature and conceptual framework

One general concern about community college students' involvement and the impact of institutional types on student success is the relative lack of research being done with this specific population of students on these specific issues. While some scholarly attention has been given to the adjustment process of community college transfer students at a public 4-year institution (Laanan, 2004, 2007; Laanan et al., 2010), the persistence of this student population in relation to their academic and social involvement at different types of 4-year institutions has rarely been examined. Some studies (Berger & Malaney, 2003; Crisp & Nora, 2010; Laanan, 2004; Townsend & Wilson, 2009; Wang, 2009) investigated involvement and its impact on persistence predominantly in individual public higher education institutions; however, their findings are limited to those specific institutions. As such, the following review of literature will cover these issues more broadly than is preferred, though the lack of specificity highlights the need for more work to be done in this area.

Academic and social involvement

There is a body of scholarship that provides the theoretical and practical underpinnings for academic and social involvement such as the works of Tinto (1993, 2007), Astin (1984), Bean and Metzner (1985), and Chickering and Gamson (1999). Connections between the environment, institutional, academic, and social systems, and the individuals within those systems, are at the center of Tinto's interactionist model (1993, 2007). According to this model, the concepts of academic and social integration describe the patterns of interaction between students and other members of the institution. Tinto's definition of *integration* is a student's psychological and behavioral fit into an institution, while *involvement* and *engagement* means his/her actual behavioral participation in academic and social activities (Wolf-Wendel, Ward, & Kinzie, 2009). Though our research on involvement is based on students' actual participation on campus, we draw from Tinto's integration concept because integration and involvement influence each other—and one is often believed to be proximal to the other. In addition, factors offered in Tinto's model influenced how we framed the model of our study.

Critical to our study from Astin's (1984) student involvement theory is the amount of time and effort students devote to participating in academic experiences, social encounters, and other activities within academic and social communities (Astin, 1993; Kuh, 2009b; Wolf-Wendel et al., 2009). Because of the critical role of first-year experiences on student success, we expect that the amount of time and energy transfer students spend on educationally purposeful activities in the receiving institutions affects their outcomes. Bean and Metzner's (1985) Student Attrition Model explains what attributes impact the departure decisions of nontraditional students. As well as individual backgrounds and college experiences, this model stressed that environmental factors—involving the family and work responsibilities—are critical indicators in their psychological and behavioral decision to drop-out.

While Tinto and Astin studied student involvement specifically focused on psychological and behavioral characteristics, Chickering and Gamson's (1999) theory to explore students' involvement and persistence is more holistic. In particular, the following components are of special importance in their theory: contact between students and faculty, cooperation among students, active learning, prompt feedback, and diverse talents and ways of learning. Chickering and Gamson's study directed us to focus on what factors help community college transfer students to be actually involved in *good practices* and finally achieve their positive outcomes.

Various other empirical studies address the issues related to interactions between college actors and peers, faculty, and staffs (Bauer & Bauer, 1994; Britt & Hirt, 1999; Harbin, 1997; Kuh, Douglas, Lund, & Ramin-Gyurnek, 1994; Pascarella & Terenzini, 2005; Rendón, 1994; Townsend, 1995; Umbach & Wawrzynski, 2005; Vaala, 1991). The findings suggested that it is essential for students to be more interactively engaged in campus activities because more engagement results in higher goal achievement. Some studies posited that interaction with other students, particularly when they make inquiries for information and advice on navigating the university, helps transfer students to develop informal relationships and engage socially on campus (Laanan & Starobin, 2004). Berger and Malaney (2003) supported the idea of social interaction's importance with peers because it fosters community college transfer students' sense of social adjustment, leading these students to be more satisfied with their university experience. Collectively, these studies suggested that the social involvement of community college transfer students is as crucial as academic involvement. We hypothesize that students who are involved socially, academically, or both will be more engaged, and will, therefore, persist and attain a degree at a higher rate.

Institutional characteristics

The second focus of our study is on the level of involvement, and how the positive outcomes of community college transfer students vary by the type of institution these students move to. The

studies of involvement generally show positive association with successful outcomes for all students; however, it should be noted that some students are more engaged than others (Kuh, 2009a). For example, vertical transfers—students in 2-year colleges who move to 4-year universities—were more engaged than lateral transfers—students who move between 4-year universities—in all engagement areas except for student-faculty interactions (Kirk-Kuwaye & Kirk-Kuwaye, 2007). Scholars who specifically studied community college transfer students argued that the different paths of these students should be examined because the differing missions, cultures, and climates of receiving institutions shift students psychologically and behaviorally (Bahr et al., 2013; Townsend & Wilson, 2006, 2009).

Recent research of the institution's impact on student persistence has discussed to what extent institutions can provide students with a high quality of college experiences including curriculum, faculty interaction, peer interaction, student services, academic and social resources, and campus facilities. Hurtado (2007) also claimed that student experiences vary by institutional structure; she suggests characterization of collegiate environment for measuring student academic and social experiences in a college impact model. These studies stress how the success of a college student could be distinguished by the role of institutional characteristics and culture.

Few studies examined differences in the college experiences of community college transfers between varying types of 2-year sending institutions and 4-year receiving institutions. Berger and Malaney's (2003) study of community college transfer students' transitions and adjustments in a large public university found that the college involvement patterns of the transfers varied by institution. They reported that students were more likely to be involved in social activities if they enrolled in a larger university, as compared to a community college. On the other hand, while they attended a university, they were less likely to spend time in a workplace and with family than were students who attended a community college. While this study speculated as to reasons why the transfers shifted their behaviors according to the institution type, Townsend and Wilson's (2006) qualitative study offered evidence for the reasons posed in Berger and Malaney's study. In particular, the study of Townsend and Wilson targeted transfer students who attended community colleges in a state and successfully transferred to a selective research university in the same state. They found that student perceptions of different institutional cultures come from different institutional missions and aligning institutional practices. The study claims that the more the sending institutions differed from the receiving institutions in terms of type, the more students sensed difficulty in their adjustment: feeling impersonal faculty attitudes toward students; attending large classes; less connecting with peer students; frequently having courses taught by graduate assistants; simplifying assessment for a course through few tests. These studies explicitly stated that transfer students' college experiences and involvement are influenced by institutional characteristics.

Conceptual framework

The conceptual model of our project is derived from the theoretical models mentioned previously (Astin, 1984; Bean & Metzner, 1985; Chickering & Gamson, 1999; Tinto, 1993, 2007). With these theoretical models, abundant empirical research has contributed to building relationship among predictive variables. Building upon the empirical theories and models, we included the following variables as academic and social involvement attributes: interacting with faculty, peer, and academic advisors, and participating in clubs and student organizations. To examine the effects of behavioral involvements at a receiving institution on persistence and degree attainment, we used three categorized factors as controls: individual backgrounds, pretransfer experience, and environmental pull factors (see Figure 1). Additionally, this framework shows how institutional types interact with academic and social involvement and how these interactions impact the persistence and degree attainment of community college transfer students.

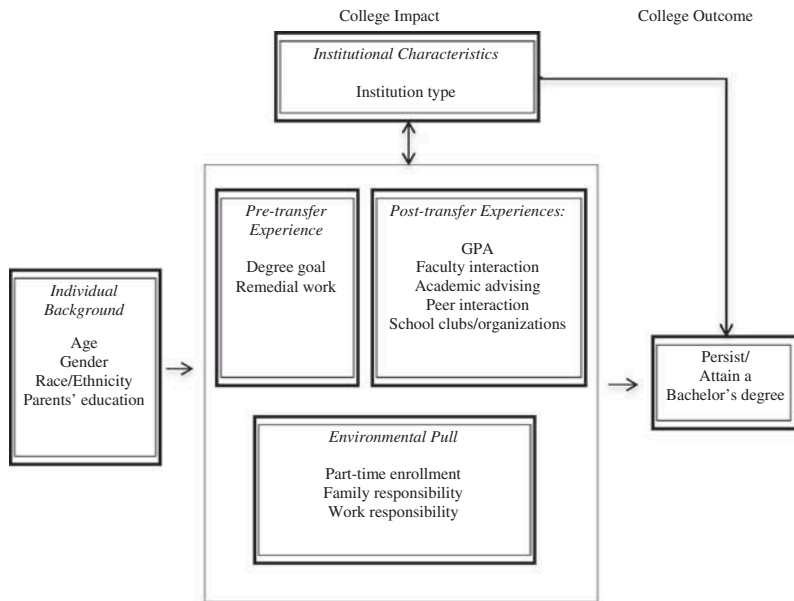


Figure 1. A model of community college transfer students' involvement and persistence.

Methods

Data source and sample

We used data from the Beginning Postsecondary Students Longitudinal Study (BPS:04/09), a survey in the Integrated Postsecondary Education System (IPEDS) sponsored by the National Center for Education Statistics (NCES) of the Institute of Education Sciences (IES).¹

BPS longitudinal studies were designed to study college students' experiences, enrollment behaviors, transitions through postsecondary education, and persistence and degree completion for a period of 6 years (Wine, Janson, & Wheelless, 2011). This data set followed a cohort of first-time beginners of postsecondary education starting in the 2003–2004 academic year. Students participated in data collections at three points in time: 2004 (base year), 2006 (first follow-up), and 2009 (second follow-up). IPEDS provides ample information regarding student enrollment, financial aid, and human resources in higher education institutions. This study follows institutional information collected during the 2005–2006 academic year and aligns it with transfer students' college experiences in the 2006 follow-up survey of BPS:04/09. Of the 2,760 4-year institutions in 2005–2006, 490 institutions were selected as destination institutions as a result of matching with community college transfer students by 2006 from BPS:04/09.

Research study participants were restricted to community college transfer students who first began their postsecondary education at a 2-year institution in 2003–2004 and then transferred to a 4-year institution. Out of the 16,680 students who completed the final survey of BPS:04/09, we drew 920 students who completed a transition from a 2-year institution to a 4-year institution by June 2006. Because our study examined community college transfer students' academic and social

¹Our project was conducted in accordance with the Helsinki Declaration on Human and Animal Rights. Prior to conducting the research, the study was approved by the University of Madison's Institutional Review Board that confirmed that it had no harm to human subjects. Research participants are subpopulations of two national datasets offered by NCES: BPS (a restricted data) and IPEDS (a public data). NCES collects, manipulates, and codes raw data, and it eliminates any information that can identify a specific research participant when the data is provided to secondary users. Thus, our data cannot identify individual participants and this study has no harm to them.

experiences in the receiving institutions, and accordingly used variables of students' college experiences from the 2006 data collection, these students who responded in 2006 while at their receiving institutions are selected as our research sample. During the matching process, 30 cases were excluded because of unmatched institution identifications (IDs), and another 30 cases were removed because of missing values in their 2006 college experiences. Thus, the sample cases decreased to 860 students, who were nationally representative of 208,200 students (weighted sample). A description of these community college transfer students' demography and background is presented in [Table 1](#). It is worth noting that upward transfer students, especially those who finished transfer within the first 3 years (traditional transfer pathway), may have discrepancy with student characteristics of lateral transfer or late upward transfer students. Student demographics and background suggest that research participants in this study have young and White dominants. Almost 50% of the research sample has parents who hold a bachelor's degree and above, and three fourth of them did not take remedial courses in their 2-year institutions.

Measure

We used cumulative persistence and degree attainment during 6 years after enrolling in postsecondary education as a dependent variable. If a student had obtained a baccalaureate degree by 2009, we coded it as "1." If a student was still enrolled in a postsecondary institution in 2009 but lacked a degree, we regarded the student as persisting in the postsecondary education and coded this as "1." Cases that did not satisfy either of these conditions were regarded as neither degree earned nor persisted and coded as "0."

Student-level independent variables are conceptually grouped into categories. The group of individual background characteristics includes age, gender, race, and parents' highest education. The group of pretransfer experiences includes a student's degree goal in the first year and if remedial courses were taken. Environmental pull variables are part-time enrollment, working hours per week, and dependent status. Together, these three groups of variables were selected as covariates because a plethora of empirical research on the predictors of student persistence have suggested that these variables are statistically significant in predicting student success (Alfonso, 2006; Berger & Malaney, 2003; Crisp & Nora, 2010; Goldrick-Rab & Pfeffer, 2009; Hagedorn, Moon, Cypres, Maxwell, & Lester, 2006; Ishitani & McKittrick, 2010; Kirk-Kuwaye & Kirk-Kuwaye, 2007; Lundberg, 2003; Pike, Kuh, McCormick, Ethington, & Smart, 2011; Reyes, 2011; Townsend & Wilson, 2009; Wang, 2009). Factoring out the effects of these variables on persistence and attainment allows us to minimize the bias in estimations between posttransfer college experiences and persistence or degree attainment.

Institution-level variables include institutional type (Carnegie classification in 2000) and institutional control in 2005–2006, which are combined into one institutional variable. This variable was divided into a series of dummy variables such as an institution of public doctoral, private not-for-profit doctoral, public nondoctoral, private not-for-profit non doctoral, and private for-profit. A complete list of variables is described in [Table 2](#).

Research design and analytic methods

We adopted listwise deletion because incomplete cases are less than 5% of the research participants (Allison, 2001). They also did not respond broadly across the survey questions, and thus, computing missing values was not plausible.

In response to the first research question, depending on what institutions students transferred to, mean comparison via *t* test was adopted to measure academic involvement and social involvement. Involvement indicators were drawn from survey questions about interaction with faculty, peers, academic advisors, and social groups on campus. The value of the indicator is measured by the average values of those four variables, and the average value was then multiplied by 100. Based on the scale, levels of academic and social involvement—both in the sending

Table 1. Descriptive analysis of frequency and persistence/attainment for transfer students.

	Unweighted Frequency	Weighted Frequency	Persistence/Attainment
	(%)	(%)	(%)
<i>Background Characteristics</i>			
Age			
Below 23	93.95	95.2	69.8
Above 24	6.05	4.8	45.6
Gender			
Female	55.3	54.45	70.7
Male	44.7	45.55	66.1
Race			
Asian	5.70	6.68	69.7
Black	9.55	10.04	52.8
Hispanic	10.13	10.07	76.6
White	69.52	68.69	68.9
Other Minority	5.01	4.52	79.8
Parent's education			
Bachelor or above	44.82	45.87	76.6
Other or no degree	55.28	54.13	61.8
<i>Pretransfer Experiences</i>			
Degree goal			
Bachelor or above	86.61	88.21	72.3
Other or no degree	13.39	11.79	40.5
Remedial courses			
Taken remedial courses	25.96	22.98	64.4
No remedial courses	74.04	77.02	69.8
<i>Environmental Pull Factors</i>			
Enrollment intensity			
Always Full-time	49.24	53.42	69.0
Mixed/Always Part-Time	50.76	46.58	68.2
Family responsibility			
Having dependent	8.15	8.28	44.3
No dependent	91.85	91.72	70.8
Work responsibility			
Working more than 20 hours	44.35	45.18	64.1
Working less than 20 hours	54.82	54.82	72.3
<i>Posttransfer Experiences</i>			
Faculty interaction in 2006			
Often	85.91	86.23	69.5
Sometimes or never	14.09	13.77	63.2
Academic advisor interaction			
Often	88.24	87.14	70.4
Sometimes or never	11.76	12.86	56.4
Peer interaction			
Often	67.64	67.34	69.2
Sometimes or never	32.36	32.66	67.4
Social involvement			
Often	41.56	42.35	78.5
Sometimes or never	58.44	57.65	61.4
<i>Institutional Characteristics</i>			
Posttransfer institution type			
Public doctoral	35.86	41.35	71.0
Private nonprofit doctoral	3.96	3.17	91.8
Public non-doctoral	37.6	33.75	67.7
Private nonprofit nondoctoral	17.69	16.66	71.5
Private for-profit	4.89	5.07	31.0
Total (N)	860	208,200	

institutions and in the receiving institutions—are calculated. The sending institutions are 2-year institutions and the receiving institutions vary by institutional type. All descriptive analysis of group mean and involvement changes is weighted using a panel weight (WTB000) provided by the BPS:04/09 dataset.

Table 2. List of variables in the proposed model.

Variable Name	Description	Label
Dependent Variable		BPS Label
Persistence	Cumulative persistence and degree attainment anywhere 2008–2009, 1 = Bachelor, No degree but still enrolled, 0 = Otherwise	PROUT6
Independent Variables		
<i>Background characteristics</i>		
Age	Age in 2003, continuous	AGE
Gender	Dummy variable, 1 = female, 0 = male	GENDER
Race	A series of dummy variables, Asian, Black, Hispanic, Other Minorities with White as the reference category	RACE
Parents' education	Parent's highest education, dummy variable, 1 = Bachelor/above, 0 = Otherwise	PAREduc
<i>Pretransfer experiences</i>		
Degree goal	Whether students expected to earn a degree in the first year, dummy, 1 = Bachelor and above, 0 = otherwise	DGOALY1
Remediation	Whether a student took remedial work, dummy variable, 1 = yes, 0 = no	REMETOOK
<i>Posttransfer experiences</i>		
Academic achievement	Grade Point Average (GPA) in 2005–2006, continuous	GPA06
Faculty interaction	Meeting with faculty informally and talking with faculty outside class representing in 2006, dummy, 1 = Often, 0 = Sometimes or never	FREQ06B
Academic advisor interaction	Meeting academic advisor representing in 2006, dummy, 1 = Often, 0 = Sometimes or never	FREQ06 C
Peer interaction	Studying with peer group representing in 2006, dummy, 1 = Often, 0 = Sometimes or never	FREQ06D
Social interaction	Participating the clubs or organization on campus representing in 2006, dummy, 1 = Often, 0 = Sometimes or never	FREQ06 F
<i>Environmental pull factors</i>		
Enrollment intensity	Enrollment for 6 year status, dummy 1 = Always full-time, 0 = Mixed or Always part-time	ENINPT6Y
Family responsibility	Whether a student have a dependent, dummy: 1 = yes, 0 = no	DEPANY06
Work responsibility	Average working hours per week, continuous	HRSWK06
<i>Institutional characteristics</i>		<i>IPEDS label</i>
Type	Institution type by Carnegie Classification (collapsed) and institutional control, a series of dummy variable, Private not-for-profit Doctoral, Public Nondoctoral, Private not-for-profit Nondoctoral, Private for-profit with Public Doctoral as the reference category	CARNEGIE HD2005 CONTROL HD2005

A series of logistic regression analysis are used to analyze the associations between conceptually categorized independent variables and persistence or degree attainment. Because the dependent variable is a dichotomous indicator and least-squares linear regression cannot yield the normally distributed error and constant variance, a logistic regression is an appropriate analytic method (Fox, 2008). One item worth noting is that we used a clustered standard error in the logistic regression analysis because BPS:04/09 has a nested data structure; students were nested within an institution. Considering the possible dependency of student-level variables on institution-level variables, we adopted a clustered standard error, which would make the standard error unbiased in a single-level analysis.

Four logistic regression models were conducted by sequentially adding categorized variables to respond to the second and the third research questions. Conceptually categorized variables involving student backgrounds, pretransfer variables, and environmental pull factors were added into model 1. Model 2 estimated the effect of posttransfer experience while model 3 measured the effect of

institutional type. The moderating effects of using interaction terms between variables pertaining to involvements and variables of institutional characteristics were estimated by model 4.

Before we estimated the effects of logistic regression parameters, we measured multicollinearity that occurs where one or more independent variables are highly correlated to the other independent variable in statistical analysis, which consequently leads to large standard errors in the analysis (Fox, 2008). By estimating the extent of multicollinearity, we intended to avoid confounding effects among independent variables and obtain the pure effect of each variable. In our analysis of multicollinearity, we noted that the variance inflation factor of independent variables in the proposed model was less than 2, and thus, independent variables were not highly correlated to each other.

Limitations

This study has several limitations. First, our conceptual framework is mainly informed by Astin's involvement theory, Tinto's interactionist model, Bean and Metzner's Student Attrition Model, and Chickering and Gamson's theory of student involvement and persistence. All these theories have limitations because they are based on extensive research of White students on 4-year campuses. As a result, normalized successful practices of student transition to a new campus discussed in the aforementioned studies do not reflect experiences of the new majority (Lundberg, 2014) of community colleges that have to navigate structural and institutional norms that were intentionally developed for White students.

Secondly, regarding the BPS:04/09 data, one concern is the limited number of survey questions pertaining to involvement. This small number of questions is not likely to be representative of student involvement experiences overall. Regardless, we proceeded with this particular data set because no other data includes the involvement and persistence of community college transfer student on a national scale. Moreover, it gave us an advantage in analyzing involvement because the 6-year longitudinal data provided us with valuable information on the involvement of community college transfer students on their home 2-year campuses, both before they moved and after they transitioned into a 4-year institution.

Finally, there is a limitation related to the sample. In particular, this study does not follow-up with returning students because the BPS:04/09 study surveyed a cohort that began their postsecondary education in 2003. Considering the number of returning adult students who hold an associate's degree and later return to school for a bachelor's degree, the time-defined window of this survey does not account for this specific subpopulation of students when analyzing community college transfer students' persistence.

Findings

Involvement patterns by transfer path

Through an explanatory analysis of involvement, we found that community college transfer students showed different patterns of academic and social involvement depending on the type of the receiving institution. As can be seen in Figure 2, our findings suggest that transfer students were academically and socially involved in their receiving institutions, but the extent of involvement differed by the specific indicator being examined. Another trend is that students are more academically involved rather than socially involved regardless of institutional type.

Academic and social involvement is grouped into interactions with faculty, academic advisors, peers, and social groups (see Figure 2 and Table A1–A4 for raw data). While students transferred to public doctoral, public nondoctoral, and private nondoctoral institutions experienced similar increases in level of involvement, those who transferred to private not-for-profit and private for-profit institutions showed significantly different patterns. Students who transferred to private not-for-profit institutions became more actively committed to faculty, academic advisor, peers, and social groups compared to those who

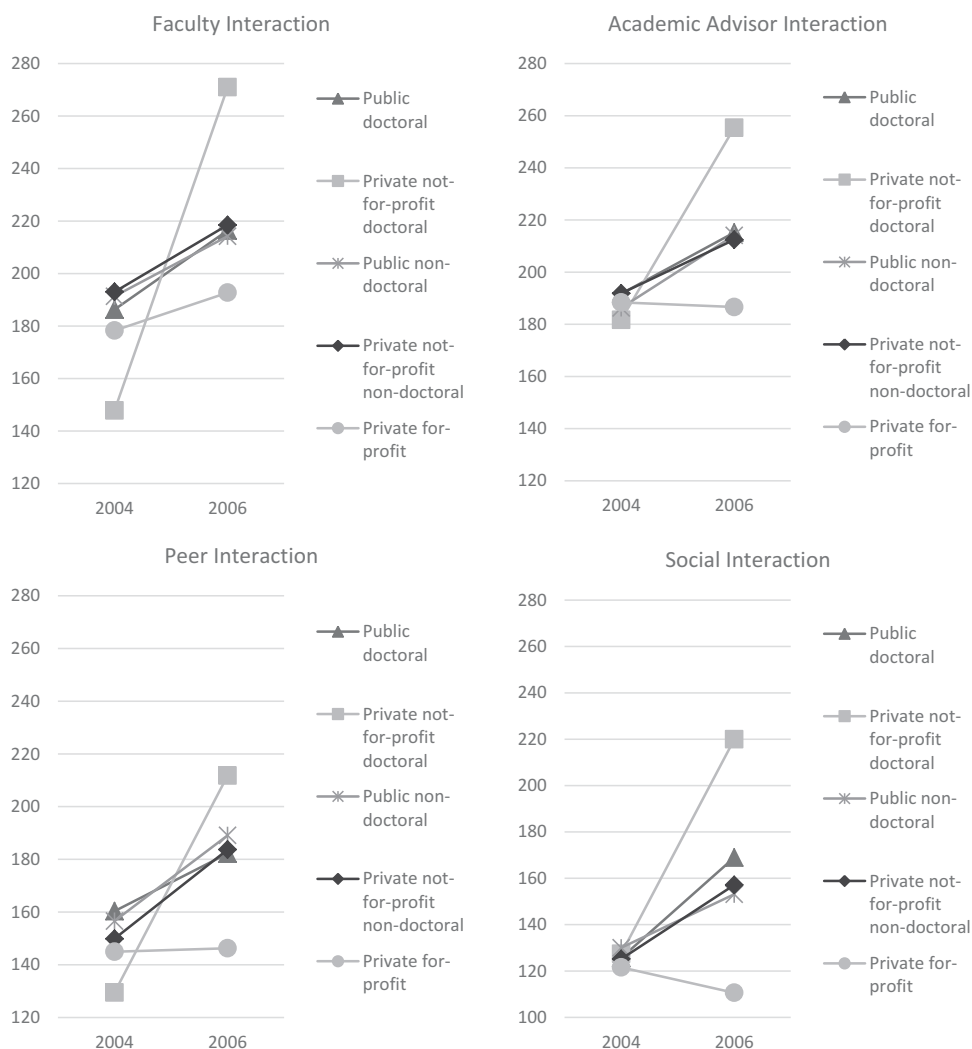


Figure 2. Changes of college experiences between pretransfer in 2004 and posttransfer in 2006. *Note.* Institutional types are drawn from Carnegie Classification (collapsed) and Control of IPEDS, which are combined and categorized into five institution types.

transferred to other types of institutions. On the other hand, students who moved to private for-profit institutions received low marks of posttransfer involvement. Their involvement between pre- and posttransfer remained the same or decreased.

Model diagnostics

Model diagnostics is applied to evaluate whether the proposed model fits to the data. We proposed four models, and by using model comparison, we intended to choose a better or the best model. We used residual deviance ($-2\log$ likelihood) and Akaike Information Criteria (AIC) for testing the models because logistic regression estimates the parameters of the proposed model by Maximum Likelihood (ML) instead of Ordinary Least Square (OLS). As a result of model evaluations, residual deviance and AIC decreased from Model 1 through Model 3, indicating that model fit improved. In model comparisons by ANOVA using Chi square (X^2), we noticed that Model 2 is significantly different from Model 1 ($p < .01$), and that Model 3 is also significantly different from Model 2

($p < .01$). However, an ANOVA test suggests that Model 3 and Model 4 are not significantly different from each other. Based on this result, Model 3 was selected as the final model.

Logistic regression parameter estimates

The four logistic regression models estimated the effects of a series of blocked variables on persistence and bachelor's degree attainment. The estimated coefficients, standard errors, and odds ratios of three of the proposed models are presented in [Table 3](#).

For individual background variables, the relative likelihood of persisting or attaining a degree is significantly associated with race and with parents' highest education attainment level. In the race component, being Hispanic showed as a statistically significant indicator predicting persistence and degree attainment. In this study, Hispanic refers to individuals who identified themselves as Hispanic in a BPS survey of NCES. Hispanic transfer students have a 1.87 times better chance to persist or attain a bachelor's degree than their White counterparts. Transfer students who have parents with bachelor's degree or above are 1.69 times more likely to persist or attain a degree than transfer students whose parents lack a postsecondary degree. Regarding the effect of pretransfer experience, students with a goal of attaining a bachelor's degree or above have 2.92 times higher odds of persisting and attaining a degree than those with a goal of an associate's degree or no degree. In examining the effects of environmental pull variables, working hours per week are significantly associated with the likelihood of persisting or attaining a degree among transfer students. Similar findings by Bahr et al. (2013), Owens (2010), and Townsend and Wilson (2006, 2009) revealed that the more transfer students worked, the less those students persisted or attained a degree. Our study indicates that for every 1-hour increase in weekly working hours, the odds of persisting or attaining a degree decreased by 2.0.

Regarding the effect of college experiences, Grade Point Average (GPA) and academic advising are significantly associated with persisting or attaining a bachelor's degree. First-year GPA has been a strong indicator of student success in previous studies (Crisp & Nora, 2010; Glass & Harrington, 2002; Townsend & Wilson, 2006; Wang, 2009). In the same manner, the study suggests that students with a better GPA in the third year of postsecondary education after transferring have better chances to persist or attain a bachelor's degree. A 1.0 increase in the third-year GPA is associated with an increase in the likelihood of persisting and attaining a bachelor's degree by 1.32 times. Among the variables of academic involvement in the receiving institutions, only academic advising was a statistically significant indicator predicting transfer students' success. Students who more frequently visited academic advisors in the receiving institutions were 2.14 times more likely to persist or attain a bachelor's degree than students who met less frequently with academic advisors after the transfer.

Institutional types turned out to be not statistically different in persistence among transfer students. Interaction terms between institutional type and academic advising were added in Model 4, but the model fit was not improved. Moreover, the mediating effect of academic advising between private not-for-profit institution and persistence proved to be statistically significant, but its effect is not reliable. Because an extremely small number of students transferred to that type of institution, the number of students belonging to this interaction term is also small, which could provide a biased estimate.

Discussion

Several variables in this study were positively related to the persistence of community college transfer students. The race component is of particular significance for this study. For example, our findings show that Hispanic students have higher chances of persistence and degree attainment than other racial or ethnical groups. Existing literature (Crisp & Nuñez, 2014) suggested underrepresented student population is less likely to transfer to a 4-year institution compared to White students. Based on our results, we can say Hispanic students highly succeeded at a

Table 3. Model coefficients, standard errors, odds ratio, and fit indexes.

	Model 1		Model 2		Model 3		Model 4	
	<i>b</i> (SE)	Odds ratio	<i>b</i> (SE)	Odds ratio	<i>b</i> (SE)	Odds ratio	<i>b</i> (SE)	Odds ratio
<i>Student persistence and degree attainment for 6 years (n = 870)</i>								
<i>Individual backgrounds</i>								
Age	−0.02 (0.03)	0.98	−0.02 (0.03)	0.98	−0.01 (0.03)	0.98	−0.02 (0.03)	0.98
Gender	0.32 (0.21)	1.37	0.29 (0.20)	1.34	0.25 (0.20)	1.28	0.22 (0.20)	1.25
Race/Black	−0.31 (0.35)	0.73	−0.44 (0.35)	0.64	−0.50 (0.36)	0.61	−0.54 (0.37)	0.58
Race/Hispanic	0.53 (0.30)	1.69	0.57 (0.29)	1.77	0.62 (0.30)	1.87*	0.61 (0.29)	1.84*
Parent Edu/Bachelor	0.63 (0.22)	1.87**	0.60 (0.22)	1.81**	0.52 (0.21)	1.69*	0.52 (0.22)	1.68*
<i>Pre-transfer experiences</i>								
Goal/Bachelor	1.04 (0.30)	2.84***	1.08 (0.32)	2.93**	1.07 (0.34)	2.92**	1.06 (0.34)	2.90**
Remedy	−0.28 (0.27)	0.75	−0.26 (0.27)	0.77	−0.25 (0.28)	0.78	−0.25 (0.28)	0.80
<i>Environmental pull factors</i>								
Enrollment/Full	0.00 (0.23)	0.99	0.06 (0.24)	1.06	0.04 (0.24)	1.04	0.06 (0.24)	1.06
Having dependent	−0.80 (0.43)	0.45	−0.73 (0.41)	0.48	−0.63 (0.43)	0.53	−0.63 (0.43)	0.53
Working hours	−0.02 (0.01)	0.98**	−0.02 (0.01)	0.98	−0.02 (0.01)	0.98**	−0.02 (0.01)	0.98**
<i>Posttransfer experiences</i>								
GPA			0.23 (0.12)	1.25	0.28 (0.12)	1.32*	0.30 (0.12)	1.34*
Faculty interaction			0.01 (0.29)	1.01	0.02 (0.29)	1.02	0.04 (0.29)	1.04
Academic advising			0.78 (0.29)	2.18**	0.76 (0.29)	2.14**	0.76 (0.45)	2.13
Peer interaction			0.04 (0.29)	1.04	0.02 (0.28)	1.02	0.01 (0.28)	1.01
Social interaction			0.55 (0.32)	1.73	0.43 (0.33)	1.54	0.41 (0.33)	1.51
<i>Institutional characteristics of the receiving institutions</i>								
Institution/PNP doctoral					1.46 (0.82)	4.31	0.87 (0.84)	2.38
Institution/P nondoctoral					−0.20 (0.23)	0.82	−0.24 (0.25)	0.78
Institution/PNP nondoctoral					0.06 (0.34)	1.06	0.12 (0.39)	1.13
Institution/Private for-profit					−0.58 (0.59)	0.56	−0.46 (0.64)	0.63
<i>Interaction between involvement and institutional characteristic</i>								
Institution/PNP doctoral x Academic advising							14.3 (1.22)	1.7x10 ⁶ ***
Institution/P nondoctoral x Academic advising							0.17 (0.54)	1.19
Institution/PNP nondoctoral x Academic advising							−0.30 (0.66)	0.74
Institution/Private for-profit x Academic advising							−0.64 (1.30)	0.53
<i>Fit Indexes</i>								
−2 x log likelihood		986.5		944.0		922.7		908.5
AIC		1052.05		1037.46		1034.8		1041.12

Note. *b* = logistic regression coefficient; SE = standard error.

GPA is an abbreviation of Grade Point Average in the third year during the 6-year window.

Black and Hispanic students in the race category are selected because these two groups are largest growing population, and so these two groups are of our interest in this research.

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

receiving 4-year institution compared to White students once they successfully transferred. Because Hispanic students show higher levels of persistence, it is important to examine pathways of specific racial and ethnic student populations to identify challenges and opportunities unique to each group. Moreover, the findings posit that having a goal of a bachelor's degree is a significant indicator of a student's persistence, which was also evident in other studies (Goldrick-Rab & Pfeffer, 2009; Wang, 2009). Because degree goal is important for increasing students' persistence, community college transfer students should receive encouragement in their new institutions not only to aim at attaining a bachelor's degree, but also to consider pursuing a higher degree. Finally, working hours play an important role in the degree of involvement of community college transfer students. Our data show that less working hours increase persistence of these students because they can use free time to get involved in various activities and services on campus.

The findings reveal that involvement patterns for community college transfer students differ depending on the type of receiving institution, a finding consistent with studies by Berger and Malaney (2003) and Townsend and Wilson (2006). In particular, the results indicate that students were more actively involved with faculty, academic advisor, peers, and social groups after transferring to private institutions. However, not all private institutions showed high involvement of their transfer students. Community college students who transferred to private for-profit institution had low level of posttransfer involvement. The evidence that students' involvement remained at the same level or decreased after transfer should be a concern to professionals of community colleges who prepare their students to transfer. Considering the rising costs of education, the information on low campus involvement in private for-profit institutions should be shared with prospective graduates who are exploring various types of institutions for transfer. Only by considering all options, and each option's ramifications, students will be able to make informed decisions about their future.

Regarding the involvement effects on persistence, our research, unlike other studies, shows that faculty and peer interactions are not strong indicators of students' involvement and persistence. This can be explained by the fact that community college transfer students experience difficulties developing relationships with faculty in a new institution. As Bahr et al. (2013) pointed out, establishing mentoring relationships or getting to know faculty may be challenging and occur less frequently for community college transfer students (Matlock & Wade-Golden, 2009), particularly for part-time enrollees (Ishitani & McKittrick, 2010). Meanwhile, academic advising helps students persist, and this study shows that students who have had more academic advising showed higher persistence and attainment than those who had less academic advising. This finding is more meaningful because academic advising was proved to be a strong predictor even when it was conservatively measured. Recent studies have emphasized the importance of faculty and peer interaction in student success (Jackson & Laanan, 2015; Kuh et al., 1994; Myers, Starobin, Chen, Baul, & Kollasch, 2015; Pascarella & Terenzini, 2005; Starobin et al., 2016; Umbach & Wawrzynski, 2005). By allowing variables of faculty and peer interaction in the proposed model, we could control for the effects of these variables. Even after controlling for these variables, we observed academic advising as a statistically significant indicator.

The findings from this study support the notion that the academic involvement of community college transfer students can be explained, to some extent, by the combined influence of various personal characteristics as well as the advising services of the 4-year institutions to which they transfer. These findings provide some potentially important implications for educational policy and practice. For example, because transfer students represent more diverse populations in terms of age, ethnicity, prior learning, and other experiences, 4-year institutions should improve their transfer admission policies and support services for community college transfer students to address their varying needs. Also, because involved and engaged students persist more, institutions should develop policies and practices that provide adequate services and support specifically to community college transfer students that will result in higher campus engagement among this group. Finally, because academic advising plays a critical role at certain type of institutions, administrators need to develop policies and practices for student services that will allow transfer students more access to, and time with, their advisors. The implications for policy and practice—as well as for the future research—are discussed below in more detail.

Implications and recommendations for policy and practice

Our findings lead to a number of implications and recommendations for practitioners at 4-year institutions. Based on our analysis, several academic indicators in the BPS:04/09 data play an important role in helping students persist. In particular, academic advisors in receiving 4-year institutions should be made aware of the special needs of community college transfer students. In addition to their assistance with choosing courses and identifying necessary resources, referrals, and

other needs, academic advisors can review and revise orientation programs and other student activities on campus to meet the academic and social needs of transfer students.

It is also important to augment the role of academic advisor in regard to enhancing students' interactions with faculty and peers. Our study reveals that faculty and peer interaction are not strong indicators of community college transfer students' success. To the extent that this represents community college transfer students' lack of skills in initiating and developing close relationships with faculty and peers, academic advisors can assist with providing tools and mechanisms for building these relationships and facilitate the process.

The findings of this study do not suggest that participating in social activities is statistically related to student persistence. However, student affairs professionals at receiving institutions should pay more attention to transfer students' social involvement on campus because many academic activities also enhance social integration. In this regard, advising should not only stress the importance of academic engagement as a principle, but also provide suggestions on how to make social involvement a reality.

Lastly, we suggest that institutions initiate professional development for student affairs staff, including academic advisors. We learned that the needs of community college students differ from the nontransfer student population in 4-year institutions, and that the majority of student affairs professionals are generally trained to predominantly support nontransfer students. Thus, administrators should consider providing professional development for staff to make them aware of the academic and social challenges transfer students face after moving into a new institution. And staff should be trained on how to meet the unique needs of this group of students.

Implications and recommendations for research

Community college transfer students continue to experience challenges with academic and social involvement after they transfer to a new 4-year institution. Based on the findings of our study, academic advising is a significant indicator of successful engagement and involvement among these transfer students. Additional qualitative research could answer questions about what characteristics of academic advisors and what factors of academic advising most contribute to community college transfer students' engagement and involvement.

Another research recommendation is to further study Hispanic transfer students. We learned that Hispanic community college transfer students succeed at higher rates than other racial or ethnic groups. Further research could identify the successful practices for student involvement on campuses that helped Hispanic students integrate and persist. Research should also test potential solutions for other student groups. It will be essential for this further research to use a critical lens and examine Hispanic and other minority students' participation in campus academic and social activities that have been designed for White students. Understanding their involvement is critical in order to increase the representation of this new majority of students on 4-year campuses after they transfer. It will be also important to examine the patterns of academic and social involvement of Hispanic and other minority transfer students based on their major and courses they take.

Examining transfer timing will be another important area of future research. Upward transfer students who follow the traditional transfer pathway may have different student characteristics, experiences, and success from those who transfer later. Investigating the differences between early and later upward transfer students may result in identifying challenges and opportunities unique to each group.

Additionally, further research can examine peer relations and interactions among community college transfer students. A large body of scholarship provides evidence that these interactions play an important role in student persistence. Could learning communities be organized for community college transfer students in the receiving 4-year institutions that will allow them to interact with their peers in a meaningful way? Also, our findings show that community college transfer students have lower academic and social involvement when they transfer to private for-profit institutions. More

research should be done on how these institutions engage students, taking into account that a large number of these institutions provide education online.

Conclusion

The findings of our study reveal how the academic and social involvement of community college transfer students differs by the type of receiving institution. Though there is a growing amount of attention being paid to the experiences of these students, the research has not taken into account the receiving institution types that are associated with their involvement and persistence. Because the data show that community college transfer students transfer to a variety of 4-year institutions, the different institutions should have varying policies and practices to support these students during their transition. This study examined the existing knowledge on transfer students' experiences and their relationship to persistence and degree attainment. It focused on how community college transfer students participate in academic and social activities on campus and how the various types of 4-year institutions moderate these involvement patterns. In particular, ethnicity, parents' level of higher education, higher degree goals, fewer working hours, higher posttransfer GPA, and more interaction with academic advisors all played a positive role in the persistence and degree attainment of community college transfer students after transfer. The findings can help higher education professionals better understand the challenges of transfer students and develop more effective approaches to meeting their diverse needs.

We did not find any association between academic and social involvements of different types of posttransfer institutions and their success, but we did confirm that academic advising at a 4-year institution plays a critical role for transfer students. Overall, our findings are important for developing best practices in improving services for community college transfer students' success. These students comprise almost one sixth of total enrollments in postsecondary education, and more work needs to be done to serve their needs and encourage their persistence and degree attainment.

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Appendix

Table A1. Faculty interaction changes by institutional type.

	2004	2006	Diff	SE	<i>p</i>
Public doctoral	186.28	216.41	30.13	0.29	<.001
Private not-for-profit doctoral	147.83	270.99	123.16	0.99	<.001
Public nondoctoral	191.34	214.22	22.88	0.35	<.001
Private not-for-profit nondoctoral	193.03	218.51	25.47	0.47	<.001
Private for-profit	178.29	192.73	14.43	0.97	<.001

Table A2. Academic advisor interaction changes by institutional type.

	2004	2006	Diff	SE	<i>p</i>
Public doctoral	191.72	215.21	23.49	0.3	<.001
Private not-for-profit doctoral	181.7	255.4	73.7	0.88	<.001
Public nondoctoral	186.3	214.11	27.8	0.35	<.001
Private not-for-profit nondoctoral	191.86	212.46	20.61	0.49	<.001
Private for-profit	188.4	186.63	−1.75	1	<.001

Table A3. Peer interaction changes by institutional type.

	2004	2006	Diff	SE	<i>p</i>
Public doctoral	160.36	182.19	21.83	0.32	<.001
Private not-for-profit doctoral	129.46	211.82	82.36	0.99	<.001
Public nondoctoral	156.58	189.1	32.52	0.37	<.001
Private not-for-profit nondoctoral	149.89	183.72	33.84	0.49	<.001
Private for-profit	144.96	146.26	1.31	0.93	.16

Table A4. Social interaction changes by institutional type.

	2004	2006	Diff	SE	<i>p</i>
Public doctoral	125.6	168.95	43.35	0.34	<.001
Private not-for-profit doctoral	127.39	219.95	92.57	1.28	<.001
Public nondoctoral	130.01	153.08	23.07	0.37	<.001
Private not-for-profit nondoctoral	125.19	157.12	31.93	0.5	<.001
Private for-profit	121.57	110.61	−20.96	0.5	<.001