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Keywords
graduate students, academics, publishing, citizenship, gender, race, graduate schools

Comments

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Running head: PUBLISHING SUCCESS OF GRADUATE STUDENTS

Citizenship, Gender, and Racial Differences in the Publishing Success Of Graduate Students and Young Academics

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Abstract

Although extensive research exists on the publishing success of academics, few studies have examined factors influencing the publishing success of graduate students and young academics. Data from a survey of 12,000 graduate students in the Humanities and related social sciences was used to examine citizenship, gender and racial/ethnic differences in publishing success during graduate school and the first three years after graduation. The results of this analysis indicate that international students have the highest publication rates during graduate school as well as in the first three years following receipt of degree. Results also indicate that female graduate students are less likely than male graduate students to publish, a gap that remains in the years following graduate school. Finally, results indicate that U.S. citizen minority students exhibit lower levels of publishing success compared with non-minority students during graduate school, but that this gap that disappears within the first few years after graduate school.

Citizenship, Gender, and Racial Differences in the Publishing Success of Graduate Students and Young Academics

The median time to degree for graduate students in the Humanities and social sciences has risen dramatically. From 1978 to 2003 the median time to degree in the Humanities increased 1.5 years from 7.5 to 9.0 years (Hoffer & Welch Jr., 2006). Over this same time period, median time to degree in the social sciences increased 1.6 years from 6.2 to 7.8 years. Over these time periods, time to completion in the Humanities and social sciences has increased more than the fields of physical sciences, engineering, life sciences, and education, with Humanities having the longest time to degree. Due to this increasing and high duration of doctoral education, much attention has been given to examining the factors that influence time to degree (Bowen and Rudenstine, 1992; Ehrenberg and Mavros, 1995; Siegfried and Stock, 2001). Since publishing is seen as an informal requirement for graduation, studying publications in the Humanities and related social sciences is particularly.

Existing research on determinants of publications for academics in all fields indicates that specific institutional and personal characteristics influence publishing success. The two institutional characteristics shown to be the greatest predictors of publishing success are faculty position and rank of department (Blackburn, Behymer, & Hall, 1978; Tien & Blackburn, 1996). Bland et al. (2006) also show that faculty with a tenure position produce more than faculty who do no have tenure. Existing research also indicates that gender and race/ethnicity have historically played a large role in publishing success and continue to do so today. For instance, in 1977, Hammovitch and Morgensten found that female faculty tended to publish less than male faculty. Blackburn, Behymer,

and Hall (1978) similarly found that men published more than women irrespective of academic field. In a more recent study, Xie and Shauman (1998) show that even though these gender differences in research productivity have declined since the 1960's, they continue to exist today. Additionally, Toutkoushian (1998) finds that the mean number of publications for black academics is considerably lower than for other racial categories. The same study asserts that Asian academics publish a higher mean number of journal articles than black and white academics. Further examining the racial gap in publications, Bellas and Toutkoushian (1999) find that among various racial and ethnic groups, black academics have the lowest level of research output and Asian academics the highest.

Whereas the previous studies focused on determinants of publishing success for all academic fields, several studies focus specifically on academics in the fields of Humanities and related social sciences. Wanner, Lewis and Gregorio (1981) and Blackburn, Behymer, and Hall (1978) find that the quality of institution attended greatly increased the number of publications and that female and minority academics within the Humanities field were less likely to publish. More recent studies provide support that these findings have remained constant over time (Tien & Blackburn, 1996, Bland et al., 2006). Specifically among the related social sciences, factors that influence publishing success include rank of Ph.D. program where an individual received his or her degree (Hogan, 1981; Young, 1995; Tien & Blackburn, 1996;, Rice, McCormick, & Bergmann, 2001) More recent research in the social sciences additionally indicates that individuals who attain higher GRE scores, attend higher ranked PhD programs, have research experience as a graduate student, and work with productive faculty have greater

publishing success during the first several years after receiving their PhD (Buchmueller, Dominitz, and Hansen, 1999; Grove and Wu, 2005).

Furthermore, although extensive research exists on the publishing success of the academic in a wide range of fields, few studies to date have examined the publishing success of graduate students and young academics in the Humanities. The research that does exist indicates a general rise in both the fraction of students who publish as well as the overall number of publications published over the past thirty years (Bieber and Blackburn, 1993; Lee, 2000). Specifically within the field of American Literature, Lee (2000) finds that the fraction of graduate students who published during graduate school rose from 7% in 1965 to 35% in 1995 with the sharpest rise between 1965 and 1975. Lee also finds during the same period a rise in the average volume of publications from .31 publications in 1965 to .57 publications in 1995, nearly all of which were sole authored works. Yet there appears to be a gap in the literature regarding determinants of publication success of graduate students.

The existing research indicates that institutional and personal characteristics such as gender and race are important factors of publishing success of the academic. The current study will further this research by analyzing the effects of citizenship, gender, and racial differences on publishing success among graduate students and young academics in the Humanities and related social sciences.

Methods

The data used in the current study was collected by the Mellon Foundation as part of the Graduate Education Initiative (GEI). The GEI was a ten-year program that

provided funding to PhD programs in the Humanities and related social sciences with the goal of increasing graduation rates and decreasing time needed to complete a degree. A full list of the participating departments is found in Groen et al. (2006), with the three largest fields in terms of number of students being English, History, and Political Science. The data includes information collected from the university records related to race, citizenship, gender, GRE test scores, and whether each student had a master's degree before enrolling.

In addition to collecting administrative data from departments, the Mellon Foundation also administered a survey directly to students. The survey included items regarding whether the student had published and the number and type of publications (book, journal article, other article, or book review). These questions referred to the time the student was pursuing a PhD and also the first three years following the completion of his or her degree. Single authorship is more common in the humanities than in other fields, and thus no distinction is made between sole or co-authored papers (in fact, of the students who published during graduate school, over 90% published at least one sole authored work).

Two measures of publication output are used in the analysis. The first is the total number of refereed journal articles and books each student published, and the second is simply whether or not a student published at least once. Equal weight is placed on books and articles, as it is in Hansen, Weisbrod, and Strauss (1978). The focus on refereed journal articles and books reflects the importance placed on these types of publications in tenure decisions. Furthermore, the influence of refereed journal articles on promotional decisions in Humanities has increased greatly in recent years (Ginther & Hayes, 2003).

One empirical issue is that a large fraction of the observations are clumped at zero. The first row in Table 1 shows that about a quarter of all students in the sample never published. Various approaches to this issue have been used in the context of publication output research, including using a negative binomial or poison regression (Goodwin and Sauer, 1995), tobit regression (Levin and Stephan, 1991), or least squares regression. Buchmueller et al. (1999) use all three models to estimate the impact of graduate training on early publication success of graduate students in economics and found that the results were not qualitatively different from one model to the other. In this paper, OLS results are reported when the outcome variable is number of publications[1]. For the models in which the outcome variable is whether or not the student published, logit regression is used.

Results

Descriptive statistics of the data are provided separately for differing race and citizenship in Table 1, where minority is defined as the historically disadvantaged (i.e. Black, Hispanic, and Native American) US citizens[2]. The table illustrates that minority students are much more likely to have never published and have fewer publications, while just the opposite is true for foreign students (non-US citizens). The empirical analyses that follow control for the student characteristics listed in these tables to provide estimates of racial and citizenship differences that are not directly attributable to the differences in observable characteristics of each group.

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[1] A Tobit model was used and the results are robust. However, the OLS coefficients are reported due to the straightforward interpretation.

[2] An indicator variable is used to account for cases in which race is not reported.

These differences in output during graduate school by race and citizenship are explained in part by the admissions criteria used by graduate programs. Both Attiyeh & Attiyeh (1997) and Krueger and Wu (2000) found that graduate programs give preference to US citizens over foreign students and preference to minority students over non-minority students. As a result, the foreign students that do get admitted are of a higher quality on average, while the minority students that get admitted tend to have lower qualifications. Table 1 indicates that the minority students in the GEI sample tend to have lower GRE scores, graduate from lower quality BA institutions (in terms of average SAT scores), and are less likely to have a masters degree prior to starting graduate school than non-minority students. In spite of this, minority students are still significantly more likely to obtain a tenure track position initially. Using a regression approach and controlling for past education as well as student and departmental characteristics, Ehrenberg et al. (2006) finds that minorities were 21% more likely to obtain a tenure track position as their initial placement.

Table 2 illustrates the summary statistics between men and women. Men have higher GRE quantitative scores, are more likely to have a master's degree prior to enrollment, and are more likely to attend seminars. Women are more likely to come from higher quality Bachelor of Arts programs than men and there is no statistically significant difference in GRE verbal scores. Although men are more likely to publish and to have a higher volume of publications, there is no statistical difference between the two groups when examining initial job placement.

Table 3 provides the results of the OLS model for the determinants of number of publications. The first column examines at publications during graduate school. The

second column looks at publications during the first three years after gradate school and column three does the same but also controls for initial job placement. The coefficients on the job placement variables in column 3 are not meant to provide a measure of causal impact on a student's initial placement on publishing, since it is likely that a student's unobserved characteristics influence both job placement and publishing success. Table 4 provides similar results by examining the probability of publishing using a logit regression. The results in the table are the average marginal effects of each factor on the probability of publishing. The average marginal effect is generally more meaningful than calculating the marginal effect at the average of each variable. The interpretation of the coefficients is the percentage point change in the probability of publishing for each unit change in the particular factor.

The findings for non-US citizens indicate that, compared to non-minority US citizens, international students are more likely to publish during and after graduate school as well as produce more publications. The results in the first column of Tables 3 and 4 indicate that international students are about 5.7 percentage points more likely to publish during graduate school and have .25 more publications. The second column shows that during the first three years after graduate school they are 6.8 percentage points more likely to publish and have .34 more publications. These differences are robust when controlling for the student's initial placement.

Tables 3 and 4 indicate that female graduate students experience less publishing success than male graduate students. The results in the first column show women are 11 percentage points less likely to publish during graduate school and have .34 fewer publications. Gender differences in publication rates persist in the first three years after

graduate school, with women being 6.3 percentage points less likely to publish and having .37 fewer publications. There is no change in the gender gap when controlling for initial job placement.

During graduate school, minority students are 9.1 percentage points less likely to publish and have .30 fewer publications than non-minority US citizens. The racial gap in publications closes in the first three years after graduate school with no significant difference in the number of publications and a gap of only 8 percentage points in the probability of publishing. However, the third column shows that once initial placement is controlled for, minority students have lower levels of publishing than non-minority students with similar initial placements. This suggests that the better placement of minority students at the assistant professor level closes the racial gap in academic performance during the early career of academics across PhD recipients[3].

Discussion

Citizenship

The results in the study indicate that international students have the highest publication rates during graduate school as well as in the first three years following receipt of their degree. These findings match the results of Grove and Wu (2005) for graduate students in economics, who find that foreign students are 24% more likely to

[3] A separate analysis was performed clumping individuals into groups of “White”, “Black” and “Other Minority.” Under this alternative specification, the same results hold for blacks only with larger coefficients. The “Other Minority” racial/ethnic group was less likely to publish both during graduate school and after leaving graduate school than white US citizens.

publish during the fifteen years after enrolling in graduate school and on average have 1.3 more publications. However, these results may also be influenced by the fact that our survey was retrospective. If international students who have greater publishing success during graduate school are more likely to work in the US (and hence easier to track down for the survey) then this would bias upward our estimates of the actual productivity of international students. Therefore, these results, with respect to international students, should be interpreted with caution.

Gender

Using refereed journal articles and books as a measure of publishing success, women are less likely to publish during graduate school and have fewer publications than men. This gender gap continues among young academics even when controlling for initial job placement. These gender gap findings match those of past studies by Hamovitch and Morgenstern (1977) and Matthews and Andersen (2001).

Explanations for gender gaps in publishing performance provided in past studies include challenges in balancing work and family (Rosser and Lane, 2002), lack of mentors, fewer resources, and more time spent teaching, advising, and doing administrative work (Ginther and Kahn, 2004). An additional explanation explored by McDowell, Singell, and Stater (2006) is differential access to coauthors. However, they find no evidence of differences in propensities to coauthor (conditional on publications), except at top departments, where women are less likely to coauthor.

Race

The most striking findings, however, relate to the racial differences in publishing success among students who are from the U.S. Although minorities publish less during graduate school, they are more likely to obtain a tenure track position upon completion. Due to this initial job placement, they publish more and the productivity gap shrinks considerably and loses statistical significance in the first three years of the students' academic career (from .307 to .124 publications). This gap reappears once we control for the initial placement of the student, indicating that the overall gap would be much larger if minority students were less likely to obtain tenure track positions. Our results indicate that the better placement of minority students effectively closes the overall racial gap in productivity. This matches past research indicating that receiving a better initial placement has a large impact on the productivity over an employee's career (Oreopoulous, Von Watcher, and Heisz, 2005; Kahn 2005; Oyer, 2006).

Conclusion

The current study examines differences by citizenship, gender, and race in the publishing success of graduate students in the Humanities and related social sciences. Results of this study indicate that international students generally have the highest publication rates in terms of fraction who publish and the volume of publications both during graduate school and during their early career. This holds even when controlling for initial job placement. We also find that women are less likely to publish and have fewer publications than men in similar fields both during graduate school and during the first few years after leaving school.

The finding with the greatest policy implication is the result dealing with the racial/ethnic publishing gap. During graduate school, minority US citizens were less likely to publish and had fewer publications than non-minorities. However, three years after graduate school the number of publications is statistically the same for minority and non-minority students. As minority students are more likely to obtain a tenure track position immediately after graduation, this initial job placement may be driving the reduction of the racial productivity gap. Thus, better placement of minority students following graduate school seems to reduce the overall racial gap in productivity.

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Table 1. Summary Statistics by race/citizenship

	(1) US citizen non-minority	(2) US citizen minority	(3) Non US-citizen	p-value (1) vs (2)	p-value (1) vs (3)
Published:					
Never	0.282	0.351	0.219	0.00	0.00
During but not after	0.061	0.075	0.044	0.20	0.06
After but not during	0.330	0.383	0.343	0.53	0.56
Both during and after	0.327	0.191	0.394	0.00	0.00
Volume of publications:					
During graduate school	0.78	0.49	1.09	0.00	0.00
First 3 years after PhD	1.63	1.47	2.27	0.10	0.00
Personal Characteristics					
GRE verbal	698	613	604	0.00	0.00
GRE quant	646	555	628	0.00	0.00
BA quality	1177	1154	1166	0.00	0.38
MA	0.265	0.230	0.363	0.05	0.00
Age	25.1	25.3	26.5	0.38	0.00
Attends seminars often	0.526	0.502	0.583	0.30	0.00
Initial Job					
Tenure track at 4 yr	0.306	0.486	0.341	0.00	0.03
Non-tenure track at 4 yr	0.384	0.282	0.342	0.00	0.01
Other academic	0.057	0.054	0.053	0.80	0.64
Non-academic	0.109	0.089	0.092	0.17	0.13
Unemployed	0.144	0.089	0.171	0.00	0.03
N	4,594	725	983		

Notes: The 4th column provides the p-value of the t-test for whether the mean of the variable is different between white and minority students and the 5th column does the same for non-minority and foreign students.

Table 2. Summary Statistics by gender

	(1) Men	(2) Women	P-value (1) vs (2)
Published:			
Never	0.249	0.315	0.00
During but not after	0.051	0.066	0.01
After but not during	0.328	0.344	0.19
Both during and after	0.372	0.275	0.00
Volume of publications:			
During	0.93	0.66	0.00
After	1.95	1.44	0.00
Personal Characteristics			
GRE verbal score	679	677	0.58
GRE quantitative score	656	613	0.00
BA quality	1168	1176	0.05
Had a master's degree	0.282	0.261	0.04
Age at start of program	25.5	25.2	0.00
Attends seminars often	0.535	0.520	0.19
Initial Job			
Tenure track at 4 yr	0.318	0.327	0.44
Non-tenure track at 4 yr	0.376	0.372	0.76
Other academic	0.055	0.057	0.65
Non-academic	0.118	0.088	0.00
Unemployed or not looking	0.133	0.156	0.01
N	3,781	3,321	

Notes: The 3rd column provides the p-value of the t-test for whether the mean of the variable is different between male and female students.

Table 3. Determinants of volume of publications during and after graduate school.

	Publication During Grad School	Publication First 3 Years After Grad School	Publication First 3 Years After Grad School
Had a master's degree	0.132*	0.128*	0.106
	[0.055]	[0.062]	[0.061]
GRE verbal score	-0.013	-0.078*	-0.078*
	[0.029]	[0.033]	[0.033]
GRE quantitative score	-0.031	-0.051	-0.061*
	[0.026]	[0.029]	[0.029]
Female	-0.336**	-0.369**	-0.382**
	[0.042]	[0.048]	[0.047]
Non US citizen	0.250**	0.342**	0.338**
	[0.063]	[0.071]	[0.070]
US citizen minority	-0.304**	-0.123	-0.221**
	[0.070]	[0.079]	[0.078]
Age at start of program	0.044	-0.135*	-0.126
	[0.060]	[0.068]	[0.067]
Age^2	-0.001	0.002	0.002
	[0.001]	[0.001]	[0.001]
Attends seminars often	0.146**	0.276**	0.210**
	[0.044]	[0.047]	[0.047]
Rank of department	0.005	0.003	0.006
	[0.004]	[0.005]	[0.005]
Publications during grad school		0.501**	0.487**
		[0.015]	[0.015]
Initial Job Outcome			
Tenure track at 4 year school			0.365**
			[0.054]
Non-tenure track at 4 year school			
Other academic			-0.006
			[0.106]
Non-academic			-0.506**
			[0.080]
Unemployed or not looking			-0.549**
			[0.072]
Field dummies	Yes	Yes	Yes
Institution dummies	Yes	Yes	Yes
Constant	0.454	3.890**	3.863**
	[0.863]	[0.978]	[0.961]
N	5857	5857	5857
R^2	0.04	0.22	0.24

Notes: The results are based on an OLS regression. Standard errors are in parenthesis. ** indicates significance at 1 % level and * indicates significance at 5% level. A dummy variable was used to control for missing information on race and ethnicity.

Table 4. Determinants of probability of publishing during and after graduate school.

	Published During Grad School	Published First 3 Years After Grad School	Published First 3 Years After Grad School
Had a master's degree	0.051**	0.023	0.016
	[0.017]	[0.016]	[0.015]
GRE verbal score	0.017	-0.002	-0.001
	[0.009]	[0.008]	[0.008]
GRE quantitative score	-0.001	-0.012	-0.015*
	[0.008]	[0.007]	0.007
Female	-0.106**	-0.063**	-0.069**
	[0.013]	[0.012]	[0.012]
Non US citizen	0.057**	0.068**	0.065**
	[0.020]	[0.018]	[0.017]
US citizen minority	-0.091**	-0.080**	-0.113**
	[0.021]	[0.020]	[0.020]
Age at start of program	0.027	-0.027	-0.024
	[0.019]	[0.017]	[0.017]
Age^2	0.000	0.000	0.000
	[0.000]	[0.000]	[0.000]
Attends seminars often	0.076**	0.061	0.040**
	[0.013]	[0.012]	[0.012]
Rank of department	0.033*	0.005	0.001
	[0.013]	[0.012]	[0.012]
Published during grad school		0.287**	0.267**
		[0.011]	[0.011]
Initial Job Outcome			
Tenure track at 4 year school			0.111**
			[0.014]
Non-tenure track at 4 year school			--
			--
Other academic			-0.045
			[0.026]
Non-academic			-0.177**
			[0.021]
Unemployed or not looking			-0.164**
			[0.019]
Field dummies	Yes	Yes	Yes
Institution dummies	Yes	Yes	Yes
N	5,954	5,954	5,954

Notes: The numbers in each cell represent the average marginal effect of a unit change in each variable on the probability of having published following a logit regression. Standard errors are in parenthesis. ** indicates significance at 1 % level and * indicates significance at 5% level. A dummy variable was used to control for missing information on race and ethnicity.