

Early Integration and Other Outcomes for Community College Transfer Students

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Abstract The purpose of this study was to explore academic and social integration and other outcomes for community college transfer students. The study used Tinto’s (Leaving college: Rethinking the causes and cures of student attrition, 1993) *Longitudinal Model of Institutional Departure* and Deil-Amen’s (J Higher Educ, 82:54–91, 2011) concept of “socio-academic integrative moments” to inform the selection and organization of potential predictors. We developed regression models for relationships between demographic and background variables of interest and perceived academic and social integration following the first six weeks at the receiving university. We also included these perceived integration scores in regression models for six outcomes (first and second semester grade point average, first and second semester earned hours ratios, and second and third semester persistence). Academic and previous college background explained the greatest amount of variance in predicting early integration and academic outcomes.

Keywords Transfer student adjustment · Integration · Success ·
Community college · Transition · Retention · Persistence

Introduction

In this era of higher education focused on college completion, it is essential that the research and policy communities explore those factors which may limit and/or enhance

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college student success. Some of our nation's major higher education organizations have set goals upon which to measure success efforts. One of note is College Board's "55 by 25" initiative with the goal of increasing the proportion of 25- to 34-year-olds who hold an associate degree or higher to 55 % by the year 2025 (Lee et al. 2011). Considering that approximately 43 % of all first-time college students attend 2-year institutions (AACC 2012a), and 47 % of students who earn baccalaureate degrees have at some point completed at least one course at a community college (Mullin 2012), the College Board's "55 by 25" goal is not remotely possible without significant attention on community colleges and the community college-to-university transfer process. In fact, the role of community colleges has been recognized as one of the 10 College Board recommendations that involves easing the transfer process to achieve completion goals (Lee et al. 2011) and the 21st-Century Commission on the Future of Community Colleges' recent report notes the need for better transfer opportunities to achieve student success recommendations (AACC 2012b). The importance of transfer and transfer success metrics was also acknowledged when the American Association of Community Colleges (AACC) (2011) introduced the Voluntary Framework of Accountability, which includes progress measures related to successful transfer to track the performance of 2-year colleges.

It is the focus on transfer students in these high-profile goals and accountability initiatives that helps to drive the policy-level and institutional relevance of transfer student success, both of which provide the impetus for this study. Our intent was to consider the early academic and social integration (see, Tinto 1993) of community college transfer students and to document connections between these variables and multiple measures of success. We believe our findings contribute to efforts to identify potential barriers and facilitators that transfer students experience as they move through higher education.

Review of Literature

Our research is grounded in what is known about the success of transfer students. This knowledge base informed our interest in outcomes as well as predictors of them and formed the base for the decision we made about the variables that we included and the relationships that we studied.

Transfer Student Outcomes

We begin our review of student success with findings associated with their initial experiences with the transfer process. We also review evidence from studies documenting what happens after they have enrolled in the 4-year setting.

Pre-Transfer success and Adjustment

Bradburn and Hurst (2001) found that 25 % of all beginning community college students ever enrolled in a 4-year institution; however, they indicated that accurately measuring transfer rates also depends on one's definition of "potential transfer." For example, 71 % of public 2-year college students "expected to complete a bachelor's degree or higher," and among those students 36 % transferred to a 4-year institution. They concluded that more restrictive definitions of potential transfer, of which they propose multiple options, may yield higher transfer rates. They caution, however, that more restrictive definitions of

potential transfer will also eliminate successful transfer students from the calculation who may not meet those criteria.

Even using Bradburn and Hurst's (2010) most restrictive definition of potential transfer only yielded a transfer rate of 52 %; thus, many community college students are not meeting their transfer goals (see, Hagedorn et al. 2006), and some (Alfonso 2006; Bound et al. 2010) have found that beginning one's education at a community college could indeed be a barrier to degree completion. Others identify some of the factors that may ease or hinder the transfer process. Hagedorn et al. (2006) found that a key barrier to students becoming transfer ready is the requirement to complete developmental studies (i.e., remedial courses). In addition, the urban community college study showed that African American students were less likely to demonstrate transfer readiness than Hispanic students, and Hispanic students were more likely to become transfer ready than Asian or Caucasian students. The authors note that some in the study may elect to transfer before meeting the study's definition of "transfer ready." Further, Hagedorn et al. (2008) took a retrospective look to identify factors associated with students who successfully transferred. They found that those who transferred were more likely to be younger, less likely to be required to complete developmental courses, and more likely to demonstrate academic readiness based on the completion of more course modules and more rigorous courses, spending less time at the community college possibly due to not needing to complete developmental courses, and maintaining continuous enrollment. Hagedorn et al. (2010–2011) confirm previous findings by noting that taking higher level courses and persevering through developmental sequences are associated with greater likelihood of successful transfer.

Based on a statewide study, Doyle (2009) found that greater numbers of credit hours completed increase the likelihood of transfer, which is consistent with Hagedorn et al.'s (2008) finding that academic preparation in the community college matters. In addition, the challenges for ill-prepared community college students are appropriately identified as a factor in transfer discussions. While lack of preparation can be a barrier, Roksa and Calcagno (2010) found that nearly 20 % of the students in their study who were unprepared upon entering community colleges still managed to transfer to a senior institution; however, they acknowledge that those who enter prepared are more likely to transfer. Also, they note the challenges to helping students overcome poor college preparation. Overall, it seems that greater academic preparation upon entering the community college and while at the community college is an advantage to transfer.

Post-Transfer Success and Adjustment

While we accept that there are challenges transferring, particularly for those who are less academically prepared, the focus of the present study is on the success of community college students who do make it to the university; and, many potential contributors to the success of transfer students have been identified in the literature. Among the most prevalent are higher college grade point average (GPA) upon transfer (Carlan and Byxbe 2000; Luo et al. 2007; Mullen and Eimers 2001; Pennington 2006; Zhai and Newcomb 2000; Wang 2009), higher degree aspirations (Wang 2009; Zhai and Newcomb 2000), and transferring with more credit hours (Ishitani 2008; Luo et al. 2007).

Additionally, the following may also be associated with transfer student success: not majoring in technical fields such as science (Carlan and Byxbe 2000; Mullen and Eimers 2001); being female, of higher socioeconomic status (Wang 2009), and non-minority (Mullen and Eimers 2001); and, having greater involvement or perceived connectedness

with campus (Luo et al. 2007; Wang 2009). Geography is also a consideration; however, the findings are inconsistent. Luo et al. 2007 found that junior-level transfer students from the largest urban community college were more likely to be retained than those transferring from out-of-state colleges or other in-state institutions (community colleges and universities). Mullen and Eimers (2001) learned that transfer students from in-state institutions were less likely to graduate. These somewhat mixed findings between and even within studies demonstrate the need to explore further the potential influence of origin institution on post-transfer success.

Zhai and Newcomb (2006) found that those who transfer from universities rather than 2-year colleges were more likely to succeed. Yet the more common comparison in this discussion is about the success rates of transfer students versus native students; however, both Carlan and Byxbe (2000) and Glass and Harrington (2002) found that community college transfer students, following a slight dip in performance after initial transfer, performed at equivalent levels to native students.

This dip in performance immediately following transfer is common for community college transfer students, and is a phenomenon known as “transfer shock.” Hills (1965) indicated that 2-year college transfer students should expect a lower initial GPA at the receiving institution than the previous college (i.e., transfer shock). One should also expect recovery from that initial shock in GPA following transfer. In another exploration of transfer shock among community college transfer to a 4-year liberal arts college, Cejda et al. (1998) found that there is no significant transfer shock when students entered the senior institution, overall. They did find, however, that some transfer shock existed among those in math and science majors. Again, majoring in science may serve as a barrier for incoming community college transfers.

Rather than just considering those factors associated with success, or lack thereof, it is also important to understand elements of the transfer student experience at the receiving institution and their influence on how well students adjust to university life. For example, Berger and Malaney (2003) found that the most prevalent indicator of student satisfaction at the university and their academic performance is transfer preparedness. This preparedness may include counseling, advice from faculty and staff, and having an understanding of academic requirements, which is somewhat contrary to Pennington’s (2006) finding that transfer advising/counseling had no influence on first-semester academic performance post-transfer; however, it was not a detriment either. Pennington’s main finding was that community college GPA (i.e., academic preparation) was the greatest predictor of first-semester performance.

Through the implementation of the Laanan-Transfer Students’ Questionnaire (Laanan 2004), Laanan (2007) explored the factors related to academic and social adjustment of community college transfer students in the destination institution. Among the many findings, the study showed that negative perceptions of the 4-year environment and interactions with community college counselors leads to academic adjustment challenges. While at the university, those with lower GPAs, lower intellectual self-confidence, and greater perceptions of a competitive environment will have more difficulty. On the topic of social adjustment, no background characteristics were significant (e.g., age, gender) nor were community college environmental factors, but there were many significant factors in the university environment that impact social adjustment. The most prevalent are related to organized (i.e., more formal) social involvement activities, including participation in clubs and organizations and attendance at events organized by cultural groups (Laanan 2007).

The literature related to transfer student outcomes shows that a variety of factors that transfer students encounter are related to their adjustment/integration into the university

setting and perhaps their success. Among those more widely documented are pre-entry attributes, goals and aspirations, and institutional experiences.

Predictors of Transfer Student Success

When considering the elements that may be associated with the likelihood of transfer student success once attending the destination institution, it is appropriate to begin with one of the most pervasive theories, Tinto's (1993) *Longitudinal Model of Institutional Departure*. While the primary focus of the model is on the intellectual and social integration of students once they attend college, the model includes one's goals and commitments, academic and social experiences once in college, and their many pre-entry attributes.

Academic and Social Integration in the 2-Year Setting

In a look at Tinto's (1975) Student Integration Model, Chapman and Pascarella (1983) considered institution type to explore the relevance of academic and social integration among these different populations. They noted that community college students had less social contact with the institution. It is not that they are not social, but rather their social outlets were outside of the college. In addition, Chapman and Pascarella recommended that universities consider these differences among sectors, particularly when enrolling transfer students.

Despite the common use of the theory, some question the empirical support for the model for multiple types of institutions, such as 2-year or commuter colleges (e.g., Braxton et al. 2004; Braxton and Lien 2000). However, Tinto (1993) acknowledged that there are questions about the parallels with non-traditional students, including community college students and older commuting students; yet, the model does contain elements that specifically address the potential external commitments of these students.

Despite potential criticisms of the relevance for community college students, there have been many research efforts looking at the academic and social integration of community college students on the 2-year campus. In an effort to test Tinto's model for 2-year colleges, Pascarella et al. (1986) found that academic and social integration were significant factors for both men and women when predicting persistence and completion.

In a study at one suburban community college, academic and social integration were both found to be significant in predicting retention in addition to intent to earn a degree or transfer rather than taking classes for a job-related reasons or academic exploration. Intent to reenroll and employment (fewer hours) were also predictive of persistence (Bers and Smith 1991).

In a single institution study, Borglum and Kubala (2000) found no link between academic and social integration and persistence. Essentially, community college students visited the campus long enough to attend classes and showed little interest in the social activities on campus that are traditionally considered to be social integration. This questions the relevance of social integration in Tinto's model for community college students, and perhaps new ways of thinking about the theory are necessary for the community college population.

Deil-Amen (2011) has continued to question the dichotomous conceptualization of academic and social integration for community college students. Rather, Deil-Amen proposed the idea of "socio-academic integrative moments" to describe those occurrences that bridge the two concepts. Examples include studying with peers and interactions during

class time. In a qualitative study at two community colleges, Karp et al. (2010–2011) found that the majority of students in their sample reported being connected (i.e., integrated) in the college environment, and that integration was associated with persistence. Also, much of that integration does not fit the traditional constructs of distinct academic and social integration, but rather an amalgam of the two (see, Deil-Amen 2011). Much of the integration they found was social integration that began in the academic realm; therefore, they recommend a revision of Tinto's framework for community college students that does not consider academic and social integration as distinct constructs.

Academic and Social Integration of Community College Transfer Students

While the use of Tinto's theory in the 2-year setting has become prevalent, a relatively new theme in the literature has been to use the ideas of academic and social integration with the transfer student population following matriculation in the receiving institution.

In a qualitative study of community college transfers at a large university, Townsend and Wilson (2006) found that the transfers struggled in making connections with university faculty (i.e., academic integration), and many expressed challenges in making friends in the university setting (i.e., social integration). They noted that the classroom is a place where community college transfers were likely to engage both socially and academically, due to their experience in commuter 2-year college settings. In a follow-up study among community college transfers who had persisted, Townsend and Wilson (2008–2009) found that despite a slow integration process, many eventually gained a sense of academic belonging; however, the early lack of social integration did not change. The activities in which they participated were directly related to their majors, thus implying social integration can be influenced by "socially-oriented academic integration" (p. 419). Similar to Deil-Amen (2011), this demonstrates the relevance of a connection between the two concepts.

Ishitani and McKittrick (2010) compared the engagement of native and community college transfer students at the receiving institution. They found that, overall, community college transfer students were less engaged than native students; however, community college transfers who enrolled full-time and/or transferred earlier in their academic careers were more likely to engage than part-time students and/or those who transferred after their sophomore year. Living off campus did have a negative effect on student–faculty interaction but did not impact other forms of engagement. In addition, Roberts and McNeese (2010) found similar differences between transfer and native students, but level of involvement was not statistically significant between those who transferred from universities and those who transferred from community colleges.

Laanan et al. (2010–2011) found that transfer students' academic adjustment was improved by the academic skills developed at the community college, but many transfers also felt stigmatized in the university setting, thus limiting adjustment. Socially, community college transfer student social adjustment was positively influenced by interaction and experiences with faculty, yet another example of how community college transfers find social belonging through academic means.

Most recently, Lester et al. (2013) conducted a qualitative study of transfer students at the receiving institution and found that transfers largely found on-campus engagement through academic means. The transfer students were not without social engagement; however, they experienced the social piece outside of the university.

Many of the studies to date that specifically address the integration of transfers at the receiving university (e.g., Lester et al. 2013; Townsend and Wilson 2006, 2008–2009)

make valuable contributions to the related discussion and are based on relatively small samples through qualitative methods. Other valuable studies (e.g., Ishitani and McKittrick 2010) focus on varied types of student engagement as the outcomes. The present study aims to build on this growing body of literature by using a relatively large institutional sample to construct predictive models for multiple indicators of student success. It is the authors' hope that a quantitative analysis focused on both integration and success outcomes will provide additional context upon which the discussion of transfer students can continue to unfold.

Purpose and Conceptual Framework

The theoretical guide for the study is Tinto's (1993) Longitudinal Model of Institutional Departure to identify variables associated with the early academic and social integration of community college transfer students once attending their destination institution. The authors also included the concept of socio-academic integration as conceptualized by Deil-Amen (2011). Elements of Tinto's model and Deil-Amen's notion were selected based on availability of data through an existing dataset generated based on (a) a comprehensive survey administered during the first semester of university enrollment, (b) matched data with the institution's student records system, and (c) relevance to the transfer student population at the institution. This framework (see Fig. 1) positions demographic background, academic and previous college background, commitment and support, and institutional experiences, including socio-academic experiences, as predictive of early academic and social integration and academic outcomes. Central to the analysis in this study is the use of early academic and social integration as both independent and dependent variables. Thus, we seek to better understand the predictors of early integration and then include early academic and social integration with potential predictors of subsequent success.

Method

Following the conceptual framework, the authors examined regression models for early academic and social fit and student success measured by six outcome variables (i.e., first-semester GPA, second-semester GPA, second-semester enrollment, third-semester enrollment, first-semester earned hours ratio, and second-semester earned hours ratio). The following research questions framed the study:

1. What variables identified and informed by elements of Tinto's (1993) Longitudinal Model of Institutional Departure and Deil-Amen's (2011) concept of socio-academic integration were predictors of the perceived early academic and social integration of community college transfer students?
2. What variables identified and informed by elements of Tinto's (1993) Longitudinal Model of Institutional Departure and Deil-Amen's (2011) concept of socio-academic integration were predictors of first-year success of community college transfer students?

Institutional Setting

The setting for this study, Southeastern Urban University (SUU), is located in a fast-growing metropolitan center in the southeastern United States. The institution is part of a

<p>Demographic Background</p> <p>Age Gender Race/Ethnicity</p>	<p>Academic & Previous College Background</p> <p>Associate degree attainment Major Origin institution Parent education Preparedness in math Preparedness in writing Time since last college enrollment Transfer GPA</p>	<p>Commitment & Support</p> <p>Employment Family support Residence location (local/non-local) Satisfaction with major</p>	<p>Institutional Experiences</p> <p><u>Academic</u> Class participation Engage faculty Engage advisor</p> <p><u>Socio-Academic</u> Study with peers Transition seminar</p> <p><u>Social</u> Participation in club or sport</p>
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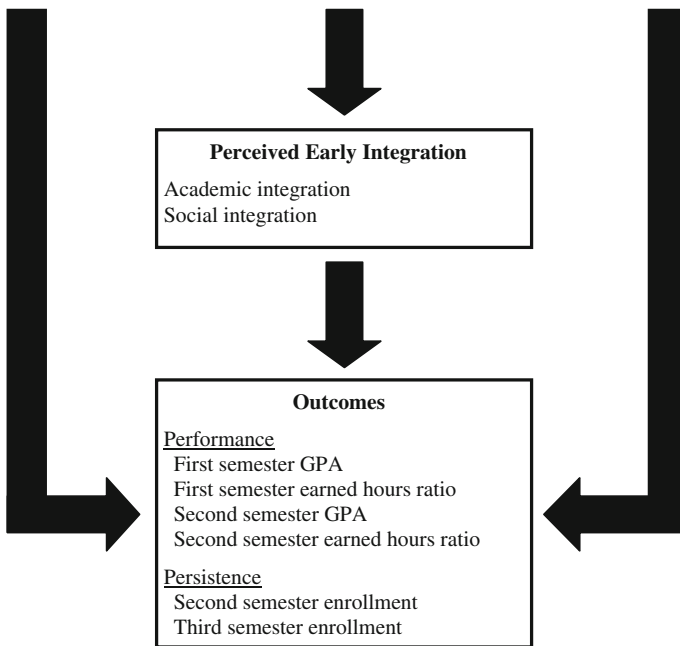


Fig. 1 Conceptual framework: community college transfer student early integration and success

state system with a campus enrollment exceeding 26,000 students, and, according to state system reports, the institution also serves as the top destination of transfer students in the state with more than 2,400 in the fall semester of 2011 alone. The large transfer enrollment and its location among many feeder community colleges make SUU an ideal setting for a single-institution study of transfer student integration. Additionally, the system’s close partnership with the community college system in the state ensures opportunities for individuals to use articulation agreements for seamless transfer. This is evidenced by the fact that the system reports a majority of transfer students into the system each year come from one of the state’s public community colleges.

In a discussion of institutional action, Tinto (2012) wrote, “First, we must recognize that a college or university, once having admitted a student, has an obligation to do what it can to help the student stay and graduate” (p. 6). Although many institutions will focus heavily on the first-year, first-time students due to reporting requirements, the transfer enrollment prevalence at SUU heightens the focus on both first-year and transfer students. It was the desire to learn more about who succeeded and did not succeed that led SUU to design and implement a survey instrument for all incoming students (including transfers). The survey was assembled primarily based on Tinto’s (1975, 1987, 1993) student departure model and Astin’s (1984, 1996) theory of student involvement. The intent of the survey was to capture data 6 weeks after initial enrollment on new students’ academic preparation, expected performance, and engagement patterns. While the survey was originally conceptualized using both Tinto’s and Astin’s work, only selected items from the survey were used to fit this study’s conceptual framework, which is based on Tinto’s (1993) Longitudinal Model of Institutional Departure.

The survey was administered from weeks six through eight in order to capture data at approximately the half way point of the semester and at a time when faculty were evaluating students for mid-term grades. Combined with student records, the survey helped identify students at-risk of attrition and/or poor performance and initiate a longitudinal research process on first-year and transfer student outcomes. Initially designed and implemented in 2005, the full version of the survey was administered through the 2010–2011 academic year. Since there were modifications to the survey throughout its use at the institution, we elected to use three cohorts (2008, 2009, and 2010), since survey items were most consistent during these 3 years, and all items selected for the present study were identical. During the 2008–2010 time period, the data were used as one institutional approach to identifying at-risk students. For example, those demonstrating a risk factor were notified of that risk, and academic departments that wished to identify at-risk students could do so; however, the use of these data was not as systematic until 2011–2012, when a brief version of the survey was employed and academic advisors were notified of student responses. The dataset is described in greater detail in the following section.

While the present study of community college transfer students is the most recent use of data from the survey, this is not the University’s first effort to drive transfer success based on the data. Following the first administration, institutional leaders (Wolf Johnson et al. 2008) found that unmet financial need, perceived academic difficulty after 6 weeks, missed classes, and employment were risk factors for transfer students. In the subsequent years, the university has been proactive in advising/orienting transfer students, implementing transfer seminar sections, and establishing a transfer honor society. While these and other efforts are still underway, it illustrates how the data are and can be used to facilitate success, and more research is needed. These authors also acknowledged heterogeneity among the university’s transfer population. Even with the majority of transfers coming from the 2-year sector, there are also many 4-year transfers; thus, a detailed analysis of the community college transfer population through the present study is warranted.

Data Source and Sample

Community college transfer students are the target population of interest in this study, defined as students initiating studies at a 4-year institution whose previous college attendance includes attendance or completion of a degree at a 2-year institution. The sampling frame for the study included student records in the aforementioned database who indicated transfer student status and previous studies at a 2-year institution ($n = 1,147$). Transfer

students whose previous studies were only at 4-year institutions or students who had attained a 4-year degree were excluded from the sample. The final sample in each analysis was based on listwise deletion of those records for which data on all of the study variables were not available; thus, the final sample size was $n = 968$ with the sample ranging from $n = 895$ to $n = 968$ in the specific models depending on available data.

The demographic profile of the sample included 48 % non-traditional age (24 or older), 40 % first-generation (neither parent with a 4-year degree), 56 % women, 66 % White, 16 % African American, and 18 % other race/ethnicity. About 70 % resided in the metro area of the 4-year institution (within 20 miles). Nearly half of the sample participants (49 %) had attained a 2-year degree upon transfer to the 4-year institution, and about 46 % had previously studied at a feeder community college. Very few students (7 %) were enrolled in a transition seminar during the first semester at the 4-year institution.

Key Variables

The independent variables selected for this study included five sets of potential predictors which represent related conditions or indicators of student success, following the conceptual model shown in Fig. 1. First, we identified items from the institutional survey to align with the variables of interest in each of the conceptual model categories. Then, descriptive correlational analysis and an exploratory factor analysis (EFA) were conducted on items purported to measure academic background (math and writing preparation, transfer GPA), academic experiences (meeting with faculty, meeting with advisor, participating in class), socio-academic experiences (studying with peers), social experiences (participating in club or sport), and early academic and social integration. EFA is appropriate when the exploration of a data set, not confirmation of factor structure, is the goal (Costello and Osborne 2005). Following the best practices recommendations of Costello and Osborne (2005), the EFA employed maximum likelihood method of factor extraction with oblique rotation, retaining factors with eigenvalues greater than 1.0, and examining the scree plot to determine final number of factors to be retained. Three factors were retained, representing academic background, institutional experiences, and perceived integration. The factor loadings examined from the pattern matrix along with the correlations (Table 1) indicated that the items representing each category were generally related in the expected direction. Based on these analyses, all 10 of these items, along with 13 others representing indicators of demographic and academic background and external commitments, were retained as variables in the study. Each of the variables is presented in Table 2 including the item wording or description, coding, and descriptive statistics.

The majority of the independent variables were operationalized dichotomously to identify the presence or absence of each potential predictor of student outcomes. Demographic background variables included age, gender, and race/ethnicity. Eight academic and previous college background variables were estimated, including whether the participant had attained an associate degree, enrolled in a STEM major, previously enrolled at a feeder community college, had at least one parent who attained a 4-year degree, perceived self to be well-prepared in math and in writing, enrolled at another institution in the previous year, as well as the student's incoming transfer GPA. Variables representing student commitment and support were work hours, emotional support and understanding from family members, whether the student was a local resident (living within 20 miles of the institution), and whether the student was satisfied with his or her major. Six different variables representing institutional experiences were included. Academic experiences were operationalized as whether the student had ever met with a faculty member or academic advisor

Table 1 Exploratory factor analysis pattern coefficients and intercorrelations between items intended to measure academic and previous college background, institutional experiences, and early integration ($n = 968$)

Variables	Pattern coefficient	Correlations										
		Academic and previous college background					Institutional experiences					Early integ.
		Math prep	Writing prep	Transfer GPA	Class partic	Engage faculty	Engage advisor	Study Peers	Club or sport	Academic fit		
Math prep	0.45											
Writing prep	0.55	0.29***										
Transfer GPA	0.12	0.09**	0.07**									
Class partic	0.40	0.04	0.14***	0.00								
Engage faculty	0.58	0.00	0.01	0.02	0.22***							
Engage advisor	0.40	-0.01	0.03	0.02	0.17***	0.23***						
Study peers	0.19	0.06*	0.02	-0.03	0.08**	0.15***	0.05*					
Club or sport	0.09	0.04	0.11***	0.00	0.04	0.05	0.07*	0.12***				
Academic fit	0.42	0.20***	0.16***	-0.07*	0.17***	-0.01	0.02	0.02	0.11			
Social fit	1.03	0.15***	0.09**	-0.04	0.02	0.03	0.00	0.19***	0.18	0.41***		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2 Variable labels, descriptions, and descriptive statistics for study model constructs

Constructs (variable label)	Item wording or description	Descriptive statistics (frequencies, M, SD)
Age (24 or older)	Are you 24 years or older?	Yes = 48.3 % No = 51.7 % ^a
Gender (male)	Gender code from student records	Female = 56.5 % ^a Male = 43.5 %
Race or ethnicity (African American)	Ethnicity code from student records	African American = 16.1 % White = 65.9 % ^a Other = 18.0 %
Associate degree	Has student completed a 2-year degree?	Yes = 49.2 % No = 50.8 % ^a
Major (STEM major)	Major in science (biology, chemistry, physics, meteorology, geology, earth sciences), technology (computer science, software, information systems), engineering (engineering, engineering technology), mathematics	Yes = 24.3 % No = 75.7 % ^a
Origin institution (feeder CC)	Did student attend a feeder community college for (institution)?	Feeder CC = 46.3 % Non-feeder = 53.7 % ^a
Parent education (first generation)	Have one or both of your parents graduated with a 4-year college degree?	Yes = 60.4 % No = 39.6 % ^a
Preparedness in math (math prep)	How well did your prior educational experiences prepare you for college in math?	Well prepared = 56.1 % Not well prepared = 43.9 % ^a
Preparedness in writing (writing prep)	How well did your prior educational experiences prepare you for college in writing papers?	Well prepared = 68.0 % Not well prepared = 32.0 % ^a
Time since last college enrollment (enrolled last year)	How long has it been since you were last enrolled for college or high school classes?	Less than 1 year = 27.1 % One or more years = 72.9 % ^a
Transfer GPA	Cumulative college GPA	M = 3.00 SD = 0.55
Employment (work hours)	How many hours per 7 day week do you work?	Do not work = 45.6 % ^a Up to 15 h = 9.0 % Over 15 h = 45.4 %
Family support	How often do you receive emotional support from your family? AND How often does your family understand the demands of your academic commitments? Range = 2–8	M = 6.26 SD = 1.75
Residence location (local)	Where do you live relative to (institution)?	Within 20 miles = 70.5 % >20 miles = 29.5 % ^a
Satisfaction with major (satisfaction major)	Are you satisfied with your current academic major?	Yes = 82.8 % No = 17.2 % ^a

Table 2 continued

Constructs (variable label)	Item wording or description	Descriptive statistics (frequencies, M, SD)
Class participation (class partic)	How often do you participate in class (ask questions, participate in discussions, etc.)?	Often = 61.8 % Infrequent or never = 38.2 % ^a
Engage faculty	How often have you met with a faculty member about an academic difficulty or other issue?	Ever = 65.5 % Never = 34.5 % ^a
Engage advisor	How many times have you met with an academic advisor this semester?	At least once = 64.4 % Never = 35.6 % ^a
Study with peers (study peers)	How often each seven day week do you study outside of class with other students?	Ever = 50.1 % Never = 49.9 % ^a
Transition seminar	Enrollment in first year or transfer seminar (from student records)	Yes = 6.7 % No = 93.3 % ^a
Participation in club or sport (club or sport)	Are you involved in at least one intramural group, club sport, or organized fitness activity on campus OR at least one student club or organization this semester?	Yes = 21.0 % No = 79.0 % ^a
Academic integration (academic fit)	I feel that this institution is a good fit for me academically (1 = strongly disagree to 5 = strongly agree)	M = 4.09 SD = 0.82
Social integration (social fit)	I feel that this institution is a good fit for me socially (1 = strongly disagree to 5 = strongly agree)	M = 3.48 SD = 0.96
First semester GPA (fall GPA)	Eight categories with equal ranges from 1 = 0.00–0.49 to 8 = 3.50–4.00	M = 6.27 SD = 1.83
First semester earned hours ratio (fall hours)	Seven categories of increasing ratio of earned to attempted hours, 1 = 0, 2 = 0.001–0.199, 3 = 0.200–0.399, 4 = 0.400–0.599, 5 = 0.600–0.799, 6 = 0.800–0.999, 7 = 1.00	M = 6.20 SD = 1.40
Second semester enrollment (Spring enrollment)	Did student re-enroll in second semester?	Yes/Persist = 92.3 % No/Not Persist = 7.7 % ^a
Second semester GPA (Spring GPA)	Eight categories with equal ranges from 1 = 0.00–0.49 to 8 = 3.50–4.00	M = 6.31 SD = 1.67
Second semester earned hours ratio (spring hours)	Seven categories of increasing ratio of earned to attempted hours, 1 = 0, 2 = 0.001–0.199, 3 = 0.200–0.399, 4 = 0.400–0.599, 5 = 0.600–0.799, 6 = 0.800–0.999, 7 = 1.00	M = 6.21 SD = 1.31
Third semester enrollment (persistence)	Did student re-enroll in third semester?	Yes/Persist = 80.8 % No/Not Persist = 19.2 % ^a

^a Reference category for regression analyses

within the first 6 weeks, along with frequency of class participation. Studying with peers and enrollment in a transfer seminar were the socio-academic experience variables estimated. Finally, social experiences were measured as whether the student participated in at least one club or sport.

Perceived academic and social integration were each measured by student agreement with a single item on a five-point Likert-type scale completed after the first 6 weeks of enrollment. To answer our first research question, we developed multivariate and univariate prediction models for perceptions of early integration using independent variables reflecting demographics, background, and support. To answer our second research question, academic and social integration scores were included as independent variables in multivariate and univariate prediction models focused on six indicators of success derived from student enrollment records and operationalized as follows: First semester and second semester GPAs were represented in eight equal intervals, covering the range from 0.00 to 4.00; earned hours ratios for the first and second semester were expressed in seven ranges, where 1 = 0, 2 = 0.001–0.199, 3 = 0.200–0.399, 4 = 0.400–0.599, 5 = 0.600–0.799, 6 = 0.800–0.999, 7 = 1.00; and, second and third semester enrollment (persistence) were dichotomized to reflect whether or not the student was enrolled.

Analysis

We used multivariate regression methods to evaluate the statistically significant predictors of early academic and social integration, and those of first and second semester student performance outcomes (earned hours and GPA) among community college transfer students at the institution under study. This approach was selected due to the presumed relationship between the dependent variables and to reduce estimation error due to the number of independent and dependent variables under study. The R^2 and regression coefficients were examined for each univariate model, along with Wilks Lambda (λ) for the multivariate model to determine whether the equations taken together were statistically significant.

For second and third semester enrollment, two separate logistic regression models were estimated. Due to the potential issue of multicollinearity, we calculated variable inflation factors (VIF) for the variables in each of the models. While VIFs >5 are generally considered to indicate multicollinearity, none was higher than 2.2; therefore, the variables in our models were shown to perform as unique items. Percent correctly classified, Nagelkerke R^2 , and model Chi square were also examined for each model, while odds ratios (Exp B) were examined at the item level. The cut-off probability used for calculation of percent correctly classified was 0.5. We used an α level of 0.05 and conducted multivariate regression analyses using SAS and logistic regression analyses using SPSS.

Results

Predicting Early Academic and Social Integration

The multivariate regression analysis for academic and social integration included 22 independent variables—demographic background (3 variables), academic and previous college background (8 variables), commitments and support (5 variables), institutional experiences (6 variables). The total R^2 and the unstandardized regression coefficients for each univariate model are shown in Table 3.

The multivariate model for early academic and social integration is statistically significant ($\lambda = 0.76, p < 0.0001$). The univariate model for academic integration explained a small but statistically significant amount of variance ($R^2 = 0.12$). Non-traditional age, perceived math preparation, writing preparation, family support, class participation, and participation in a club or sport were positively associated with academic integration;

Table 3 Predictors of early integration among community college transfer students

Predictors	Academic fit			Social fit				
	B	SE B	t	p	B	SE B	t	p
Demographic background								
24 or older	0.21	0.07	2.89	0.004	-0.06	0.08	-0.76	0.445
Male	-0.03	0.06	-0.61	0.543	-0.31	0.06	-4.81	<.0001
African American	-0.07	0.07	-0.94	0.347	-0.02	0.08	-0.23	0.818
Academic and previous college background								
Associate degree	0.03	0.05	0.48	0.630	-0.01	0.06	-0.17	0.865
STEM major	-0.12	0.06	-1.90	0.057	-0.08	0.07	-1.11	0.268
Feeder CC	0.08	0.05	1.47	0.141	-0.03	0.06	-0.47	0.636
First generation	-0.07	0.05	-1.43	0.152	-0.06	0.06	-1.01	0.312
Math prep	0.26	0.05	4.80	<.0001	0.16	0.06	2.57	0.010
Writing prep	0.17	0.06	3.06	0.002	0.07	0.07	1.11	0.266
Enrolled last year	-0.19	0.08	-2.40	0.017	-0.22	0.09	-2.36	0.019
Transfer GPA	-0.16	0.05	-3.34	0.001	-0.01	0.06	-0.24	0.812
Commitment and support								
Work ≤ 15 h	0.00	0.09	-0.03	0.976	0.21	0.11	1.99	0.047
Work > 15 h	0.04	0.05	0.74	0.461	0.08	0.06	1.21	0.227
Family support	0.07	0.01	4.72	<.0001	0.09	0.02	5.12	<.0001
Local	0.08	0.06	1.32	0.188	0.02	0.07	0.36	0.718
Satisfied major	0.04	0.07	0.64	0.526	0.04	0.08	0.57	0.570
Institutional experiences								
Class partic	0.16	0.06	2.93	0.004	-0.01	0.06	-0.15	0.884
Engage faculty	-0.09	0.06	-1.65	0.10	0.04	0.06	0.57	0.572
Engage advisor	-0.04	0.05	-0.79	0.429	-0.08	0.06	-1.24	0.216

Table 3 continued

Predictors	Academic fit			Social fit				
	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
Institutional experiences								
Study peers	-0.02	0.05	-0.31	0.757	0.35	0.06	5.72	<.0001
Transition seminar	-0.04	0.10	-0.36	0.716	-0.06	0.11	-0.52	0.605
Club or sport	0.25	0.06	4.30	<.0001	0.30	0.07	4.46	<.0001
<i>n</i>	968							
<i>R</i> ²	0.12***							

*** *p* < 0.001

however, being enrolled within the last year and transfer GPA were negative predictors of perceived academic integration.

The univariate model for social integration was slightly more successful in explained variance ($R^2 = 0.15$). Studying with peers, family support, gender (male), participation in a club or sport, math preparation, and working fewer than 15 h were all positive predictors of social integration. Only being enrolled within the last year was a negative predictor of social integration.

Predicting First-Year Success

The multivariate regression model for four first-year student performance outcomes (first and second semester GPA; first and second semester earned hours ratios) included the 22 predictors in the multivariate model for early integration, along with early academic and social integration, for a total of 24 independent variables. The multivariate model was statistically significant based on Wilks' Lambda ($\lambda = 0.66$, $p < 0.0001$). The R^2 and unstandardized regression coefficients for each univariate model are shown in Tables 4 (first semester) and 5 (second semester).

First Semester Academic Outcomes

The univariate model explained a modest amount of variance in fall GPA ($R^2 = 0.22$), with six statistically significant positive predictors: transfer GPA, academic integration, non-traditional age, working fewer than 15 h, class participation, and participation in a club or sport. Social integration, African American, and STEM major were negatively associated with fall GPA. For fall earned hours ratios, the variance explained by the univariate model was about 11 % ($R^2 = 0.11$). Transfer GPA and early academic integration were positive predictors, while African American and STEM major were negatively associated.

Second Semester Academic Outcomes

For spring GPA, the predictors explained about 17 % of variance ($R^2 = 0.17$). Four predictors were statistically significant in the positive direction: transfer GPA, academic integration, non-traditional age, and meeting with advisor; while three were significant in the negative direction: social integration, African American, and STEM major. About 10 % of variance ($R^2 = 0.10$) was explained in the univariate model for spring earned hours ratio with positive predictors being transfer GPA, perceived math preparation, and meeting with advisor, while STEM major and African American were negative predictors.

Persistence

Logistic regression models were estimated for each of the two persistence outcomes—second and third semester enrollment (see Table 6). In each case, “did not persist” was the reference category. In the model for second semester enrollment, 93 % of students were correctly classified, but a statistically significant model, $\chi^2(24) = 60.28$, $p < 0.001$, and Nagelkerke R^2 of 0.15 evidenced limited fit of the model. Two predictors significantly improved odds of enrollment: class participation (OR = 2.18) and academic integration (OR = 1.69). Only satisfaction with major (OR = 0.38) significantly decreased odds of enrollment.

Table 4 Predictors of first-semester academic outcomes among community college transfer students

Predictors	Fall GPA			Fall hours				
	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
Demographic background								
24 or older	0.56	0.14	3.95	<0001	0.03	0.11	0.27	0.788
Male	0.03	0.11	0.26	0.797	-0.06	0.08	-0.71	0.479
African American	-0.58	0.14	-4.18	<0001	-0.34	0.11	-3.11	0.002
Academic and previous college background								
Associate degree	0.09	0.10	0.93	0.350	0.07	0.08	0.93	0.355
STEM major	-0.51	0.12	-4.24	<0001	-0.48	0.09	-5.10	<.0001
Feeder CC	0.00	0.10	-0.02	0.981	-0.15	0.08	-1.88	0.061
First generation	0.11	0.10	1.06	0.288	0.09	0.08	1.2	0.232
Math prep	0.17	0.11	1.60	0.110	0.14	0.08	1.69	0.091
Writing prep	0.08	0.11	0.71	0.480	0.07	0.08	0.81	0.415
Enrolled last year	-0.12	0.16	-0.79	0.428	0.02	0.12	0.15	0.879
Transfer GPA	0.85	0.09	9.15	<0001	0.39	0.07	5.44	<.0001
Commitment and support								
Work ≤ 15 h	0.39	0.17	2.23	0.026	0.05	0.13	0.38	0.701
Work > 15 h	0.00	0.11	-0.04	0.966	-0.01	0.08	-0.18	0.859
Family support	0.03	0.03	0.91	0.365	0.03	0.02	1.51	0.132
Local	0.16	0.11	1.44	0.150	0.00	0.09	0.03	0.979
Satisfied major	-0.26	0.12	-2.12	0.034	-0.13	0.10	-1.33	0.184
Institutional experiences								
Class partic	0.33	0.11	3.10	0.002	0.09	0.08	1.1	0.270
Engage faculty	-0.11	0.11	-1.05	0.295	-0.07	0.08	-0.83	0.409
Engage advisor	0.13	0.10	1.23	0.219	0.12	0.08	1.55	0.121

Table 4 continued

Predictors	Fall GPA			Fall hours			
	<i>B</i>	<i>SE B</i>	<i>p</i>	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
Institutional experiences							
Study peers	-0.17	0.10	0.111	-0.11	0.08	-1.38	0.169
Transition seminar	0.04	0.18	0.830	0.04	0.14	0.29	0.773
Club or sport	0.26	0.11	0.018	0.06	0.09	0.75	0.452
Perceived early integration							
Academic fit	0.22	0.07	0.002	0.14	0.05	2.55	0.011
Social fit	-0.26	0.06	<0.001	-0.05	0.05	-1.02	0.310
<i>n</i>	895			895			
<i>R</i> ²	0.22***			0.15***			

*** $p < 0.001$

Table 5 Predictors of second semester academic outcomes among community college transfer students

Predictors	Spring GPA				Spring hours			
	B	SE B	t	p	B	SE B	t	p
Demographic background								
24 or older	-0.45	0.15	-3.01	0.003	-0.07	0.12	-0.55	0.582
Male	0.08	0.11	0.76	0.450	-0.07	0.09	-0.77	0.443
African American	-0.51	0.15	-3.49	0.001	-0.27	0.12	-2.28	0.023
Academic and previous college background								
Associate degree	-0.04	0.10	-0.39	0.700	-0.06	0.08	-0.74	0.457
STEM major	-0.29	0.13	-2.29	0.022	-0.48	0.10	-4.73	<.0001
Feeder CC	-0.18	0.11	-1.63	0.103	-0.15	0.09	-1.76	0.078
First generation	0.04	0.10	0.38	0.702	0.05	0.08	0.54	0.587
Math prep	0.13	0.11	1.15	0.249	0.24	0.09	2.72	0.007
Writing prep	0.07	0.12	0.6	0.551	-0.11	0.09	-1.17	0.244
Enrolled last year	0.07	0.16	0.45	0.654	0.13	0.13	1.02	0.309
Transfer GPA	0.86	0.10	8.8	<.0001	0.44	0.08	5.60	<.0001
Commitment and support								
Work ≤ 15 h	0.08	0.18	0.46	0.646	0.07	0.15	0.50	0.619
Work > 15 h	0.11	0.11	0.95	0.345	-0.03	0.09	-0.32	0.748
Family support	0.02	0.03	0.79	0.432	0.01	0.02	0.61	0.544
Local	0.11	0.12	0.94	0.348	0.13	0.09	1.43	0.153
Satisfied major	-0.18	0.13	-1.4	0.161	-0.05	0.10	-0.44	0.660
Institutional experiences								
Class partic	0.09	0.11	0.78	0.434	-0.06	0.09	-0.66	0.508
Engage faculty	0.07	0.11	0.6	0.548	0.03	0.09	0.36	0.722
Engage advisor	0.26	0.11	2.36	0.018	0.21	0.09	2.42	0.016

Table 5 continued

Predictors	Spring GPA			Spring hours			
	<i>B</i>	<i>SE B</i>	<i>p</i>	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
Institutional experiences							
Study peers	-0.01	0.11	0.939	0.08	0.09	0.93	0.353
Transition seminar	-0.10	0.19	0.608	-0.19	0.15	-1.25	0.213
Club or sport	0.10	0.12	0.412	-0.02	0.09	-0.24	0.809
Perceived early integration							
Academic fit	0.25	0.07	0.001	0.09	0.06	1.56	0.118
Social fit	-0.23	0.06	0.000	-0.01	0.05	-0.11	0.914
<i>n</i>	895			895			
<i>R</i> ²	0.17***			0.10***			

*** $p < 0.001$

Table 6 Predictors of persistence among community college transfer students

Predictors	Second semester odds ratio	Third semester odds ratio
Demographic background		
24 and older	0.57	1.01
Male	1.60	0.86
African American	1.34	1.19
Academic and previous college background		
Associate degree	1.47	1.20
STEM major	0.69	0.79
Feeder CC	1.45	1.42
First generation	0.77	0.95
Math prep	1.03	1.24
Writing prep	1.70	1.09
Enrolled within last year	1.72	1.05
Transfer GPA	1.34	1.28
Commitment and support		
Work \leq 15 h	1.29	1.78
Work $>$ 15 h	0.71	0.85
Family support	1.02	0.94
Local	1.58	1.25
Satisfied major	0.38*	0.77
Institutional experiences		
Class partic	2.18*	1.12
Engage faculty	1.12	1.03
Engage advisor	1.44	1.12
Institutional experiences		
Study peers	1.50	1.25
Transition seminar	4.85	1.28
Club or sport	1.51	1.08
Perceived early integration		
Academic fit	1.69**	1.51***
Social fit	1.03	0.96
Constant	2.34	1.81
<i>N</i>	968	968
Percentage correctly classified	93.2 %	83.1 %
χ^2 (<i>df</i>)	60.28(24)***	38.76(24)*
Nagelkerke R^2	0.15	0.07

* $p < 0.05$, ** $p < 0.01$,*** $p < 0.001$

While 83 % of students were correctly classified for third semester enrollment, the final model showed weak fit [$\chi^2(24) = 38.76$, $p = 0.03$, Nagelkerke $R^2 = 0.07$]. Only academic integration (OR = 1.51) significantly improved odds of persistence among the predictors in the model. Since the intent was to measure third semester enrollment rather than continuous enrollment across three semesters, the analysis included all students in the sample rather than just those who returned for the second semester. This is necessary since the transfer student population may not view continuous enrollment as a priority. Evidence

of this is that 12 students in the sample did not enroll in the second semester but returned for the third.

Discussion

The organization of the study was informed by Tinto's model by using specific model elements and categorizing variables appropriate to the transfer student population. The use of the adapted model and viewing dependent variables through a semester-to-semester lens allowed the researchers to (a) identify important features of academic and social integration and outcomes for community college transfer students, (b) consider appropriate implications for practice that can be considered by those working closely with the transfer population, and (c) reflect upon the conceptualization of this study in recommending suggestions for further inquiry about community college transfer students.

The primary filter through which this study explored the findings relevant to community college transfers was integration, more specifically academic and social integration. Considering that the sample consisted of new transfer students, the authors operationalized academic and social integration as perceived academic and social fit after attending the receiving university for just 6-to-8 weeks. The results showed that perceived academic fit served as the most consistent predictor of outcomes, being significant for all but second semester earned hours. This finding is consistent with the idea that academic integration is important for transfer students. The fact that perceived social fit was not a positive predictor and was a negative indicator of GPA further supports the notion in previous literature (Lester et al. 2013; Townsend and Wilson 2008–2009) that transfer student integration on campus can be more associated with academics than the social arena.

This idea of academic fit being associated with student success is perhaps best seen in the findings on spring enrollment (i.e., first-to-second-semester persistence). The two positive predictors of second semester return were perceived academic fit and participation in class. Each of these significant items helps to show that perceived academic competence, direction, and integration was associated with second semester return, which advances Townsend and Wilson's (2006) finding that it is in the classroom where community college transfers make their connection. Thus, it is the academic connections that are associated with positive community college transfer outcomes. A somewhat contradictory finding is the negative association between satisfaction with major and second semester return. While significant at the 0.05 level, it appears to have little practical significance. Eighty-three percent of all community college transfer students were satisfied with their majors, and 91.5 % of those who were satisfied returned for the second semester compared with 95.4 % of those who were not satisfied.

Additionally, there are other significant variables which assist in painting the community college transfer student success picture. Perhaps the most prevalent in previous literature was transfer GPA. In the present study, transfer GPA was an indicator of higher academic performance as measured through GPA and earned hours ratio, which is consistent with the many findings indicating that college GPA prior to transfer is an indicator of student success (Carlan and Byxbe 2000; Luo et al. 2007; Mullen and Eimers 2001; Pennington 2006; Zhai and Newcomb 2000; Wang 2009). However, the current findings show that persistence was not affected by transfer GPA. In some ways this demonstrates that students are admitted at an appropriate GPA threshold; however, there are additional implications. For example, those with lower GPAs may be more susceptible to transfer shock (see Hills 1965) and dropping classes. In addition, the combination of these findings

and consideration of the STEM variable provides other points for review. STEM major was a negative predictor for GPA and earned hours, and thus may be consistent with Cejda et al.'s (1998) discussion of transfer shock among math and science majors and other findings that show academic challenges for community college transfer students in science and technology majors (e.g., Carlan and Byxbe 2000; and Mullen and Eimers 2001). Similar to the transfer GPA findings, STEM major was also a negative predictor of GPA and earned hours, but it had no effect on returning to or departing the institution.

Another key theme is the academic skills developed in the community college prior to transfer, and how they may improve academic adjustment after transfer (see, Laanan et al. 2010–2011). Some of the variables included in the study could be clustered with the idea that they represent evidence of academic skills (e.g., transfer GPA, perceived academic preparation). The importance of academic skills is supported by the notion that transfer GPA was a positive predictor of several outcome variables and perceived preparation in math was a predictor of second semester earned hours ratio. However, transfer GPA was associated negatively with perceived early academic fit. This shows that even if one demonstrates potential for success, they may experience difficulty adjusting to the university setting upon arrival. Other variables that had the potential to be associated with a transfer student's knowledge about and comfort with the destination institution was community college origin, which was operationalized as a primary feeder (i.e., local) college and colleges outside of the greater metropolitan area, and college enrollment in the year immediately prior to transfer. The findings showed that origin institution was not significant in any of the models suggesting that community college transfers may come in with similar opportunities and challenges regardless of where they attended previously. However, being enrolled in the last year was a significant negative predictor of academic and social integration perhaps indicating that comfort and familiarity with the previous institution may, in some small way, limit academic and social connections in the first few weeks at the receiving university. It is noteworthy that recent enrollment was not a predictor, positively or negatively, of academic performance or persistence.

Somewhat related to the origin institution is the local residence in which a student lived during their first 6 weeks at the university. In the present study, distance from campus was not significant positively or negatively. The variable consisted of those living local versus non-local, which is a bit different than Ishitani and McKittrick's (2010) consideration of on-campus and off-campus when finding that those off-campus were less likely to engage with faculty. However, it appears in this study that neither perceived fit nor any of the outcome variables were affected by location; perhaps it is not a factor for students accustomed to attending a commuter institution.

Although 66 % of students had met with a faculty member and 64 % had met with an advisor in the first 6 weeks, there were mixed findings regarding their effect on outcome variables. Meeting with faculty was not significant, while meeting with an advisor was a significant positive predictor of second semester GPA and earned hours ratio, in contrast to previous research (Pennington 2006) that did not find a link between advising and academic performance immediately following transfer. In terms of faculty, Townsend and Wilson (2006) indicated that transfers struggle in making connections with instructors, which may have been at play here, but there are other considerations in terms of the study's design that can provide additional context. These data were collected following the first six weeks, which was merely a snapshot of the students' early experiences with faculty and advisors. Clearly, the advisor connection may have positively influenced future course selection and information gathering leading to an association with second semester outcomes, but the faculty connection element may be more complex. The faculty question in

the survey does not capture the quality of the interactions which may develop later in the semester once more in-depth interactions occur.

Lastly, the two variables labeled under the relatively new concept of socio-academic integration (see Deil-Amen 2011), studying with peers outside of class and completing a transfer seminar course, were not significant other than studying with peers being a factor of social fit. The authors recognize that many transfer students do not lead traditional college lives and may depart campus immediately following class; and, thus, their connections with the university may happen in the classroom setting more than anywhere else. So, although the two primary socio-academic variables were not significant, it is possible that for the community college transfer population that a factor such as participating in class, traditionally considered an academic activity, may serve as both an academic and a social outlet. In addition, few students completed the transfer seminar, which may have in some way influenced the results. Additional research is warranted on the connections between the academic and social integration constructs for the transfer student population.

Limitations

Limitations that affect the internal validity and generalizability of the study include the sample selection and setting at a single institution, the use of existing data which are aligned with but not specifically designed to address the research questions, along with the use of single-item measures for the study variables. About 26 % of entering transfer students completed the survey, whom may not be representative of the entire body of transfer students at the institution particularly in terms of their early experiences and sense of integration. There are also some slight demographic differences. We know, for example, that the sample includes more White students (66 % compared with 64 % for the entering transfer population) and more female students (56 % compared with 52 % for the entering transfer population). Also, the use of the survey to provide information to students and requesting departments could potentially have led to interventions targeting at-risk students. There is no way to determine if such interventions were sought or employed, and these potential services represent one avenue within the university setting to assist students.

In addition, we acknowledge that students could have transferred at different points of their academic careers. While number of credit hours at the time of transfer was not available, we included transfer GPA as a measure of prior academic performance and associate degree attainment as a measure of number of courses completed to mitigate the limitation. Further, there was not sufficient representation of particular racial and ethnic groups in the sample (Asian American, Latino, Native American) to study whether membership in any of these groups is a predictor of the student outcomes studied. Because of the use of single-item measures for constructs for institutional experiences and integration, it was not possible to generate validity and reliability coefficients. Accordingly, we emphasize the exploratory nature of this work and the intent to contribute to a continuing conversation about the predictors of success for community college transfer students.

Implications for Practice

Two deliberate design features of this study contribute to the potential to inform practice. First is considering the performance and persistence variables that involve GPA, earned hours ratios, or persistence. Second is the grouping of outcomes semester-by-semester. The authors accept that generalizations are limited from a single-institution study; however, as the top destination of transfers in a state with both a large university and community

college system and as an institution that enrolls nearly as many transfer students as first-time, first-year students, the findings may guide other institutions' exploring the integration and success of community college transfers.

When considering the findings by category of independent variables, one can see that the institutional experiences (i.e., those under perhaps the greatest control of the destination institution), explained relatively little variance compared with academic and previous college background. An important exception is the role of advisors in second semester outcomes. The findings make it particularly important that interventions are targeted to community college transfers' greatest needs. The overall finding that perceived academic fit is significant in nearly every model, it seems best to nurture academic connections, and perhaps socio-academic connections depending on variable categorizations, for the community college transfer population. In addition, it is important to consider the outcomes an institution is most interested in targeting, since each included in this study is relevant to a different aspect of university priorities. For example, persistence is important for the continued progress toward graduation, but it is also a common performance metric for both federal and state reporting purposes. GPA is critical for students seeking to enter selective majors including some STEM fields, and from a university standpoint GPAs are relevant to the advising function. Earned hours ratios and course withdrawal has become increasingly relevant as colleges and universities seek to shorten time to degree, and from a financial aid perspective the new 12 semester Pell Grant cap results in new implications for financial aid.

Another important lesson learned from this research is that the data collected following the first 6 weeks at the destination institution have the strongest association with perceived early academic and social integration and first-semester outcomes. Lessening effects into the second and third semesters do not account for any early momentum that leads to long-term outcomes (e.g., completion); however, at the least it shows that when considering interventions, it is important to act quickly to positively influence the first semester, which can be a vulnerable time for community college transfer students in transition.

Also, it should be noted that, other than class participation, many of the significant variables are either out of the institution's control (e.g., demographics) or they occur based on pre-transfer experiences (e.g., transfer GPA, perceived preparation). While the pre-transfer experience may traditionally be thought of as outside of the influence of the university, stronger connections through "bridge" programs (see, Blaylock and Bresciani 2011) with community colleges may provide opportunities for prospective transfers to enhance preparation, gain greater feelings of fit/integration upon transfer, and develop greater satisfaction with the receiving institution.

Finally, as colleges and universities enhance their focus on STEM majors, these findings confirm that many community college transfer students in STEM fields may struggle with grades and completion of courses; however, there is good news among these negative findings. The fact that STEM major enrollment is not associated with persistence indicates that these students are persisting toward completion, which is perhaps the most appropriate measure of success for this student population.

Implications for Future Research

In light of the limited scholarship on the academic and social integration of community college transfer students once attending the receiving institution, there are many opportunities to expand the efforts of the current study.

Based on model fit statistics (R^2 for multiple regression; Chi square and Nagelkerke R^2 for logistic regression), the conceptual framework of this study was most successful in predicting GPA and early outcomes including second semester return. Additional work can and should be done on understanding more about those who depart during or following the first semester, since that appears to be a time of vulnerability following transfer. Additionally, second year data collection on similar items may help interpret changes in perceptions and/or institutional experiences and whether those changes influence longer-range outcomes. Qualitative data collection may also contribute to the understanding of what it means for community college transfer students to feel integrated and further explore the concept of socio-academic integration.

Conclusions

While this inquiry was not intended to be a commentary on the use of Tinto's model or its adaptation for community college transfer students, it is important to recognize where the conceptual framework, which was loosely based on the model, worked and did not provide the best fit when attempting to understand this population based on the available data points. Academic and previous college background factors proved to be the most important predictors across outcomes, while demographics, institutional experiences, and perceived early academic and social integration played a less significant role in model fit. In an effort to better understand the transfer student population, the authors' primary recommendation is to not consider university entry as the starting point of such inquiry. The findings show

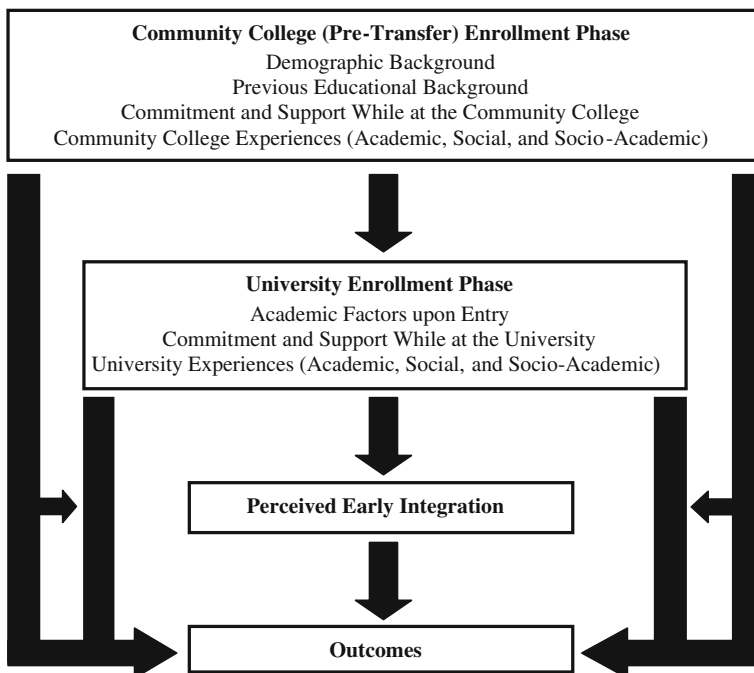


Fig. 2 Revised conceptual framework for the future study of community college transfer students

that what happens prior to arrival is critically important to understanding what is associated with perceived early academic and social integration and outcomes. Therefore, the authors propose a revision to the conceptual framework in Fig. 2 that includes an additional layer that captures transfer students' experiences prior to transfer and tracks them longitudinally into the receiving institution. It is important for both the research community and practitioners to embrace a perspective of a higher education continuum when considering the success of community college transfer students.

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