Does the reputation of a faculty member’s graduate programme and institution matter for labour market outcomes?

Jarrett B. Warshaw, Robert K. Toutkoushian & Hyejin Choi

To cite this article: Jarrett B. Warshaw, Robert K. Toutkoushian & Hyejin Choi (2017) Does the reputation of a faculty member’s graduate programme and institution matter for labour market outcomes?, Journal of Education and Work, 30:8, 793-812, DOI: 10.1080/13639080.2017.1380300

To link to this article: http://dx.doi.org/10.1080/13639080.2017.1380300

Published online: 26 Sep 2017.

Article views: 41

View related articles

View Crossmark data
Does the reputation of a faculty member’s graduate programme and institution matter for labour market outcomes?

Jarrett B. Warshaw, Robert K. Toutkoushian and Hyejin Cho

ABSTRACT
For a future faculty member the choice of which graduate programme and institution to attend is considered to have important implications for securing academic employment, developing skills to succeed in academia, and yielding positive returns on investment of time and money in education. Yet does it matter where a faculty member attends graduate school – and if so, is it the reputation of the programme or the institution that matters most for his or her labour market outcomes? In this study, we used nationally representative data from the U.S. to estimate the relationship between a faculty member’s graduate programme and institution and their institution of first academic employment, research productivity, and salary. Our findings suggest that the reputation of one’s graduate department may factor more heavily than reputation of institution in the type and level of institution at which he or she is first employed, while graduate institution reputation has notable marginal, positive benefits associated with research productivity and salary. We discuss implications for the influence of graduate education on academic careers.

Introduction
Each year, thousands of students worldwide head to graduate school to pursue doctoral degrees. After deciding whether to attend graduate school, they must choose programmes and institutions that match their intended areas of specialisation and career goals. Doctoral programmes are fewer in number than baccalaureate programmes, but still present myriad options to students within their fields. The National Research Council identifies in the U.S. over 100 programmes in fields such as sociology, computer science, and physics and suggests considerable variation in departmental prestige and reputation (Ostriker, Kuh, and Voytuk 2011). Where one attends graduate school is considered to shape his or her career prospects (e.g. Berelson 1960) of securing academic employment, developing skills to succeed in academia, and yielding positive returns on investment of time and money in education (e.g. Kyvik and Olsen 2012).

There is an important difference between graduate and undergraduate education in the U.S. that can affect the prestige-benefits received by students. At the undergraduate level, admission decisions are made in a centralised administrative office, and students take a wide range of classes across the institution. As a result, the perceived value of an undergraduate degree is most often associated with the institution and not the student’s programme (Bowman and Bastedo 2009) because students
tend to engage in curricular and co-curricular experiences throughout the campus (Kim and Bastedo 2017). In contrast, admission decisions for graduate students are typically made at the department and programme level. Graduate students also take most of their classes within a single programme. Accordingly, the prestige of graduate students’ training can be associated with the reputations of both the programme and institution at which they have enrolled. Thus the value of a doctoral degree from the economics department at the University of Minnesota would be influenced by the perceived quality of this specific economics department as well as the reputation of the University of Minnesota itself.

The graduate programme and institution attended may each confer different amounts of prestige on faculty members. Although higher-ranked graduate programmes are often housed in higher-ranked institutions and vice versa (Toutkoushian, Dundar, and Becker 1998), there are exceptions to this rule. The Jacobs School of Music at Indiana University is regarded as one of the top music graduate programmes in the U.S., while Indiana University is seldom mentioned among the most elite institutions for its overall reputation. At Brown University, on the other hand, the Chemistry Department falls outside of the top 50 programmes in its field, and the elite Ivy League institution is consistently rated in the top 20 nationally (Ostriker et al. 2011).

Because many future faculty members believe that doctoral degrees from more prestigious places will advantage them in academic labour markets, their admission into top programmes and institutions can be very competitive. Little is known, however, about the marginal, positive benefits – and the relative magnitude of these outcomes – in a student’s career as associated with graduate programme and institution reputation. This is particularly true for students who enter into academic careers after they complete their education.

In this study, we ask: does it matter where a prospective faculty member attends graduate school – and if so, is it the reputation of the programme or the institution that matters the most for his or her career? A number of researchers found positive effects of graduate programme rankings on first job placement, but their studies were specific to individual fields such as economics (Laband 1985), management (Bedeian and Feild 1980), and sociology (Burris 2004). After a faculty member enters academe, to what extent does the reputation of his or her graduate programme and/or institution influence productivity and salary? Studies of research productivity (Bellas and Toutkoushian 1999; Bland et al. 2006; Dwyer 1994; Toutkoushian 1994) and compensation (Perna 2003; Toutkoushian 1998, 2002; Umbach 2007) usually focus on human capital measures such as years of experience, highest degree, and field and rarely consider indicators of graduate training.

It remains unclear, a priori, the extent to which graduate training may matter in academic career outcomes. If a faculty member’s skills are correlated with reputation of a department attended through selection into the programme or developed in the programme, then one who attends a more reputable programme should have better career outcomes than peers elsewhere. Alternatively, these differences may be reduced as those who become faculty members have demonstrated the skills to succeed regardless of where they have attended graduate school. Likewise, the reputation of the institution may not seem to matter given that training and admission are centred at the programme level for graduate education, though hiring institutions may want to pay a premium for graduates of highly reputable institutions.

Here, we focus on PhD recipients who enter the professoriate and whether selected indicators of career outcomes are associated with the reputations of their graduate programme and/or institution. Using nationally representative data from the U.S., our analyses examine the extent to which graduating from a top programme and/or institution increases the likelihood that a faculty member finds employment at research-intensive institutions and leads to higher research productivity and salary. Our study aims to make three contributions to the literature on graduate education and academic careers. First, we considered the influences of both graduate programme and institution reputation on an academic’s career. Second, we examined three distinct career measures for faculty members rather than only one such as salary or initial institution of employment. Finally, instead of limiting the study to a single academic discipline, we used data to quantify outcomes across disciplinary fields.
Graduate education and academic careers

There has been long-standing interest among researchers and analysts, department and campus leaders, professional associations, and national policy groups in what happens to graduate students after they finish their doctoral degrees (e.g. Berelson 1960; Council of Graduate Schools 2013; Ehrenberg and Kuh 2009). For departments and prospective students alike, employability and career prospects after graduation weigh heavily in admissions and enrolment decisions (Krueger and Wu 2010). Many who pursue their doctorates are often white, male, middle-class, and from highly reputable undergraduate institutions (Posselt 2014; Zhang 2005), although participation rates of underrepresented students have been increasing. In addition, the career interests and goals of graduate students may vary substantially by field (Kyvik and Olsen 2012).

As Finkelstein, Conley, and Schuster (2016, 108) observe, about half of all PhD recipients in the U.S. enter academe and ‘at one end of the spectrum, more than four-fifths of humanities doctorates enter academe (closely followed by social science doctorates at three-fifths), while at the other end, fewer than one-fifth of engineering doctorates do (closely followed by physical science doctorates at one-third)’. Graduates in fields with low placement rates in academe (e.g. physical sciences and engineering) may encounter compressed labour markets. Top students from the highest ranked programmes and institutions may not self-select into the professoriate, leaving the next tier of graduates for academic employment. Likewise, graduates who enter the professoriate from lower-ranked programmes and institutions, overcoming any disadvantage in pedigree, may be just as strong as their peers from higher-ranked programmes and institutions to receive academic appointments. In fields with high placement rates in academe (e.g. humanities and social sciences), graduates may find collapsed labour markets with limited opportunities due to scant openings and an oversupply of candidates for jobs. Thus faculty members may take what they get at whichever institutions have vacancies.

While employment trends typically reflect down-placement (e.g. securing employment at tiers of institutions and programmes lower than candidates’ pedigrees), this is not always the case. For example, in law (Merritt and Reskin 1997), sociology (Burris 2004), and biochemistry (Long, Allison, and McGinnis 1979), graduates of the most prestigious programmes were more likely than peers of less selective programmes to secure appointments in other elite departments. Such an outcome may pertain to small numbers of select graduates, yet suggests the influence of programme prestige (Fogarty and Saftner 1993) and particularistic factors (Tomlinson 2007) on access to quality job opportunities. Nevertheless, it remains unclear whether the reputation of the institutions graduates attended also influences hiring decisions. As higher-ranked programmes are usually in higher-ranked institutions (Toutkoushian et al. 1998), the reputation of a graduate programme and graduate institution are often positively correlated. However, as noted in the Introduction, there are exceptions to this pattern.

As faculty members enter academe, they face pressure to publish in peer-reviewed academic journals and books. Research productivity remains a predominant way by which scholars disseminate new knowledge and gain recognition from colleagues on campus and in their fields (Melguizo and Strober 2007; O’Meara 2007). A number of factors are associated with research productivity, including institutional context (with more publications at research-orientated institutions), field, rank/experience, appointment type, gender, marital status, and time allocated to research (Bellas and Toutkoushian 1999; Bland et al. 2006; Dwyer 1994). Labour market dynamics, related to field, may also influence productivity: faculty members in compressed labour markets may be more alike than different in skills and abilities, with little variation explained by graduate programme or institution reputation. Faculty members in collapsed labour markets may have limited mobility across institution-types. If the faculty member’s initial placement is at a teaching-intensive university, and opportunities to move elsewhere are slim or random at best, he or she may be precluded from developing a research-focused career. More generally, attending a prestigious graduate programme could be positively correlated with research productivity if elite departments provide better research preparation for their students and attract students who are more predisposed to conducting research. Toutkoushian (1994) found that faculty members who
graduated from top 10 programmes in their fields were about 5% more likely to be highly cited relative to colleagues in their departments. However, his study only focused on graduate programme prestige.

Finally, there has been significant attention to factors that influence faculty members’ salaries. Variables such as years of experience, highest degree earned, productivity, and rank are each positively associated with academic salaries (Barbezat 2004; Toutkoushian 1998). Some studies show large pay differences by gender, field, labour market differences outside of academe, and institution type (e.g. Bowen and Schuster 1986; Domínguez and Gutiérrez 2013; Ehrenberg, McGraw, and Mrdjenovic 2006; Ransom and Megdal 1993). Melguizo and Strober (2007) found that tenure-track professors who increased their research activity earned more than those who allocated more time and attention to other work, as research productivity was perceived as increasing the prestige of departments and institutions. Stock and Alston (2000), controlling for personal and pre-graduate school characteristics, found that programme rankings influenced salary, but did not include in their models reputation of graduate institution attended.

Overall, the research literature indicates connections between academic career outcomes and the reputation of the department where a faculty member received his or her training. Yet analyses that contribute to this literature do not test whether reputation of the institution or programme attended is related to these outcomes. What is more, these studies focus on individual disciplines rather than controlling for field (e.g. for compressed or collapsed labour markets) and examining outcomes across them to assess broad patterns in academe.

Theoretical framework

Three theoretical perspectives frame our analysis of the influence of graduate programme and institution reputation on career outcomes for faculty members. First, human capital theory (Becker 1994; Mincer 1958) implies that individuals who attend better, more reputable graduate programmes will likely gain more human capital than others, and these skills are rewarded in academic labour markets. Typically studies in this tradition incorporate variables such as years of experience, highest degree earned, and research productivity as human capital measures, but do not account for reputation of the graduate programme and institution attended. Human capital theory assumes that programmes and institutions cultivate talent of individuals and this talent leads to benefits in labour markets; however, the theory does not address the ways in which departments and institutions sort students based on innate skills and abilities and facilitate selection of graduates for employment.

A second conceptual framework that guides this study is the screening hypothesis of education (Spence 1973; Stiglitz 1975). This theory holds that individuals who graduate from highly reputable programmes and/or institutions are perceived in academic labour markets as being better than their counterparts by virtue of their pedigrees. As a result, graduating from a more reputable programme or institution signals the labour market about a graduate’s quality, which then becomes reflected in the rewards over a professor’s career. Note that according to this theory, the benefits from attending a top programme or institution are not necessarily due to the individual having gained more human capital than his or her peers. Yet, analogous to human capital theory, the screening hypothesis assumes a level of meritocracy: innate skills and abilities of graduates will, by way of their education, lead to academic labour market benefits. Neither human capital theory nor the screening hypothesis, however, addresses the mechanisms of prestige in higher education – how it works, for whom, and in what ways over time.

The benefits that faculty members receive from their graduate education could also be due to the notoriety that departments and institutions gain from hiring and cultivating scholars from top programmes and/or institutions. According to this perspective, departments and institutions seek to maximise reputation and prestige (Melguizo and Strober 2007; O’Meara 2007). In part, this may be achieved by hiring academics from more prestigious backgrounds, as reflected in where they received their graduate education. The reputation of one’s graduate programme and/or institution attended could thus raise the profile – and national visibility – of hiring departments and institutions. But reputation, in contrast to human capital theory and the screening hypothesis, may not necessarily reflect
on skills and abilities: it may indicate membership in elite groups that opens select opportunities for employment (Burris 2004), publication (Toutkoushian 1994), and salary (Melguizo and Strober 2007). Thus, academic career outcomes become entwined with reputation of departments and institutions.

Taken together, these frameworks suggest that graduate programme and institution reputation could indeed be related to academic career outcomes. Yet an argument could be made that graduate programme and institution may have limited influences. When graduates of lower-ranked programmes and institutions are hired over graduates with more prestigious backgrounds, their skills and attributes may have more than made up for any disadvantage in pedigree. Accordingly, the winners in the academic job market could be more similar to each other than may be found in the broad pool of graduate students, reducing differences between them once they have started their careers as faculty members. Likewise, if most of a faculty member’s graduate training takes place within the programme and not the university in general, then the institution may not contribute to the graduate’s human capital beyond what is received from the programme. A priori it remains unclear the extent to which there are positive, marginal benefits for a faculty member in relation to his or her graduate programme and institution reputation – and if there are, whether it is the programme or institution reputation that matters most.

Research design

Data

Our data come from the 2004 National Survey of Postsecondary Faculty (NSOPF:04), the 1993 National Research Council (NRC) ratings of graduate programmes, and the 1993 U.S. News & World Report (USNWR) institutional rankings. We combined them into one data-set to determine which selected career outcomes for a faculty member was associated with the reputation of the graduate programme or institution attended.

NSOPF:04 is the most current nationally-representative survey of faculty members in the U.S., capturing respondents’ demographic characteristics, academic and work experiences, and perceptions of careers and future plans (Finkelstein et al. 2016). To isolate influences of graduate education on career outcomes, we restricted the analysis to NSOPF:04 respondents who held PhDs and graduated from departments and institutions tracked in the NRC data-set. We also limited the sample to full-time, tenure-track faculty members at 4-year institutions so that we would study associations between graduate education and research productivity. After we deleted outliers and observations with missing data, our final sample was approximately 2200 faculty members (rounded per NCES guidelines for confidentiality of respondents).

The 1993 NRC ratings of graduate programmes included data on programmes in 274 universities (105 private and 169 public) that granted doctorate degrees in any of 41 fields. We merged NSOPF:04 and 1993 NRC datasets according to the name of graduate institution and department, approximating graduate programme reputation for the median faculty member at the time of the NSOPF:04 survey. Faculty members in Foreign Languages, Education, Business, and Communication were omitted due to differences in the definitions of academic programmes in the NSOPF:04 and NRC datasets. Because graduate programme reputations change very slowly over time (Toutkoushian et al. 1998), the 1993 NRC ratings serve as helpful proxies for the average programme reputation for most individuals in our sample.

We created variables in NRC to represent the scholarly quality of each graduate programme. In the NRC survey, individual graduate programmes were rated in their fields on a scale of 0 to 5, with a low of 0 = ‘not sufficient for doctoral study’ to a high of 5 = ‘distinguished’. To reduce possible measurement error and changes over time in graduate programme ratings, we grouped the resulting mean programme ratings into three dichotomous variables. The first variable represented graduate programmes with average ratings of 4.00 and higher. The middle-tier programmes averaged scores between 3.00 and 4.00. Finally, the graduate programmes in the lowest-tier averaged ratings of less than 3.00.

To capture the reputation of institution attended, we used data from the 1993 USNWR rankings. The institutional rankings in USNWR are based on assessments of institutions received from college officials.
and on selected, ‘objective’ indicators such as admissions selectivity, graduation rate, and academic salaries (Bastedo and Bowman 2010). We opted to use the 1993 USNWR rankings so that they aligned with the timing of the NRC graduate programme ratings and the average experience levels of faculty members in our sample. We grouped the individual rankings into a dichotomous variable for whether an institution was in the top 25 nationally in 1993. Because the USNWR ratings are, analogous to the NRC ratings, also fairly stable over time, our approach should provide a helpful estimate of whether a person’s graduate institution is perceived as highly reputable.

Figure 1 shows the distribution of graduate programmes and institutions based on the reputation categories that we defined for this study. Nearly 28% of graduate programmes in our sample were categorised as highly rated, 37% were middle-tier, and 35% were in the lowest-rated category. About one-third of the graduate institutions were listed as highly rated.

**Methods**

We estimated three sets of statistical models in our study (see Appendix for a list and definition of variables). Each set corresponded to a different dependent variable of interest. In all of our models, we adjusted the standard errors to account for the unique stratified sampling design and weighting structure used in NSOPF:04.

In the first model, we examined how the following factors affected the type of institution where a faculty member was first employed:

\[
C = \mathcal{f}(B, D, Rep(p), Rep(i))
\]

(1)

where \(C\) = Carnegie classification in 1994 of the institution where first hired, \(B\) = set of background characteristics of faculty including gender and race/ethnicity, \(D\) = dummy variables for academic department where currently employed, \(Rep(p)\) = dummy variables for the average reputation of the faculty member’s graduate programme, and \(Rep(i)\) = dummy variable for whether the faculty member’s graduate institution was highly ranked by USNWR. The field variables \(D\) are interpreted as fixed effects that represent the net effect on employment options for these specific departments. Accordingly, these fixed effects capture the unique supply and demand considerations (e.g. window of entry into the academy) for faculty positions by field.

Because NSOPF:04 did not include a variable for institution of first academic employment, we restricted the analysis for this model to those who were employed by one institution as of the 2004 survey (n ~ 850). The subsequent statistical models expand the sample to include those who have worked at more than one
institution. The dependent variable for Carnegie classification of the institution consisted of four different categories: \( C = 1 \) if employed by a research I institution, \( C = 2 \) if employed by other doctoral-granting institutions (includes doctoral I and II as well as research II institutions), \( C = 3 \) if employed by a comprehensive I or II institution, and \( C = 4 \) if employed by a liberal arts I or II institution. We chose this particular breakdown to highlight employment at the most research-intensive institutions in the data (research I). Due to the categorical nature of the dependent variable, we used multinomial logit analysis to estimate the parameters for the explanatory variables in the model. All of the results are reported as average marginal effects.

In the second statistical examination, we posited that a faculty member’s career research productivity \( (R) \) was a function of background characteristics, academic field, allocation of work time \( (T) \), type of institution where employed \( (C) \), and reputation of graduate programme and institution. We estimated the following five models:

\[
R = f(B, D, \text{Rep}(p)) 
\]

\[
R = f(B, D, \text{Rep}(i)) 
\]

\[
R = f(B, D, \text{Rep}(p), \text{Rep}(i)) 
\]

\[
R = f(B, D, \text{Rep}(p), \text{Rep}(i), T) 
\]

\[
R = f(B, D, \text{Rep}(p), \text{Rep}(i), T, C) 
\]

The set of variables \( B \) now also included age and years of experience in addition to gender and race. The time allocation measures \( T \) consisted of average hours worked per week, and the percentage of work time allocated to research and teaching in 2004. The dependent variable \( R \) represented the number of journal articles that a faculty member published during his or her career. The frequency distribution for this variable showed large positive spikes at regular 5- or 10-unit intervals of reported publication counts (such as \( R = 5, 10, 15, \ldots 200 \)). We attributed these higher frequencies to respondents who perhaps rounded their publication counts when responding to the survey. To reduce the influence of these spikes on our results, we created a dichotomous variable for whether the publication count was a multiple of 5 (up through 100) or a multiple of 10 (from 100 to 200) and added this variable to our model. Each model included fixed effects for fields to account for the average differences in research productivity of faculty across disciplines.

We estimated five different models to show how the connections between a faculty member’s graduate programme and institution reputation and research productivity were affected by other variables. In the first model, we controlled for graduate programme reputation (but not institution reputation), time allocation, or type of institution where the faculty member is employed. In model (2.2), we replaced the graduate reputation variables with the institutional reputation variable. Both reputation measures were then added to the model (2.3) to determine how each was associated with research productivity after taking the other into account. For the fourth model, we added time allocation measures to see whether our results were in part explained by differences in how a faculty member allocated his or her time to teaching, research, and other activities. Finally, in the last model we controlled for the type of institution where the person was employed, as time allocated to research (hence research productivity) was likely influenced by whether the faculty member’s institution emphasised research.

To estimate the parameters in Equations (2.1) through (2.5), we relied on count data models. Count data techniques have been found to be preferable to ordinary least squares in applications where the dependent variable represents the number of times that a particular event occurs, the value zero is a legitimate – and frequent – outcome for the dependent variable, and the distribution of the dependent variable is highly skewed to the right. All of these characteristics apply to the number of journal articles produced over a faculty member’s career.

The two most frequently used count models are the poisson regression model and the negative binomial regression model (Greene 2008). The poisson model assumes that the dependent variable...
follows a poisson probability distribution. This functional form is very restrictive, however, because it assumes that the population mean and variance of the dependent variable are equal. When the variance exceeds the mean, negative binomial regression should be used as an alternative to account for over-dispersion. We estimated both models, and since we rejected the hypothesis that the mean equalled the variance for all models, we only reported the results from the negative binomial regression along with the test statistics for overdispersion.

Finally, we concluded our analysis with a series of models to isolate influences of graduate programme and institution reputation on a faculty member’s salary, after controlling for factors that also influence earnings. We estimated five salary equations of the form:

\[ \ln Y = f(B, D, I, \text{Rep}(p)) \]  
(3.1)

\[ \ln Y = f(B, D, I, \text{Rep}(i)) \]  
(3.2)

\[ \ln Y = f(B, D, I, \text{Rep}(p), \text{Rep}(i)) \]  
(3.3)

\[ \ln Y = f(B, D, I, \text{Rep}(p), \text{Rep}(i), C) \]  
(3.4)

\[ \ln Y = f(B, D, I, \text{Rep}(p), \text{Rep}(i), C, R, F) \]  
(3.5)

where the dependent variable \( \ln Y = \log \) of annual salary and \( I = \) institutional variables for the geographic location of the faculty member’s institution, whether the institution was public, and whether faculty members at the institution were unionised. In the fourth equation we controlled for the effects of the research intensity of an institution (measured by the Carnegie classification) on academic salaries. Finally, the last model included variables for career research productivity and academic rank, where \( F \) included separate dummy variables for full and associate professors.

**Findings**

**Descriptive results**

Table 1 contains descriptive statistics for the variables in our study. Note the research productivity measures were characterised by overdispersion, as their variances exceeded the means. Faculty members were rather equally distributed across the four main Carnegie classifications of institutions. The largest single disciplinary category in our sample was the social sciences (30%) followed by physical sciences (12%) and English/literature (12%).

In Table 2, we provide means for the institutional reputation variables and our dependent variables broken down by the three categories of graduate programme reputation. Not surprisingly, there was a strong correlation between the reputation of a faculty member’s graduate programme and institution. Four out of five (79%) graduates from a higher-ranked programme also attended a higher-ranked institution. Only 5% of graduates from a lower-ranked programme attended a higher-ranked institution.

Turning to the dependent variables in our study, we found that, after conducting a one-way analysis of variance test, there were statistically significant differences in the means by graduate programme reputation for all variables except current employment at other doctoral institutions \( (p < .01) \). On average, graduates from higher-ranked programmes were more likely to be employed at Research I institutions (40% for graduates of higher-ranked programmes versus 22% for mid-ranked programmes and 10% for lower-ranked programmes), and were less likely to work at comprehensive and liberal arts institutions.

Similarly, graduates from higher-ranked programmes had, on average, more career journal articles (26 in higher-ranked programmes versus 14 in lower-ranked programmes). Finally, for salary, faculty members from higher-ranked programmes earned, on average, 10% more than those who attended mid-ranked programmes and 18% more than those who attended lower-ranked programmes.
Table 1. Descriptive statistics.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Salary</td>
<td>11.03</td>
<td>0.34</td>
<td>9.65</td>
<td>12.32</td>
</tr>
<tr>
<td>Articles</td>
<td>19.26</td>
<td>30.33</td>
<td>0</td>
<td>200</td>
</tr>
<tr>
<td>Chapters</td>
<td>7.18</td>
<td>12.85</td>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>Books</td>
<td>2.87</td>
<td>7.20</td>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>Hours Worked</td>
<td>51.57</td>
<td>11.09</td>
<td>4</td>
<td>95</td>
</tr>
<tr>
<td>Pct Time Research</td>
<td>21.46</td>
<td>14.69</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Pct Time Teaching</td>
<td>65.33</td>
<td>16.52</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Hispanic</td>
<td>0.045</td>
<td>0.21</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Black</td>
<td>0.043</td>
<td>0.20</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>White</td>
<td>0.834</td>
<td>0.37</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other Race</td>
<td>0.078</td>
<td>0.27</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>0.298</td>
<td>0.46</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Experience</td>
<td>14.24</td>
<td>10.80</td>
<td>1</td>
<td>49</td>
</tr>
<tr>
<td>Age</td>
<td>49.78</td>
<td>10.34</td>
<td>29</td>
<td>78</td>
</tr>
<tr>
<td>Full Professor</td>
<td>0.409</td>
<td>0.49</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>0.308</td>
<td>0.46</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>0.283</td>
<td>0.45</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Research I Institution</td>
<td>0.225</td>
<td>0.42</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Doctoral Institution</td>
<td>0.228</td>
<td>0.42</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Comprehensive Institution</td>
<td>0.303</td>
<td>0.46</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Liberal Arts Institution</td>
<td>0.217</td>
<td>0.41</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Public Institution</td>
<td>0.568</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Unionized Institutional</td>
<td>0.200</td>
<td>0.40</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Region: East</td>
<td>0.504</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Region: Midwest</td>
<td>0.264</td>
<td>0.44</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Region: Southwest</td>
<td>0.139</td>
<td>0.35</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Region: West</td>
<td>0.093</td>
<td>0.29</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Performing Arts</td>
<td>0.060</td>
<td>0.24</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Biomedical Sciences</td>
<td>0.057</td>
<td>0.23</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Information Sciences</td>
<td>0.029</td>
<td>0.17</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Engineering</td>
<td>0.063</td>
<td>0.24</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>English &amp; Literature</td>
<td>0.121</td>
<td>0.33</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Health Professions</td>
<td>0.003</td>
<td>0.06</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Mathematics</td>
<td>0.081</td>
<td>0.27</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Philosophy &amp; Religion</td>
<td>0.073</td>
<td>0.26</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>0.123</td>
<td>0.33</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Psychology</td>
<td>0.088</td>
<td>0.28</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>0.301</td>
<td>0.46</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes: Sample size is approximately 2200 (rounded per NCES regulations). Academic department variables represent graduate school disciplines in which faculty members have earned their Ph.D.s.

Table 2. Breakdown of selected variable means, by graduate programme reputation.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Higher-Ranked Graduate Programme</th>
<th>Mid-Ranked Graduate Programme</th>
<th>Lower-Ranked Graduate Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher-Ranked Graduate Institution</td>
<td>0.787</td>
<td>0.238</td>
<td>0.050</td>
</tr>
<tr>
<td>Research I Institution</td>
<td>0.398</td>
<td>0.216</td>
<td>0.097</td>
</tr>
<tr>
<td>Doctoral Institution</td>
<td>0.223</td>
<td>0.237</td>
<td>0.224</td>
</tr>
<tr>
<td>Comprehensive Institution</td>
<td>0.191</td>
<td>0.297</td>
<td>0.398</td>
</tr>
<tr>
<td>Liberal Arts Institution</td>
<td>0.173</td>
<td>0.215</td>
<td>0.253</td>
</tr>
<tr>
<td>Articles</td>
<td>26.25</td>
<td>18.98</td>
<td>14.04</td>
</tr>
<tr>
<td>Log Salary</td>
<td>11.13</td>
<td>11.03</td>
<td>10.95</td>
</tr>
</tbody>
</table>

Notes: Sample size is approximately 2200 (rounded per NCES regulations). Graduate programme reputation variables are based on 1993 NRC graduate programme ratings. Higher-Ranked Graduate Programme = 1 if average scholarly quality NRC rating is 4 or higher. Mid-Ranked Graduate Programme = 1 if average scholarly quality NRC rating is between 3.00 and 3.99. Lower-Ranked Graduate Programme = 1 if average scholarly quality NRC rating is less than 2.99. Differences in means are statistically significant for all variables except Doctoral Institution (one-way ANOVA) at $\alpha = 0.01$. 
In Table 3 we show the comparison of means for the same variables in our study broken down by institution reputation. About two-thirds of graduates from higher-ranked institutions also attended higher-ranked programmes, whereas nine out of ten who did not receive their doctorate degrees from higher-ranked institutions attended mid- or lower-ranked graduate programmes. There was substantial but not perfect overlap between graduate programme and institution ratings in our sample. On average, graduates from a higher-ranked institution were more than twice as likely as graduates from lesser-ranked institutions to work at Research I institutions and least likely to work at comprehensive institutions. Faculty members from higher-ranked institutions published about seven more journal articles than their peers on average and reported earnings that were 13% higher.

### Employment by institution type

In Table 4, we focus on the relationship between the type of institution where the faculty member was hired after graduate school and the reputation of his or her graduate programme and institution. As noted earlier, we restricted the sample for this model to individuals who were employed by only one institution at the time of the survey (n ~ 850). We used multinomial logistic regression analysis to estimate the parameters in the model, controlling for race/ethnicity, gender, and academic field. Interestingly, we found little evidence of any racial/ethnic differences in the Carnegie classification of institution where a graduate was initially hired. There was some evidence that female faculty members were more likely to find employment at comprehensive institutions and less likely to work at other doctoral institutions, but no statistical differences in hiring by research I institutions. The only fields with statistically significant differences in academic placements were engineering and information sciences: faculty members in these fields were more likely to work at doctoral-level institutions as opposed to liberal arts institutions where these fields were less prominent.

With regard to graduate reputation variables, we found that they had statistically significant and large connections to types of institutions where faculty members were employed. Relative to graduates from lower-ranked programmes, graduates from higher-ranked programmes were about 29% more likely to work at a Research I institution and least likely to work at a comprehensive institution. Similar outcomes were associated with those from mid-ranked doctoral programmes, except the marginal benefits were about one-third smaller than they were for those who came from higher-ranked programmes. At the same time, the reputation of graduate institution was marginally related to the type of institution where a faculty member was first employed. Faculty members from higher-ranked institutions were about 8% more likely to work at a research I institution, even after taking into account the reputation of their graduate programmes. Taken together, graduate programme reputation was found to have a stronger association than institutional reputation with the type of institution where the faculty member was initially hired.
Table 4. Estimation of the relationship between institution of first employment and graduate programme and institution reputation.

<table>
<thead>
<tr>
<th>Research I Other Doctoral Comprehensive Liberal Arts</th>
<th>Institution</th>
<th>Institution</th>
<th>Institution</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>−0.027</td>
<td>−0.138</td>
<td>0.139</td>
<td>0.026</td>
</tr>
<tr>
<td></td>
<td>(0.095)</td>
<td>(0.094)</td>
<td>(0.092)</td>
<td>(0.073)</td>
</tr>
<tr>
<td>Black</td>
<td>−0.009</td>
<td>−0.060</td>
<td>0.113</td>
<td>−0.045</td>
</tr>
<tr>
<td></td>
<td>(0.085)</td>
<td>(0.081)</td>
<td>(0.077)</td>
<td>(0.058)</td>
</tr>
<tr>
<td>Other Race</td>
<td>−0.066</td>
<td>0.103+</td>
<td>−0.053</td>
<td>0.016</td>
</tr>
<tr>
<td></td>
<td>(0.065)</td>
<td>(0.058)</td>
<td>(0.070)</td>
<td>(0.045)</td>
</tr>
<tr>
<td>Female</td>
<td>−0.022</td>
<td>−0.104**</td>
<td>0.090*</td>
<td>0.037</td>
</tr>
<tr>
<td></td>
<td>(0.039)</td>
<td>(0.039)</td>
<td>(0.041)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>Performing Arts</td>
<td>−0.129</td>
<td>−0.014</td>
<td>0.015</td>
<td>0.128*</td>
</tr>
<tr>
<td></td>
<td>(0.101)</td>
<td>(0.087)</td>
<td>(0.089)</td>
<td>(0.052)</td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>−0.001</td>
<td>−0.088</td>
<td>0.074</td>
<td>0.014</td>
</tr>
<tr>
<td></td>
<td>(0.071)</td>
<td>(0.088)</td>
<td>(0.075)</td>
<td>(0.050)</td>
</tr>
<tr>
<td>Information Sciences</td>
<td>0.018</td>
<td>0.204**</td>
<td>−0.094</td>
<td>−0.127</td>
</tr>
<tr>
<td></td>
<td>(0.085)</td>
<td>(0.073)</td>
<td>(0.099)</td>
<td>(0.091)</td>
</tr>
<tr>
<td>Engineering</td>
<td>0.126+</td>
<td>0.254***</td>
<td>−0.052</td>
<td>−0.327**</td>
</tr>
<tr>
<td></td>
<td>(0.070)</td>
<td>(0.062)</td>
<td>(0.100)</td>
<td>(0.126)</td>
</tr>
<tr>
<td>English &amp; Literature</td>
<td>−0.118+</td>
<td>0.059</td>
<td>0.026</td>
<td>0.034</td>
</tr>
<tr>
<td></td>
<td>(0.065)</td>
<td>(0.059)</td>
<td>(0.066)</td>
<td>(0.039)</td>
</tr>
<tr>
<td>Mathematics</td>
<td>0.056</td>
<td>0.002</td>
<td>−0.059</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>(0.059)</td>
<td>(0.065)</td>
<td>(0.077)</td>
<td>(0.058)</td>
</tr>
<tr>
<td>Philosophy &amp; Religion</td>
<td>−0.039</td>
<td>0.008</td>
<td>0.039</td>
<td>−0.008</td>
</tr>
<tr>
<td></td>
<td>(0.076)</td>
<td>(0.080)</td>
<td>(0.085)</td>
<td>(0.050)</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>−0.112*</td>
<td>0.041</td>
<td>0.033</td>
<td>0.038</td>
</tr>
<tr>
<td></td>
<td>(0.050)</td>
<td>(0.049)</td>
<td>(0.054)</td>
<td>(0.037)</td>
</tr>
<tr>
<td>Psychology</td>
<td>−0.110</td>
<td>0.074</td>
<td>0.019</td>
<td>0.017</td>
</tr>
<tr>
<td></td>
<td>(0.068)</td>
<td>(0.060)</td>
<td>(0.065)</td>
<td>(0.049)</td>
</tr>
<tr>
<td>Higher-Ranked Graduate Programme</td>
<td>0.290***</td>
<td>0.025</td>
<td>−0.238***</td>
<td>−0.077*</td>
</tr>
<tr>
<td></td>
<td>(0.052)</td>
<td>(0.047)</td>
<td>(0.055)</td>
<td>(0.036)</td>
</tr>
<tr>
<td>Mid-Ranked Graduate Programme</td>
<td>0.185***</td>
<td>0.041</td>
<td>−0.182***</td>
<td>−0.044</td>
</tr>
<tr>
<td></td>
<td>(0.045)</td>
<td>(0.040)</td>
<td>(0.039)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>Higher-Ranked Graduate Institution</td>
<td>0.083*</td>
<td>−0.035</td>
<td>−0.074</td>
<td>0.026</td>
</tr>
<tr>
<td></td>
<td>(0.041)</td>
<td>(0.039)</td>
<td>(0.049)</td>
<td>(0.033)</td>
</tr>
</tbody>
</table>

Notes: Dependent variable = type of institution for first academic job. Sample size is approximately 850 (rounded per NCES regulations). Parameters in the model were estimated using multinomial logistic regression analysis. Average marginal effects are reported for each variable. Standard errors are shown in parentheses. Data were weighted to account for NSOPF:04 stratified sampling design. Reference category for race is non-Hispanic white. Reference category for academic field is social sciences. Health sciences was excluded from the model due to perfect collinearity with the outcome variable. Reference category for graduate programme reputation is lower-ranked programme. Reference category for graduate institution reputation is lower-ranked graduate institution.

***p < .01; **p < .05; *p < .10 (two-tailed test).
Research productivity

The results take on intriguing directions as we move into explaining research productivity, as represented by the number of articles published in academic journals during one’s career. Table 5 shows results from the five equations specified in the methods section. Recall that the sample in this table was expanded to include faculty members who were employed at more than one institution during their career. The last row in Table 5 shows that we were able to reject the null hypothesis of no overdispersion, and therefore we concluded that the negative binomial model was preferable to the poisson regression model for this application.

The results of many of our variables corresponded to what might be predicted from human capital models and the empirical literature on scholars’ productivity. A faculty member’s career journal article count was positively associated with percentage of time spent on research and the person’s age. Not surprisingly, fixed effects for field showed large differences in career journal article counts by discipline, with faculty members in the sciences having more publications than similarly situated colleagues in the social sciences, arts, and humanities. Career journal article counts were significantly higher for faculty members at more research-intensive institutions where such productivity might be more important for career advancement.

For the variables of focus in our study, the reputations of a faculty member’s graduate programme and institution were, by themselves, each positively associated with greater research productivity. When we controlled for both programme and institution (model 3), only institutional reputation had a positive and significant association with career journal articles. This finding persisted after we added controls to the model for time allocation, but became insignificant after we controlled for the type of institution where a faculty member was employed.

Salary

Finally, in Table 6, we examined whether a faculty member’s graduate programme and institutional reputation were related to his or her salary after controlling for other factors that may also impact salary. As in Table 5, this sample included faculty members who had been employed at multiple institutions over their careers. Although there were no significant pay differences by race/ethnicity in our sample, female faculty members earned three to five percent less than male faculty members with similar measurable characteristics. Faculty salaries increased with age, years of experience, and rank, and they varied substantially by field and the type of institution where the person was employed.

Of particular relevance to our investigation, the reputation of both graduate programme and institution had positive and statistically significant relationships with salary. The coefficients in model 3 indicated that graduates from higher-ranked programmes earned seven to eight percent more than graduates of lower-ranked programmes, and graduates from higher-ranked institutions earned eight percent more than graduates of non-higher-ranked institutions. After we controlled for type of institution where the faculty member worked, the variables for graduate programme reputation became insignificant. In contrast, we observed a persistent positive and statistically significant relationship between one’s graduate institution reputation and salary even after controlling for type of institution employed, research productivity, and academic rank.

Discussion

Our study has focused on whether it matters where a future faculty member goes to graduate school – and if so, whether programme or institution attended matters most for his or her career outcomes. The choice of which graduate school to attend has long been considered an important decision with lasting influences on students (see, for example, Berelson 1960, 109–110); however, there is a dearth of information about academic career outcomes associated with graduate programme and institution reputation. We know little about the magnitude of any labour market benefits for faculty members.
Table 5. Estimation of the relationship between career journal articles and graduate programme and institution reputation.

<table>
<thead>
<tr>
<th></th>
<th>Model (1)</th>
<th>Model (2)</th>
<th>Model (3)</th>
<th>Model (4)</th>
<th>Model (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>−0.366</td>
<td>−0.670</td>
<td>−0.528</td>
<td>−1.420</td>
<td>−1.873</td>
</tr>
<tr>
<td></td>
<td>(3.102)</td>
<td>(3.070)</td>
<td>(3.085)</td>
<td>(2.740)</td>
<td>(2.454)</td>
</tr>
<tr>
<td></td>
<td>(2.943)</td>
<td>(2.953)</td>
<td>(2.944)</td>
<td>(2.840)</td>
<td>(2.823)</td>
</tr>
<tr>
<td>Other Race</td>
<td>3.576</td>
<td>2.932</td>
<td>3.288</td>
<td>1.442</td>
<td>1.114</td>
</tr>
<tr>
<td></td>
<td>(2.871)</td>
<td>(2.820)</td>
<td>(2.816)</td>
<td>(2.713)</td>
<td>(2.548)</td>
</tr>
<tr>
<td>Female</td>
<td>−4.458*</td>
<td>−4.632**</td>
<td>−4.538*</td>
<td>−2.100</td>
<td>−2.677</td>
</tr>
<tr>
<td></td>
<td>(1.787)</td>
<td>(1.780)</td>
<td>(1.781)</td>
<td>(1.750)</td>
<td>(1.610)</td>
</tr>
<tr>
<td>Experience</td>
<td>0.034</td>
<td>0.056</td>
<td>0.038</td>
<td>0.026</td>
<td>−0.061</td>
</tr>
<tr>
<td></td>
<td>(0.096)</td>
<td>(0.097)</td>
<td>(0.096)</td>
<td>(0.094)</td>
<td>(0.086)</td>
</tr>
<tr>
<td>Age</td>
<td>0.811***</td>
<td>0.790***</td>
<td>0.806***</td>
<td>0.840***</td>
<td>0.796***</td>
</tr>
<tr>
<td></td>
<td>(0.119)</td>
<td>(0.122)</td>
<td>(0.119)</td>
<td>(0.119)</td>
<td>(0.107)</td>
</tr>
<tr>
<td>Performing Arts</td>
<td>−8.878*</td>
<td>−8.316*</td>
<td>−8.761*</td>
<td>−6.164</td>
<td>−7.532*</td>
</tr>
<tr>
<td></td>
<td>(3.530)</td>
<td>(3.553)</td>
<td>(3.525)</td>
<td>(3.570)</td>
<td>(3.152)</td>
</tr>
<tr>
<td></td>
<td>(2.289)</td>
<td>(2.234)</td>
<td>(2.280)</td>
<td>(2.205)</td>
<td>(1.951)</td>
</tr>
<tr>
<td>Information Sciences</td>
<td>17.336***</td>
<td>16.834***</td>
<td>17.087***</td>
<td>16.931***</td>
<td>13.941***</td>
</tr>
<tr>
<td></td>
<td>(2.884)</td>
<td>(3.962)</td>
<td>(3.803)</td>
<td>(3.804)</td>
<td>(2.529)</td>
</tr>
<tr>
<td>Engineering</td>
<td>15.555***</td>
<td>16.697***</td>
<td>16.266***</td>
<td>17.986***</td>
<td>14.004***</td>
</tr>
<tr>
<td></td>
<td>(2.527)</td>
<td>(2.599)</td>
<td>(2.571)</td>
<td>(2.465)</td>
<td>(2.347)</td>
</tr>
<tr>
<td></td>
<td>(2.382)</td>
<td>(2.403)</td>
<td>(2.403)</td>
<td>(2.382)</td>
<td>(2.485)</td>
</tr>
<tr>
<td>Philosophy &amp; Religion</td>
<td>0.898</td>
<td>0.646</td>
<td>0.781</td>
<td>0.894</td>
<td>0.669</td>
</tr>
<tr>
<td></td>
<td>(3.389)</td>
<td>(3.334)</td>
<td>(3.425)</td>
<td>(2.761)</td>
<td>(2.958)</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>19.103***</td>
<td>19.809***</td>
<td>19.410***</td>
<td>20.489***</td>
<td>20.103***</td>
</tr>
<tr>
<td></td>
<td>(2.542)</td>
<td>(2.581)</td>
<td>(2.560)</td>
<td>(2.353)</td>
<td>(2.139)</td>
</tr>
<tr>
<td>Psychology</td>
<td>9.380***</td>
<td>10.343***</td>
<td>10.046***</td>
<td>10.342***</td>
<td>10.084***</td>
</tr>
<tr>
<td></td>
<td>(2.010)</td>
<td>(2.077)</td>
<td>(2.040)</td>
<td>(1.897)</td>
<td>(1.753)</td>
</tr>
<tr>
<td>Health Professions</td>
<td>25.540***</td>
<td>27.860***</td>
<td>27.068***</td>
<td>23.656***</td>
<td>21.512***</td>
</tr>
<tr>
<td></td>
<td>(5.366)</td>
<td>(5.216)</td>
<td>(5.328)</td>
<td>(3.206)</td>
<td>(3.017)</td>
</tr>
<tr>
<td>Higher-Ranked Graduate Programme</td>
<td>7.331***</td>
<td>–</td>
<td>4.114</td>
<td>3.415</td>
<td>−0.961</td>
</tr>
<tr>
<td></td>
<td>(2.301)</td>
<td>(2.204)</td>
<td>(2.289)</td>
<td>(1.949)</td>
<td></td>
</tr>
<tr>
<td>Mid-Ranked Graduate Programme</td>
<td>2.497</td>
<td>–</td>
<td>1.588</td>
<td>1.168</td>
<td>−0.956</td>
</tr>
<tr>
<td></td>
<td>(1.676)</td>
<td>(1.606)</td>
<td>(1.518)</td>
<td>(1.527)</td>
<td></td>
</tr>
<tr>
<td>Higher-Ranked Graduate Institution</td>
<td>–</td>
<td>6.433***</td>
<td>4.147*</td>
<td>3.682*</td>
<td>2.883*</td>
</tr>
<tr>
<td></td>
<td>(1.872)</td>
<td>(1.642)</td>
<td>(1.613)</td>
<td>(1.519)</td>
<td></td>
</tr>
<tr>
<td>Hours Worked</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.038</td>
<td>0.031</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(0.055)</td>
<td>(0.053)</td>
</tr>
<tr>
<td>% Time Research</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.362***</td>
<td>0.286***</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(0.082)</td>
<td>(0.074)</td>
</tr>
<tr>
<td>% Time Teaching</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>−0.101</td>
<td>−0.049</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(0.077)</td>
<td>(0.068)</td>
</tr>
<tr>
<td>Research I Institution</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>14.868***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(2.393)</td>
<td></td>
</tr>
<tr>
<td>Other Doctoral Institution</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>8.750***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(1.685)</td>
<td></td>
</tr>
<tr>
<td>Liberal Arts Institution</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>4.367*</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(1.912)</td>
<td></td>
</tr>
<tr>
<td>Log Likelihood</td>
<td>−298496</td>
<td>−298445</td>
<td>−298324</td>
<td>−294866</td>
<td>−291354</td>
</tr>
<tr>
<td>Wald $\chi^2$</td>
<td>958***</td>
<td>950***</td>
<td>968***</td>
<td>1370***</td>
<td>1764***</td>
</tr>
<tr>
<td>Overdispersion ($\alpha$)</td>
<td>1.01***</td>
<td>1.01***</td>
<td>1.01***</td>
<td>0.92***</td>
<td>0.84***</td>
</tr>
</tbody>
</table>

Notes: Dependent variable = number of articles published in academic journals during career. Sample size is approximately 2200 (rounded per NCES regulations). Parameters in the model were estimated using negative binomial regression analysis. Average marginal effects are reported for each variable. Standard errors are shown in parentheses. Data were weighted to account for NSOPF-04 stratified sampling design. Reference category for race is non-Hispanic white. Reference category for academic field is social sciences. Reference category for graduate programme reputation is lower-ranked graduate programme. Reference category for graduate institution reputation is lower-ranked graduate institution. Reference category for type of institution is comprehensive. Table excludes dummy variable for whether publication counts are at intervals of five.

*** $p < .001$; ** $p < .01$; * $p < .05$ (two-tailed test).

Wald $\chi^2$ = test for overall fit of the model. Overdispersion ($\alpha$) = test for negative binomial versus poisson regression model.
Table 6. Estimation of the relationship between salary and graduate programme and institution reputation.

<table>
<thead>
<tr>
<th></th>
<th>Model (1)</th>
<th>Model (2)</th>
<th>Model (3)</th>
<th>Model (4)</th>
<th>Model (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>0.021</td>
<td>0.018</td>
<td>0.019</td>
<td>0.017</td>
<td>0.026</td>
</tr>
<tr>
<td></td>
<td>(0.040)</td>
<td>(0.039)</td>
<td>(0.039)</td>
<td>(0.036)</td>
<td>(0.032)</td>
</tr>
<tr>
<td>Black</td>
<td>0.005</td>
<td>-0.002</td>
<td>0.005</td>
<td>0.009</td>
<td>0.042</td>
</tr>
<tr>
<td></td>
<td>(0.038)</td>
<td>(0.038)</td>
<td>(0.038)</td>
<td>(0.037)</td>
<td>(0.035)</td>
</tr>
<tr>
<td>Other Race</td>
<td>-0.008</td>
<td>-0.009</td>
<td>-0.008</td>
<td>-0.014</td>
<td>-0.022</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.025)</td>
<td>(0.025)</td>
<td>(0.026)</td>
<td>(0.026)</td>
</tr>
<tr>
<td>Female</td>
<td>-0.053**</td>
<td>-0.055**</td>
<td>-0.054**</td>
<td>-0.054***</td>
<td>-0.031*</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.017)</td>
<td>(0.017)</td>
<td>(0.016)</td>
<td>(0.015)</td>
</tr>
<tr>
<td>Experience</td>
<td>0.007***</td>
<td>0.007***</td>
<td>0.007***</td>
<td>0.005***</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Age</td>
<td>0.010***</td>
<td>0.010***</td>
<td>0.010***</td>
<td>0.010***</td>
<td>0.003**</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Region: East</td>
<td>-0.075**</td>
<td>-0.085***</td>
<td>-0.077**</td>
<td>-0.070***</td>
<td>-0.051*</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.025)</td>
<td>(0.026)</td>
<td>(0.025)</td>
<td>(0.024)</td>
</tr>
<tr>
<td>Region: Midwest</td>
<td>-0.110***</td>
<td>-0.117***</td>
<td>-0.110***</td>
<td>-0.116***</td>
<td>-0.094***</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.026)</td>
<td>(0.027)</td>
<td>(0.026)</td>
<td>(0.025)</td>
</tr>
<tr>
<td>Region: Southwest</td>
<td>-0.118***</td>
<td>-0.127***</td>
<td>-0.120***</td>
<td>-0.116***</td>
<td>-0.105***</td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
<td>(0.029)</td>
<td>(0.029)</td>
<td>(0.029)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>Public Institution</td>
<td>-0.012</td>
<td>-0.011</td>
<td>-0.010</td>
<td>-0.054**</td>
<td>-0.052**</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.018)</td>
<td>(0.016)</td>
</tr>
<tr>
<td>Unionized Institution</td>
<td>0.009</td>
<td>0.014</td>
<td>0.012</td>
<td>0.059***</td>
<td>0.062***</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.014)</td>
</tr>
<tr>
<td>Performing Arts</td>
<td>-0.117***</td>
<td>-0.103***</td>
<td>-0.110***</td>
<td>-0.103***</td>
<td>-0.083***</td>
</tr>
<tr>
<td></td>
<td>(0.026)</td>
<td>(0.026)</td>
<td>(0.026)</td>
<td>(0.025)</td>
<td>(0.022)</td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>0.067**</td>
<td>0.085**</td>
<td>0.080**</td>
<td>0.086**</td>
<td>0.070*</td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.031)</td>
<td>(0.031)</td>
<td>(0.029)</td>
<td>(0.028)</td>
</tr>
<tr>
<td>Information Sciences</td>
<td>0.267***</td>
<td>0.252***</td>
<td>0.264***</td>
<td>0.241***</td>
<td>0.220***</td>
</tr>
<tr>
<td></td>
<td>(0.039)</td>
<td>(0.041)</td>
<td>(0.039)</td>
<td>(0.036)</td>
<td>(0.034)</td>
</tr>
<tr>
<td>Engineering</td>
<td>0.213***</td>
<td>0.227***</td>
<td>0.222***</td>
<td>0.189***</td>
<td>0.158***</td>
</tr>
<tr>
<td></td>
<td>(0.033)</td>
<td>(0.033)</td>
<td>(0.033)</td>
<td>(0.034)</td>
<td>(0.034)</td>
</tr>
<tr>
<td>English &amp; Literature</td>
<td>-0.046</td>
<td>-0.044*</td>
<td>-0.042</td>
<td>-0.021</td>
<td>-0.046*</td>
</tr>
<tr>
<td></td>
<td>(0.022)</td>
<td>(0.022)</td>
<td>(0.022)</td>
<td>(0.021)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>Mathematics</td>
<td>0.030</td>
<td>0.032</td>
<td>0.032</td>
<td>0.040</td>
<td>0.017</td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
<td>(0.029)</td>
<td>(0.029)</td>
<td>(0.027)</td>
<td>(0.026)</td>
</tr>
<tr>
<td>Philosophy &amp; Religion</td>
<td>-0.046</td>
<td>-0.047</td>
<td>-0.047</td>
<td>-0.043</td>
<td>-0.070*</td>
</tr>
<tr>
<td></td>
<td>(0.036)</td>
<td>(0.035)</td>
<td>(0.036)</td>
<td>(0.035)</td>
<td>(0.029)</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>0.007</td>
<td>0.014</td>
<td>0.011</td>
<td>0.025</td>
<td>-0.000**</td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td>(0.023)</td>
<td>(0.022)</td>
<td>(0.021)</td>
<td>(0.021)</td>
</tr>
<tr>
<td>Psychology</td>
<td>0.007</td>
<td>0.022</td>
<td>0.018</td>
<td>0.024</td>
<td>0.012</td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
<td>(0.028)</td>
<td>(0.028)</td>
<td>(0.026)</td>
<td>(0.023)</td>
</tr>
<tr>
<td>Health Professions</td>
<td>0.279***</td>
<td>0.322***</td>
<td>0.305***</td>
<td>0.271***</td>
<td>0.175*</td>
</tr>
<tr>
<td></td>
<td>(0.050)</td>
<td>(0.052)</td>
<td>(0.050)</td>
<td>(0.054)</td>
<td>(0.076)</td>
</tr>
<tr>
<td>Higher-Ranked Graduate Programme</td>
<td>0.135***</td>
<td>–</td>
<td>0.076**</td>
<td>0.019</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.023)</td>
<td>(0.023)</td>
<td>(0.022)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>Mid-Ranked Graduate Programme</td>
<td>0.058***</td>
<td>–</td>
<td>0.043**</td>
<td>0.013</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.016)</td>
<td>(0.014)</td>
</tr>
<tr>
<td>Higher-Ranked Graduate Institution</td>
<td>–</td>
<td>0.118***</td>
<td>0.079**</td>
<td>0.064***</td>
<td>0.058***</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.019)</td>
<td>(0.019)</td>
<td>(0.018)</td>
<td>(0.017)</td>
</tr>
<tr>
<td>Research I Institution</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.220***</td>
<td>0.169***</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(0.020)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Other Doctoral Institution</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.101***</td>
<td>0.090***</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(0.017)</td>
<td>(0.017)</td>
</tr>
<tr>
<td>Liberal Arts Institution</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>-0.010</td>
<td>-0.016</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(0.019)</td>
<td>(0.019)</td>
</tr>
<tr>
<td>Articles</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.001***</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Books</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Book Chapters</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.002***</td>
</tr>
<tr>
<td></td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Full Professor</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.290***</td>
</tr>
</tbody>
</table>

(Continued)
A number of studies emphasise factors that influence where faculty members are hired, their productivity, and their salary. Our paper contributes to the literature on this topic by focusing on connections between graduate programme and institution reputation and these three groups of academic career indicators. To this end, we combined nationally representative data on faculty members with reputation measures for their graduate programmes and institutions. In contrast to prior studies, we derived separate measures of their graduate programme and institutional reputation to isolate how each was related to various outcome measures. We also examined these associations for faculty members across a range of disciplines, as opposed to many previous studies that considered select outcomes in a single disciplinary field.

In our analyses, both a faculty member's graduate programme and institution reputation had positive benefits associated with his or her career, but each in different ways. We anticipated finding that graduate education had quantifiable effects particularly for the human capital, screening, and prestige benefits accrued. But surprisingly the influences of programme and institutional reputation varied across the career measures we considered here.

Graduate programme reputation, in our study, had a sizeable influence on the type of institution where an academic found employment. Recall that in comparison to graduates from lower-ranked programmes, faculty members who graduated from higher-ranked programmes were about 29% more likely to work at a Research I institution than at a liberal arts institution and least likely to work at a master’s comprehensive institution. That is, graduates from higher-ranked programmes were less likely than graduates from lower-ranked programmes to experience down-placement in the Carnegie classification in hiring. Although this finding is consistent with studies in economics (Laband 1985), management (Bedeian and Feild 1980), and sociology (Burris 2004), graduates from top programmes in our study are not necessarily, on average, more productive in research than those who have attended less reputable programmes.

Our study’s finding on research productivity calls into question whether top programmes impart more human capital than others, or select students who are more likely to be productive. Alternatively, there may be less variance among those who find employment in academe, implying that faculty members from lower-tier programmes could overcome disadvantages of pedigree by out-producing their peers from higher-tier programmes and thus signalling to the labour market their skills and abilities. The strongest graduates from top programmes do not necessarily pursue academic careers (Finkelstein et al. 2016), which leaves the next tier of graduates for academe and compresses the labour market and any observed differences among the pool of professors. Meanwhile, collapsed labour markets could limit the research productivity of faculty members by restricting their initial placement in the Carnegie classification (e.g. professors take whichever jobs are available wherever they may find them) as well as future mobility to research-intensive institutions. Yet research productivity is also connected to the human capital that faculty members develop on the job as they work within the incentives and reward...
systems of their campuses and disciplines and fields (Melguizo and Strober 2007). Likewise, the salary advantage of graduates of top programmes appears an artefact of where they work, perhaps due to the indirect influence of top programmes on securing academic employment in more research-intensive and better resourced institutions.

We found very little connection between institutional reputation and the type of university or college for first academic job. This could be due to the fact that academic hiring occurs at the departmental level, where search committees are likely familiar with reputation of programmes in their fields regardless of where the programmes are housed. Curiously, there was a positive outcome of graduating from a top institution on research productivity even after controlling for programme reputation and time allocation. Highly reputable institutions are the most research-intensive (O’Meara 2007), and they could have infrastructure and opportunities across programmatic areas to help graduate students train and develop as scholars. Yet the name of one’s institution – not department or programme – is typically linked to authorship in journals and books, suggesting potential signalling benefits from institutional pedigree and credentials. After controlling for all of the other factors in our model, we found that graduates from top institutions still earned significantly more than others. This result could reflect the involvement of institutional leaders (e.g. provosts, deans, associate deans, etc.) in approving tenure lines and salaries, if they are more familiar with institutional rather than departmental reputation. It could also suggest that top recruits have offers from other institutions to leverage for higher salaries.

The distribution of some of the benefits for faculty members from graduate programme and institution reputation is uneven based on particularistic factors. For example, our analysis revealed differences in hiring and salary outcomes by gender. We found that female faculty members were more likely than male faculty members to receive down-placements in the academy (e.g. finding employment at less prestigious and more teaching-intensive institutions), and they earned lower salaries, on average, than male colleagues even when we controlled for graduate programme and institution reputation. These gender gaps could be attributed to longstanding segmentation in the academic labour market (Bellas and Toutkoushian 1999; Toutkoushian, Bellas, and Moore 2007), such that fields with high proportions of female faculty members (arts, humanities, and social sciences) are relatively low-resourced and at teaching-intensive institutions while fields with predominantly male faculty members (science and engineering) are typically well-resourced and at research-focused universities (e.g. Perna 2003; Umbach 2007).

Strikingly, we found that, graduate programme and institution reputation held constant, Black faculty members had about 15 fewer career publications than White faculty members. This finding lends support to prior research indicating that academic reward systems may not fully count or give credit for the work and careers that some scholars of colour pursue, such as engaging more in teaching, student mentoring, and service activities and researching social justice and inequality and publishing on these issues in less mainstream academic journals (e.g. Jayakumar et al. 2009). The broadening of access for underrepresented students to top graduate programmes and institutions is important in light of campus and departmental goals of equity and diversity (Posselt 2014); however, as our analysis suggests, race/ethnicity, analogous to gender, is associated with limits on the type and magnitude of labour market outcomes for faculty members from graduate programme and institution reputation.

There are several limitations to our study. The NSOPF survey was administered in 2004, suggesting that some empirical results in our analysis might be different among recently-employed faculty members. However, these data constitute the most current nationally-representative sample available to researchers in the U.S. (for a related discussion, see Finkelstein et al. 2016, 472–473). What is more, many of these same individuals are still employed in academe, and reputations of programmes (Toutkoushian et al. 1998) and institutions (Bastedo and Bowman 2010; Kim and Bastedo 2017) change very slowly over time. Another limitation is that our study only includes individuals who worked in programmes and institutions that match data collected by NRC. Nonetheless, our coverage of fields is fairly broad and wider than most prior studies in the literature.

Methodologically, the relationships we observe between graduate programme and institutional reputation and academic careers are not causal per se. Graduate students are not randomly assigned
to programmes and institutions, and it is likely that, on average, higher ability students enrol in higher-ranked programmes and institutions. If these students entered graduate education with more ability and human capital, their labour market benefits would not be solely attributable to where they attended graduate school. Alternative experimental research designs are needed to help isolate the effects of the graduate programme or institution from the effects of the students who enrol in these institutions and programmes.

Thus a number of questions cannot be adequately addressed with the data in our study. For example, we cannot examine the impact that graduate training has on whether someone is able to even secure an academic position in the first place. More reputable graduate programmes and institutions are perhaps more successful at placing graduates in academic positions, and thus the distribution of graduates who enter the professoriate may vary by prestige as well. As noted earlier, one might expect fewer differences among graduates who become faculty members than would appear for the larger graduate population. Such an analysis, in the U.S., may be possible through the restricted-use version of the National Science Foundation’s Survey of Earned Doctorates, but this data-set does not include crucial information on the initial sorting of students into graduate programmes. Nonetheless, it is still important to examine the specific labour market experiences and outcomes for those individuals who become faculty members and how their outcomes are related to graduate training. Finally, we do not examine the growing population of full-time and part-time non-tenure track (e.g. contingent) faculty members. It would be important to study how graduate training is related to the types of appointments graduates can secure – and whether graduate training has prepared them for their careers.

**Conclusion**

Our study suggests that a combination of graduate programme and institution reputation differentiates pay-offs for faculty members. At the same time, this analysis also indicates the ways in which labour market dynamics for disciplines and fields (e.g. the window into the academy) as well as particularistic factors such as gender and race/ethnicity could delimit the range and magnitude of benefits for faculty members in the sample. Several emerging conditions in the U.S. may intensify these asymmetries in the professoriate in the years ahead.

For example, the number of full-time, tenure-track positions is shrinking nationally and constitutes less than half of all current academic appointments. On the heels of economic recession from the market crash of 2008 and ongoing retrenchment of public funding for higher education, private institutions and departments are gaining notable resource advantages over their public counterparts that are financially constrained. Amid governmental calls for accountability, and campus-level agendas to advance in rankings and prestige (O’Meara 2007), institutions in both sectors are working to enhance perceptions of quality, performance, and reputation (though such perceptions and measures for public institutions can be tied to their core funding). The competition across sectors, institutions, departments, and faculty members will likely heighten, strengthening the importance associated with signals of prestige and status but prompting further disequilibria in the academy (e.g. Hearn, Warshaw, and Ciarimboli 2016).

But should prospective students who aim to join the professoriate, as they strategise for the labour market within a contemporary context (e.g. Tomlinson 2007), decide where to attend graduate school based on programme and/or institutional reputation? The results in our analyses represent average relationships for faculty members in the study sample, and it remains unclear how much of the benefits from graduate programme and institution attended are due to human capital, screening, and/or prestige-maximisation. With shifting job prospects in academe that increase the likelihood of down-placement, a number of top-rated departments and institutions are changing how they prepare graduates for the professoriate. At Stanford University, the Office of the Vice Provost for Graduate Education offers training for students to ‘experience faculty life first-hand at a comprehensive, teaching-focused university or a community college’ (Stanford University n.d., para. 1). As such an initiative suggests, prestige does not guarantee that graduates who seek careers in academe or among the elite will secure what they want; efforts to improve the quality and depth of training may prepare them for what they get.
Acknowledgment

An earlier version of this paper was presented at the annual meeting of the American Educational Research Association in Philadelphia, Pennsylvania, USA, April 2014. The authors gratefully acknowledge the helpful comments of Nick Hillman and the editor and anonymous reviewer for this journal.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Jarrett B. Warshaw is an assistant professor of higher education in the Department of Educational Leadership and Research Methodology at Florida Atlantic University. His research focuses on postsecondary organisation, finance, and policy, with an emphasis on change, adaptation, and innovation at the system and campus levels. He has written on innovation in and the financial futures of liberal arts colleges, public policy and emerging organisational forms in research universities, and roles and boundaries of faculty and administrators in various institutional and resource contexts.

Robert K. Toutkoushian is a professor of higher education in the Institute of Higher Education at the University of Georgia. He specialises in the application of economics and statistics to a wide range of problems and issues in higher education. Topics on which he has written include higher education finances, student demand for higher education, and faculty compensation. In addition to his faculty appointment, Professor Toutkoushian serves as the editor of the journal Research in Higher Education.

Hyejin Choi is a doctoral student of higher education in the Institute of Higher Education at the University of Georgia. Her research interests include various topics on international higher education, institutional research and data visualisation. She previously worked as a research analyst in the Institutional Research Office at the University of Georgia.

References


# Appendix 1. Definition of variables.

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Salary</td>
<td>Base salary</td>
</tr>
<tr>
<td>Career Journal Article Publication</td>
<td>Number of career articles in refereed journals</td>
</tr>
<tr>
<td>Books</td>
<td>Number of career books and textbooks</td>
</tr>
<tr>
<td>Book Chapters</td>
<td>Number of career book chapters, book reviews, and creative works</td>
</tr>
<tr>
<td>1993 NRC Graduate Program Ratings (Rating 0 to 5)</td>
<td></td>
</tr>
<tr>
<td>Top Tier Programme</td>
<td>Average rating for the graduate programme is 4 or higher</td>
</tr>
<tr>
<td>Middle Tier Programme</td>
<td>Average rating for the graduate programme is between 3.00 and 3.99</td>
</tr>
<tr>
<td>Lowest Tier Programme</td>
<td>Average rating for the graduate programme is between 0 and 2.99</td>
</tr>
<tr>
<td>Reputation Unknown</td>
<td>Graduate programme was not rated by NRC</td>
</tr>
<tr>
<td>1993 U.S. News &amp; World Report Rankings (Top 25)</td>
<td></td>
</tr>
<tr>
<td>Top 25 Graduate IHE</td>
<td>1 if a faculty member's graduate institution belonged to U.S. News &amp; World Report Top 25, else 0</td>
</tr>
<tr>
<td>Hours Worked per Week</td>
<td>Average number of hours spent on work per week</td>
</tr>
<tr>
<td>Percent of Time on Research</td>
<td>Percent of time spent on research activities</td>
</tr>
<tr>
<td>Percent of Time on Teaching</td>
<td>Percent of time spent on instruction (undergraduate, graduate/first-professional)</td>
</tr>
<tr>
<td>Percent of Time on Other Activities</td>
<td>Percent of time spent on other unspecified activities</td>
</tr>
<tr>
<td>Years of Experience</td>
<td>Years of experience as a faculty member</td>
</tr>
<tr>
<td>Age</td>
<td>Age in 2004</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1 if race/ethnicity of the faculty member is Hispanic, else 0</td>
</tr>
<tr>
<td>Black</td>
<td>1 if race/ethnicity of the faculty member is African-American, else 0</td>
</tr>
<tr>
<td>White</td>
<td>1 if race/ethnicity of the faculty member is non-Hispanic White, else 0</td>
</tr>
<tr>
<td>Other Race</td>
<td>1 if race/ethnicity of the faculty member is other than Hispanic, African-American, or White, else 0</td>
</tr>
<tr>
<td>Female</td>
<td>1 if female, else 0</td>
</tr>
<tr>
<td>Full Professor</td>
<td>1 if the faculty is a full professor, else 0</td>
</tr>
<tr>
<td>Associate Professor</td>
<td>1 if the faculty is an associate professor, else 0</td>
</tr>
<tr>
<td>Assistant Professor</td>
<td>1 if the faculty is an assistant professor, else 0</td>
</tr>
<tr>
<td>Graduate Training Academic Department</td>
<td></td>
</tr>
<tr>
<td>Performing Arts</td>
<td>1 if the Highest Degree Field of the faculty member is Visual and Performing Arts, else 0</td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>1 if the Highest Degree Field of the faculty member is Biological &amp; biomedical sciences, else 0</td>
</tr>
<tr>
<td>Information Science</td>
<td>1 if the Highest Degree Field of the faculty member is Computer/Information Science and Support-Technology, else 0</td>
</tr>
<tr>
<td>Engineering</td>
<td>1 if the Highest Degree Field of the faculty member is Engineering, Technologies/Technicians, else 0</td>
</tr>
<tr>
<td>Literature</td>
<td>1 if the Highest Degree Field of the faculty member is English Language and Literature/Letters, else 0</td>
</tr>
<tr>
<td>Mathematics</td>
<td>1 if the Highest Degree Field of the faculty member is Mathematics and Statistics, else 0</td>
</tr>
<tr>
<td>Philosophy</td>
<td>1 if the Highest Degree Field of the faculty member is Philosophy, Religion, and Theology, else 0</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>1 if the Highest Degree Field of the faculty member is Physical Sciences, else 0</td>
</tr>
<tr>
<td>Psychology</td>
<td>1 if the Highest Degree Field of the faculty member is Psychology, else 0</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>1 if the Highest Degree Field of the faculty member is Social sciences (except psychology) and History, else 0</td>
</tr>
<tr>
<td>Hiring Institution</td>
<td></td>
</tr>
<tr>
<td>Region 1</td>
<td>1 if the geographic location of employing universities/colleges of the faculty is East Coast, else 0</td>
</tr>
<tr>
<td>Region 2</td>
<td>1 if the geographic location of employing universities/colleges of the faculty is Midwest, else 0</td>
</tr>
<tr>
<td>Region 3</td>
<td>1 if the geographic location of employing universities/colleges of the faculty is South- west, else 0</td>
</tr>
<tr>
<td>Region 4</td>
<td>1 if the geographic location of employing universities/colleges of the faculty is West Coast, else 0</td>
</tr>
<tr>
<td>Public IHE</td>
<td>1 if the hiring institution is public, 0 for public, non-profit, non-for profit</td>
</tr>
<tr>
<td>Unionized IHE</td>
<td>1 if the faculty is a member of union or other bargaining association that is legally recognised to represent faculty at employing institution</td>
</tr>
<tr>
<td>1994 Carnegie Classification Categories</td>
<td></td>
</tr>
<tr>
<td>Research IHE</td>
<td>1 if the hiring institution is Research I, else 0</td>
</tr>
<tr>
<td>Doctoral IHE</td>
<td>1 if the hiring institution is Research II, Doctoral I, or Doctoral II, else 0</td>
</tr>
<tr>
<td>Comprehensive IHE</td>
<td>1 if the hiring institution is Master's I or Master's II, else 0</td>
</tr>
<tr>
<td>Liberal Arts IHE</td>
<td>1 if the hiring institution is Baccalaureate I or Baccalaureate II, else 0</td>
</tr>
</tbody>
</table>