Unsettling Experiences: Factors That Discourage International Students From Desiring Research and Teaching Careers

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It is estimated that one-third of students completing their doctoral study in the United States are international. This is notable because the higher education socialization processes for international students are uniquely challenging, yet little scholarship has addressed how these challenges influence doctoral students' pursuits of faculty careers. Employing multi-institutional data from the U.S. research-intensive universities, this study examined how interpersonal socialization difficulties (based in linguistic challenges, cultural differences, and identity-based bias/discrimination) with peers, faculty, and staff were associated with declined interest in pursuing faculty positions at research-oriented universities and teaching-oriented universities. The results indicated that international doctoral students who experienced interpersonal challenges due to cultural conflicts were more likely to lose interest in faculty positions. U.S. higher education is recommended to help both international doctoral students and people around them to minimize communication difficulties of cultural differences to retain international talents who can be future international faculty.

Keywords: *doctoral students, faculty careers, globalization, higher education, international education/studies, regression analyses*

Introduction

Universities have long recognized the range of benefits that flow from recruiting top students and faculty from across the globe, seeing them as essential to compounding internationalization efforts. Altbach and Yudkevich (2017) describe international scholars as "drivers of international consciousness at universities," noting that they are both prolific researchers and globally "constitute much of the academic labor force" (p. 8). There are several contested benefits to diversity, but the desire for international diversity is clear, as Rumbley and de Wit (2017) emphasize that worldwide competition for top international scholars is fierce and success in attracting international scholars to university life positively influences an institution's rankings and prestige.

Research universities in the United States have been a top destination for international graduate students (Altbach & Yudkevich, 2017). Recent estimates indicate that one-third of students completing their doctoral studies in the United States are international (NSF, 2020). Close to three-quarters of international students in the United States enroll in the campuses classified as Doctoral Universities: Very High Research Activity (R1s) or Doctoral Universities: High Research Activity (IIE, 2021). On the global level, the United States is the top producer of doctoral degrees; in 2017, U.S. universities granted about 71,000 doctorates, followed by Germany with approximately 28,000 (OECD, 2019). This strong U.S. doctoral pipeline is at risk, however, given threats to international scholars pursuing graduate degrees.

At present, the environment for international students on U.S. campuses is hampered by COVID-19 but also by the compounding contexts of a surge in nationalist and xenophobic ideology in the United States or racial unrest (Yao & George Mwangi, 2022). These factors likely contributed to the fall in enrollments of new international graduate students

in the United States by 37.4% in 2020 (Zhou & Gao, 2021). These current realities hold the potential to create a range of challenges for international students that could have detrimental effects on their future career interests and intentions. Moreover, these can contribute to changes in career interest during the course of studies. Thus, understanding the nature and impact of challenges international students in the United States face is particularly salient for graduate training, as international doctoral students constitute part of a global pipeline that sustains and expands universities' capacities for internationalization of research and teaching in higher education. Moreover, it is essential to understand factors that contribute to international students' career preferences and intentions and how interpersonal challenges may disrupt these processes.

To date, little is known about what and how the experiences of international doctoral students studying in the United States shape their subsequent intentions to pursue academic careers. For this study, we use the 2018 graduate version of the Student Experiences in Research Universities survey (GradSERU) to draw a sample of international doctoral students enrolled in top U.S. research universities. We ask: What factors contribute to students' intentions to pursue academic careers? Are there distinct influences that distinguish between international students' preferences to pursue careers at research-intensive universities as compared to pursuing careers at teaching-oriented universities? Our study is one response to Altbach and Yudkevich's (2017) question about whether international faculty should be "hired to teach or do research" (p. 9). However, in this approach, we center the changing perspectives and agency of this future faculty by considering how international scholars have experienced socialization in graduate education. With this study, we seek to highlight international students' experiences to better understand how their personal backgrounds, academic training, and socialization reshape career intentions. In particular, we examine the range of challenges international students face as part of their interactions and engagement in the campus community. Moreover, in addition to centering international student experiences and exploring unique challenges, we seek to provide insight into how research universities can be more effective in fulfilling their responsibilities to the higher education sector—namely, to prepare future faculty by reducing the challenges that international doctoral students experience in their training programs.

Doctoral Students' Interests in Academic Careers

The landscape of graduate education has shifted with regard to doctoral students' pursuits of faculty careers. Generally, macrostructural changes have contributed to the unbundling of the university professor role (Gehrke & Kezar, 2015) and have spurred corollary growth in doctoral holders rethinking the types of careers they desire, whether inside or outside the academy or focused on research, teaching, or clinical activities at universities (Sauermann & Roach, 2012; Sinche et al., 2017; St. Clair et al., 2017). Amid these changes, doctoral students' relative interest in faculty careers is crucially important, as these students are the pipeline for future generation of professors (Curtin et al., 2016; Sauermann & Roach, 2012). For example, in a survey of more than 4,000 STEM doctoral students, more than half indicated faculty career intentions (Sauermann & Roach, 2012). Graduate program experiences are critical for students interested in faculty careers, because doctoral students explore and develop their professional identities as future faculty members while engaged in their studies (Jaeger et al., 2013).

Institution types are also critical for student academic careers. Positions at teaching-intensive universities have long been more numerous than research universities (NCES, 2013), which is why it is important to understand whether students consider these roles as viable career pathways during their doctoral pursuits. Some qualitative research indicates that some students may expressly seek faculty opportunities at teaching universities (McLoughlin et al., 2019), but these students may be the exception. Research universities typically enjoy greater national and international prestige than teaching institutions (Campbell et al., 2019; Volkwein & Sweitzer, 2006), which may influence graduate student desire to seek employment at these different types of institutions. Moreover, upon securing faculty roles at teaching institutions, early career scholars may experience challenges based upon their socialization to faculty work at these types of colleges and universities (Baker, 2020; Baker et al., 2017).

Influences on Academic Career Interest

According to previous research, doctoral students' career development and intentions can be positively influenced by a range of factors. When students gain experience with faculty work tasks, it can increase interests in such careers. Choe and Borrego (2020), as well as Gibbs and colleagues (2014), noted a positive pattern that as doctoral students' research performance, research mind, research self-efficacy, and publication count increase, so does interest in faculty positions. Beyond exposure to faculty work activities, students' interpersonal interactions with faculty members, peers, and others in a department can shape doctoral students' career intentions. For instance, feeling supported by faculty members has been observed to motivate doctoral students to pursue faculty or research positions (Curtin et al., 2016; Gibbs et al., 2014; Sauermann & Roach, 2012). Curtin and colleagues' (2016) analyses denote that mentorship addressing skill-related, psychosocial, or advocacy/networking from a primary advisor had a positive, indirect effect on students' intentions to pursue academic careers.

Alternately, prior research also indicates factors associated with decreased desire for faculty careers. Categorically, there is a relationship between one's personal background and career placement. Curtin and colleagues (2016) observed female students and underrepresented racial minority students as less likely to pursue faculty careers. Some evidence suggests that after spending time in academia, doctoral students may shun faculty careers due to concerns about work-life balance, extensive competition and stress, scarcity of faculty positions, or hardship of attaining research grants (Gibbs & Griffin, 2013). Observing a decline in interest over time may not be entirely surprising, as doctoral students can overrate faculty careers at the start of the PhD, and they also tend to narrowly focus on the positive aspects of the job before they begin their studies (Sauermann & Roach, 2012).

With so much about career intentions shaped by students' experiences, it is suitable to note factors involved with the interpersonal aspects of doctoral study. Generally, there is a well-established pattern that interactions with peers, laboratory staff, and postdocs influence the quality and substance of doctoral students' experiences (Jaeger et al., 2013; Le & Gardner, 2010; Mason & Hickman, 2019). The aforementioned studies about academic career interest offer useful insight but often ignore or exclude international doctoral students. Thus, we turn our attention to what is known about particular factors that influence these students' unique career interests and intentions.

International Doctoral Student Experiences

To focus on international doctoral student experiences, we first turn to persistence and career interest trends. International doctoral students have been observed as more likely to pursue an academic position than domestic students (Choe & Borrego, 2020). Across the literature, the number of studies about the experiences of international doctoral students and any corresponding influence on career interests is relatively limited compared to studies focusing on domestic students. Also, the studies that do exist tend to involve relatively small samples (fewer than 50 students). Those that do offer insight reveal that interactions with others contribute to what international doctoral students derive from their education. Similar to the findings from domestic doctoral students aforementioned, positive relationships with an advisor, peer, or staff members were associated with interest in faculty positions (Cotterall, 2015; Le & Gardner, 2010; Lee, 2017; Mason & Hickman, 2019).

However, international doctoral students confront challenges that their domestic counterparts rarely encounter. Those challenges include English proficiency, additional English coursework, and dissimilarities of academic and social cultures between one's home country and host country (Ku et al., 2008; Le & Gardner, 2010; Wang & Li, 2011). Also, international doctoral students in the United States often experience financial issues (Gao, 2021; Ku et al., 2008), which may be related to federal work restrictions and limited opportunities to earn money by virtue of international student visa status (international students studying on a student visa are disallowed from working off-campus in their first year or working more than 20 hours per week [U.S. Immigration and Customs Enforcement, 2021]). Although these challenges have been identified in the literature about international doctoral students, current research fails to explore whether these challenges influence international doctoral students' intentions to pursue faculty careers, particularly in the changing faculty landscape.

Theoretical Framework

Given that prior literature points to how several converging influences and experiences in doctoral programs are key to the relative quality of international doctoral student career appraisal, we turn to theory associated with doctoral student socialization. Socialization theory offers several ways of considering the role acquisition process of international doctoral students in the United States and is well-suited to address the relative impact of experiencing challenges in graduate school on corresponding interests in pursuing faculty careers at either research-focused or teaching-focused universities. Specifically, we center Véliz's (2020) international student socialization framework that builds upon Weidman and colleagues' (2001) framework of graduate and professional student socialization. In the original theoretical apparatus from Weidman and colleagues (2001), graduate student socialization theory explains the variety of channels into, through, and out of doctoral education and careers by examining characteristics of students, institutions, communities, and life passages. Véliz (2020) reframes this form of higher education socialization by adding unique elements to the framework, rearticulating socialization for international students as a process whereby international students face a unique series of challenges with university structures. These include encounters with language and communication, cultural adjustment, finances, and interaction with peers and mentors (Véliz, 2020). In developing our understanding of international doctoral students' academic career pursuits, we draw upon these socialization frameworks and Véliz's (2020) socialization challenges to identify an array of relevant factors and to develop models to assess their impact. In practice, naming and analyzing these socialization challenges that are unique to the international student experience allows university faculty and administrators to remove barriers to full inclusion.

Socialization challenges can be especially imposing on doctoral students when accounting for the prevailing neoliberal climate at large research universities. Although defining neoliberalism and neoliberal ideology in higher education lacks some consensus, we appreciate the framing from

Saunders and Blanco Ramírez (2017) that invokes neoliberalism in higher education as the application of free-market logic to all aspects of society surrounding the university apparatus, including commodification of students, teachers, and the notion of excellence. To examine the influence of socialization challenges on faculty interest, we acknowledge the role of neoliberal ideology in bringing international students to the United States for their doctoral studies. Taylor and Cantwell (2015) remark that American research universities enroll international doctoral students as a way to cope with pressures of globalization and to engage in economic opportunism. International doctoral students are commodified and discarded amid the neoliberal university climate as Suspitsyna (2013) describes: "[w]ith their tens of thousands of students, campuses the size of towns, and overseas centers and gateways, large, predominantly white, American research universities operate as colonial metropolises, fashioning themselves as multicultural centers of learning and global providers of knowledge and, at the same time, remaining negligent of their multicultural and international subjects" (p. 1361). The neoliberal climate can leave universities underappreciating the challenges the academic and identity-based international doctoral students experience while pursuing their studies and overlooking the role the institution plays in producing environments that exacerbate these challenges. These misalignments have consequences for how universities socialize students to potential faculty careers, a process by which neoliberal logics are reproduced in slotting graduates into faculty roles.

Although today's American research universities are institutions that are imbued with ongoing neoliberal and neoracist dimensions (Squire, 2020), historically marginalized, international graduate students possess agency in their university environments. Several socialization scholars have pointed out how students possess individual and collective power to influence their universities through two-way socialization processes (Antony & Schaps, 2021; Winkle-Wagner et al., 2020). In the prototypical American research university, two-way doctoral socialization processes have individual and institutional dimensions; not only do newcomers experience socialization through engagement with the organization, but they also reshape their institutions and the others engaged with them during the course of their studies. Thus, even within these two-way dynamics, socialization processes must account for multiple influences. First, socialization varies widely between academic disciplines, influencing definitions of what might be considered effective or successful socialization (Gardner, 2009). Second, Baker (2020) noted how decades of research showed that graduates from research universities are frequently ill-informed about what to expect from faculty careers at postsecondary institutions outside of research universities, especially with regard to teaching and service responsibilities. Third, although several have noted that access to capital-building socialization experiences is unevenly distributed, often based on identity (Gopaul, 2016; Ramirez, 2017), even a student who has experienced socialization in myriad activities aligned with their academic discipline may find themselves unprepared for the academic profession in an unfamiliar geographic or organizational context. Nonetheless, socialization is inextricably linked with the development of role-related expectations, connected to neoliberal logics that commodify scholars in the university apparatus. Thus it remains important to understand how socialization processes factor into international doctoral students' contemplation of future career pursuits. With greater access to positive doctoral socialization experiences, students may develop more confidence and certainty that faculty jobs—and the work that constitutes them—are a viable career pathway.

Present Study

A socialization approach to considering the experiences students have in their programs, specifically the types and the nature of the interactions during doctoral studies, may offer some insights about interests in faculty careers shifting after spending time in their programs (Sauermann & Roach, 2012). Further, the challenges Véliz (2020) highlighted—language and communication, cultural adjustment, financial hardships, and interaction with peers and mentors—may provide clues about processes of socialization that contribute to international doctoral students' relative interest in faculty careers. To this end, the purpose of our study is to examine how these three challenges faced by international doctoral students derived from the unique features of the neoliberal American research university (the hegemony of English language in the United States, pressure to conform to American culture, and possible identity-based experiences of anti-immigrant or xenophobic sentiments and racism) relate to intentions to pursue faculty positions at research-oriented or teaching-oriented universities.

Methods

Our data are from the 2018 GradSERU survey and consist of 1,059 international doctoral students enrolled in five elite, research-intensive U.S. universities. GradSERU is a comprehensive, theory-driven, multi-institutional survey that incorporates measures of curricular experiences, research experiences, teaching and professional development experiences, cocurricular experiences, social life, and personal life (SERU Consortium, n.d.). Our sample involves data from the first multi-institutional administration of the instrument. The cross-sectional international doctoral student sample represents 27.52% of the total sample gathered during the survey administration. The unifying criteria for participation in GradSERU is that the campuses are

intensively engaged in research and are typically either members of the Association of American Universities (AAU); are classified in the Doctoral University: Research Intensive Carnegie descriptors; or are engaged in similar research activities but are located outside North America. SERU Consortia institutions administer GradSERU periodically to their student bodies with a set of standard questions for all institutions and institution-specific wildcard questions. (Note: although international research universities are members of the SERU Consortia, they did not participate in this administration of the GradSERU survey.) As a matter of positionality, members of the research team conducting this study are affiliated with a campus-participating GradSERU data collection, and our team includes scholars from the United States and other countries, all of whom have engaged in doctoral study in the United States. We approach this work with a collective appreciation for the promise of international higher education and specific desire to improve the experiences of international graduate students.

The elite, research-intensive nature of the GradSERU-participating institutions provides a sample of survey respondents from the types of universities that tend to produce graduates who are most competitive for faculty positions (Clauset et al., 2015). Further, the GradSERU survey provides information about students' personal backgrounds, academic experiences, and career intentions; as such, this data set is ideal for assessing our outcomes of interest. Students' demographic information, such as race and international student status, were provided from each institution rather than the self-reported questionnaire items. Moreover, the broad range of survey items and measures of professional intentions allow us to assess students' relative interest in pursuing a career at research- or teaching-oriented universities based on their experiences throughout their doctoral training.

In our sample, which was analyzed using Stata, slightly less than half of the international students were female (43%), and the average age of the sample was 28.6. The majority of international doctoral students were enrolled in STEM (62%) fields, followed by social science (15%), health/medical (7%), humanities (7%), professional (4%), education (4%), and other (1%) fields. Close to half of the students were from East Asian countries (46%), with other students originating from South Asia (19%), Europe/Central Asia (11%), Latin America (9%), Middle East/North Africa (9%), and other regions (7%). World Bank Country Group categories were selected to classify the home geographies of survey respondents. Racial information was derived from institutional data, which was provided from each institution to the SERU administrator. However, most cases in our sample of international students in the GradSERU dataset did not include specific racial information. (Note: the uniform data classifications utilized in the U.S. higher education sector categorizes international status under the racial category

in the IPEDS module of the National Center for Education Statistics, which is likely a contributing factor as to why institutionally reported demographic measures included in the dataset lack racial information for international students.) In our sample, 60% of the sample's racial demographics consisted of unknown/other, and 28.5%, 7.7%, 2.5%, 1.0%, and 2.3% of the sample were identified racially as Asian, White, Hispanic or Latino, Black or African American, and multiracial, respectively. The latter three racial groups were combined and treated as one group of other racial minorities in the statistical analysis to account for the extremely small numbers of international students that would have limited inferential analysis. Notably, our choice in collapsing categories is by no means intended to suggest that these groups are the same or that there are no meaningful differences embedded in these racial categories. Rather, collapsing the three racial categories should be understood as both a potential limitation of our study, as well as a reminder that U.S. higher education must be intentional about developing talent in its graduate ranks from a more diverse pool of students. Supplemental Material 1 shows the descriptive statistics of all variables.

Measures

Dependent Variables. This study includes two dependent variables. Each outcome was measured with a three-point scale, where students noted whether their interest in working at a particular type of university (research-oriented or teaching-oriented university) had declined (=1), not changed (=2), or increased (=3). However, by running the Wald test by multinominal regression to assess whether the alternatives were independent of one another as a diagnostic test, we observed that the categories of "not changed" and "increased" were not distinct for both outcome variables. Correspondingly, we dichotomized the outcome into binary measures that collapsed the categories of "not change" and "increased" into a single group (labeled as 0 for the reference group), and we left the category of "declined" as its own group (labeled as 1). With these revised groupings, we narrowed our research question to assessing challenges that international graduate students face, which contribute to a decrease in their interest in research- or teaching-oriented career pursuits. In our sample, 17% of international students' interests declined in pursuing a career at a research university (*SD* = .37), and 12% reported their interests declining in pursuing a career at a teaching university (*SD* = .33).

Independent Variables. Our independent variables reflect the aforementioned literature and theory. Our primary independent variables of interest reflected three distinctive types of challenges that international students face while pursuing their doctoral studies in the neoliberal U.S. university context. We generated constructs for the three types

of challenges (see Supplemental Material 2). Each challenge measure comprises multiple items measuring the extent international doctoral students experience challenges with faculty, peers, and staff based on language and communication (3 items, α = .91), cultural adjustment (3 items, α = .83), and identity-based bias (12 items, α = .97). All items were measured on a five-point, Likert-type scale assessing a perceived challenge's impact (1 = Not at all, 2 = To a small extent, 3 = To a moderate extent, 4 = To a large extent, 5 = To a very large extent). For example, for the language and communication factor, items asked whether students experienced difficulties interacting with faculty, peers, or staff (each measured separately) because of language challenges. Similarly, three items were used to measure cultural adjustment and inquired about the degree of difficulties interacting with faculty, peers, and staff, respectively. The third factor variable, identity-based bias, similarly asked about the difficulties of interacting with faculty, peers, or staff attributable to bias or hostility to a students' nationality, gender, race, and religion.

In addition, various variables were used as control variables. Demographic characteristics included institutionally reported categorical measures for a student's biological sex, race, and age (measured continuously). Region of origin (1 = East Asia, 2 = Europe/Central Asia, 3 = Latin America, 4 = Middle East/North Africa, 5 = South Asia, 6 = Other) and academic discipline (1 = STEM, 2 = Professional, 3 = Social science, 4 = Education, 5 = Humanities, 6 = Other, 7 = Health and Medicine) were categorical variables, with East Asia and STEM as the reference groups respectively. Academic experiences consisted of dummy variables denoting whether a student based their choice to enroll in their doctoral program on job placement (0 = No, 1 = Yes; 13%), and whether they were currently working on their dissertation (0 = No, 1 = Yes; 50%). We included a five-point, pseudo-continuous measure indicating the level of concern a student felt regarding their finances (1 = Not at all concerned to 5 = Extremely concerned). Although this is not explicitly a socialization variable as Véliz (2020) suggested, this self-reported item about a challenge with finance was the best available measure in this data set to account for the role of finances. Additionally, we included categorical measures that indicated the type of teaching assistant or research assistant position each student held (1 = Neither, 2 = Research assistant only, 3 = Teaching assistant only, 4 = Both), where the "Neither" was the reference group (38% of the sample).

Analysis

Because this dataset includes missing values (3.5% of all values), multiple imputation by chained equations was employed, which generated 20 datasets with no item-level missing data on all variables. The result from each dataset was pooled and adjusted, which produced the final result from the imputed datasets. This approach was selected due to its more accurate estimation than listwise deletion and advantages over many other alternative methods (for more information, see Carpenter & Kenward, 2013; van Buuren, 2018). In our dataset, the majority of missing values were derived from the variable of region of origin with 15.8% of the missing rate. However, this variable is a control variable, and the missing rates of our dependent variables and key independent variables ranged from 1.2% to 2.7%. Thus, it can be said that the missing values of the dataset do not distort the findings of this study.

We used binomial logistic regression analyses to examine the relationship between international doctoral students' three types of challenges (language and communication, cultural adjustment, and identity-based bias) and any declines in pursuing careers at research-oriented universities or teaching-oriented universities. Each type of university context was assessed separately, thereby generating two logistic regression models—one for each dependent variable. All models contained the main independent variables and all covariates. Because of the multi-institutional characteristics of the dataset, institutional-fixed-effect design (by adding dummy variables of all universities except for a reference one) and sandwich estimate were employed to adjust for the institutional difference. In addition, because previous studies have found the shifting interest in academic careers between the early phase and later phase of doctoral programs (e.g., Sauermann & Roach, 2012), an interaction model between three challenges of the key independent variables and a dissertation phase variable was explored. Coefficients of the models are presented below as odds ratios (OR). An OR greater than 1 demonstrates the increasing probability of selecting declines compared to stable or increasing interest. Conversely, an OR less than 1 demonstrates a decreased chance that a student's interest will decline compared to the chance of it not changing or increasing, representing stability in the faculty pipeline.

Limitations

There are some limitations to this study. First, the GradSERU dataset does not include information about international students' predoctoral academic preparation. We acknowledge some international doctoral students pursued undergraduate or master's education in the United States before starting their doctoral programs, which may account for different socialization processes and interests in careers. Also, with the cross-sectional design of this study, the data set does not include a measure assessing students' initial interest in faculty positions upon enrollment. For example, students with a high interest in a faculty position at enrollment may actively interact with other students, faculty, and staff members as a mechanism for increased professional

academic socialization. However, frequent interactions can bring frequent communication challenges. Third, the imputed values may be still biased if the missing pattern is not random even after taking other predictors. Although it is not feasible to test whether the dataset is MAR (missing at random) and MNAR (missing not at random), the multiple imputation allows a less-biased estimation than alternative methods, such as list-wise deletion (Carpenter & Kenward, 2013; van Buuren, 2018).

Findings

Table 1 presents the results of binomial logistic regression models, and there are two overarching, significant patterns. First, Model 1 (research-focused institutions) indicates that international students' difficulties based both on cultural adjustment and in language and communication are significantly associated with international students' career interests at institutions similar to those they currently attend. The divergent effects of these socialization challenges are detailed later. Model 2 reveals that cultural adjustment challenges contribute to relative declines in desire to work at teaching universities. No other independent variables, with the exception of actively working on the dissertation (as opposed to being at earlier stages in an academic program), had a significant relationship to the outcomes.

When experiencing cultural adjustment challenges, international doctoral students are two times more likely to report decreased interest in seeking a research-oriented university position (OR = 2.09, $p < .001$). Alternately, when students experienced language and communication challenges (OR = .68, $p < .05$) it reduced the chance that students' career interest in working at a research-oriented university would decline. In Model 2, similar to Model 1, when international students reported experiencing cultural adjustment challenges, these experiences were associated with a declining interest in a career at a teaching-oriented university (OR = 1.70, $p < .01$). Unlike Model 1, however, we did not observe a relationship between students experiencing language and communication challenges and their relative interest in teaching-oriented universities.

In both models, the only other variable we observed as having a relationship to the outcomes was the variable accounting for current progress through their academic program. That is, when in the dissertation phase, international doctoral students reported declined interest in careers at both research (OR = 1.74, $p < .01$) and teaching (OR = 1.64, $p < .05$) universities. Also, when international students reported experiencing identity-based bias, such experiences were not observed as significantly contributing to their career interests either at research-oriented universities or teaching-oriented universities. Notably, of the three types of socialization challenges we examined, identity-based bias was the type of challenge that international students reported

experiencing "to a small extent," whereas both cultural adjustment and language and communication challenges were more commonly experienced, with the mean aligning with the "to a moderate extent" value.

Lastly, when we generated interaction terms between the dissertation phase and the three types of challenges, the interaction terms were not significant for either outcome (results are not shown). This finding means there is no statistical evidence to claim that the associations that these socialization challenges and declined interest in faculty positions vary depending on the stage of doctoral study.

Discussion

The findings from this study demonstrate that not all types of challenges for international graduate students are the same, nor do they have the same relationship with students' future career interests within academia. It is curious that cultural challenges dissuade international students' ambitions for faculty careers, at either research- or teaching-oriented universities, whereas language challenges have the opposite influence on students' career interests—sustaining or increasing their interests in pursuing careers at research-oriented universities. There are several potential explanations for how large research universities in the neoliberal U.S. institutional context engage international students in formal and informal faculty socialization processes. Moreover, we consider the implications of these findings for theories of socialization. Finally, we discuss the range of higher education institutions where students may wish to obtain employment and consider whether there is a relationship between international student experiences and anticipatory socialization to institutional type.

Practically speaking, our findings are consistent with some prior work about international graduate students' career pursuits. For example, Shen and Herr's (2004) qualitative study reported that international students' academic field, personal demographics, and geographies had little influence over how they thought about their futures, noting that students' individual communication and cultural experiences had more sway over consideration of future career plans. As such, our study provides a quantitative example of a similar phenomenon, albeit more explicitly through a socialization framework.

To approach answering the question of why cultural challenges may pose a greater threat to international students' faculty ambitions compared to socialization challenges attributable to linguistic challenges, it is necessary to consider the environments where the interactions that manifest these challenges take place. The data for our study were collected at archetypical U.S. research universities and furnished by students who are most frequently subject to ongoing neoliberal and neoracist socializing pressures (Squire, 2020). Thus, in considering doctoral socialization

TABLE 1

Odds Ratios From Logistic Regression to Predict the Decline in Interest in Working at University

	Model 1: Research		Model 2: Teaching	
	OR	SE	OR	SE
Challenge type				
Language (English)	.72*	(.10)	.78	(.12)
Cultural adjustment	1.73***	(.24)	1.50**	(.24)
Identify-based bias	.86	(.11)	.94	(.14)
Demographic variables				
Female	.96	(.20)	.81	(.18)
White	1.24	(.58)	1.66	(.79)
Other RM	1.18	(.67)	.80	(.55)
Unknown	1.49	(.41)	.83	(.29)
Age	1.00	(.02)	1.00	(.02)
Region of home country				
Europe/Central Asia	.82	(.29)	.65	(.27)
Latin America	.64	(.27)	.71	(.36)
Middle East/North Africa	.57	(.23)	.70	(.29)
South Asia	.77	(.21)	.76	(.24)
Other areas	.49	(.23)	.51	(.27)
Academic discipline				
Professional	.19	(.20)	1.23	(.70)
Social science	.83	(.25)	1.58	(.47)
Education	.98	(.50)	.36	(.35)
Humanities	.56	(.25)	.68	(.39)
Other	.94	(.83)	.98	(1.01)
Health/medical	.78	(.31)	1.20	(.52)
Academic experience				
Enrollment reason—job placement	.90	(.25)	.64	(.22)
Currently working on dissertation	1.80**	(.36)	1.63*	(.38)
Financial concern	.91	(.07)	.91	(.09)
Research assistant role	.75	(.17)	1.05	(.27)
Teaching assistant role	1.01	(.29)	.58	(.22)
Both research and teaching roles	.78	(.24)	.82	(.28)
Pseudo R²	.074		.056	
Observations	1059		1059	
Wald (*df* = 29)	61.03		47.99	
p-Value for Wald chi2	.001		.015	
Log likelihood	−458.7		−381.4	
AIC	977.4		822.7	
BIC	1126.3		971.7	

Note. The reference category of race, region of home country, academic discipline, and assistant role is Asian, East Asia, STEM, and no assistant role. All fitting indices are from the first imputed dataset. *$p < .05$ **$p < .01$ ***$p < .001$.

processes for international students, our interpretation of findings incorporates an understanding that an underlying institutional rationale for U.S. research universities is to enroll international doctoral students as a method of coping with pressures of globalization and engage in economic opportunism (Taylor & Cantwell, 2015). Our sample exclusively involves large research universities, which are institutions that purport to have robust support and services for

students around language and, as such, reckon with notions of linguistic identity in the United States. Each of the campuses has some institutional apparatus dedicated to ensuring that students who do not speak English as a first language have avenues to improve their writing, speaking, and general communication. These organizational features influence graduate student socialization in formal and informal ways. Formally, the units may offer skills and strategies for

language mastery, but informally their presence on campus indicates a climate of support for overcoming language barriers (and thereby adopting U.S. academic norms) as a university value. Persistent messaging about these services at the research university may be the reason for the shielding effect of encountering linguistic challenges on future ambitions to work at research universities.

This study design asks students to separate linguistic challenges from cultural challenges and, in doing so, allows for interpretation of conflicting messages about experiences on campus. Students may perceive a cultural mismatch or push toward assimilation when support for linguistic transition to the U.S. university environment is robust but cultural supports are simultaneously insufficient. The study found the experience of cultural challenges was related to diminished students' desires for faculty careers at both research and teaching institutions, indicating these as the biggest threat to welcoming international scholars into the academic ranks. If the goal of the modern U.S. research university is to train and recruit the highest-quality global scholars, university leaders should attend to the needs of these scholars-in-training to strengthen the academic pipeline. Several studies of undergraduate students consider how international students are recruited by universities and then undersupported (e.g., Choudaha, 2016), but this study suggests that the phenomenon extends at a broad level to graduate students at research universities as well, negatively influencing their socialization to faculty careers.

As Véliz (2020) noted, the doctoral socialization journey for international scholars was a series of barriers, and our finding that the length of time engaged in graduate study supports that notion. Both cultural challenges and extended time in a doctoral program diminished students' desire to work in academia. This casts light on the institutional failures to support missions of inclusion on campus among both student and faculty populations. Recent socialization theories advance the notion that socialization is a two-way process (Weidman & DeAngelo, 2020; Winkle-Wagner et al., 2020), but these diminished desires to enter the academic ranks in the first place suggest that international students are being forced out prior to their advancement into the faculty ranks. This points out the relative power differential in two-way socialization theorizing: although students may have some agency to influence the campus environment through advocacy for needs and cultural change, departure due to negative graduate socialization is underacknowledged in the present theory.

Finally, underscoring what Baker (2020) noted about socialization to liberal arts colleges, new faculty often seem unaware of formal and informal systems in place at these teaching-focused institutions. The results of our study indicate less diminished interest in pursuing careers at teaching institutions than research institutions. Although there are several ways to interpret this finding (e.g., that students may become disillusioned with research, that research universities that have more cultural challenges are more undesirable workplaces), we consider that teaching-focused institutions are simply not as well understood by doctoral students who have been socialized within, and to, the culture of the American research university. As such, they may be more open to pursuit of careers at these types of institutions rather than writing off academic pathways completely. We thus recommend that graduate colleges and doctoral programs provide students with more information about academic positions beyond research institutions, such as regional comprehensive universities or liberal arts colleges. Such formal socialization would still influence the diversification of faculty ranks in the United States and provide pathways into academia for international scholars.

Conclusions

According to the result of this study, U.S. higher education institutions should offer effective cultural adjustment support to both international doctoral students and to the peers, faculty, and staff with whom the international students interact. More precisely, international student offices and other relevant offices should teach the U.S. communication culture to international students who have different cultural backgrounds; this can alleviate the cultural challenges. Also, such efforts should be concentrated on not only international students but also others around international students. Training or workshops about intercultural communication may be one of the opportunities in which peers, faculty, and staff of international students learn how they appropriately communicate with students from foreign countries.

Recruiting and retaining international graduate students and international faculty is critical for the development of education, economy, and society. As the leading host country of international students, U.S. higher education has long welcomed foreign talents who can be the future faculty within and outside of the United States. Regardless of the institutional context, such international doctoral students with international perspectives can contribute to *both* teaching and research. Although this is our response to Altbach and Yudkevich's (2017) question of whether international faculty should be "hired to teach or do research," our data indicate that there is an inclination for the latter (p. 9). However, it is critical for U.S. universities to prevent international talents from losing their interest in becoming faculty, especially given the opportunities available to them across institutional types.

Further research is certainly needed on this topic. While this study examined the association between negative experiences and declined interest in faculty positions, positive experiences and their effect on international doctoral students remain understudied. For example, research on what kind of support from universities can enhance international

students' interest in faculty positions can be beneficial. Also, the GradSERU dataset cannot explore whether certain experiences can lead international students to academic careers in a host country, their home country, or any other country. If higher education leaders in the United States and in other countries are interested in promoting international doctoral students to the faculty ranks, it is critical to understand the mechanisms of graduate socialization that motivates international students to stay in a host country beyond the doctorate. Finally, the phenomenon of diminishing interest in research careers after a longer time spent in doctoral study warrants additional exploration.

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Open Practices

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