

© *Journal of International Students*
Volume 12, Issue 2 (2022), pp. 467-488
ISSN: 2162-3104 (Print), 2166-3750 (Online)
doi: 10.32674/jis.v12i2.3198
ojed.org/jis

The Duality of Persistence: Academic Enclaves and International Students' Aspirations to Stay in the United States

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ABSTRACT

International students have been a growing presence in U.S. higher education institutions for over a decade. Feelings of belonging play a crucial role in the adjustment of these students to campus life in American universities, and their co-nationals play a significant role in facilitating this adjustment process. However, the role of belonging and co-national communities in facilitating the persistence of international students toward and beyond degree attainment remains understudied. In our examination of the aspirations of 642 international students across 9 U.S. universities, we establish that stronger feelings of academic and social belonging are associated with a higher likelihood of aspiring to stay in the United States after graduation. In particular, we demonstrate the presence of an academic enclave effect wherein larger communities of co-nationals have a stronger influence on the aspirations of international students with low social belonging but does not affect the aspirations of socially well-integrated international students.

Keywords: belonging, ethnic enclaves, higher education, international graduate students, international students, student persistence

INTRODUCTION

Every year, tens of thousands of international students arrive in the United States to pursue their career ambitions in higher education (Institute

International Education [IIE], 2020a). For many, the beginning of their higher education journey also marks the start of the gradual process of incorporation into American society. A critical moment in this incorporation process is whether these students choose to stay in the United States upon graduating from their institutions. In this paper, we examine the factors that determine the outcome of this critical juncture in an international students' life. In particular, we ask two key questions: how do feelings of belonging shape international students' aspirations to stay in the United States? And how do university-level factors—co-national diversity specifically—alter this association?

The role of feelings of belonging in facilitating international students' adjustment to campus life (Glass & Gesing, 2018; Kaya, 2020; Tang et al., 2018; Wang & Freed, 2021) and its positive impact on international students' psycho-social well-being is well-established (Cho & Yu, 2015; Khanal & Gaulee, 2019). There is also a growing body of scholarship on recruitment and retention of international students. However, these studies primarily focus on factors such as institutional funding and support services, and immigration policy (Bista & Foster, 2011; Glass et al., 2013; Srivastava et al., 2010). The role of feelings of belonging in shaping the persistence of international students in U.S. higher education institutions remains understudied (Garcia et al., 2019; Mamiseishvili, 2012). Further, while the importance of co-nationals in engendering feelings of belonging amongst international students is recognized (Rivas et al., 2019; Tang et al., 2018), whether these groups create different paths of persistence for different groups of international students has not been examined.

Our concept of academic enclaves, defined as the concentration/density of students from the same country of origin (co-nationals) in the same university, provides a more nuanced model of international student persistence. In particular, we demonstrate the duality of structure (Giddens, 1979) wherein communities of co-nationals encourage persistence by facilitating feelings of belonging for one group of international students and have no effect on another group. We contribute to the scholarship on belonging of international students by demonstrating how these feelings in tandem with institutional characteristics give rise to heterogeneity in the international student experience and persistence in the United States.

LITERATURE REVIEW

Belonging and Persistence

We emphasize the importance of understanding the lived experiences of international students in this study instead of focusing on individual students' ability to incorporate themselves into the dominant culture of their universities. Since the concept of belonging acknowledges the inherent subjectivity of the incorporation process, we employ it to understand international students' experiences in higher education institutions. Further, we anticipate these feelings will play a critical role in ensuring the retention of international students just as they do for American students, particularly students of color (Hausmann et al., 2007; Museus et al., 2017).

Feelings of belonging are contingent on individual student characteristics as well as the student's evaluation of their educational environment. Belongingness is understood as the feeling of connectedness and the idea that one matters to others (Rosenberg & McCullough, 1981) and students' psychological sense of connection to their campus community (Hurtado & Carter, 1997). Belonging is also operationalized as a function of perceived support from peers, teachers, and family members (Johnson et al., 2007; Strayhorn, 2008). Drawing on Strayhorn's definition of belongingness as "students' perceived social support on campus, a feeling or sensation of connectedness, the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the group (e.g., campus community) or others on campus (e.g., faculty, peers)" (2012, p. 3), we use a conceptual definition of belonging that allows us to examine how supported and included international students feel not only in their interactions but also with respect to the resources and networks they need to succeed.

Using the concept of belonging allows us to acknowledge that students engage in subjective evaluations of their integration which vary based on the context (Strayhorn, 2012) rather than adhering to a set of universal and objective criteria for integration. Further, it allows for the recognition that students' feelings of belonging can be fostered in multiple ways across different contexts and does not necessitate their integration into the dominant culture of the university. After all, "some student communities are developed as forms of resistance to the larger institutional culture, but they will still represent unique areas where students' views of themselves and their aspirations converge" (Strayhorn, 2012, p. x).

International Students' Belonging

Feelings of belonging often take on heightened significance in certain contexts and certain times (Strayhorn, 2012). One such instance is when individuals are in unfamiliar and foreign contexts where they are more likely to perceive themselves as being marginal to the mainstream life of college (Anderman & Freeman, 2004; Strayhorn et al., 2013). Academic and social interactions that constitute campus life in American universities present such unfamiliar and foreign contexts to international students. In fact, the marginalization and isolation that international students experience in U.S. universities, particularly in social interactions with American colleagues and local community members, is well documented (Kaya, 2020; Khanal & Gaulee, 2019; Wang & Freed, 2021). In addition to facilitating academic achievement and psychological well-being, feelings of belonging play a central role in facilitating the persistence of American students toward the final goal of degree attainment in higher education institutions (Maestas et al., 2007; Museus et al., 2017). Preliminary examinations of international undergraduate students' experiences in U.S. colleges also suggest that an increase in their sense of belonging reduces their withdrawal from college (Garcia et al., 2019; Mamiseishvili, 2012).

We build on this evidence in two key ways. First, we make international students' aspirations to stay in the United States after graduation our focal point of inquiry. Thus, we are able to extend the understanding of international student

persistence beyond the commonly examined outcome of degree attainment. Although an international student's presence in the United States after graduation is constrained by several legal factors, aspirations to persist are foundational to the movement toward this final goal. We propose that these aspirations are indicative of the probability of international students transitioning into the U.S. labor market, an area of the immigrant experience that remains underexamined. Second, we only focus on graduate student experiences because being a graduate student comes with its own set of challenges which are distinct from the challenges faced by undergraduate students (Brunsting et al., 2018; Le et al., 2016).

Experiences of domestic and international students indicate the presence of two key dimensions to feelings of belonging—one engendered by the students' academic interactions (i.e., academic belonging) and another by the students' social ties (i.e., social belonging). Increased academic interactions and engagement—discussions with peers about course content, tutoring other students, frequent discussions with faculty members—are strongly associated with feelings of belonging (Horne et al., 2018; Hurtado & Carter, 1997; Maestas et al., 2007). Social interactions that result in the establishment of meaningful relationships with other students and faculty on campus and participation in student organizations also play an important role in bolstering feelings of belonging (Glass & Gesing, 2018; Hurtado & Carter, 1997; Strayhorn, 2012; Yao, 2016). Further, preliminary evidence also suggests that academic and social integration influence international students' persistence in opposite directions (Mamiseishvili, 2012). Thus, we examine academic belonging and social belonging separately.

Given the centrality of feelings of belonging in reducing social isolation and improving academic achievement, we propose that international students' feelings of academic and social belonging are critical in determining their persistence within and beyond their universities in the United States. We hypothesize:

- H1(a): International students with higher levels of academic belonging are more likely to aspire to stay in the United States than those with low levels of academic belonging.
- H1(b): International students with high levels of social belonging are more likely to aspire to stay in the United States than those with low levels of social belonging.

The Academic Enclave Effect

Co-national students play a critical role in facilitating feelings of belonging for international students (Glass et al., 2013; Rivas et al., 2019; Tang et al., 2018). Students from the same country studying in U.S. universities help each other maintain connections with their home culture and language (Du & Wei, 2015; Rivas et al., 2019), provide alternatives to participating in mainstream campus culture (Rose-Redwood & Rose-Redwood, 2013), and are a source of valuable information on how to survive in a foreign country (Tang et al., 2018). Rather

than assume that all international students respond similarly to the presence of co-nationals, we build on this evidence to examine whether the presence of co-nationals has a differential impact on the aspirations of persistence for different groups of graduate international students.

Drawing on the concept of ethnic enclaves, we propose that a concentration of international students from the same country in the same U.S. university creates “academic enclaves.” Ethnic enclaves are best characterized as tight knit networks of co-ethnic migrants within a specific geographical location. Typically, these areas have a high concentration of residency and business operations of a particular migrant minority group that has a distinct cultural character (Hikido, 2018; Kosta, 2019; Toussaint-Comeau, 2008). Further, ethnic enclaves serve multiple economic and social functions including the provision of economic opportunities and encouraging feelings of belonging (Bouk et al., 2013; Portes & Manning, 2013).

The primary utility of ethnic enclaves lies in the close social networks that they help foster since these networks provide access to resources and help members navigate racial hostility and discrimination (Portes & Jensen, 1989; Portes & Manning, 2013). Close social networks serve similar functions for communities of co-national international students; they insulate their members from physical harm and social stigma, facilitate academic engagement, help in the maintenance of one’s national identity, and facilitate social cohesion through cultural activities (Guo & Chase, 2011; Page, 2019). In our conceptualization, we emphasize the academic nature of enclaves because they are created by the transnational inflow of co-nationals into the very specific organizational setting of academic institutions.

While the importance of co-nationals in facilitating international students’ feelings of belonging is well supported (Glass et al., 2013; Rivas et al., 2019; Tang et al., 2018), this evidence does not account for the heterogeneity in the distribution of international students across the United States. The overall population of international students is not equally distributed across all universities with some universities attracting larger proportions of international students than others (IIE, 2020c). Furthermore, not all nationalities are equally represented in the growing diversity of U.S. higher education institutions (IIE, 2020b). For instance, the international student population from China and India is usually larger than that from Somalia and Morocco. Thus, some nationalities in the international student community constitute an “ethnic majority” while others form an “ethnic minority” (Geven et al., 2016).

The ethnic density hypothesis posits that members of immigrant groups are more likely to experience better mental health outcomes when they are surrounded by higher proportions of people of the same ethnicity (Bécares & Nazroo, 2013; Das-Munshi et al., 2010). The presence of co-ethnics buffers the detrimental effects of interpersonal racism and discrimination on the health of ethnic minorities. Similar positive effects of co-ethnic ties in the form of social support and increased feelings of belonging have been noted for students studying in schools with a higher share of co-ethnics (Geven et al., 2016). Immigrants’

income is also positively influenced as the proportion of co-ethnics living in their residential communities increases (Andersson et al., 2014).

Building on this density proposition, we anticipate that variations in the concentration of co-nationals of international students will shape the environment in which international students operate and the extent to which their feelings of belonging translate into aspirations to persist in the United States. For instance, between two international students with the same level of academic or social belonging, we expect the student surrounded with more co-nationals to be more likely to aspire to persist in the United States after graduation. After all, preliminary evidence suggests that both international and domestic students find their campus climates to be more inclusive in the presence of more international students (Zhao et al., 2005), which is likely to impact their belongingness and persistence. Thus, we hypothesize that:

H2(a): The association between academic belonging and aspirations is moderated by the size of a student's co-national community. As the size of a student's co-national community increases, the association between academic belonging and aspirations is stronger.

H2(b): The association between social belonging and aspirations is moderated by the size of a student's co-national community. As the size of a student's co-national community increases, the association between social belonging and aspirations is stronger.

METHODS

We utilize several data sources to examine our research questions.

International STEM Graduate Student in the U.S. Survey

The “International STEM graduate student in the United States Survey 2015” (Han et al. 2015) is the most recent, publicly available dataset on the experiences of international students. The online survey was conducted with domestic and international graduate students who were enrolled in STEM disciplines at the 10 U.S. institutions with the largest total number of enrolled international students in 2013–2014—Arizona State University, Columbia University, Michigan State University, New York University, Northeastern University, Purdue University, University of California-Los Angeles, University of Illinois-Urbana Champaign, University of Southern California, and University of Washington at Seattle (Han & Appelbaum, 2016). In 2019–2020, nine of these ten institutions continue to be amongst the top 15 U.S. schools with the highest international student population (IIE, 2020c).

A total of 2,810 graduate students from 114 departments across the 10 institutions participated in the survey (see Han et al. (2015) for response rate details). Of the 2,493 students who completed the survey, 836 students were international students. The analysis presented in this paper draws on information collected from these 836 students. We were able to identify the university

affiliation of 667 of these students across the 10 universities using their email addresses and the latitude-longitude coordinates collected by Qualtrics. More details about this process are available on request from the authors. After accounting for missing data, our final sample consists of 642 international students across nine universities. The sample characteristics are presented in Table 1.

Table 1: Sample Characteristics ($N = 642$)

Variable	Frequency	Percentage
Gender		
Men	394	61.00
Women	237	37.00
Do not want to respond	11	2.00
Country of Origin (Top 3)		
China	190	29.60
India	170	26.48
Taiwan	21	3.27
Discipline		
Life Sciences	103	16.04
Physical Sciences	89	13.86
Engineering	221	34.42
Mathematics	61	9.50
Computer Science	85	13.24
Other	83	12.93

International Student Enrollment

Nine of the ten universities in the sample make their international student enrollment data, including their distribution by country of origin, publicly available. The only exception is Northeastern University and therefore it was dropped from the sample. We utilize the Fall 2014 enrollment reports of the remaining nine universities to determine the proportionate representation of each country in the international student population of each university. Of these nine universities, two universities—Arizona State University and the University of Southern California (Los Angeles)—only provide data for the top 15 countries from where they receive the highest enrollment of international students. In our sample, only eight students' country of origin, across both universities, was not included in the top 15 countries. Hence, these students were removed from our analysis.

U.S. News & World Report 2018

U.S. News provides education rankings and is a popular resource to access institutional-level data. We rely on their latest department rankings since rankings from past years are not publicly available.

University Websites

Information pertaining to the type of institution (private or public) and the location of the university (rural or urban) is drawn from individual university websites

ETS Test Taker Data 2014

The ETS publishes annual reports on the population of individuals taking the GRE every year across various demographic characteristics such as age, gender, race, U.S. citizenship status, and country of citizenship. We utilize the average quantitative and verbal GRE scores in 2014 for test takers from each country in our analysis.

Variables

Dependent Variable (DV). The key concept of interest in this study is international students' aspirations to stay in the United States after graduation. Aspirations is measured by asking international students whether they hope to remain in the United States after graduation.

Focal Independent Variable (IV). We employ two variables to measure the dimensions of belonging, i.e. (a) academic belonging, and (b) social belonging. Academic belonging is conceptualized as the feelings of belonging engendered by a student's interaction and engagement with faculty and peers on academic issues (Hurtado & Carter, 1997). We extend the definition to include engagement in different parts of the research process such as access to books and journals, and freedom to pursue self-proposed research. We measure academic belonging using seven items where each international student is asked to rate seven different facets of their U.S. academic experience, compared with their home country.

Feelings of belonging in each area are recorded on a 5-point scale ranging from very much worse (1) to very much better (5). The areas of interest are as follows: (a) open classroom discussions; (b) professors' teaching styles; (c) subject teaching matter; (d) access to books, magazines, journals, and databases; (e) freedom to openly debate established theories; (f) freedom to pursue new, self-proposed research directions; (g) collaboration with other graduate students in your lab. An aggregate academic belonging score is computed for each student by taking an average of responses across the seven areas (Chronbach's $\alpha = 0.8294$).

Social belonging is conceptualized as the feelings of belongings kindled by a student's interactions with their peers and friends in non-work settings (Hurtado & Carter, 1997; Maestas et al., 2007; Walton & Cohen, 2007). We measure social belonging using the question "how do you feel you are treated by your colleagues and professors in the U.S. in comparison with those in your home country?" We recognize that this measure is limiting since (a) it does not refer to social interactions alone, and (b) it does not examine social interactions across multiple settings but condenses them into a single, aggregate measure. Nevertheless, in the absence of widely available secondary data on international students, we utilize it as a conservative measure to examine our theory.

International students' feelings of social belonging are recorded on a 5-point scale ranging from 'treated much worse (1)' to 'treated much better (5)'. Given the categorical nature of the dependent variable and limited sample size, social belonging was recoded into a binary variable with the categories of 'Better' (1) and 'Not Better' (0) to facilitate meaningful comparisons.

A key characteristic of all the items used to construct these two measures of belonging is their relational nature; the items capture a students' feelings of academic and social belonging in the United States compared with their home country. Such a conceptualization reaffirms a key premise of the belonging framework that feelings of belonging are subjective in nature and vary across contexts. Further, a framing of this nature ensures that the same subjective experience is being captured for all international students, i.e., their experience in the United States compared with their home country.

Moderating Variable (MV). To examine the effect of academic enclaves on students' integration and aspirations, we employ co-national concentration as the key moderating variable in our analysis. Thus, we measure the concept of academic enclaves as the concentration of each nationality in an individual university. The international students in the survey reported their nationality across 79 different countries. Since most of these countries have extremely low representation (less than 1% of the total international student population) in each university, the distribution of the percentage of country representation was skewed to the right. To address this skewness, we performed a log transformation of the percentage of the international student population represented by each country in a university to arrive at a more normally distributed curve.

Control Variables

We control for several factors that are associated with our dependent and independent variables: department prestige, gender, type of institution and location of institutions, and GRE scores. Details of these variables can be found in Table 2.

**Table 2: Variables of Interest: Definitions and Descriptive Statistics
(N = 642)**

Variable	Description and coding	Frequency	%	Mean	S.D.
Dependent variable					
Aspirations to stay in the United States	International students' plan to stay in the United States after graduation. Binary variable.	642	100		
	No (0)	68	11		
	Possible (1)	574	89		
Independent variables					
Academic belonging	International students' feelings of belonging engendered by academic systems and communities in the United States compared with their home country. Continuous variable.	642		3.87	0.65
Social belonging	International students' feelings of belonging engendered by social interactions in the United States compared with their home country. Dichotomous variable.	642			
	Not Better (0)	340	53		
	Better (1)	302	47		
Moderating variable					
Academic enclave	Logged percentage of international students from each country in a university (Co-national Concentration). Continuous variable.	642		2.06	1.42
Control variables					
Discipline prestige	Prestige of a department within a university in relation to the same department across other U.S.	642		28.43	17.62

Variable	Description and coding	Frequency	%	Mean	S.D.
	universities. Continuous variable.				
Gender	Self-identified gender identity of international students. Dichotomous variable.	642	100		
	Men (0)	394	61		
	Women (1)	237	37		
	Do not want to respond (88)	11	2		
Type of institution	The funding status of a university Dichotomous variable.	642	100		
	Private (0)	192	30		
	Public (1)	450	70		
Location of institution	The location of a university Dichotomous variable.	642	100		
	Rural (0)	222	35		
	Urban (1)	420	65		
GRE Score— Quantitative	The average GRE quantitative score of all test takers from each country	642		157.19	5.30
GRE Score— Verbal	The average GRE verbal score of all test takers from each country	642		147.15	3.44

Data Analysis

The analysis of this study proceeds in two steps. First, we examine the relationship of academic and social belonging with students' aspirations to stay in the United States (H1a and H1b). We then analyze how co-national concentration moderates this relationship (H2a and H2b). Since aspirations to stay in the United States is a nominal variable, we employ multinomial logistic regression models to test all our hypotheses and calculate the predicted probabilities of aspiring to stay in the United States across different degrees of belonging. In addition to aforementioned theoretical reasons, we run separate models for academic and social belonging because there is a moderate amount of correlation (polyserial correlation of 0.5.) between the two variables. To account for clustering and heteroscedasticity, we use robust standard errors in our models.

All analyses rely on predicted probabilities and marginal effects. Marginal effects represent the difference between two predictions. While marginal effects are identical to regression coefficients in linear regression models, this is not the case when nonlinearities are introduced in the models. We examine the association between belonging and aspirations (H1a and H1b) by interpreting the coefficients of the belonging variables in the predicted probabilities metric and computing its marginal effect. For our second set of hypotheses (H2a and H2b), we test how the association between belonging and aspirations varies depending on the size of a student's co-national community, our measure of academic enclaves. Although we include the interaction term between co-national concentration and belonging in the logit models, we do not utilize its coefficient to draw conclusions about the significance of statistical interaction because it "does not provide a test for whether the effect differs in the predicted probability metric" (Mize, 2019, p. 98).

Instead, we test for equality of multiple marginal effects. The first effect that we examine, i.e., first level differences, is the marginal effect of the belonging on the aspirations (DV) at different levels of co-national concentration (MV). In the case of second level difference, we use Wald's test to examine whether these first-level differences are significantly different across levels of co-national concentration (Berry et al., 2010; Long & Freese, 2014; Mize, 2019). More specifically, we test whether the marginal effect of belonging when co-national concentration is 5 is significantly different from the marginal effect of belonging when co-national concentration is 0.

Predicted probabilities and marginal effects are computed using Stata's `16.1 margins` command and Long and Freese's (2014) user-written command for Stata called `mtable` (program name is `spost13`). The Wald's tests underlying the computation of second differences are evaluated using the user-written command `mlincom` within the `spost13` program (Long & Freese, 2014).

RESULTS

Importance of Belonging

We find support for the first set of hypotheses that greater feelings of belonging—academically and socially—are more likely to be associated with stronger aspirations to stay in the United States after graduation (H1a and H1b respectively). In Figure 1A, we see that international students who report one unit higher on academic belonging than their peers have a 0.115 higher probability of aspiring to stay in the United States ($p < 0.001$) (Figure 1). Further, students who are higher on the academic belonging scale are significantly less likely than their peers to feel undecided about their aspirations to persist in the country ($ME = -0.101$, $p < 0.001$). Overall, the more a student feels like they belong academically, the more likely they are to aspire to stay in the country and less likely to feel undecided about their future plans.

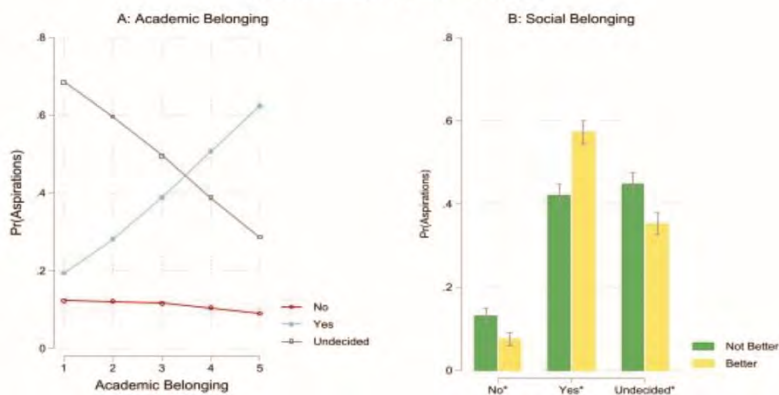


Figure 1: Probability of Aspiring to Stay in the United States Based on Feelings of Belonging

Note: Outcomes for social belonging with significant differences are starred

We find a similar positive relationship between social belonging and the aspirations to persist in the United States. In Figure 1B, we see that international students who report ‘better’ levels of social belonging in the United States compared with their home country have a 0.152 higher probability of aspiring to stay in the United States ($p < 0.001$) and 0.057 lower probability of aspiring to leave ($p < 0.05$) than international students with ‘not better’ levels of social belonging. Students with better levels of social belonging also have a 0.095 lower probability ($p < 0.05$) of feeling undecided about their future aspirations compared with their less socially integrated peers.

Thus, our findings corroborate the importance of feelings of belonging in ensuring the persistence of international students. Students who feel more like they belong in the United States—academically or socially—are more likely to aspire to stay in the country upon graduation.

Academic Enclave Effect

Our second set of hypotheses propose that academic enclaves, as measured by co-national concentration, will have a positive moderating effect on the association between feelings of belonging and aspirations. Thus, the marginal effect of belonging on aspirations should be larger as co-national concentration increases. We anticipate that international students who feel like they belong more are less likely to want to leave the United States after graduation and more likely to want to stay when they are enrolled in universities with a larger share of co-nationals than universities with a smaller share.

The results only provide support for our social belonging hypothesis (H2b). In our test for H2a, the marginal effect of academic belonging for all categories of aspirations does not change significantly between high and low levels of co-national concentration. Thus, there exists no moderating effect of co-national concentration on the association between academic belonging and aspirations.

However, we find support for the social belonging hypothesis albeit through a different pathway, i.e., co-national concentration shapes the effect of social belonging on aspirations to not stay in the United States/leave the United States after graduation instead of the aspiration to stay in the United States. At initial levels of co-national concentration, the marginal effect of social belonging (better—not better) on aspirations to not stay is negative and significant at $\alpha < 0.1$ (see Mize, 2016 for significant testing approaches).¹ Thus, students who report better levels of social belonging have a lower probability of aspiring to leave after graduation than those who report not better levels of social belonging. After the logged value of co-national concentration exceeds 2, this marginal effect is no longer significant (dotted section of Figure 2).

To ascertain whether these changes in the marginal effect of social belonging are meaningful, we compute the difference between the marginal effects of social belonging at the highest (5) and lowest level of co-national concentration (0) and find the difference to be significantly different (second difference = 0.132, $p < 0.1$). The second level difference is not significant for the remaining outcome categories of ‘Yes’ and ‘Undecided’ and thus not reported here. In keeping with H2b, we conclude that the effect of social belonging on a student’s aspirations varies based on the size of their academic enclaves made up of co-nationals. However, the moderation does not take the pathway we had anticipated, i.e., the association between social belonging and aspirations does not become stronger as the density of academic enclave increases.

Nevertheless, a closer examination of the factors driving the changes in the marginal effect of social belonging still lends support to the positive role of dense academic enclaves in ensuring international student persistence. The probability of aspiring to leave/not stay for students with ‘better’ levels of social belonging (blue line in Figure 2) does not vary at different degrees of co-national concentration. However, as the size of the co-national concentration increases, students who report ‘not better’ levels of social belonging are less likely to aspire to want to leave.

¹ Marginal effects of social belonging outcome category ‘No’: (a) ME at concentration 0 = -0.128 ($p < 0.05$); (b) ME at concentration 1 = -0.078 ($p < 0.05$); (c) ME at concentration 2 = -0.042 ($p < 0.1$); (d) ME at concentration 3 = -0.019 ; (e) ME at concentration 4 = -0.004 ; and ME at concentration 5 = 0.004 .

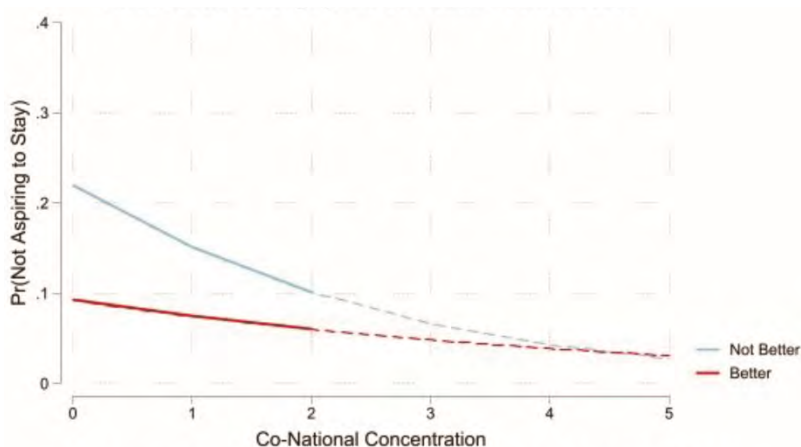


Figure 2: Probability of Aspiring to Stay in the United States Across Social Belonging and Co-National Concentration

Note: Group difference (better vs. less better) is significant at the $p < 0.1$ level when lines are solid

Thus, changes in the marginal effect of social belonging are driven by two unanticipated factors. First, only the aspirations of students who experience lower social belongingness change in response to an increasing presence of co-nationals. Students who report stronger feelings of belonging are less likely to be influenced by the presence or absence of co-nationals. Second, co-nationals do not bolster the aspirations of students with low levels of social belongingness to “stay” in the United States. Instead, academic enclaves temper international students’ “desire to leave” but that is also only up to the point when they become as well-adjusted as their peers. We refer to these dual paths of persistence that emerge when we account for heterogeneity in the presence and experiences of international students as the “academic enclave effect.”

DISCUSSION AND CONCLUSION

Our findings demonstrate the importance of “academic enclaves” in ensuring the persistence of international graduate students in the United States. Building on scholarship that emphasizes the importance of co-nationals in improving academic outcomes, reducing loneliness, and bolstering the psycho-social well-being of international students (Glass & Gesing, 2018; Kaya, 2020; Khanal & Gaulee, 2019; Wang & Freed, 2021), we draw attention to the positive association between feelings of belonging (academic and social) and the persistence of graduate international students. Our examination of international student persistence extends into aspirations to stay in the United States upon graduation. We emphasize the importance of this extension because factors contributing to the transition of international students into the American labor market, beyond legal factors, remain underexamined (Wadhwa et al., 2009).

By accounting for the heterogeneity in the distribution of the international student community across universities, we are also able to establish a more nuanced model of international student persistence. We find that students with lower levels of social belonging are more likely to persist in the United States, when they are enrolled in universities with a higher density of co-nationals. In contrast, co-national density does not have a significant bearing on the aspirations of students with higher levels of social belonging. We refer to these dual paths of persistence as the “academic enclave effect” because we conceptualize co-national communities as “academic enclaves” that support international students in the same way ethnic enclaves support immigrant communities (Hikido, 2018; Kosta, 2019). However, academic enclaves differ from ethnic enclaves on account of the “enclave ceiling effect” present in the former—co-national communities only shape the likelihood of persistence for those students who are experiencing a certain level of paucity in their social belonging and have no bearing on socially well-integrated international students.

Limitations

The analysis presented in this paper is based on cross-sectional data and therefore associational and not causal. Further, given the sampling frame, our results are generalizable only to the experiences of international graduate students enrolled in universities with relatively large international student populations. Another limitation lies in the measure of aspirations. Aspirations to not leave do not imply that students are more likely to stay—they could simply feel undecided. Nevertheless, the reduced probability of leaving is still a movement in the direction to retain valuable, yet overlooked, members of the American society (Hagedorn & Lee, 2005). Finally, we also recognize that individuals of the same nationality can be of different racial identities and that these identities shape their feelings of belonging and persistence within U.S. higher education institutions (Mwangi, 2016). Although we focus on the national identity of international students, we hope that future research will take a closer look at how racial dynamics influence the academic enclave effect.

Implications and Future Research

Our findings demonstrate the important relationship between feelings of belonging and the persistence of international students, not only toward the completion of their degrees but also in terms of aspiring toward transitioning into the American labor market. Second, our explicit focus on the graduate international student population addresses an important gap in the international student scholarship that is predominantly focused on undergraduate students’ experiences.

Finally, recognition of the academic enclave effect extends our understanding of how co-nationals influence international students’ experiences in the United States. The pivotal role of co-nationals in creating inclusive spaces for international students where they feel like they belong is well established (Glass

et al., 2013; Kaya, 2020; Rivas et al., 2019; Tang et al., 2018). Evidence also indicates that international students' reliance on their co-nationals as a primary source of social support changes as their duration of stay in the United States increases (Bhochhibhoya et al., 2017; Le et al., 2016). We contribute to this knowledge about co-national communities' influence on international students' experiences by demonstrating how variations in their density have implications on international students' persistence.

At a broader policy level, the discourse on the persistence of international students is often focused on visa and immigration policies. Our results demonstrate the importance of meso-level, institutional factors—the presence co-national communities—in shaping international students' aspirations to stay in the United States. International graduate students, especially those pursuing doctoral programs, spend long durations of time in the United States and are an integral component of American society. Future research should inquire into additional university-level factors that would similarly encourage international students to aspire for a life in the United States beyond degree attainment.

By highlighting the heterogeneity in international students' experiences and their differing responses to increasing co-national presence, we facilitate future research into other factors that engender variations in this community's experiences. In particular, future research should examine the factors that shape the persistence of students with higher levels of social belonging. It is critical to identify the factors engendering variations in international students' experiences so that universities can develop more inclusive policies and structures to best support all groups of international students instead of treating them a homogenous community.

REFERENCES

- Anderman, L. H., & Freeman, T. M. (2004). Students' sense of belonging in school. In P. R. Pintrich & M. L. Maehr (Eds.), *Advances in motivation and achievement. Motivating students, improving schools: The legacy of Carol Midgley* (Vol. 13, pp. 27–63). Elsevier.
- Andersson, R., Musterd, S., & Galster, G. (2014). Neighbourhood ethnic composition and employment effects on immigrant incomes. *Journal of Ethnic and Migration Studies*, 40(5), 710–736. <https://doi.org/10.1080/1369183X.2013.830503>
- Bécares, L., & Nazroo, J. (2013). Social capital, ethnic density and mental health among ethnic minority people in England: A mixed-methods study. *Ethnicity & Health*, 18(6), 544–562. <https://doi.org/10.1080/13557858.2013.828831>
- Berry, W. D., DeMerrit, J. H. R., & Esarey, J. (2010). Testing for interaction in binary logit and probit models: Is a product term essential? *American Journal of Political Science*, 54, 248–266. <https://doi.org/10.1111/j.1540-5907.2009.00429.x>
- Bhochhibhoya, A., Dong, Y., & Branscum, P. (2017). Sources of social support among international college students in the United States. *Journal of International Students*, 7(3), 671–686. <https://doi.org/10.5281/zenodo.570032>

- Bista, K., & Foster, C. (2011). Issues of international student retention in American higher education. *The International Journal of Research and Review*, 7(2), 1–10. Available at SSRN: <https://ssrn.com/abstract=1958362>
- Bouk, F. E., Vedder, P., & Poel, Y. T. (2013). The networking behavior of Moroccan and Turkish immigrant entrepreneurs in two Dutch neighborhoods: The role of ethnic density. *Ethnicities*, 13(6), 771–794. <https://doi.org/10.1177/1468796812471131>
- Brunsting, N. C., Smith, A. C., & Zachry, C. (2018). An academic and cultural transition course for international students: Efficacy and socio-emotional outcomes. *Journal of International Students*, 8(4), 1497–1521. <https://doi.org/10.5281/zenodo.1467805>
- Cho, J., & Yu, H. (2015). Roles of university support for international students in the United States: Analysis of a systematic model of university identification, university support, and psychological well-being. *Journal of Studies in International Education*, 19(1), 11–27. <https://doi.org/10.1177/1028315314533606>
- Das-Munshi, J., Becares, L., Dewey, M. E., Stansfeld, S. A., & Prince, M. J. (2010). Understanding the effect of ethnic density on mental health: Multi-level investigation of survey data from England. *British Medical Journal*, 341, c5367. <https://doi.org/10.1136/bmj.c5367>
- Du, Y., & Wei, M. (2015). Acculturation, enculturation, social connectedness, and subjective well-being among Chinese international students. *The Counseling Psychologist*, 43(2), 299–325. <https://doi.org/10.1177/0011000014565712>
- Garcia, H. A., Garza, T., & Yeaton-Hromada, K. (2019). Do we belong? A conceptual model for international students' sense of belonging in community colleges. *Journal of International Students*, 9(2), 460–487. <https://doi.org/10.32674/jis.v9i2.669>
- Geven, S., Kalmijn, M., & Tubergen, T. (2016). The ethnic composition of schools and students' problem behaviour in four European countries: The role of friends. *Journal of Ethnic and Migration Studies*, 42(9), 1473–1495. <https://doi.org/10.1080/1369183X.2015.1121806>
- Giddens, A. (1979). *Central Problems in Social Theory: Action, structure and contradiction in social analysis*. Berkeley: University of California Press.
- Glass, C. R., Buus, S., & Braskamp, L. A. (2013). Uneven experiences: What's missing and what matters for today's international students. Global Perspective Institute.
- Glass, C. R., & Gesing, P. (2018). The development of social capital through international students' involvement in campus organizations. *Journal of International Students*, 8(3), 1274–1292. <https://doi.org/10.5281/zenodo.1254580>
- Guo, S., & Chase, M. (2011). Internationalisation of higher education: Integrating international students into Canadian academic environment. *Teaching in Higher Education*, 16(3), 305–318. <https://doi.org/10.1080/13562517.2010.546524>

- Hagedorn, L. S., & Lee, M.-C. (2005). International community college students: The neglected minority? In *Online Submission*. ERIC: Institution of Education Sciences. <https://eric.ed.gov/?id=ED490516>
- Han, X., & Appelbaum, R. P. (2016). *Will they stay or will they go?: International STEM students are up for grabs* (p. 50). Ewing Marion Kauffman Foundation.
- Han, X., Appelbaum, R. P., Stocking, G., & Gebbie, M. (2015). *International STEM graduate student in the United States Survey 2015*. Inter-university Consortium for Political and Social Science Research. <http://doi.org/10.3886/E43668V1>
- Hausmann, L. R. M., Schofield, J. W., & Woods, R. L. (2007). Sense of belonging as a predictor of intentions to persist among African American and White First-Year college students. *Research in Higher Education*, 48(7), 803–839. <https://doi.org/10.1007/s11162-007-9052-9>
- Hikido, A. (2018). Entrepreneurship in South African township tourism: The impact of interracial social capital. *Ethnic and Racial Studies*, 41(14), 2580–2598. <https://doi.org/10.1080/01419870.2017.1392026>
- Horne, S. V., Shuhui Lin, Anson, M., & Jacobson, W. (2018). Engagement, satisfaction, and belonging of international undergraduates at U.S. research universities. *Journal of International Students*, 8(1), 351–374. <https://doi.org/10.5281/zenodo.1134313>
- Hurtado, S., & Carter, D. F. (1997). Effects of college transition and perceptions of the campus racial climate on Latino college students' sense of belonging. *Sociology of Education*, 70(4), 324–345. <https://doi.org/10.2307/2673270>
- Institute of International Education. (2020a). *International scholars trends, 1999/00–2019/20* (Open Doors Report on International Educational Exchange). <https://opendoorsdata.org/data/international-scholars/international-scholars-trends/>
- Institute of International Education. (2020b). *Leading places of origin of international scholars, 2000/01–2019/20* (Open Doors Report on International Educational Exchange). <https://opendoorsdata.org/data/international-scholars/leading-places-of-origin/>
- Institute of International Education. (2020c). *Top 25 institutions hosting international students, 2000/01–2019/20* (Open Doors Report on International Educational Exchange). <https://opendoorsdata.org/data/international-students/leading-institutions/>
- Johnson, D. R., Soldner, M., Leonard, J. B., Alvarez, P., Inkelas, K. K., Rowan-Kenyon, H. T., & Longerbeam, S. D. (2007). Examining sense of belonging among first-year undergraduates from different racial/ethnic groups. *Journal of College Student Development*, 48(5), 525–542. <https://doi.org/10.1353/csd.2007.0054>
- Kaya, J. (2020). Inside the international student world: Challenges, opportunities, and imagined communities. *Journal of International Students*, 10(1), 124–144. <https://doi.org/10.32674/jis.v10i1.1031>

- Khanal, J., & Gaulee, U. (2019). Challenges of international students from pre-departure to post-study: A literature review. *Journal of International Students*, 9(2), 560–581. <https://doi.org/10.32674/jis.v9i2.673>
- Kosta, E. B. (2019). Becoming Italian, becoming American: Ethnic affinity as a strategy of boundary making. *Ethnic and Racial Studies*, 42(5), 801–819. <https://doi.org/10.1080/01419870.2018.1432871>
- Le, A. T., LaCost, B. Y., & Wismer, M. (2016). International female graduate students' experience at a Midwestern University: Sense of belonging and identity development. *Journal of International Students*, 6(1), 128–152. <https://doi.org/10.32674/jis.v6i1.485>
- Long, J. S., & Freese, J. (2014). Regression models for categorical dependent variables using Stata (Third). Stata Press.
- Maestas, R., Vaquera, G. S., & Zehr, L. M. (2007). Factors impacting sense of belonging at a hispanic-serving institution. *Journal of Hispanic Higher Education*, 6(3), 237–256. <https://doi.org/10.1177/1538192707302801>
- Mamiseishvili, K. (2012). International student persistence in U.S. Postsecondary Institutions. *Higher Education*, 64, 1–17. <https://doi.org/10.1007/s10734-011-9477-0>
- Mize, T. D. (2016). Sexual orientation in the labor market. *American Sociological Review*, 81(6), 1132–1160. <https://doi.org/10.1177/0003122416674025>
- Mize, T. D. (2019). Best practices for estimating, interpreting, and presenting nonlinear interaction effects. *Sociological Science*, 6, 81–117. <https://doi.org/10.15195/v6.a4>
- Museum, S. D., Yi, V., & Saelua, N. (2017). The impact of culturally engaging campus environments on sense of belonging. *The Review of Higher Education*, 40(2), 187–215. <https://doi.org/10.1353/rhe.2017.0001>
- Mwangi, C. A. G. (2016). Exploring sense of belonging among Black International Students at an HBCU. *Journal of International Students*, 6(4), 1015–1037. <https://doi.org/10.32674/jis.v6i4.332>
- Page, A. G. (2019). Ethnic enclaves transcending space Chinese international students' social networks in a European University town. *Asian Ethnicity*, 20(4), 418–435. <https://doi.org/10.1080/14631369.2019.1570816>
- Portes, A., & Jensen, L. (1989). The enclave and the entrants: Patterns of ethnic enterprise in Miami before and after Mariel. *American Sociological Review*, 54(6), 929–949. <https://doi.org/10.2307/2095716>
- Portes, A., & Manning, R. D. (2013). The Immigrant Enclave: Theory and Empirical Examples. In J. Lin & C. Mele (Eds.), *The Urban Sociology Reader* (Second, pp. 202–213). New York: Routledge.
- Rivas, J., Hale, K., & Burke, M. G. (2019). Seeking a sense of belonging: Social and cultural integration of international students with American College Students. *Journal of International Students*, 9(2), 682–704. <https://doi.org/10.32674/jis.v9i2.943>
- Rosenberg, M., & McCullough, B. C. (1981). Mattering: Inferred significance and mental health among adolescents. *Research in Community & Mental Health*, 2, 163–182.

- Rose-Redwood, C. R., & Rose-Redwood, R. S. (2013). Self-segregation or global mixing?: Social interactions and the international student experience. *Journal of College Student Development*, 54(4), 413–429. <https://doi.org/10.1353/csd.2013.0062>
- Srivastava, S. K., Srivastava, A. K., Minerick, A., & Schulz, N. (2010). Recruitment and retention of international graduate students in US universities. *International Journal of Engineering Education*, 26(6), 1561–1574. <https://krex.k-state.edu/dspace/bitstream/handle/2097/7514/SchulzIJEE2010.pdf?sequence=1>
- Strayhorn, T. L. (2008). Fittin' in: Do diverse interactions with peers affect sense of belonging for Black men at predominantly White Institutions? *NASPA Journal*, 45(4), 501–527. <https://doi.org/10.2202/1949-6605.2009>
- Strayhorn, T. L. (2012). College students' sense of belonging: A key to educational success for all students. Routledge. <https://doi.org/10.4324/9780203118924>
- Strayhorn, T. L., Long III, L. L., Kitchen, J. A., Williams, M. S., & Stenz, M. E. (2013). *Academic and social barriers to Black and Latino Male Collegians' success in engineering and related STEM fields*. 120th ASEE Annual Conference and Exposition, Atlanta, GA. <https://commons.erau.edu/publication/295>
- Tang, X., Collier, D. A., & Witt, A. (2018). Qualitative study on Chinese students' perception of U.S. university life. *Journal of International Students*, 8(1), 151–174. <https://doi.org/10.5281/zenodo.1134279>
- Toussaint-Comeau, M. (2008). Do ethnic enclaves and networks promote immigrant self-employment? *Economic Perspectives*, 32(4), 30. Available at SSRN: <https://ssrn.com/abstract=1297315>
- Wadhwa, V., Saxenian, A., Freeman, R., & Salkever, A. (2009). *Losing the world's best and brightest: America's new immigrant entrepreneurs, Part V*. Ewing Marie Kauffman Foundation. <https://www.immigrationresearch.org/report/other/losing-worlds-best-and-brightest-americas-new-immigrant-entrepreneurs-part-v>
- Walton, G. M., & Cohen, G. L. (2007). A question of belonging: Race, social fit, and achievement. *Journal of Personality and Social Psychology*, 92(1), 82–96. <https://doi.org/10.1037/0022-3514.92.1.82>
- Wang, X., & Freed, R. (2021). A Bourdieusian analysis of the sociocultural capital of Chinese international graduate students in the United States. *Journal of International Students*, 11(1), 41–59. <https://doi.org/10.32674/jis.v11i1.952>
- Yao, C. W. (2016). Unfulfilled expectations: Influence of Chinese international students' roommate relationships on sense of belonging. *Journal of International Students*, 6(3), 762–778. <https://doi.org/10.32674/jis.v6i3.355>
- Zhao, C., 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. <https://doi.org/10.1353/jhe.2005.0018>

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