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Short-Term Internationally Mobile Academics and Their Research Collaborations Upon Return: Insights From the Fulbright U.S. Scholar Program

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Abstract

The international mobility of academics is one of the key mechanisms through which university internationalization occurs; yet, fewer studies have investigated the impact that it has on academics' teaching, research, and service. This study investigates the relationship between short-term international mobility and changes in academics' research networks. Using bibliometric data, research collaboration patterns of 303 U.S. Fulbright academics were analyzed to determine with which academics abroad they are more likely to collaborate and which factors influence the likelihood of research collaboration. The findings demonstrate a positive relationship between short-term international mobility and subsequent research collaborations between mobile academics and host institution and host country academics, but co-publications were more likely with host institution as opposed to host country academics. The results also indicate that this positive relationship is mediated by academics' pre-existing networks, characteristics of the abroad experience, and academics' sociodemographic characteristics.

Keywords

academics, faculty, international mobility, Fulbright, internationalization of research, international research collaboration

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Introduction

Academics play a central role in the success and sustainability of at home and cross-border internationalization practices (Dewey & Duff, 2009; Knight, 2004; Stohl, 2007). One way that universities encourage the involvement of academics in the internationalization process is by supporting their engagement in international mobility. Academics are internationally mobile at different stages of their careers for varying lengths of time to engage in studying, teaching, and research abroad (Horta et al., 2018; Kim & Locke, 2010; Rostan & Höhle, 2014; Teichler, 2017). A recent bibliometric study found that 3.7% of approximately 16 million academics had been internationally mobile at least 1 time between 2008 and 2015, measured by changes in their institutional affiliations (Robinson-Garcia et al., 2019). Mobility exposes academics to different cultures and working environments that can influence their approaches to teaching and research (Hamza, 2010; Patrício et al., 2018), and it also provides them access to transnational collaboration networks through which they can develop and maintain ties with colleagues abroad (Jonkers & Cruz-Castro, 2013; Jonkers & Tijssen, 2008).

Despite the role it plays in internationalization, fewer studies have investigated the impact of international mobility on academics' teaching, research, and service. Studies on the relationship between mobility and research have shown a positive relationship between international mobility and research collaboration among mobile academics and academics abroad (Finkelstein et al., 2013; Jonkers & Cruz-Castro, 2013; Jonkers & Tijssen, 2008; Patrício et al., 2018; Rostan & Höhle, 2014). However, few studies have investigated the relationship between short-term mobility programs and subsequent international research collaboration (Jöns, 2011; Patrício et al., 2018). In particular, there is a lack of research that differentiates between the academics abroad with whom mobile academics collaborate as well as the factors that impact the likelihood of collaboration between the mobile academics and colleagues abroad. To address this gap, this study investigates the relationship between participation of academics in a government sponsored short-term mobility program and their research collaboration patterns with foreign academics after they return from abroad. It pays special attention to the academics in the host country with whom they collaborate and the factors that influence whether collaboration occurs.

Literature Review

Mobility of Academics and International Research Collaboration

Recent research has demonstrated a positive relationship between the international mobility of academics and international research collaboration (Finkelstein et al., 2013; Jonkers & Cruz-Castro, 2013; Jonkers & Tijssen, 2008; Jöns, 2011; Patrício et al., 2018; Pope et al., 2017; Rostan & Höhle, 2014). This research has focused on whether mobile academics are more likely to co-publish with foreign colleagues compared with their nonmobile peers (Finkelstein et al., 2013; Rostan & Höhle, 2014) and also on whether mobile academics co-publish specifically with colleagues from host

institutions, host countries, and host regions after they return from abroad (Jonkers & Cruz-Castro, 2013; Jonkers & Tijssen, 2008).

Concerning the former, mobile academics in general are more likely to co-publish with foreign colleagues than their nonmobile peers (Finkelstein et al., 2013; Rostan & Höhle, 2014). However, there are differences in the likelihood of publishing with foreign colleagues based on the purpose of mobility, amount of time one is mobile, and career stage when an academic goes abroad. Academics who are mobile for their doctoral studies are the least likely to co-publish with foreign colleagues (Kwiek, 2018; Rostan & Höhle, 2014); whereas, academics who permanently migrate for work later in their careers are the most likely (Rostan & Höhle, 2014). Moreover, related to time spent abroad, academics who are mobile for 1 or more years are more likely to co-publish with foreign colleagues than academics who are mobile for shorter periods of time (Finkelstein et al., 2013; Jonkers & Tijssen, 2008; Rostan & Höhle, 2014).

Research has also shown a positive relationship between mobility and co-publishing with colleagues from host institutions, host countries, and host regions upon return from abroad. Through interviews and surveys with mobile academics, several studies have shown that mobility results in expanded research networks and co-publications with colleagues from host institutions and from host countries (Demir et al., 2000; Eddy, 2014; Hamza, 2010; Patrício et al., 2018; Pope et al., 2017). These studies demonstrate that short periods abroad, 2 months to 1 year, provide opportunities to engage in international research collaborations with foreign colleagues (Patrício et al., 2018; Pope et al., 2017). The studies also show that collaboration opportunities occur not only for academics who are mobile for research purposes but also for those who are mobile to engage in teaching while abroad (Hamza, 2010; Patrício et al., 2018; Pope et al., 2017).

Moreover, research utilizing bibliometric data has also shown a positive relationship between mobility for research purposes and co-publishing with colleagues from the host country and region (Jonkers & Cruz-Castro, 2013; Jonkers & Tijssen, 2008). Jonkers and Tijssen (2008) analyzed co-publication patterns of Chinese plant molecular life scientists who had been temporarily mobile for work later in their careers. The authors found that work experience in the United States and Western Europe was correlated with co-publications with the United States and Western European academics. Similarly, Jonkers and Cruz-Castro (2013) found that Argentinean life scientists who obtained work experience abroad in North America and Europe later in their careers were more likely to publish with academics from those regions than their peers who had not been abroad. In both studies, the authors found that the effect of mobility was isolated to the country or region where mobility occurred.

Although a positive relationship exists between mobility and research collaboration, a number of studies have identified sociodemographic factors and contextual factors of the abroad experience that may positively or negatively impact outcomes. Regarding gender, Jöns (2011) found that internationally mobile female natural scientists had difficulties with integrating into male-dominated research environments resulting in significantly fewer scientific interactions with foreign colleagues upon returning from abroad compared with male counterparts. Moreover, opportunities for

collaboration may differ based on mobile academics' countries of origin and destination countries (Bauder et al., 2018; Morley et al., 2018). Academics from periphery countries may be more inclined to seek collaboration with core country academics, but, at the same time, face barriers that reduce collaboration opportunities (Morley et al., 2018; Patrício et al., 2018). In contrast, mobile core country academics may be less likely to collaborate with periphery country academics (Leydesdorff & Wagner, 2008). Furthermore, mobile academics can face language barriers that limit their abilities to fully integrate into the host system and engage in collaboration (Larbi & Ashraf, 2020). Finally, differences in scientific practices can also limit scientists' opportunities to collaborate with foreign academics (Davies, 2020).

Study Context

U.S. Academics and the Fulbright U.S. Scholar Program

This study utilizes data on U.S. academics who participated in the Fulbright U.S. Scholar Program to investigate the relationship between mobility and changes in research collaboration patterns. The Fulbright U.S. Scholar Program is an international education and culture exchange program that offers U.S. academics the opportunity to travel abroad for 2 months to 1 year to teach and/or conduct research at educational institutions abroad (U.S. Department of State, n.d.). The program promotes the development and maintenance of relationships between U.S. academics and foreign academics that can be utilized to help advance their teaching and research while abroad and upon their return home. Investigating academics who participate in the Fulbright program provide an ideal opportunity to understand the relationship between short-term mobility and changes in research collaboration patterns (Eddy, 2014; Pope et al., 2017).

Several studies have demonstrated a relationship between the U.S. Fulbright Scholar Program and changes in academics' research and professional networks (Demir et al., 2000; Eddy, 2014; Meyer-Emerick, 2010; Pope et al., 2017). These studies have mainly employed qualitative methodologies reporting on personal experience or the experiences of a small group of academics. Results have shown that the Fulbright program can result in new professional connections with colleagues at host institutions and in host countries (Demir et al., 2000; Eddy, 2014; Meyer-Emerick, 2010; Pope et al., 2017). In addition, academics with pre-existing relationships with foreign colleagues have reported the strengthening of their relationships as a result of the Fulbright program (Pope et al., 2017). The relationships made or strengthened while abroad have resulted in opportunities for research collaboration in the form of co-publications (Demir et al., 2000; Meyer-Emerick, 2010; Pope et al., 2017).

In sum, the research presented above provides support for a positive relationship among the international mobility of academics; the development and maintenance of professional relationships with colleagues from host institutions, countries, and regions; and international research collaboration. This study contributes to the existing literature through an exploration of the relationship between the short-term international mobility

of academics and contextual factors that impact the likelihood of collaboration occurring between the mobile academics and particular academics abroad. Three research questions guided the study:

Research Question 1 (RQ1): Does the participation of U.S. academics in the Fulbright program lead them to publications with peers in the host institution and country, after its conclusion?
Research Question 2 (RQ2): Is there a difference in the extent to which the Fulbright program leads U.S. academics to co-publish with host institution and host country academics after the completion of the program?
Research Question 3 (RQ3): How does prior publication activity, characteristics of the Fulbright experience, and sociodemographic characteristics of academics impact the likelihood of publishing with host institution and host country academics after the Fulbright program?

Method

Sample

The sample for this study consists of 303 academics in science and engineering related fields who participated in the U.S. Fulbright Scholar Program during the calendar years from 2009 to 2013. Academics were selected if they met four criteria. First, they held the rank of professor, associate professor, or assistant professor at a higher education institution that offered at least a bachelor's degree at the time they participated in the program. Second, they had only participated on the Fulbright program 1 time during the time period under investigation. Third, they did not change institutions 5 years before or after participation in the Fulbright program. Finally, their publication information was available in Scopus (Elsevier, 2020), an abstract and citation indexing database.

Publication Data

To examine the relationship between participation on the Fulbright program and research collaboration patterns, 10 years of publication data were collected for the Fulbright academics using Scopus. In this study, co-authored publications served as a proxy for research collaborations. Co-authorship was chosen because it is a commonly accepted scientific indicator for measuring and evaluating research collaboration patterns (Lundberg et al., 2006). Similar to other studies, no distinction was made among publication types (Kwiek, 2018; Rostan & Höhle, 2014). Publications included journal articles, conference papers, reviews, editorials, books, book chapters, letters, errata, notes, short surveys, and business articles (Elsevier, 2020).

Publication data were collected from the 5 years before the calendar year that the Fulbright academic participated on the Fulbright program and from the 5 years after the Fulbright academic participated on the program. Data from the calendar year in

which the Fulbright academic went abroad were not included in the analysis. Five years of data collection before and after participation was deemed sufficient based on previous studies which used 3-year time periods to measure if an academic had been engaged in international research collaboration (Finkelstein et al., 2013; Kwiek, 2018).

Fulbright Experience Characteristics and Sociodemographic Information

In addition to publication data, data on Fulbright experience characteristics and academics' sociodemographic characteristics were also collected from the online Fulbright Scholar Directory (n.d.) and from university websites. Fulbright experience information gathered included the countries where the Fulbright academics went; the length of the academics' experiences abroad; the type of activity the academics participated in while abroad, and the host institutions abroad. Data on the countries where the Fulbright academics went were also collected. This included the per capita gross domestic product (GDP) and population of a country at the time the Fulbright academics were abroad as well as a country's English as an official language status. Academics' sociodemographic information collected included the home institution of the Fulbright academic and the rank of the academic when he or she participated on the Fulbright program. The gender of the scholar was not provided in the directory, but this information was ascertained by referencing the academics' images and reading their biographies on university webpages. Finally, information was also collected on the country where the Fulbright academics earned his or her doctorate via university webpages and academics' CVs.

Data Coding

Data on a total of 10,931 publications were downloaded from Scopus. These data included the number of publications over the 10-year period, the year of each publication, and the names and affiliations of all co-authors for each publication. The authors of each publication were coded to identify their institution and country affiliations at the time of the publication. Differential coding was used to identify the Fulbright academics, academics from host institutions, and academics from host countries. Host institution academics are defined as academics from the institution abroad that committed to hosting the Fulbright academics, and host country academics are defined as academics affiliated with an institution in the country where the Fulbright academic went but who are not affiliated with the host institution.

After the publication data were coded for the different types of academics, the data were coded using binary variables to identify both the Fulbright academics who had publications with academics from host institutions and host country before and after the program. Academics were coded as either having or not having publications with the two types of academics during both time periods. Some Fulbright academics had publications that included more than one type of foreign academic. If this occurred, these academics were considered as having publications with each type of academic who collaborated on the publications.

Data Analyses

Three levels of analysis were conducted to understand the relationship between participation on the Fulbright program and subsequent international research collaboration. First, the total number and proportion of Fulbright academics who had publications with host institution and host country academics during the 5 years before and 5 years after participation on the Fulbright program were calculated and statistically compared using chi-square tests. Next, McNemar tests were conducted to determine whether there was a statistically significant increase in the number of Fulbright academics who published with host institution and host country academics after the Fulbright program (Adedokun & Burgess, 2012; Field, 2014). A follow-up chi-square test of independence was performed on the McNemar tests' discordant pairs to determine if the increase in number of academics who published with host institution academics was significantly larger than the increase in number of academics who published with host country academics (Adedokun & Burgess, 2012).

Finally, four logistic regression models were run to provide insight into the variables that help predict whether a Fulbright academic collaborated with host institution or host country academics. The models differed according to the dependent variables and independent variables entered into the models (see Tables 6 and 7). Models 1 and 2 used publications with host institution academics as the dependent variable; whereas, Models 3 and 4 used publications with host country academics. Three groups of independent variables were included in the models based on the findings of previous studies related to the relationship between international mobility and research collaboration discussed above (Finkelstein et al., 2013; Hamza, 2010; Jonkers & Tijssen, 2008; Jöns, 2011; Pope et al., 2017; Rostan & Höhle, 2014). Additional variables were included based on the findings of studies on the factors that predict international research collaboration among academics (Finkelstein et al., 2013; Kwiek, 2018; Rostan et al., 2014; Rostan & Höhle, 2014; Uhly et al., 2017).

The first group of variables were related to past publication activity with host institution and host country academics. These included two binary variables: prior publication with host institution academics and prior publication with host country academics. Research has shown that having pre-existing relationships with academics at the host institution and in the host country may increase the likelihood of collaboration opportunities during and upon returning from abroad (Pope et al., 2017). Due to coding procedures in which Fulbright academics with publications that included more than one type of foreign academic were considered as having publications with each type of academic who collaborated on the publications, these two variables are not mutually exclusive. Thus, they were entered into the models with each dependent variable separately. Models 1 and 3 included the variable prior publication with host institution academics, and Models 2 and 4 included the variable prior publication with host country academics (see Tables 6 and 7).

The second group of variables was Fulbright experience characteristics. First, Fulbright grant type—research, lecturing, and lecturing and research—was included to examine whether the purpose of mobility influences the likelihood of future

international collaborations. Research has demonstrated that both teaching and research abroad can lead to the development of professional ties and research collaborations (Hamza, 2010; Patrício et al., 2018); however, it has not been examined whether certain activities abroad increase the likelihood of co-publications occurring. Next, length of stay—one semester (2–5 months abroad) or two semesters (6–12 months abroad)—was included to determine if longer sojourns abroad increase the likelihood of co-publications as has been demonstrated in the past studies (Finkelstein et al., 2013; Horta et al., 2020; Jonkers & Tijssen, 2008; Rostan & Höhle, 2014). Finally, an additional three variables were included in this group based on studies demonstrating a significant relationship between the variables and international research collaboration (Kwiek, 2018; Rostan et al., 2014). These include the following: economic status, emerging or mature, as academics from mature economies have been shown to be more likely than those from emerging economies to collaborate internationally (Rostan et al., 2014); country population size, small, medium, or large, as academics from smaller population countries have been shown to be more likely to engage in international collaboration than academics from large population countries (Kwiek, 2018; Rostan et al., 2014); and English as official language status, yes or no, as academics from English-speaking countries have been shown to be less likely to engage in international research collaborations (Kwiek, 2018; Rostan et al., 2014).

The third group of variables was related to academics' sociodemographic characteristics. Gender—female or male—was included due to findings that have demonstrated male academics are more likely to collaborate internationally (Kwiek, 2018; Rostan et al., 2014; Uhly et al., 2017) as well as findings that have shown mobile female academics had fewer interactions with foreign colleagues upon returning from abroad compared with male academics (Jöns, 2011). Moreover, professor ranking, professor versus associate or assistant professor, was included based on past studies that have shown that academics at later career stages are more likely to engage in international collaboration than their early career academics (Finkelstein et al., 2013; Rostan et al., 2014). Next, institution type—doctoral or non-doctoral granting—was included based on prior findings that academics who work at doctoral granting, research institutions are more likely to engage in international research collaborations compared with academics who do not (Rostan et al., 2014). Then, discipline—basic or applied sciences—was included as studies have found basic scientists or scientists whose research includes a basic element are more likely to collaborate internationally (Kwiek, 2018; Rostan et al., 2014). Finally, country of PhD, PhD in the United States or PhD in another country, as it has been shown that earning a PhD abroad can impact the likelihood of engaging in international research collaboration with some studies saying it decreases the odds (Kwiek, 2018) and others saying it increases the odds (Rostan et al., 2014).

All models were tested for collinearity between variables to determine if a dependence among predictors was present in the models. First, an interpredictor correlation matrix was produced, and the results demonstrate weak correlations among variables with values ranging between .240 and –.283 (Table 1; Thompson et al., 2017). Next, variance inflation factors were calculated for all variables, and the

Table 1. Interpredictor Correlation Matrix for All Independent Variables in the Logistic Regression Models.

Variables	Publication with host institution before	Publication with host country before	Grant type	Length of stay	Economic status	Population size	English as official language	Gender	Career stage	Institution type	Discipline	PhD location
Publication with host institution before	1.00	—	−.145	−.022	.017	.142	−.022	.093	−.011	−.044	−.121	.057
Publication with host country before	—	1.00	−.079	.034	.083	.240	.006	.115	−.048	−.043	−.092	−.045
Grant type	−.145	−.079	1.00	−.006	−.283	−.154	−.039	−.007	−.052	−.074	.135	−.096
Length of stay	−.022	.034	−.006	1.00	.041	.006	.132	.031	.006	.004	.044	−.025
Economic status	.017	.083	−.283	.041	1.00	−.142	.216	.071	−.081	−.076	−.020	.042
Population size	.142	.240	−.154	.006	−.142	1.00	−.171	−.029	−.058	−.002	−.043	−.056
English as official language	−.022	.006	−.039	.132	.216	−.171	1.00	−.060	−.062	−.009	−.031	−.037
Gender	.093	.115	−.007	.031	.071	−.029	−.060	1.00	−.184	−.122	.070	−.016
Career stage	−.011	−.048	−.052	.006	−.081	−.058	−.062	−.184	1.00	.131	.028	−.103
Institution type	−.044	−.043	−.074	.004	−.076	−.002	−.009	−.122	.131	1.00	−.186	−.070
Discipline	−.121	−.092	.135	.044	−.020	−.043	−.031	.070	.028	−.186	1.00	−.032
PhD location	.057	−.045	−.096	−.025	.042	−.056	−.037	−.016	−.103	−.070	−.032	1.00

Table 2. Tolerance and VIF Collinearity Statistics for Independent Variables in the Logistic Regression Models.

	Models 1 and 3		Models 2 and 4	
Variables	Tolerance	VIF	Tolerance	VIF
Publication with host institution before	.937	1.068	—	—
Publication with host country before	—	—	.903	1.107
Grant type	.833	1.200	.842	1.187
Length of stay	.976	1.024	.976	1.025
Economic status	.835	1.198	.827	1.209
Population size	.885	1.129	.844	1.184
English as official language	.901	1.110	.900	1.111
Gender	.927	1.079	.924	1.082
Career stage	.916	1.092	.917	1.091
Institution type	.921	1.085	.923	1.083
Discipline	.927	1.079	.931	1.074
PhD location	.959	1.043	.960	1.042

Note. VIF = variance inflation factor.

values ranged between 1.024 and 1.209, indicating that collinearity among variables is unlikely (Table 2; Thompson et al., 2017). Finally, tolerance values were calculated for each variable. The results show that all tolerance values were above 0.827, further demonstrating a lack of collinearity among variables (Table 2; Thompson et al., 2017).

Results

Table 3 displays the frequencies and percentages of independent and dependent variables for the regression models. Regarding independent variables, there are some distinct characteristics among the sample. The majority of academics did not have prior publications with host institution and host country academics, only 15.8% and 17.5%, respectively. Related to Fulbright experience characteristics, most academics either engaged in research (38.6%) or lecturing and research (48.8%) while abroad, and the vast majority spent between 2 and 5 months abroad (74.9%). Moreover, 56.1% traveled to countries with emerging economies compared with 43.6% who traveled to countries with more mature economies. A relatively similar number of academics went to low (36.0%) and high population (44.2%) countries, whereas only 19.8% went to middle population countries. In addition, 83.5% of academics traveled to countries where English is not an official language. In terms of academics' sociodemographic characteristics, nearly three quarters were males (74%), and there were more academics with the rank of professor (57.1%) than assistant or associate professor (42.9%). The majority worked at doctoral granting institutions (79.2%). Likewise, most received their PhDs in the United States (89.8%) compared with foreign countries (10.2%).

Table 3. Frequencies and Percentages for All Independent and Dependent Variables in the Logistic Regression Models.

Variables	Frequency (%)	Publication after with host	Publication after with country
International collaboration experience			
Prior publications with host institution scholars			
Yes	48 (15.8%)	36 (75.0%)	25 (52.1%)
No	255 (84.2%)	118 (46.3%)	51 (20.0%)
Prior publications with host country scholars			
Yes	53 (17.5%)	33 (62.3%)	38 (71.7%)
No	250 (82.5%)	121 (48.4%)	38 (15.2%)
Fulbright experience characteristics			
Grant type			
Research	117 (38.6%)	72 (61.5%)	31 (26.5%)
Lecture	38 (12.5%)	10 (26.3%)	7 (18.4%)
Lecture and research	148 (48.8%)	72 (48.6%)	38 (25.7%)
Length of stay			
2–5 months	227 (74.9%)	120 (52.9%)	53 (23.3%)
6–12 months	76 (25.1%)	34 (44.7%)	23 (30.3%)
Economic status			
Emerging (per capita GDP $\leq$ US$20,000)	170 (56.1%)	75 (44.1%)	42 (24.7%)
Mature (per capita GDP $\geq$ US$20,001)	133 (43.9%)	79 (59.4%)	34 (25.6%)
Country population			
Low (Population $<$ 15 million)	109 (36.0%)	53 (48.6%)	10 (9.2%)
Middle (15 million $<$ Population $<$ 40 million)	60 (19.8%)	28 (46.7%)	15 (25.0%)
High (Population $>$ 40 million)	134 (44.2%)	73 (54.5%)	51 (38.1%)
English as official language			
English official	50 (16.5%)	23 (46.0%)	12 (24.0%)
Non-English official	253 (83.5%)	131 (51.8%)	64 (25.3%)
Sociodemographic characteristics			
Gender			
Female	79 (26.0%)	35 (44.3%)	13 (16.5%)
Male	224 (74.0%)	119 (53.1%)	63 (28.1%)
Rank			
Professor or higher	173 (57.1%)	87 (50.3%)	43 (24.9%)
Assistant or associate professor	130 (42.9%)	67 (51.5%)	33 (25.4%)
Institution type			
Doctoral granting	240 (79.2%)	123 (51.2%)	66 (27.5%)
Non-doctoral granting	63 (20.8%)	31 (49.2%)	10 (15.9%)
Discipline			
Basic sciences	147 (48.5%)	85 (57.8%)	37 (25.2%)
Applied sciences	156 (51.5%)	69 (44.2%)	39 (25.0%)
Country of doctorate			
The United States	272 (89.8%)	143 (52.8%)	67 (24.7%)
International (not the United States)	31 (10.2%)	11 (34.4%)	9 (28.1%)

Note. GDP = gross domestic product.

Table 4. Total Number of Fulbright Academics Who Had Publications With Each Co-Author Type During the 5 Years Before and 5 Years After Participation on the Fulbright Program.

	Before				After			
	Yes		No		Yes		No	
Publication Type	No.	%	No.	%	No.	%	No.	%
Publications with host institution academics	48	15.8	255	84.2	154	50.8	149	49.2
Publications with host country academics	53	17.5	250	82.5	76	25.1	227	74.9

Table 5. Concordant and Discordant Pairs of Fulbright Academics With and Without Publications With Host Institution and Host Country Academics Before and After the Fulbright Program.

		After Fulbright			
		Publication with host institution academics		Publication with host country academics	
		Yes	No	Yes	No
Before Fulbright	Yes	36	12	38	15
	No	118	137	38	212

Finally, approximately the same number of academics was in basic science (48.5%) and applied science (51.5%) disciplines.

Table 4 shows the number and percentage of all Fulbright academics who had publications with host institution and host country academics before and after the Fulbright program. Prior to the program, the proportion of academics who had publications with host institution and host country academics was approximately the same, 15.8% and 17.5%, respectively, $\chi^2(1) = 0.297$, $p = .586$, phi = .022. After the program, the proportion of academics who published with host institution academics increased to 50.8%, whereas the proportion who published with host country academics increased to 25.1%. Unlike before the program, the proportion of academics who published with host institution academics was significantly higher than those who published with host country academics after the Fulbright program, $\chi^2(1) = 42.633$, $p = .000$, phi = .265.

The McNemar tests demonstrate that the number of Fulbright academics who published with both host institution and host country academics after the program was significantly higher than before the program. Table 5 shows that 118 academics who had not previously published with host institution academics did so after the program compared with 12 academics who had published with host institution academics before the program and who did not after the program, $\chi^2(1) = 84.808$, $p = .000$, odds

ratio (OR) = 9.833. Likewise, there were 38 Fulbright academics who had not previously published with host country academics who did so after the program, whereas only 15 academics who had published with host country academics before the program did not do so after, $\chi^2(1) = 9.132$, $p = .003$, OR = 2.53. However, the chi-square test for the probability of change indicates that the increase in number of academics who published with host institution academics was significantly larger than the increase in number of academics who published with host country academics, $\chi^2(1) = 10.888$, $p = .001$, phi = .244. In other words, the likelihood of co-publishing with academics where one works abroad was significantly higher than co-publishing with other academics within the host country.

Table 6 displays the logistic regression results for Models 1 and 2 with the dependent variable publications with host institution academics. Regarding publication activity, only prior co-publications with host institution academics significantly increased the likelihood of co-publishing with them after the program; prior co-publications with host country academics had no significant effect. Related to Fulbright experience characteristics, in both Models 1 and 2, academics who engaged in only research abroad were significantly more likely than academics who only lectured abroad to publish with host institution academics. A significant difference was also found in both models when comparing academics who lectured and researched abroad and academics who only lectured abroad ($p \leq .05$). Thus, although past studies have demonstrated that engaging in either lecturing or research abroad can lead to research collaboration (Hamza, 2010; Patrício et al., 2018), the findings of this study indicate that being mobile to engage in research increases the likelihood of co-publishing compared with only lecturing abroad. Furthermore, in both Models 1 and 2, academics who went to countries with higher per capita GDPs were roughly 2 times more likely than academics who went to lower per capita GDP countries to publish with host institution academics. This result supports prior findings that academics from higher income countries were more likely to collaborate internationally (Rostan et al., 2014), and it suggests that the availability of economic resources in host countries may impact the likelihood of collaboration occurring (Chinchilla-Rodríguez et al., 2018). Concerning sociodemographic characteristics, in Model 1, earning one's PhD in the United States significantly increased the odds of publishing with host institution academics. This finding is consistent with Kwiek's (2018), and although the opposite may be expected, within the sample, there was a difference between the country where an academic earned their PhD abroad and the country where they participated on the Fulbright program. Only four out of 32 academics who earned a PhD abroad traveled to the same country where they earned their PhD. Finally, in Model 2, academics within basic science disciplines were significantly more likely to collaborate with host institution academics compared with those in applied science disciplines. This finding is in line with previous studies (Rostan et al., 2014) and may be explained by the more universal nature of the basic sciences compared with applied sciences, which are more locally oriented (Frame & Carpenter, 1979).

Table 6. Logistic Regression Results for Publications With Host Institution Academics After Participation on the Fulbright Program.

	Model 1			Model 2		
Variables	β	*SE*	Exp(β)	β	*SE*	Exp(β)
Publication activity						
Publication with host institution before (ref: no publication)	1.104**	0.383	3.015	—	—	—
Publication with host country before (ref: no publication)	—	—	—	0.326	0.339	1.386
Fulbright experience characteristics						
Grant type (ref: research)						
Lecture	−1.070*	0.453	0.343	−1.234**	0.450	0.291
Lecture and research	−0.244	0.288	0.783	−0.343	0.281	0.709
Length of stay (2–5 months)	−0.357	0.288	0.700	−0.382	0.284	0.682
Economic status (ref: emerging)	0.597*	0.280	1.817	0.537*	0.276	1.710
Population size (ref: low)						
Medium	−0.073	0.358	0.930	−0.038	0.355	0.963
High	0.064	0.295	1.066	0.092	0.299	1.097
Language (ref: non-English official)	−0.479	0.358	0.630	−0.476	0.350	0.621
Sociodemographic characteristics						
Gender (ref: female)	0.257	0.288	1.293	0.299	0.287	1.349
Rank (ref: professor)	0.099	0.260	1.104	0.116	0.257	1.123
Institution type (ref: doctoral)	−0.132	0.316	0.877	−0.165	0.313	0.848
Discipline (ref: basic)	−0.481	0.258	0.618	−0.525*	0.255	0.592
PhD country (ref: The United States)	−0.885*	0.431	0.413	−0.750	0.419	0.472
Model statistics						
χ^2		41.664			33.464	
df		13			13	
Model significance		<.001			.001	
R^2 (Nagelkerke)		.171			.139	

Note. SE = standard error.
*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

The results of logistic regression for Models 3 and 4 for the dependent variable publications with host country academics included several independent variables that significantly predicted whether Fulbright academics published with host country academics (Table 7). Prior publications with host institution and host country academics significantly increased the likelihood of publishing with host country academics after the

Table 7. Logistic Regression Results for Publications With Host Country Academics After Participation on the Fulbright Program.

	Model 3			Model 4		
Variables	β	*SE*	Exp(β)	β	*SE*	Exp(β)
Publication activity						
Publication with host institution before (ref: no publication)	1.349***	0.369	3.853	—	—	—
Publication with host country before (ref: no publication)	—	—	—	2.505***	0.384	12.245
Fulbright experience characteristics						
Grant type (ref: research)						
Lecture	0.265	0.547	1.303	0.112	0.595	1.119
Lecture and research	0.586	0.358	1.797	0.541	0.393	1.717
Length of stay (ref: 2–5 months)	0.417	0.340	1.518	0.397	0.362	1.487
Economic status (ref: emerging)	0.358	0.342	1.431	0.066	0.378	1.068
Population size (ref: low)						
Medium	1.361**	0.491	3.899	1.227*	0.532	3.806
High	2.023***	0.419	7.562	1.769***	0.461	5.134
Language (ref: non-English official)	0.284	0.441	1.258	0.305	0.475	1.373
Sociodemographic characteristics						
Gender (ref: female)	0.690	0.379	1.994	0.590	0.402	1.803
Rank (ref: professor)	0.407	0.315	1.503	0.527	0.345	1.694
Discipline (ref: basic)	−0.652	0.422	0.521	−0.771	0.464	0.462
Institution type (ref: doctoral)	−0.012	0.309	0.988	0.130	0.337	1.139
PhD country (ref: The United States)	0.460	0.474	1.584	0.752	0.507	2.122
Model statistics						
χ^2		57.263			92.296	
df		13			13	
Model significance		<.001			<.001	
R^2 (Nagelkerke)		.255			.389	

Note. SE = standard error.
*$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.

Fulbright program. This relationship was particularly strong for prior publications with host country academics, Exp(β) = 12.245. These results combined with the results for Model 1 highlight the role that pre-existing relationships play in enhancing the likelihood that co-publications will occur when academics are internationally mobile (Pope et al., 2017). Related to Fulbright experience, in both Models 3 and 4, academics who went to countries with medium or high populations were significantly more likely than

academics who went to low population countries to publish with host country academics. This finding runs counter to studies that have shown academics from small countries are more likely to collaborate internationally (Kwiek, 2018; Rostan et al., 2014). In the case of mobile academics, a greater pool of academics in the host country may enhance the likelihood of collaboration occurring. This could be because there are simply more academics available to collaborate with or that host institution academics are also more likely to collaborate domestically (Kwiek, 2018; Rostan et al., 2014), which enhances the opportunities available for mobile academics.

Limitations

Although the results demonstrate an increase in the number of academics who published with host institution and host country academics as well as insight into which factors increase the likelihood of co-publications occurring, there are a number of limitations with the analyses that must be taken into consideration. Although co-publications allow for the quantification of research collaboration, they do not provide insight into the motivations, processes, or activities that shape the outcomes of the research (Katz & Martin, 1997). Simply because an academic's name does not appear on a publication does not mean he or she did not contribute to the research. Thus, other forms of research collaboration may have occurred between Fulbright academics and host institution and country academics that were not accounted for in this study. In addition, U.S. academics may be less likely to collaborate internationally compared with academics from other countries due to their large choice of domestic collaborators (Kwiek, 2018; Rostan et al., 2014). Therefore, the inclusion of mobile academics from other countries or regions could have provided greater insight into how origin country characteristics impact the likelihood of collaboration. Furthermore, the analysis did not consider the objectives and motivations of Fulbright academics for joining the program, and the impact this could have had on outcomes. Although Fulbright academics are not required to co-publish with host institution or country academics, their motivations for joining the program and what they expect to get out of it likely influence whether they co-publish with host institution and host country academics. Finally, the methods employed in this study are unable to prove a causal link between participation on the program and future publications with host institution and host county academics. Fulbright academics self-select into the program, and thus, they are likely to be motivated to engage professionally with host institution and host country academics. In some cases, they had already published with host institution and host country academics prior to the program. Future studies should utilize more rigorous methods, such as the incorporation of a matched control group, to better understand if a causal relationship exists between short-term mobility and international research collaboration.

Conclusion

This study set out to investigate the relationship between the short-term mobility of academics and changes in their research networks. The results of the analyses demonstrate

a positive relationship between short-term international mobility and subsequent research collaboration between the mobile academics and host institution and host county academics; however, co-publications with host institution academics were more likely than with host country academics. Furthermore, the results also indicate that this positive relationship is mediated by academics' pre-existing networks, characteristics of the abroad experience, and academics' sociodemographic characteristics.

In addition to the significant positive relationships, two nonsignificant results are worth mentioning. First, unlike previous studies (Finkelstein et al., 2013; Horta et al., 2020; Jonkers & Tijssen, 2008; Rostan & Höhle, 2014), this study found that length of stay was not a significant predictor of co-publications between mobile academics and host institution and host country academics. Fulbright academics abroad for shorter lengths of time, 5 months or less, were similarly able to integrate and develop working relationships with colleagues abroad as Fulbright academics who were abroad for 6 months or more. In addition, this study found that gender did not significantly predict co-publications upon return. This finding coincides with previous research that has shown there to be no statistically significant difference between male and female mobile academics and the extent to which they co-publish with host institution academics (Jöns, 2011).

The findings of the study also have implications for the Fulbright U.S. Scholar Program as well as other similar mobility programs. If such programs seek to promote research collaboration and co-publications as an outcome, they should consider the importance of pre-existing working relationships with host institution and host country academics for promoting collaborations. Moreover, they should consider the type of activity in which academics engage in abroad, and the impact this may have on program outcomes. In this case, engaging in research abroad enhances the likelihood of future co-publications. Finally, they should consider the country context where academics travel and the influence of the availability of local resources as well as population size on the promotion of research collaboration.

Although the Fulbright U.S. Scholar Program is a selective, government sponsored mobility program, the academics who participate in this program are examples of short-term internationally mobile academics who go abroad for work-related purposes. The opportunity for academics to engage in this type of mobility is not limited to government sponsored programs as many universities have partnerships with foreign institutions specifically designed to promote mobility. As universities strategize on ways to grow or enhance at home and cross-border internationalization practices, the mobility of academics should continue to garner support. The results of this study demonstrate that short-term international mobility provides academics with opportunities to engage in transnational collaboration networks through which they can develop and maintain ties with colleagues abroad.

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