Peer-Reviewed Article

© *Journal of International Students*
Volume 10, Issue 2 (2020), pp. 420-442
ISSN: 2162-3104 (Print), 2166-3750 (Online)
Doi: 10.32674/jis.v10i2.339
ojed.org/jis

The Road to the Baccalaureate: Assessing the Viability of Community Colleges as Transfer Pathways for International Students

Dina Ghazzawi
Lyle McKinney
Catherine Horn
Vincent Carales
University of Houston, USA

Andrea Burridge
Houston Community College, USA

ABSTRACT

International students are increasingly enrolling in U.S community colleges as a starting point to their higher education. However, limited research examines the factors contributing to their successful transfer to a 4-year institution and bachelor degree attainment. Utilizing longitudinal transcript data from a large community college district in Texas, this study uses hierarchical logistical regression to compare college experiences and transfer outcomes based on region of origin. Findings demonstrate that while Sub-Saharan African students have a significantly higher probability of transfer than Asian and Latin American students, the majority of bachelor degree recipients were Asian students graduating in STEM fields. Delayed enrollment into college and academic preparedness in math were negatively associated with transfer for Latin American and Caribbean students.

Keywords: community college, international students, persistence, transfer

INTRODUCTION

International students have been an important asset to U.S. higher education since the early 19th century (Bevis & Lucas, 2007; Wall Street Journal, 2016). Leaving their homes and families behind, students have migrated to the U.S. from across the globe in search of better opportunities for themselves and their families. Being the largest host of international students in the world, the United States is a popular choice for these students due to its rich quality of education and friendly culture (Zong & Batalova, 2018).

Currently, over 1 million international students study in U.S. colleges and universities (Institute for International Education [IIE], 2017). Half of all international students come from China and India, and Saudi Arabia ranks third, responsible for 5% of all international enrollments. A majority of international students choose engineering and business as their field of study, and 67% of all international students use outside funding sources to pay for their tuition (IIE, 2017).

Recent analysis indicates that international students contributed $36.9 billion to the U.S. economy (NAFSA, 2016). Aside from their significant economic impact, international students diversify campuses and add global perspectives to any classroom environment they join. Domestic students, consequently, can be equipped with the cross-cultural tools that enable them to better function in an intercultural context (Jayakumar, 2008; Knight, 2003).

Though international students traditionally enroll in 4-year institutions, they are becoming increasingly drawn toward community colleges as their starting point to U.S. higher education (Bevis & Lucas, 2007; Evelyn, 2005). As of the year 2016–2017, international students studying at community colleges comprised 9.1% of the total international postsecondary enrollment in the nation, a 13.5% increase over the past decade (IIE, 2017). According to IIE (2017), the largest proportion of international students in community colleges come from China (20.1%), followed by Vietnam (9.9%), South Korea (6.6%), Japan (5.5%), and Mexico (4.3%).

Several factors account for the recent popularity of community colleges among international students. First, community colleges present a more affordable route to bachelor degree attainment than 4-year institutions (Evelyn, 2005; Hagedorn & Lee, 2005). International students at 4-year institutions are required to enroll full time and incur high nonresident tuition fees (Bohman, 2014; Fernandez, 2015). Second, community colleges offer English as a second language to help students from non-English–speaking countries overcome language barriers, enabling them to demonstrate the full range of their true academic potential (Bailey & Weinigner, 2002; Kegel, 2002).

Community colleges also stand to gain many benefits from the increased enrollment of international students. Aside from being a great source of revenue for community colleges, international students bring diverse perspectives and global awareness and foster cultural sensitivity that might not otherwise be recognized across campuses (Barnett et al., 2016; Moore et al., 2016).

Despite the growing enrollment of international students at community colleges and the benefits that they bring to these institutions, limited research has examined these students' experiences and outcomes. Many international and domestic students

join community colleges primarily as an access bridge for 4-year transfer, yet few studies assess the viability of community colleges as a pathway to bachelor degree attainment for international students. Findings from this study will significantly contribute to the limited body of literature surrounding international students' experiences, and will enable institutional researchers to learn more about how to better support, recruit, and retain this growing segment of students at community colleges.

Purpose of the Study

The purpose of this study was to assess the viability of the community college as a pathway to bachelor degree attainment for international students. The study examines longitudinal data from Urban Community College (UCC, a pseudonym), a large community college district in Texas that caters to a large number of international students from all over the world. Recognizing that international students are a heterogeneous population, this study compares students' college experiences and enrollment outcomes based on region of origin. Three research questions guided this study:

1. What are the demographic characteristics, academic experiences, program type, and bachelor degree and enrollment outcomes of international students from different regions of origin at UCC?
2. What factors are associated with 4-year transfer among international students at UCC?
3. Are there differences in the factors predicting 4-year transfer as a function of students' region of origin?

LITERATURE REVIEW

College Experiences of International Students in the United States

International students face several challenges upon beginning their higher education in the United States. In terms of academic performance, language barriers are major deterrents toward international students' collegiate success (Gallagher, 2012; Kegel, 2009). Aside from negatively impacting their course grades, lack of English language proficiency contributes to international students' more frequent use of technology, such as email and social media, to interact with domestic peers and faculty (Gallagher, 2012; Zhao et al., 2005).

Since most international students come from non-English–speaking countries, many students struggle with adapting to coursework in a new language. Stoynoff (1997) found that English language proficiency was significantly correlated with academic performance of international students. However, studies have found that the effect of English language proficiency on academic performance is dependent upon the field of study (Smith, 2016; Van Nelson et al., 2004). Light et al. (1987) found that international students' academic performance in quantitative fields of studies, such as the natural sciences, was less affected by English language

proficiency than their performance in the domain of humanities, which require a higher degree of language skills.

Research on the academic performance of international students primarily focuses on their experiences in 4-year institutions. The results of these studies demonstrate higher academic success rates of international students as compared to their domestic counterparts. Credit accumulation, grade point average (GPA), 4-year transfer rates from community colleges to 4-year institutions, and degree attainment have been found to be higher among international students than their domestic peers in 4-year institutions (Korobova & Starobin, 2015; Y. L. Zhang, 2017).

Community College Transfer and International Students

Research examining international student persistence and transfer from community colleges indicates that international students are academically better prepared for transfer than domestic students (Hagedorn & Lee, 2005). Y. L. Zhang's (2017) study examined international student transfer through the use of student transcript data of a 4-year institution in Texas. The study demonstrated that 67.2% of international and 53.6% of domestic students transferred from one of the two largest community college districts in the area surrounding the 4-year institution. Furthermore, the study showed that approximately half of all international students attained a bachelor's degree within 1–3 years of transfer, whereas less than 40% of domestic transfer students were able to do so in the same timeframe.

Hagedorn and Lee (2005) conducted a research study of international student transcript data in the Los Angeles Community College District as part of the Transfer and Retention of Urban Community College Students Project. Their study found many significant differences between domestic and international students. First, the average cumulative GPA for international students in the study was significantly greater than their domestic counterparts, as well as their course completion measures. Furthermore, the study found that a considerably higher proportion of international students (63.3%) were enrolled in higher level mathematics courses than their domestic peers (38.9%).

Persistence and Transfer Among International Students

Given the limited studies focused on international student persistence and transfer at community colleges, it is noteworthy to examine prior research on international student persistence in U.S. higher education as a whole. Mamiseishvili's (2012) study on international student persistence utilized data from the Beginning Postsecondary Students Longitudinal Study dataset in order to determine factors that influenced their persistence in U.S. higher education institutions. Using logistic regression analysis, the study found that GPA, degree plans, and academic integration were significant predictors of international student persistence, while remedial English courses had negative effects on persistence to the second year.

Kwai's (2009) study also examined international student persistence as a function of region of origin using data from two statewide public higher education systems. The analysis studied new undergraduate students who initiated their degrees

in Fall 2006, and the factors that contributed to their persistence to the second year in their respective degree programs. Using logistic regression, the study found that country of origin had no significant impact on second year persistence. However, spring semester GPA, cumulative credit hours attempted, and on-campus employment were all found to be statistically significant predictors of second year persistence

Conceptual Framework

Tinto's (1987) model of student departure has served as the conceptual framework for multiple studies on student retention and persistence (e.g., Kerby, 2015; Longwell-Grice & Long-well-Grice, 2008). Tinto's model explains the effects of precollege characteristics, institutional goals, as well as social and academic integration on student persistence through college. However, Tinto's model fails to account for the unique differences of students from various ethnic backgrounds (Kraemer, 1997; Pascarella & Terenzini, 2005). The transfer function is seen as one of the most important objectives of community colleges, allowing them to serve as bridges to 4-year institutions for students of various backgrounds (Mullin, 2017). Few studies, however, take into account the transfer gap that exists between students of different nationalities and countries (Chase et al., 2014; Crisp & Nünez, 2014). Recognizing that this study focuses on the transfer outcomes of international students according to their region of origin, it was important to utilize a conceptual framework that considered the distinguishing factors that influence the transfer outcomes of students from different backgrounds.

Crisp and Nuñuz's (2014) Racial Transfer Gap was among the first conceptual frameworks to examine the differences in transfer rates between White and underrepresented minority students. Based on scholarly work surrounding the transfer and academic success of community college students from different racial backgrounds, the model is categorized into two aspects of characteristics that influence transfer: student-level characteristics and institutional-level characteristics (Crisp & Nuñez, 2014). The model hypothesizes that the 4-year transfer rates of underrepresented minority students would be lower than those of White students, and that these differences could be largely accounted for by sociodemographic and educational inequalities (Gandara et al., 2012). Gandara et al.'s (2012) study supported this assertion by highlighting the lower transfer rates of underrepresented minority students due to factors such as academic under-preparation, language barriers, and socioeconomic status. Research suggests that these factors are more likely to be present among Latino and African American students than White students, contributing to their lower transfer rates (Alexander et al., 2007; Gandara & Contreras, 2009). Studies on international students enrolling in community colleges also demonstrate that academic under-preparation in English and low socioeconomic status are some of the key challenges that affect their progress through college (Bailey & Weinigner, 2002; Kegel, 2009).

For those reasons, this study was guided by Crisp and Nuñez's (2014) student-level transfer gap model to understand the factors contributing to the disparities in transfer outcomes between students from different regions of origin. Considering the

limited scholarly attention toward international student transfer, applying the transfer gap model to international students can explain different academic experiences and transfer outcomes among students from different regions (Y. L. Zhang, 2017). The student-level transfer gap model stipulates that a combination of precollege characteristics, sociodemographic characteristics, pull factors, and college experiences predict vertical transfer (Crisp & Nuñez, 2014; Dougherty & Kienzl, 2006; Eddy et al., 2006). Focusing on the transfer gaps existing between White, Black, and Hispanic community college students, the student-level transfer gap model used five constructs to determine the persistence and transfer of students to a 4-year institution: (a) demographic variables, (b) precollege factors (c) environmental pull factors, (d) degree expectations, and (e) academic and social experiences. Guided by Crisp and Nuñez's (2014) student-level transfer gap model, the present study used research studies on international student experiences and characteristics to inform and adapt the transfer gap model. Recognizing the different contextual factors that influence the experiences of international students, it was important to include these factors in the model to represent a realistic picture of international students and their experiences in U.S. community colleges. Current research has called for a more refined categorization of international students that would allow a thorough examination of the disparities between and among students from different regions of origin (Li et al., 2010). This is especially relevant in today's increasingly diverse higher education landscape (Li et al., 2010; Turner, 2006).

The present study relied on the three constructs of sociodemographic variables, precollege factors, and academic and social experiences in order to better understand international student transfer to a 4-year institution, and eventual bachelor degree attainment. The adapted model used for this study did not include the construct of environmental pull factors because most of the variables included in this construct, such as enrollment status and financial aid received, apply differently to international students. Visa requirements stipulate that students must be enrolled on a full-time basis and complete their degree within the permitted visa validity time (Bohman, 2014; Fernandez, 2015; NAFSA, 2016). Furthermore, international students are not eligible for any financial aid, and are unlikely to receive scholarships from the United States (Hagedorn & Lee, 2005; Supiano et al., 2015).

The transfer gap model stipulates that differences between students' vertical transfer rates can be greatly explained by differences in sociodemographic and educational factors. This aspect of the model is particularly relevant for understanding the transfer gaps that exist between students from different countries of origin, as international students differ widely in the degree of English language proficiency they gained during their high school studies, as well as level of achievement in math and science (Caldwell & Hyams-Ssekasi, 2016). Using Crisp and Nuñez's (2014) student-level transfer gap model as the conceptual lens for this study, we predict that sociodemographic variables, precollege characteristics, and academic and social experiences are related to the enrollment outcomes of international students enrolled in community colleges.

METHOD

Data Source and Sample

This study examined transcript records from the UCC district in Texas. UCC is one of the largest community college districts in the state and specializes in offering associate's degrees and certificates. UCC enrolls among the largest percentage of international students in the nation through its various campuses located in a large metropolitan area. Transcripts can offer vital information about students' academic performance, transfer outcomes, as well as social and demographic information. Given that this study focuses on the academic and sociodemographic factors that influence transfer outcomes of international students, we found transcript data to be the most effective source to yield the outcomes of interest. We merged transcript records for international students with student demographic information provided by UCC, as well as transfer data retrieved from the National Student Clearinghouse. The dataset included the academic experiences and transfer outcomes of a cohort of international students who entered any of the UCC campuses during the Fall 2010 semester, and tracked them for 6 academic years (until Summer 2016). The sample of students (N = 591) we analyzed in this study consisted of international students with an F1 visa status, which permits students to reside in the country only for the purposes of their study and expires once the student completes their degree. This sample consisted of students from 76 countries, divided into three major groups according to the region classifications of the National Center of Education Statistics (2014), as well as the IIE's (2018a) *Open Doors* report classification of international students' region of origin.

Variables

Drawing upon Crisp and Nuñez's (2014) student level transfer gap model, the independent variables used for this analysis were categorized into three categories: sociodemographic variables, precollege factors, and academic experiences. The transfer gap model classified program type as whether or not a student enrolled in a transfer program, certificate, or vocational program. In this study, the majority of international students were enrolled in transfer programs, divided between STEM and non- STEM fields. To assess the effect of program type on transfer between students from different regions, program type was classified as a binary variable describing if the student was enrolled in a STEM or non-STEM program of study. Students enrolled in certificate programs were removed from the analysis due to their small sample size, and because these programs are not typically designed to facilitate four-year transfer. The developmental education variables indicated whether the student was assigned to courses in each subject area that was college-level, or below college-level. Coding for the independent variables is presented below:

Table 1: Description and Coding for Independent and Dependent Variables

Variable	Definition
Sociodemographic variables	
Gender	Binary variable: 0 = female, 1 = male
Age	Continuous variable
Region of origin	3-category variable representing 3 different regions: Asia = 0, Sub-Saharan Africa = 1; Latin America and the Caribbean = 2
Precollege factors	
Delayed enrollment	Binary variable: 0 = delayed enrolling in college, 1 =s enrolled into college immediately after high school
Academic preparedness in math	2-category dummy variable: 0 = Tested at college level; 1 = tested below college level
Academic preparedness in writing	2-category dummy variable: 0 = Tested at college level; 1 = tested below college level
Academic preparedness in English	2-category dummy variable: 0 = Tested at college level; 1 = tested below college level
Academic experiences	
Cumulative as GPA	Continuous variable representing the student's cumulative GPA as of Spring 2017 (range = 0.0–4.0)
Degree type	3-category dummy variable indicating student's field of study: 0 = Associate of Arts; 1 = Associate of Science; 2 = Other (nontransfer degrees)
Outcome 4-year transfer	2-category dummy variable: 0 = did not transfer to 4-year institution within 6 years; 1 = successfully transferred to a 4-year institution within 6 years

Note. GPA = grade point average.

The outcome variable of interest examined whether the student had transferred to a public or private 4-year institution within 6 years of initial enrollment at UCC.

Data Analysis

Data analysis was conducted in two phases. The first phase addressed the first research question, and the second phase addressed the second and third research questions. The full sample consisted of students from three regions of origin. These

regions included: (1) Asia, (2) Sub-Saharan Africa, and (3) Latin America and the Caribbean.

Research Question 1: What are the demographic characteristics, academic experiences, program type, and bachelor degree and enrollment outcomes of international students from different regions of origin at UCC? To address the first research question, descriptive statistics including the calculation of means, standard deviations, and frequencies, were conducted in order to examine differences in sociodemographic and academic experiences of students from each region of origin. We used an analysis of variance (ANOVA) to assess statistical difference between the cumulative GPA of students from the different regions of origin, and we used chi-square tests to examine statistical differences between the categorical independent variables.

Research Question 2: What factors are associated with 4-year transfer among international students at UCC? The second phase of the data analysis utilized multivariate logistic regression methods to address the second and third research questions. The second research question assessed the factors associated with transfer to a 4-year institution for UCC international students. We addressed this question through a logistic regression model including the international students from Asia, Sub-Saharan Africa, and Latin America and the Caribbean.

Research Question 3: Are there differences in the factors predicting 4-year transfer as a function of students' region of origin? The third research question examined predictors of transfer outcomes based upon students' region of origin. We conducted separate logistic regression models for the three major regions of origin. In this way, differences between factors predicting 4-year transfer of students from each region could be uncovered. All data analyses were conducted using SPSS 25.

RESULTS

Research Question 1: What are the Demographic Characteristics, Academic Experiences, Program Type, and Bachelor Degree and Enrollment Outcomes of International Students from Different Regions of Origin at UCC?

Table 2 presents the countries that are included within each of the categories for descriptive purposes. The percentages of UCC students from each region were 53% from Asia, 21.2% from Sub-Saharan Africa, and 17.8% from Latin America and the Caribbean. Table 3 describes the characteristics of international students from the three major groups of origin beginning in Fall 2010 at UCC. Females comprised 51.6% of the sample. Students from Asia represented the largest proportion of the sample (57.6%), compared with students from Sub-Saharan Africa (23.0%) and Latin America and the Caribbean (19.3%).

Table 2: Country of Origin Classified by Region

Asia (1)	Sub-Saharan Africa (2)	Latin America and the Caribbean (3)
China	Angola	Bahamas
Hong Kong	Benin	Bermuda
India	Botswana	Bolivia
Indonesia	Burkina Faso	Brazil
Iran	Cameroon	Colombia
Japan	Congo	Dominican Republic
Kazakhstan	Cote D'ivoire	El Salvador
Korea	Equatorial Guinea	Ecuador
Macau	Ethiopia	Guatemala
Malaysia	Gabon	Honduras
Nepal	Gambia	Jamaica
Pakistan	Kenya	Mexico
Philippines	Mali	Peru
Singapore	Namibia	Turks and Caicos
Thailand	Nigeria	Venezuela
Turkey	Rwanda	
Turkmenistan	Senegal	
Uzbekistan	South Africa	
Vietnam	Tanzania	

The majority of students were academically prepared in the areas of math (77.3%), English (82.9%), and reading (84.5%) prior to beginning their studies at UCC. However, chi-square tests revealed significant differences between students' academic preparedness in math ($p < .05$). A higher proportion of students from Latin America and the Caribbean, as well as from Sub-Saharan Africa, tested at the below college level in math, as compared with their peers from Asia.

With regard to program of study, over half (52.9%) of students were enrolled in an Associate of Arts degree plan, 28.1% were enrolled in an Associate of Science degree plan, and 19.1% were pursuing vocational or technical programs that were nontransferrable degrees. Chi-square tests demonstrated that a significantly higher proportion of students from Sub-Saharan Africa pursued an Associate of Science degree ($p < .05$) relative to students from Asia or Latin America and the Caribbean.

The mean GPA for the major groups of origin was 2.94 for Asian students, 2.70 for Sub-Saharan African students, and 2.85 for Latin American and Caribbean students. The mean GPA for the full sample of students was 2.87. We conducted a one-way ANOVA to test for statistically significant differences in cumulative GPA between students from the three major groups of origin. Tukey post hoc analysis revealed that the mean difference of the cumulative GPA of students from Asia and Sub-Saharan Africa was statistically significant ($p = .033$), with Asian students scoring a higher mean cumulative GPA score.

In terms of vertical transfer, 32.6% of students transferred to a 4-year institution. Chi-square tests revealed that a significantly higher proportion of students from Sub-Saharan Africa transferred to a 4-year institution (43.2%), as compared with students from Asia (31.9%) and Latin America and the Caribbean (21.9%). Notably, close to half of the students (46.1%) transferred to the largest local public university system in UCC's metropolitan area. Almost 30% of transferred students attained a bachelor's degree within 6 years of transfer. Of the transferred students, 65.4% attained a Bachelor of Science degree, compared with 25% who attained a Bachelor in Business Administration. Note that due to the small sample sizes of bachelor degree graduates, we could not conduct reliable tests of significant differences between regions of origins. However, results showed that 32 out of the 52 bachelor degree graduates were Asian students, and all of these students gained a Bachelor of Science degree.

Table 3: Descriptive Statistics for the Sample Based on Three Major Regions of Origin

Variables (*n*)	Sample (%)	Asia (%)	Sub-Saharan Africa (%)	Latin America & Caribbean (%)
Full sample (543)	100.0	57.6	23.0	19.3
Gender*				
Female (280)	51.6	54.6	40.0	56.2
Male (263)	48.4	45.4	60.0	43.8
Age in 2010 (*M* [*SD*])	22.3 (4.9)	22.5 (5.1)	22.9 (4.8)	23.0 (6.1)
Enrollment				
Delayed (444)	81.8	79.9	88.0	80.0
Immediate (99)	18.2	20.1	12.0	20.0
Academic preparedness in math*				
College level (420)	77.3	85.0	74.4	58.1
Below college level (123)	22.7	15.0	25.6	41.9
Academic preparedness in English				
College level (450)	82.9	85.0	78.4	81.9
Below college level (93)	17.1	15.0	21.6	18.1
Academic preparedness in reading				
College level (459)	84.5	85.3	83.2	83.8
Below college level (84)	15.5	14.7	16.8	16.2
Degree Type				
Associate of Arts (286)	52.9	56.9	47.6	47.1
Associate of Science (152)*	28.1	27.5	37.1	19.2
Nontransfer degree (103)*	19.0	15.7	15.3	33.7

Variables (*n*)	Sample (%)	Asia (%)	Sub-Saharan Africa (%)	Latin America & Caribbean (%)
Cumulative GPA (*M* [*SD*])	2.87 (0.87)	2.94 (0.88)	2.70 (0.82)	2.85 (0.88)
Transfer to a 4-year institution*				
Transferred (177)	32.6	31.9	43.2	21.9
Did not transfer (366)	67.4	68.1	56.8	78.1
Bachelor degree attainment				
Attained BA (52)	9.9	10.9	8.0	9.5
Did not attain BA (489)	90.1	89.1	92.0	90.5
Bachelor degree type				
Bachelor of Science (35)	67.3	78.1	60.0	40.0
Bachelor of Arts (17)	32.7	21.8	40.0	60.0

Research Question 2: What factors are associated with 4-year Transfer Among International Students at UCC?

We used a hierarchical logistic regression to predict the probability of 4-year transfer of Asian, Sub-Saharan, and Latin American and Caribbean international students at UCC. Sociodemographic variables, consisting of age and region of origin, were used as co-variates in the first block. In the second block, we entered precollege factors including delayed enrollment and academic preparedness in math, English, and reading. In the third and final block, we entered the academic experience variables of cumulative GPA and degree type. All categorical variables were dummy coded indicating the reference group of each variable. Table 4 displays the results of the logistic regression results across the three successive blocks.

Regarding the statistical significance of sociodemographic variables, Sub-Saharan African students were 2.23 times more likely to transfer than Asian students, after controlling for precollege and academic experiences. When the academic experiences variables were added in the third block, male students were 1.95 times more likely to transfer than female students (p = .03). Age was also significantly associated with success in the final block, reducing the likelihood of transfer by 10% with each increase in age (measured by year). Cumulative GPA had the strongest association to 4-year transfer, controlling for all other variables in the model, as with every 1-point increase in a student's cumulative GPA, their odds of transfer increased by 2.94.

Table 4: Logistic Regression: Factors Predicting 4-Year Transfer for Asian, Sub-Saharan, and Latin American and Caribbean Students

	Odds ratios (beta-coefficient/standard error)[a]		
Variable	Demographics	Precollege factors	Academic experiences
Male (Female)	1.478 (0.391/0.205)	1.495 (0.402/0.206)	1.96* (0.671/0.226)
Sub-Saharan African (Asian)	1.639* (0.494/0.240)	1.678* (0.517/0.246)	2.23* (0.800/0.27)
Latin American (Asian)	0.801 (−0.222/0.300)	0.90 (−0.170/0.314)	0.90 (−0.106/0.3)
Age	0.91* (−0.095/0.026)	0.79* (−0.111/0.029)	0.90* (−0.110/0.0)
Delayed enrollment (delayed)		0.734 (−0.309/0.274)	0.593 (−0.523/0.2)
Academic preparedness in math (college level)		0.835 (−0.181/0.301)	0.992 (−0.008/0.32)
Academic preparedness in English (college level)		0.675 (−0.393/0.437)	0.631 (0.279/0.465)
Academic preparedness in reading (college level)		1.376 (0.319/0.431)	1.321 (−0.204/0.111)
Cumulative GPA			2.94* (1.080/0.183)
Degree type (AA)			1.12 (0.110/0.229)
Sample size[a]	438	438	438
−2 log likelihood	553.57	550.546	499.676
Nagelkerke R^2	.081	.090	.229
Percent correctly predicted	62.9	64.1	68.6

Note. * $p > .005$. [a]The sample size is reduced by 105 students because 104 students in nontransfer degrees were excluded from the analysis and one student was missing.

Research Question 3: Are there Differences in the Factors Predicting 4-year Transfer as a Function of Students' Region of Origin?

Separate hierarchical logistic regression models were conducted for each one of the three major regions of origin to examine the differences in predictive factors associated with 4-year transfer for students from each region. Gender was a

significant predictor of transfer for Asian students, after controlling for precollege factors and academic experiences. Male Asian students were 2.25 times more likely than females to transfer to a 4-year institution ($p = .007$). Age was also a significant negative predictor of transfer, as with every increase in age (measured in years), Asian students were 13% less likely to 4-year transfer ($p = .001$). Cumulative GPA was the strongest predictor of transfer for Asian students, increasing their odds of transfer by 3.16 times with every point increase in GPA ($p < .001$).

For Sub-Saharan African students, cumulative GPA was the only significant predictor of transfer after controlling for sociodemographic and precollege factors, increasing their odds of 4-year transfer by 2.23 times with each point increase in GPA ($p = .01$). Finally, academic experience variables explained the largest variance in the model predicting transfer for Latin American and Caribbean students, accounting for an increase in the Nagelkerke R^2 values from 0.013 in the first block to 0.387 in the final block. Delayed enrollment was negatively associated with transfer for Latin American and Caribbean students ($p = .02$). After controlling for sociodemographic and academic experiences, with each increase in age (measured in years), the odds of transfer decreased by 12.5%. Academic preparedness in math was also significantly associated with transfer, as Latin American students with higher academic preparedness levels in math were 5.81 times more likely to transfer than those who were below college level, after controlling for sociodemographic and academic experience variables ($p = .045$). The strongest predictor of transfer, again, was cumulative GPA, increasing students' odds of transfer by 8.2% ($p = .004$).

DISCUSSION AND IMPLICATIONS

Descriptive results of this study support the viability of community colleges as pathways to bachelor degree attainment for international students, demonstrated by the higher rates of transfer and comparable rates of bachelor degree attainment as compared with national averages reported by the National Student Clearinghouse (NCS, 2015). In an NCS report that investigated patterns of student mobility and success, approximately 24% of community college students transferred to a 4-year institution within 6 years of enrollment. Furthermore, over 40% of transferred students earned bachelor's degrees (NCS, 2015). In the present study, 32.6% of the international students transferred to a 4-year institution, and 30% of these transfer students attained a bachelor's degree within 6 years of enrollment.

Viewing the results through the conceptual framework (Crisp & Nuñez, 2014), findings show that a transfer gap exists among international students from different regions of origin. Specifically, results demonstrated meaningful differences between the sociodemographic, precollege, and academic experience characteristics that influence transfer and bachelor degree attainment rates between international students from different regions of origin. One of the most significant findings from this study is a higher likelihood of transfer of Sub-Saharan African Students compared with Asian students. This finding is unique among the limited body of literature that considers region of origin as a factor for international student persistence in higher education, contradicting Kwai's (2009) study that found no significant association between region of origin and persistence to the second year of college.

Considering the possible factors contributing to the higher rates of transfer of Sub-Saharan African students, descriptive results showed that a significantly larger number of these students were enrolled in an Associate of Science degree program, compared with their peers from Asia and Latin America who were enrolled in Associate of Arts degree programs. In his study of course-taking behaviors and transfer outcomes of first-year community college students, Jenkins (2011) found that students in Associate of Science degrees had the highest success rate, earned their associate's degree in less time, and were more likely to transfer to a 4-year institution than their peers enrolled in an Associate of Arts degree. Despite cumulative GPA being the strongest predictor of transfer for students from all different regions of origin in this study, Jenkins' (2011) findings suggest that the higher number of Associate of Science degree recipients among Sub-Saharan African students could have contributed to their higher transfer rates.

Although Sub-Saharan students were more likely to transfer compared with students from Asia and Latin America, results demonstrated that the majority of students who attained a bachelor's degree were Asian. Furthermore, all of these students were Bachelor of Science graduates. This finding is not surprising given that cumulative GPA, which was highest among Asian students, was found to be the strongest predictor of transfer and bachelor degree attainment across students from all regions of origin. These results are supported by several studies that demonstrate the higher academic performance of Asian international students compared with their peers from other regions (e.g., Hsia, 1998; Sue & Okazaki, 1990). Moreover, some researchers have suggested that Asian students are more likely to choose majors in STEM fields, and tend to do better in quantitative subjects that do not require emphasis on language skills, an area that some Asian students find especially difficult (Heggins & Jackson, 2003; Hsia, 1988). These studies also support prior literature that has found the success rates of Asian students to be higher in quantitative fields that do not require strong language skills like those in the humanities (Light et al., 1987; Smith, 2016). Although over half of international students in this study were enrolled in Associates of Arts degrees, results of this study found that Asian students in particular were more academically prepared in math compared with students from other regions. This finding further supports the literature demonstrating the higher success rates and academic preparedness of Asian students in STEM fields (Van Nelson et al., 2004).

Aside from the presence of a transfer gap between students from different regions of origin, results also presented evidence of a transfer gap within students of the same region of origin. In the case of Asian students, findings showed that Asian male students were 2.25 times more likely to transfer than Asian female students. Although there is limited research on the relationship between gender and transfer in international students, these results do support studies highlighting the general negative association between being female and the probability of transfer (Crisp & Nuñez, 2014; Eddy et al., 2006). Research on the experiences of Asian international students in the United States demonstrate that Asian females in particular often have the most difficulty in assimilating to American culture compared with their male counterparts (Furnham & Sheikh, 1993; L. F. Zhang, 2000). Therefore, perhaps Asian

female students experience enhanced pressures and difficulties that may impact their probability of 4-year transfer.

The study found meaningful differences in characteristics that influenced transfer among Latin American and Caribbean students. Within this group, academic preparedness in math was negatively associated with 4-year transfer. Although there is a lack of empirical evidence specific to the math ability of international Latin American and Caribbean students, prior research has found a significant relationship between math ability and success of Latino students in general (Arbona & Nora, 2007; Crisp et al., 2009). There is a supporting body of literature that demonstrates the lack of performance of Latin American and Caribbean countries in math and science, compared with international standards (Gamboa & Waltenberg, 2012). Due to lack of adequate resources, low teacher qualifications, and large socioeconomic disparities, 57 Latin American and Caribbean countries were ranked at the bottom quartile of the performance distribution in the 2006 program for international student assessment (Organization for Economic Cooperation and Development, 2009). Consequently, the academic success and transfer of Latin American and Caribbean international students may be compromised by a lack of access to advanced mathematics courses in high school.

Results indicated that for Latin American and Caribbean students, delaying college enrollment can have negative consequences in terms of their transfer and eventual baccalaureate attainment. Prior literature has emphasized the negative impact of delayed enrollment on degree completion (e.g., Adelman, 1999, 2006; Dougherty, 1994; Jacobs & King, 2002). However, research has demonstrated a particularly stronger impact of delayed enrollment on the success outcomes of domestic Latin American students (Crisp, Nora, & Taggart 2009). Given that foreign-born Caribbean students with a valid permanent residency or citizenship in the United States are officially classified as domestic Latin American students by the U.S. Census Bureau (Acosta & De La Cruz, 2011), these findings can help draw meaningful links between literature on domestic and international Latin American students.

Collectively, findings from this study demonstrate that the majority of international students are academically prepared in the areas of math, English, and reading. These findings are aligned with prior research indicating that international community college students perform better academically, and are better prepared for transfer compared to domestic students (Hagedorn & Lee, 2005; Mukherjee, 2016; Y. L. Zhang, 2017).

Limitations

There are some limitations to utilizing transcript data in examining the experiences of international students. Though transcript data reveal many facts about international student demographics and academic performance, they do not yield information about the unique challenges that international students face in the United States. Such challenges may affect student's academic performance and transfer outcomes in ways that are difficult to capture using transcript data.

Furthermore, results from this analysis may not be generalizable to international students attending community colleges in other geographic regions of the United States. This study focuses on a large metropolitan community college, but it is possible that international students attending rural community colleges, for example, may have different transfer outcomes. Finally, this study examines transfer and of students within six years; it does not account for students who potentially could have transferred following the six-year time frame captured in the dataset.

Recommendations

The recommendations proposed from this study are focused on providing stronger academic and social support for international students throughout their community college journey that will adequately prepare them for successful 4-year transfer. Studies emphasize the lack of institutional support for international students in community colleges, particularly in the area of academic advising (Behroozi-Bagherpour, 2010; Sallie, 2008). Though the results of the present study confirmed that international students are better prepared for transfer than domestic students, the unique characteristics and challenges of international students warrant an increased focus on providing stronger social support for these students (Sallie, 2008). Current efforts around Guided Pathways models may be particularly helpful in the degree progress of international students. Through these models, students are required to select a general field of study along with a narrower sequence of courses with the assistance of an academic advisor (Bailey et al., 2015; Wheeler; 2018). This structured and more personalized approach to degree planning will be particularly helpful to international students by providing them with more guided support to facilitate transfer.

Second, prior literature has highlighted the absence of knowledge among international students regarding community colleges as transfer institutions (Dowd et al., 2013). Consequently, many of these students are unaware of transfer requirements or feel overwhelmed by the process. Bensimon and Dowd's (2013) study demonstrated the importance of using specialized "transfer agents" that offer tailored support, and articulate specific policies related to transfer, such as curriculum alignment and course requirements. These professionals proved to be a great help in facilitating transfer experiences for students who otherwise felt they were lost or did not have enough information about transfer requirements (Dowd et al., 2013).

Last, given that the findings from this study support the assertion that community colleges can in fact provide a viable pathway for the transfer and bachelor degree attainment of international students, it is critical for community college administrators to engage in stronger, more tailored recruiting efforts targeted at international students. Bohman's (2014) case study used various recruitment strategies to attract international students to a select community college, including several international trips, meetings with schools and government officials, and multilingual brochures to inform students about the transfer functions of community colleges. As a result of the enhanced recruitment efforts employed through the case study, enrollment of international students on an F-1 visa increased by 44% during the case's 4-year study period.

CONCLUSION

Findings from this study portray the importance of studying international students in their own independent subgroups in order to thoroughly examine the factors associated with the transfer and success of each group. Results highlight the added support required for Latin American and Caribbean students in the area of mathematics, particularly early on in their degree plan, to positively influence and facilitate their transfer. Given the mutually beneficial relationship that exists between international students and community colleges, it is of great importance for community college faculty, administrators, and advisors to engage in strategic recruiting and academic support mechanisms that will work to both attract and retain this unique, yet often overlooked, group of students.

REFERENCES

Acosta, Y. D., & De La Cruz, P. (2011). *The foreign born from Latin America and the Caribbean: 2010*. U.S. Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau.

Adelman, C. (1999). *Answers in the toolbox: Academic intensity, attendance patterns, and bachelor's degree attainment*. Office of Educational Research and Improvement, U.S. Department of Education

Adelman, C. (2006). *The toolbox revisited: Paths to degree completion from high school through college*. Office of Educational Research and Improvement, U.S. Department of Education.

Alexander, B. C., García, V., González, L., Grimes, G., & O'Brien, D. (2007). Barriers in the transfer process for Hispanic and Hispanic immigrant students. *Journal of Hispanic Higher Education, 6*(2), 174–184.

Arbona, C., & Nora, A. (2007). The influence of academic and environmental factors on Hispanic college degree attainment. *The Review of Higher Education, 30*(3), 247–269.

Bailey, T. R., Jaggars, S. S., & Jenkins, D. (2015). *Redesigning America's community colleges: A clearer path to student success.* Harvard University Press.

Bailey, T., & Weininger, E. B. (2002). Performance, graduation, and transfer of immigrants and natives in City University of New York Community colleges. *Educational Evaluation and Policy Analysis, 24*(4), 359–377.

Barnett, G. A., Lee, M., Jiang, K., & Park, H. W. (2016). The flow of international students from a macro perspective: a network analysis. *Compare: A Journal of Comparative and International Education, 46*(4), 533–559.

Behroozi-Bagherpour, P. (2010). *International student retention in a large Texas urban community college* [Doctoral dissertation, Sam Houston State University]. Retrieved from ProQuest Dissertations and Theses database.

Bevis, T. B., & Lucas, C. J. (2007). *International students in American colleges and universities: A history.* Palgrave Macmillan.

Bohman, E. (2014). Attracting the world: Institutional initiatives' effects on international students' decision to enroll. *Community College Journal of Research and Practice*, *38*(8), 710–720.

Caldwell, E. F., & Hyams-Ssekasi, D. (2016). Leaving home: The challenges of Black-African international students prior to studying overseas. *Journal of International Students, 6*(2), 588–613.

Chase, M. M., Dowd, A. C., Pazich, L. B., & Bensimon, E. M. (2014). Transfer equity for "minoritized" students: A critical policy analysis of seven states. *Educational Policy, 28*(5), 669–717.

Crisp, G., Nora, A., & Taggart, A. (2009). Student characteristics, pre-college, college, and environmental factors as predictors of majoring in and earning a STEM Degree: An analysis of students attending a Hispanic serving institution. *American Educational Research Journal, 46*(4), 924–942.

Crisp, G., & Nuñez, A. M. (2014). Understanding the racial transfer gap: Modeling underrepresented minority and nonminority students' pathways from two-to four-year institutions. *The Review of Higher Education, 37*(3), 291–320

Dougherty, K. J. (1994). *The contradictory college: The conflicting origins, impacts, and futures of the community college*. SUNY Press.

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

Dowd, A. C., Pak, J. H., & Bensimon, E. M. (2013). The role of institutional agents in promoting transfer access. *Education Policy Analysis Archives, 21*(15), 1–39.

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

Evelyn, J. (2005). Community colleges go globe-trotting. *The Chronicle of Higher Education, 51*(23), A11.

Fernandez, M. (2015). A global community's college. *New York Times.* https://www.nytimes.com/2015/11/01/education/edlife/houston-community-college-international-students.html

Furnham, A., & Shiekh, S. (1993). Gender, generational and social support correlates of mental health in Asian immigrants. *International Journal of Social Psychiatry, 39*(1), 22–33.

Gallagher, C. (2012). Willingness to communicate and cross-cultural adaptation: L2 communication and acculturative stress as transaction. *Applied Linguistics, 34*(1), 53–73.

Gamboa, L. F., & Waltenberg, F. D. (2012). Inequality of opportunity for educational achievement in Latin America: Evidence from PISA 2006–2009. *Economics of Education Review, 31*(5), 694–708.

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

Gandara, P. C., & Contreras, F. (2009). *The Latino education crisis: The consequences of failed social policies.* Harvard University Press.

García, H. A., Garza, T., & Yeaton-Hromada, K. (2019). Do we belong? *Journal of International Students, 9*(2), 460–487.

Hagedorn, L. S., & Lee, M. (2005). *International community college students: The neglected minority?* [Doctoral dissertation, University of Arkansas, Fayetteville]. ScholarWorks@UARK.

https://pdfs.semanticscholar.org/8c3d/9412361dcc32256403e764df3fe469fd50da.pdf

Heggins, W. J., & Jackson, J. F. (2003). Understanding the collegiate experience for Asian international students at a Midwestern research university. *College Student Journal, 37*(3), 379–392.

Hsia, J. (1988). Asian Americans fight the myth of the super student. *Educational Record, 68*(4), 94–97.

Institute for International Education. (2017). *Open Doors Report 2017*. Retrieved October 2018 from https://www.iie.org/Research-and-Insights/Open-Doors/Data/International-Students/Enrollment

Institute for International Education. (2018a). *Data by region fact sheets*. Retrieved October 2018 from from https://www.iie.org/Research-and-Insights/Open-Doors/Fact-Sheets-and-Infographics/Data-by-Region-Fact-Sheets

Institute of International Education. (2018b). *Open Doors 2018: Fast facts*. Retrieved October 2018 from https://www.iie.org/Research-and-Insights/Open-Doors/Fact-Sheets-and-Infographics/Fast-Facts

Jacobs, J. A., & King, R. B. (2002). Age and college completion: A life-history analysis of women aged 15-44. *Sociology of Education*, *75*(3), 211–230.

Jayakumar, U. M. (2008). Can higher education meet the needs of an increasingly global society? Campus diversity and cross-cultural workforce competencies. *Harvard Educational Review, 78*, 330–367.

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

Kegel, K. (2009). Homesickness in international college students. In G. R. Walz, J. C. Bleuer, & R. K. Yep (Eds.), *Compelling counseling interventions, VISTAS 2009* (pp. 67–76). American Counseling Association.

Kerby, M. B. (2015). Toward a new predictive model of student retention in higher education: An application of classical sociological theory. *Journal of College Student Retention: Research, Theory & Practice, 17*(2), 138–161.

Knight, J. (2003). Updated internationalization definition. *International Higher Education, 33*(3), 2–3.

Korobova, N., & Starobin, S. S. (2015). A comparative study of student engagement, satisfaction, and academic success among international and American Students. *Journal of International Students, 5*(1), 72–85.

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

Kwai, C. K. (2009). Model of international student persistence: Factors influencing retention of international undergraduate students at two public statewide four-year university systems [Doctoral dissertation, University of Minnesota]. University of Minnesota Digital Conservancy. https://conservancy.umn.edu/bitstream/handle/11299/59314/1/Kwai_umn_0130E_10921.pdf

Li, G., Chen, W., & Duanmu, J. L. (2010). Determinants of international students' academic performance: A comparison between Chinese and other international students. *Journal of Studies in International Education, 14*(4), 389–405.

Light, R. L., Xu, M., & Mossop, J. (1987). English Proficiency and Academic Performance of International Students. *TESOL Quarterly, 21*(2), 251–261.

Longwell-Grice, R., Longwell-Grice, H. (2008). Testing Tinto: How do retention theories work for first-generation, working-class students? *Journal of College Student Retention: Research, Theory & Practice, 9*(4), 407–420.

Mamiseishvili, K. (2012). International student persistence in US postsecondary institutions. *Higher Education, 64*(1), 1–17.

Moore, K. A., Rutherford, C., & Crawford, K. A. (2016). Supporting postsecondary English language learners' writing proficiency using technological tools. *Journal of International Students, 6*(4), 857.

Mukherjee, M. (2016). *Understanding academic momentum and enrollment outcomes for international students at an urban community college system* [Doctoral dissertation, University of Houston]. University of Houston Libraries. https://uh-ir.tdl.org/handle/10657/3229

Mullin, C. M. (2017, October). *When less is more: Prioritizing open access*. American Association of Community Colleges.

NAFSA: Association of International Educators. (2016). *NAFSA international student economic value tool*. Retrieved from http://www.nafsa.org/Policy_and_Advocacy/Policy_Resources/Policy_Trends_and_Data/NAFSA_International_Student_Economic_Value_Tool/

National Center of Education Statistics. (2014). *Foreign students enrolled in institutions of higher education in the United States by continent, region, and selected countries of origin: Selected years 1980-81 through 2013-2014*. https://nces.ed.gov/programs/digest/d14/tables/dt14_310.20.asp

Organization for Economic Cooperation and Development. (2009). *PISA technical report 2009.* https://www.oecd.org/pisa/pisaproducts/42025182.pdf

Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research (Vol. 2)*. John Wiley & Sons.

Sallie, J. (2008). *A survey of first-year student support services for international students attending community colleges in the United States*. Dissertation Abstracts International: Section A. Humanities and Social Sciences, 69(1-A).

Smith, C. (2016). International student success. *Strategic Enrollment Management Quarterly, 4*(2), 61–73.

Stoynoff, S. (1997). Factors associated with international students' academic achievement. *Journal of Instructional Psychology, 24*(1), 56–68.

Sue, S., & Okazaki, S. (1990). Asian-American educational achievements: A phenomenon in search of an explanation. *American Psychologist, 45*(8), 913.

Supiano, B., Newman, J., & O'Leary, B. (2015). The financial-aid fine print: The wealthiest colleges have similar policies, but variation among them can make a real difference in what students will pay. *Chronicle of Higher Education.* https://www.chronicle.com/interactives/generosity

Turner, Y. (2006). Students from mainland China and critical thinking in postgraduate Business and Management degrees: teasing out tensions of culture, style and substance. *International Journal of Management Education, 5*(1), 3–11.

Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition.* University of Chicago Press.

Van Nelson, C., Nelson, J. S., & Malone, B. G. (2004). Predicting success of international graduate students in an American university. *College and University, 80*(1), 19.

The Wall Street Journal. (2016, March). *Exchange rates: A history of international students in the U.S.* [Video]. http://www.wsj.com/video/exchange-rates-a-history-of-international-students-in-the-us/BB681A06-E345-4232-848E-68445B9F8CE6.html

Wheeler, E. L. (2018). Extending "Guided Pathways" beyond the community college: Lessons for university transfer orientation. *Community College Journal of Research and Practice*, *43*(4), 275–279.

Zhang, L. F. (2000). University students' learning approaches in three cultures: An investigation of Biggs's 3P model. *The Journal of Psychology, 134*(1), 37–55.

Zhang, Y. L. (2017). International students in transition: International community college transfer students in a Texas research university. *New Directions for Institutional Research, 170*, 35–48.

Zhao, C. M., Kuh, G. D., & Carini, R. M. (2005). A comparison of international student and American student engagement in effective educational practices. *The Journal of Higher Education, 76*(2), 209–231.

Zong, J., & Batalova, J. (2018, May 9). International students in the United States. http://www.migrationpolicy.org/article/international-students-united-states

DINA GHAZZAWI, PhD, is a postdoctoral research fellow at the University of Houston's Department of Higher Education Leadership and Policy Studies. Her major research interests lie in the area of international student success, quantitative research methods, student engagement, and sense of belonging. Email: dalghazzawi@uh.edu

LYLE MCKINNEY, PhD, is an Associate Professor of Higher Education and Faculty-in-Residence at the University of Houston. He earned his PhD in Higher Education Administration, with a concentration in Educational Policy, from the University of Florida. His research focuses on improving college affordability and degree completion for lower-income students, particularly those who attend community colleges. Email: llmckinney@uh.edu

CATHERINE HORN, PhD is a Moores Professor of Educational Leadership and Policy Studies and Director of the University of Houston's Education Research Center. She is also Executive Director of the Institute for Educational Policy Research and Evaluation at the University of Houston and Director for the Center for Research and Advancement of Teacher Education. Her work focuses on the systemic influences of secondary and postsecondary assessment and related policies on the learning trajectories of students, particularly those traditionally underserved by the education and social sectors. Email: clhorn2@uh.edu

VINCENT D. CARALES, PhD is an Assistant Professor of Higher Education in the Educational Leadership and Policy Studies Program at the University of Houston. His research examines how institutional cultures, climates and structures influence Latinx and low-income students' experiences, opportunities, and outcomes in higher education. Email: vcarales@uh.edu

ANDREA BACKSCHEIDER BURRIDGE, PhD, is the Associate Vice Chancellor of Research, Analytics, and Decision Support at Houston Community College. Her research focuses on student success and completion in community college. Email:andrea.burridge@hccs.edu