Gender Differences in Salary and Promotion for Faculty in the Humanities 1977–95

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ABSTRACT

This study uses data from the Survey of Doctorate Recipients to evaluate gender differences in salaries and promotion for academics in the humanities. Over time, gender salary differences can largely be explained by academic rank. Substantial gender differences in promotion to tenure exist after controlling for productivity and demographic characteristics. However, we observe a slight decline in the gender promotion gap for the most recent cohort evaluated. On the basis of this evidence, we conclude that gender discrimination for academics in the humanities tends to operate through differences in promotion, which in turn affects wages.

I. Introduction

In his examination of the salaries and appointments of men and women in academia, the Director of Research at the American Association of University Professors (AAUP) observes: ''Substantial disparities in salary, rank, and tenure between male and female faculty persist despite the increasing proportion of women

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in the academic profession'' (Benjamin 1999). While the evidence presented by AAUP is striking, the gender comparisons of salaries do not control for characteristics that contribute to pay differentials such as academic field or publication record. Likewise, the AAUP combines part-time and full-time academics in its analysis of rank, implicitly assuming no gender differences in preferences for full-time employment. Furthermore, characteristics that affect salaries including publications, field of study, and employer characteristics will likely affect both academic rank and salary. Disentangling the causes of gender disparities in salary and promotion requires an in-depth examination of the relationship between the two. In this paper we examine gender differences in employment outcomes for academics in the humanities. Our study finds negligible gender salary differences within rank and substantial gender promotion differences.

Most studies of gender differences in academic employment outcomes consider only salaries. In a recent survey of that literature, Ransom and Megdal (1993) indicate that the salary gap has fallen considerably pre- and post-1972. Studies using national surveys and including publication information in the analysis (Ferber and Kordick 1978; Barbezat 1987, 1989a, 1989b; Ransom and Megdal 1993) find that the pre-1972 gap ranges from 12 to 17 percent. The post-1972 gap is narrower, 5 to 12 percent.

The literature contains far fewer studies of gender differences in academic promotion. Long, Allison, and McGinnis (1993) examine the promotion of biochemistry doctorates working in academia who received their Ph.D. between 1956 and 1967. Using a discrete time-proportional hazards model, they find that women are 10 percent less likely to be promoted than men. Kahn (1993, 1995) uses the Survey of Doctorate Recipients to compare promotion of academic economists by gender, finding that women take longer to be promoted than men. A study by Broder (1993) explicitly models the endogeneity of rank, department affiliation, and publications. Using data from National Science Foundation Economics Program grant proposal applications, she reports significant gender difference among older cohorts. The gender gap is not evident for her sample of assistant professors. McDowell, Singell, and Ziliak (1999, 2001) examine the promotion probabilities of academic economists, finding that women are less likely to be promoted than comparable men. However, they also find evidence that promotion probabilities for women are improving over time. Finally, Ginther and Hayes (1999) evaluate the career paths of academics in the humanities, showing the majority of the gender salary differential in 1993 can be explained by academic rank. Their analysis also shows significant differences in the duration to promotion to tenure by gender.

This study uses data on individuals in the humanities from the Survey of Doctorate Recipients in order to evaluate gender differences in salaries and promotion probabilities over time. Our study focuses on academics in the humanities for a number of reasons. First, academia is the largest employer of humanities doctorates; in 1995, 80 percent of humanities doctorates were employed by educational institutions, compared with 49 percent of science and social science doctorates (Brown and Henderson 1998; Ingram and Brown 1997). Second, women are more likely to receive their doctorate in the humanities than in the sciences; in 1995, 35 percent of humanities doctorates were women compared to 22 percent of science doctorates (Brown and Henderson 1998; Ingram and Brown 1997). Third, the Survey of Doctorate Recipi-

ents contains detailed information on academic productivity (publications) in the humanities. These data are not consistently available for the sciences. Finally, the Survey of Doctorate Recipients contains detailed information on demographic and employer characteristics, along with measures of promotion and salaries, allowing the researcher to compare academic salary and promotion differentials.

Our study finds differences in salary and promotion outcomes by gender using three methods: A salary decomposition is used to examine gender pay differentials. Binary choice models and duration analysis are used to estimate the probability of promotion to tenure. Over time, gender salary differences can be explained by academic rank: the gender salary gap is not significantly different from zero within all academic ranks in 1995. However, substantial gender differences in promotion to tenure exist after controlling for productivity and demographic characteristics. On the basis of this evidence, we conclude that gender discrimination for academics in the humanities tends to operate through differences in promotion. The remainder of the paper is organized as follows: Section II describes the data, Section III details the empirical methodology, Section IV evaluates the empirical results, and Section V concludes.

II. The Data

This study uses data from the 1977–95 waves of the Survey of Doctorate Recipients (SDR). The SDR is a biennial, longitudinal survey of doctorate recipients from U.S. institutions conducted by the National Research Council. The SDR collects detailed information on doctorate recipients including demographic characteristics, educational background, primary work activity, employer characteristics, and salary. The SDR has undergone substantial changes between the 1977 and 1993 waves (Mitchell, Moonesinge, and Cox 1998). Technical reports provided by National Science Foundation have allowed us to construct cross-sectional and longtudinal samples with consistent variable definition over time.[1]

We have selected two samples of doctorates in the humanities in order to examine salary and promotion differentials by gender. The first data we analyze, the cross-sectional samples, are repeated cross-sections of tenured individuals or those on the tenure track for each survey year from 1977 to 1995. To qualify as being tenured or on the tenure track, individuals in this sample must report consistent tenure status and rank (assistant, associate, or full professor).[2] In addition, these individuals must be employed at an institution classified as research, doctorate granting, comprehensive, or liberal arts by the Carnegie Foundation for the Advancement of Teaching. We also select individuals working full-time with salaries greater than $10,000. We impose these restrictions in order to evaluate changes in the gender salary gap for permanent academic employees.

Our second data set, the longitudinal sample, includes individuals who received

1. A data appendix available from the authors by request evaluates the impact of sample frame changes on the estimated results. The appendix also discusses variable definitions.

2. Tenure track status is imputed in the 1977 survey as the rank of assistant, associate, or full professor. In the remaining survey years, tenure and tenure track status are reported.

their Ph.D.s between the years of 1975 and 1989 and who meet additional restrictions. This sample is restricted to individuals who at some point are observed on the tenure track while also being in the survey at least seven years after receiving their Ph.D. Individuals are excluded from the sample if they are not observed more than once in the SDR or if they skip more than three surveys and do not report the year they received tenure. This sample is used to evaluate promotion to tenure.

The sample selection criteria used in the longitudinal sample could potentially lead to selection and attrition biases. By selecting individuals who at some point have tenure track jobs, we only observe academic ''success.'' If there is gender discrimination in obtaining a tenure track job—where women need to have outstanding qualifications to receive an appointment—this could result in the average quality of women on the tenure track being higher than the average quality of men. In turn, this selected sample could lead to biased estimates that understate the true gender differences in promotion. In addition, it could be that those who leave the tenure track are more likely to leave the sample. However, the SDR follows individuals regardless of whether they are employed in academia.

Ideally, when using this sample we would estimate the duration until promotion conditional on starting with a tenure-track academic job. However, this is not possible given the biennial design, changes in the survey questionnaire, changes in the sampling frame, changes that eliminate individuals from the survey, and the numerous individuals who skip survey years. We modify the data and analytical approach in order to account for these problems.

We construct the longitudinal sample using information from every year that an individual has a valid survey. Since we do not observe the exact year an individual enters the tenure track, we estimate the duration until promotion to tenure after receiving the doctorate. Using the 1977 through 1991 surveys, we observe the exact tenure year. After 1991, we impute tenure year as the year an individual first reports being tenured in the subsequent surveys. Thus, for the most recent cohort, imputed duration until promotion may be longer than the actual duration. Even though we have to impute tenure year for the later surveys, this is a better measure of promotion than changes in rank because we can only observe rank changes every other year. Time-varying covariates such as employer characteristics, marital status, and primary work activities are measured as the proportion of time an individual is observed in the sample meeting a given condition. For example, the variable proportion of time employed at a top college is defined as the number of times we observe an individual working at a top-tier Carnegie ranked four year or liberal-arts college divided by the total years this person is observed in the survey.

Our study focuses on the humanities because the SDR contains detailed measures of professional productivity in these fields, and women with doctorates are more prevalent in the humanities than the sciences.[3] Academic disciplines in the humanities are grouped into the following fields: history, performing arts, philosophy, English, languages, and other humanities.

Even though academic productivity is available for those in the humanities, it is measured with error for the purposes of the promotion estimates. When individuals

3. The SDR measures publications for doctorates in Science and Engineering disciplines in 1983 and 1995 only.

receive tenure, their cumulative publication record is evaluated. We do not observe an individual's cumulative publication record because the SDR only began collecting productivity information for individuals in the humanities starting with the 1983 survey, allowing us to quantify productivity for individuals between 1981 and 1995.[4] In order to estimate the effect of productivity on promotion, we use these limited observations on publications to create average measures of productivity over an individual's career, obtained by dividing the sum of the observed productivity measure by years of experience in the last year observed. In doing so, we assume that an individual's productivity is roughly constant over their career.[5]

These average measures of productivity are measured with error and will potentially bias estimates of the effect of productivity on promotion.[6] In addition, assuming constant productivity over an individual's career is likely erroneous. In the humanities, books are weighted more heavily than articles in promotion decisions, and books are more likely to appear early in an academic's career because of promotion considerations.[7] Furthermore, academics in the performing arts tend to exhibit or perform their work and this activity is included in a category for ''other publications.'' The other publications category is available starting with the 1987 survey. Although there are problems with the accurate measurement of productivity, omitting this information from promotion estimates will also cause problems, resulting in omitted variable bias. Given the need to ''publish or perish'' in academia, controlling for publications and productivity is crucial to our understanding of the promotion process; thus average productivity variables are included in these estimates.

Table 1 lists the descriptive statistics for the variables used in the pooled cross-sectional Samples. Comparing the natural logarithm of real salaries, men earn 10 percent more on average than women.[8] Women are less likely to be married or have children; they have fewer children as well. Women have fewer years of experience and are more prevalent in the lower ranks; they are also likely to be tenured than men in the humanities. Women are less likely to be employed at universities while being more likely to receive government support. Both men and women report primary work as teaching in the humanities. Men and women are evenly matched in terms of productivity with the exception of reviews, where men write more reviews than women. The three most prevalent fields for men and women are the same: English, languages, and performing arts.

Table 2 contains descriptive statistics by gender for the longitudinal sample. Women in the sample take longer to be promoted and are less likely to be promoted than men in the sample, while having the same number of years' experience. As mentioned previously, productivity is averaged over the individual's career. We find

4. The SDR did not ask productivity questions in the 1985 survey.

5. Evidence on career productivity profiles is limited. McDowell (1982) uses data on the number of publications over the careers of men and women in English and history. Although this is dated information, evidence from these two fields indicates no significant gender differences in productivity as a function of age. However, productivity is not constant over an individual's career.

6. In OLS estimates, coefficients on productivity will be biased toward zero; the effect of measurement error on multivariate probit and duration model estimates is difficult to determine.

7. Evidence from McDowell (1982) shows that productivity for his sample of academics in English and history peaks around age 40.

8. Nominal salaries are deflated using the Personal Consumption Expenditure implicit price deflator with 1992 as the base year.

Table 1
Descriptive Statistics: Means and Standard Deviations, 1977–95 Survey of Doctorate Recipients, Pooled Cross-Sectional Samples[a]

Variable	Female	Male	Variable	Female	Male
Log salary	10.657	10.759	Employed at	0.439	0.479
	(0.298)	(0.306)	University	(0.496)	(0.500)
Age	46.100	47.299		(0.496)	(0.500)
	(9.192)	(9.086)	Other institution	0.028	0.028
African American	0.068	0.050		(0.164)	(0.165)
	(0.251)	(0.219)	Government support	0.088	0.077
Other race	0.039	0.032		(0.283)	(0.267)
	(0.193)	(0.177)	Primary activity		
Foreign born	0.175	0.169	Research	0.068	0.086
	(0.380)	(0.375)		(0.251)	(0.281)
Married = 1[b]	0.497	0.749	Teaching	0.829	0.794
	(0.500)	(0.434)		(0.377)	(0.405)
Number of children[c]	0.412	0.745	Management	0.081	0.097
	(0.755)	(1.051)		(0.272)	(0.296)
Child = 1	0.285	0.423	Other	0.023	0.023
	(0.452)	(0.494)		(0.150)	(0.150)
Young child = 1	0.110	0.155	Publications[d]		
	(0.312)	(0.362)	Articles	1.131	1.259
Experience	11.665	14.051		(1.921)	(2.427)
	(9.128)	(8.863)	Books	0.355	0.400
Ph.D. from top tier	0.782	0.808		(1.317)	(0.862)
institution	(0.413)	(0.394)	Chapters in books	0.478	0.456
Ph.D. from second tier	0.103	0.100		(1.049)	(1.116)
institution	(0.304)	(0.301)	Reviews	0.882	1.098
Assistant professor	0.317	0.203		(2.064)	(2.721)
	(0.465)	(0.402)	No publications	0.243	0.248
Associate professor	0.390	0.351		(0.429)	(0.432)
	(0.488)	(0.477)	Field of study		
Full professor	0.293	0.446	History	0.138	0.165
	(0.455)	(0.497)		(0.344)	(0.371)
Tenured	0.693	0.808	Performing arts	0.144	0.184
	(0.461)	(0.394)		(0.352)	(0.388)
Employed at			Philosophy	0.087	0.133
Top college	0.409	0.368		(0.282)	(0.340)
	(0.492)	(0.482)	English	0.227	0.181
Top university	0.300	0.332		(0.419)	(0.385)
	(0.458)	(0.471)	Languages	0.289	0.254
Private institution	0.393	0.382		(0.453)	(0.435)
	(0.488)	(0.486)	Other humanities	0.115	0.082
Liberal arts college	0.534	0.493		(0.319)	(0.274)
	(0.499)	(0.500)	Sample size	13,668	21,618

a. The cross-sectional samples include all individuals working full-time, earning at least $10,000 per year in 1992 dollars, with tenure or on the tenure track at an institution classified as research, doctorate granting, comprehensive, or liberal arts by the Carnegie Foundation for the Advancement of Teaching.
b. 12,287 female observations; 18,106 male observations.
c. For all children variables 8,010 female observations; 12,091 male observations.
d. For all productivity variables 7,937 female observations; 11,945 male observations.

Table 2
Descriptive Statistics, 1977–95 Survey of Doctorate Recipients, Longitudinal Sample[a]

Variable	Female	Male	Variable	Female	Male
Years to promotion[b]	6.527	6.106	Proportion of time spent		
	(3.495)	(3.522)	Unranked	0.071	0.061
Tenured	0.713	0.793		(0.169)	(0.154)
	(0.453)	(0.406)	Unemployed	0.025	0.012
Age in 1995	50.061	49.194		(0.090)	(0.055)
	(7.677)	(6.801)	Nonacademic job	0.062	0.066
African American	0.090	0.061		(0.166)	(0.177)
	(0.286)	(0.239)	Average publications		
Other race	0.058	0.033	Articles	0.321	0.366
	(0.235)	(0.180)		(0.478)	(0.486)
Foreign born	0.147	0.149	Books	0.089	0.110
	(0.354)	(0.356)		(0.140)	(0.189)
Proportion of years married	0.530	0.711	Chapters in books	0.127	0.126
	(0.433)	(0.372)		(0.238)	(0.231)
Children	0.442	0.640	Reviews	0.230	0.297
	(0.497)	(0.480)		(0.430)	(0.540)
Proportion of years with children younger than six	0.107	0.176	Other publications	0.215	0.413
	(0.221)	(0.263)		(0.862)	(1.077)
Work experience 1995	15.317	15.281	No publications	0.145	0.104
	(4.371)	(4.482)		(0.353)	(0.305)
Proportion of career working at			Field of study		
Private institution	0.388	0.422	History	0.134	0.149
	(0.434)	(0.451)		(0.340)	(0.356)
Liberal arts/college	0.448	0.471	Performing arts	0.157	0.197
	(0.433)	(0.444)		(0.364)	(0.398)
University	0.418	0.402	Philosophy	0.092	0.180
	(0.431)	(0.441)		(0.289)	(0.384)
Proportion of primary work as			English	0.233	0.171
				(0.423)	(0.377)
Research	0.087	0.102			
	(0.179)	(0.203)	Languages	0.258	0.234
Teaching	0.775	0.758		(0.438)	(0.423)
	(0.280)	(0.295)	Other humanities	0.126	0.069
Management	0.071	0.087		(0.333)	(0.254)
	(0.173)	(0.191)	Ph.D. 1975–79	0.578	0.569
Other activity	0.067	0.052		(0.494)	(0.495)
	(0.148)	(0.136)	Ph.D. 1980–89	0.422	0.431
Government support over career	0.098	0.095		(0.494)	(0.495)
	(0.175)	(0.175)	Sample size	1,265	1,317
Number of employers	1.655	1.628			
	(0.968)	(0.910)			

a. The Longitudinal Sample includes individuals who receive their doctorates between 1975 and 1989 who at some point report working in academia in a tenure track job at an institution classified as research, doctorate granting, comprehensive or liberal arts by the Carnegie Foundation for the Advancement of Teaching.
b. 902 female observations; 1,043 male observations.

a small gender gap in average productivity consistent with that reported recently in *The Chronicle of Higher Education* (Schneider 1998). In order to evaluate changes in promotion by gender over time, longitudinal sample is divided into two cohorts defined by the year an individual received their Ph.D.

III. Empirical Methodology

The study begins with an evaluation of the gender wage structure. Wage regressions are estimated as a function of demographic characteristics, academic background, employer characteristics, and academic productivity. The analysis continues by evaluating salary differentials using a salary decomposition developed by Oaxaca (1973) where the salary gap can be characterized as follows:

$$(1) \quad \ln(\bar{w}_m) - \ln(\bar{w}_f) = \Delta\bar{X}'\beta_m + \bar{X}_f'\Delta\beta$$

Let $\Delta\bar{X} = \bar{X}_m - \bar{X}_f$ be the difference in average endowments and $\Delta\beta = \beta_m - \beta_f$ be the differences in estimated coefficients (salary structure), the term that accounts for the effect of discrimination.

In order to interpret coefficient differences as discrimination researchers must make several assumptions. First, one assumes that in the absence of discrimination, the coefficients would be the same for men and women. Second, the model must contain all relevant explanatory variables. If some relevant variables are omitted, then one cannot definitively argue that coefficient differences are due to discrimination. Third, researchers much choose the nondiscriminatory salary structure. In Equation 1 we implicitly assume that the male coefficients represent the nondiscriminatory salary structure.[9] However, discrimination may operate by conferring unfair advantage in the form of nepotism to men and unfair disadvantage in the form of discrimination to women. Thus, the male salary structure may not represent the salary that would prevail in the absence of discrimination. Researchers including Neumark (1988) and Oaxaca and Ransom (1994) suggest using a weighted average of the male and female wage structure (a pooled method) to proxy for the unobserved nondiscriminatory wage.

Although using the pooled method may correct for the combined effects of nepotism and discrimination, it requires additional assumptions about the unobserved nondiscriminatory wage and the weighting mechanism used to obtain it. Even if the pooled approach provides an accurate estimate of the nondiscriminatory wage structure, it cannot account for the competitive wage structure that would have prevailed had discrimination never existed (Oaxaca and Ransom 1994). Finally, the pooled approach is not likely to be used in legal cases concerned with discrimination. Oaxaca and Ransom observe (1994, p. 18): ''In effect U.S. law leans toward the adoption of the white or male wage structure as the norm.''

Instead of using the pooled method to estimate the nondiscriminatory salary structure, we use the male salary structure as the norm that would occur in the absence of discrimination. Men are the comparison group used almost exclusively in legal proceedings of gender discrimination. In addition, using the male wage structure as

9. The researcher may also assume that the female coefficients represent the underlying salary structure.

the norm does not require estimation of the unobserved counterfactual wage structure. Thus, the coefficient estimates attributable to discrimination in this study may reflect both male advantage and female disadvantage. As such, they may overstate the true effect of discrimination.

The study continues by evaluating gender differences in promotion using the longitudinal sample and two empirical methods. First, we estimate probit models in order to determine whether significant differences exist in the probability of promotion by gender. Second, duration models are used to estimate the conditional probability of promotion to tenure given the individual has survived untenured.

Duration to tenure is modeled using the proportional hazards model. The hazard function gives the instantaneous risk that promotion to tenure will occur at year t, where the hazard of promotion $h_i(t)$ is a function of the baseline hazard $\lambda_o(t)$ and covariates, x in Equation 2.

$$(2) \quad h_i(t) = \lambda_o(t)\exp\{\beta_1 x_{i1} + \cdots + \beta_k x_{ik}\}$$

The baseline hazard function is left unspecified and can be interpreted as the hazard function for an individual whose covariates all equal zero. The covariates in Equation 2 influence the scale of the hazard rate and are not a function of time. Additional covariates used in this analysis include demographic and employer characteristics, employment background, primary work activity, and productivity.

IV. Empirical Results

A. Estimates of the Gender Salary Structure in the Humanities

Our analysis begins by estimating the underlying gender salary structure in the humanities using the cross-sectional samples. The data for each year of the cross-sectional samples are pooled in order to evaluate the effect of demographic and employer characteristics and academic productivity on wages. We estimate three specifications that progressively add more controls in order to evaluate whether significant gender differences in the coefficients exist, and the relative contribution of these coefficient differences to the pay gap. We take this approach in order to account for the various factors that influence academic salaries. By having a comprehensive list of controls in the salary regressions, we are better able to interpret differences in coefficient estimates by gender as resulting from discrimination. The parameters of interest are reported in Table 3.[10]

Model 1 in Table 3 investigates the effect of demographic characteristics on salaries in the humanities. This specification serves as a baseline estimate of the gender salary difference with variables that are not subject to the preferences or performance

10. All specifications include dummy variables for Ph.D. cohort, survey year, and humanities field. In Model 1 the natural logarithm of real wages is regressed on a constant, age in the survey year, dummies for African American, other race, and a quadratic in work experience since Ph.D. Model 2 includes all the variables in Model 1 with the addition of rank, doctorate quality, employer quality, employer type, government support, and primary work activity. Model 3 includes all of the variables in Model 2 plus marital status, children, and productivity. Model 3 is estimated on a subsample of the data from the years 1989–95 because children, marital status, and productivity are not available in all survey years. Standard errors are clustered on individual because the data contains multiple observations on some individuals.

Table 3
Estimates of the Gender Wage Structure in the Humanities, 1977–95 Survey of Doctorate Recipients, Pooled Cross-Sectional Samples[a]

	Model 1		Model 2		Model 3	
Variable	Male	Female	Male	Female	Male	Female
Age	0.0013**	0.0005	−0.0001	−0.0001	−0.0001	−0.0003
	(0.0005)	(0.0005)	(0.0004)	(0.0004)	(0.0008)	(0.0007)
African American	0.0902**	0.0753**	0.0523**	0.0541**	0.0257	0.0603**
	(0.0135)	(0.0152)	(0.0113)	(0.0128)	(0.0191)	(0.0217)
Other race	0.0151	0.0024	0.0006	0.0059	−0.0160	0.0194
	(0.0174)	(0.0152)	(0.0168)	(0.0120)	(0.0335)	(0.0161)
Foreign born	0.0072	0.0193*	0.0103	0.0145*	−0.0091	0.0092
	(0.0092)	(0.0078)	(0.0079)	(0.0064)	(0.0136)	(0.0107)
Married = 1					−0.0025	0.0021
					(0.0104)	(0.0098)
Child = 1					0.0062	0.0075
					(0.0116)	(0.0082)
Young child = 1					0.0045	−0.012
					(0.0138)	(0.0094)
Experience	0.0285**	0.0278**	0.0139**	0.0101**	0.0143**	0.0083**
	(0.0021)	(0.0017)	(0.0019)	(0.0014)	(0.0037)	(0.0018)
Experience squared	−0.0003**	−0.0003**	−0.0001**	−0.0001**	−0.0001**	−0.0001**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Ph.D. from top tier institution			0.0348**	0.0272**	0.0376*	0.0249
			(0.0097)	(0.0090)	(0.0148)	(0.0130)
Ph.D. from second tier institution			0.0056	0.0034	0.0239	−0.0079
			(0.0119)	(0.0106)	(0.0170)	(0.0151)
Assistant professor			−0.2807**	−0.2775**	−0.2887**	−0.2769**
			(0.0116)	(0.0093)	(0.0214)	(0.0193)

Table 3 (*continued*)

	Model 1		Model 2		Model 3	
Variable	Male	Female	Male	Female	Male	Female
Associate professor			−0.1634**	−0.1727**	−0.1762**	−0.1771**
			(0.0073)	(0.0061)	(0.0123)	(0.0093)
Tenured			0.0367**	0.0437**	0.0174	0.0379*
			(0.0088)	(0.0068)	(0.0201)	(0.0154)
Employed at						
Top college			0.1156**	0.1086**	0.1842**	0.1720**
			(0.0091)	(0.0073)	(0.0158)	(0.0121)
Top university			0.0442**	0.0453**	0.0539**	0.0655**
			(0.0074)	(0.0069)	(0.0112)	(0.0127)
Private institution			−0.0544**	−0.0346**	0.0022	0.0280**
			(0.0062)	(0.0054)	(0.0092)	(0.0080)
Liberal arts college			−0.1204**	−0.1495**	−0.1710**	−0.2043**
			(0.0217)	(0.0167)	(0.0385)	(0.0266)
University			0.0061	−0.0177	0.0112	−0.0343
			(0.0209)	(0.0168)	(0.0365)	(0.0267)
Government support			0.0220**	0.0442**	0.0096	0.0340**
			(0.0067)	(0.0062)	(0.0109)	(0.0104)
Primary activity						
Teaching			−0.0160	−0.0311**	−0.0303*	−0.0315*
			(0.0092)	(0.0081)	(0.0144)	(0.0127)
Management			0.1190**	0.1149**	0.1355**	0.1490**
			(0.0129)	(0.0110)	(0.0200)	(0.0176)
Other			−0.0352*	−0.0100	−0.0598	0.0085
			(0.0175)	(0.0127)	(0.0464)	(0.0306)

Publications						
Articles					0.0013	0.0043*
					(0.0028)	(0.0019)
Books					0.0033**	0.0102*
					(0.0010)	(0.0042)
Chapters in books					0.0202**	0.0155**
					(0.0036)	(0.0034)
Reviews					−0.0026	−0.0007
					(0.0019)	(0.0014)
No publications					−0.0205	−0.0086
					(0.0128)	(0.0076)
Field of study						
History	0.0282*	−0.0098	0.0329**	−0.0068	0.0191	−0.0247
	(0.0137)	(0.0125)	(0.0112)	(0.0099)	(0.0174)	(0.0166)
Performing arts	−0.0017	−0.0164	−0.0022	−0.0186*	−0.0339*	−0.0378**
	(0.0129)	(0.0115)	(0.0103)	(0.0089)	(0.0167)	(0.0146)
Philosophy	−0.0080	−0.0290*	0.0207	−0.0015	−0.0310	−0.0176
	(0.0159)	(0.0129)	(0.0138)	(0.0103)	(0.0248)	(0.0161)
English	−0.0313**	−0.0470**	−0.0080	−0.0309**	−0.0208	−0.0438**
	(0.0120)	(0.0115)	(0.0096)	(0.0090)	(0.0136)	(0.0147)
Languages	−0.0362**	−0.0511**	−0.0119	−0.0339**	−0.0297*	−0.0495**
	(0.0112)	(0.0110)	(0.0091)	(0.0085)	(0.0135)	(0.0145)
Intercept	10.1367**	10.3082**	10.5214**	10.7461**	10.6827**	10.8173**
	(0.0936)	(0.0731)	(0.0866)	(0.0649)	(0.1648)	(0.1320)
Additional controls						
Ph.D. cohorts	Yes	Yes	Yes	Yes	Yes	Yes
Survey year	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	13,668	21,618	13,668	21,618	4,707	7,655
R-squared	0.37	0.434	0.5	0.566	0.451	0.521

[a] Standard errors in parentheses clustered on individual. ** indicates statistically significant at the 1 percent level; * indicates statistically significant at the 5 percent level.

of the individual.[11] However, the baseline specification omits important factors that contribute to salary differences such as the quality of doctorate and employer, variables that proxy for productivity such as primary work activity and government support, and variables that are affected by productivity such as rank and tenure status; these factors are influenced by the preferences and performance of individuals. Model 2 includes controls for the Carnegie ranking of the doctoral institution and employer, academic rank, employer type, government support, and primary work activity because they have a significant impact on salaries. In addition, some important variables are not included in every survey year such as fertility, marital status, and productivity. Model 3 includes these variables, allowing us to evaluate the effect of these demographic characteristics and productivity on the gender salary structure. This model is estimated using those years of the survey that contain all of these variables (1989–95).

We will compare coefficient estimates across specifications in Table 3 to highlight gender differences in the salary structure. Coefficient estimates for demographic characteristics including age, race, and experience are remarkably similar for men and women across the three models and have the expected signs. When additional variables are added in Models 2 and 3 we continue to see little difference in coefficient estimates. If there are gender differences in these estimates, they are small in magnitude. Both men and women earn less in the lower ranks and earn more after reporting tenure. However the tenure premium is higher for women once productivity is incorporated in Model 3. In Model 2, women gain significantly by working at a top college; once productivity is included in Model 3, working at a top college or university improves the salaries of both men and women by similar amounts. In Model 2, men have a 5 percent salary penalty for working at a private institution while the penalty for women is 3.5 percent. When productivity is incorporated in the model, the private institution penalty reverses itself for women, who earn 3 percent more, and is not significantly different from zero for men. Both men and women earn less at liberal arts colleges; however, the penalty is 3 percent larger for women. Women's salaries increase more than men's when they receive government support. Primarily working as a teacher lowers the salaries of men and women by equal amounts in Model 3, while women earn slightly more when working in management.

Model 3 includes controls for marriage, children, and productivity. The coefficients on marriage and children are not statistically significant for either men or women. The coefficients on the productivity variables are positive, statistically significant, small in magnitude, and quite similar for men and women. Women have slightly larger coefficients on articles and books, while men have a larger coefficient on chapters in books. The estimates presented in Table 3 indicate small differences in the salary structure by gender. Adding controls for academic rank and the Carnegie ranking of the doctorate and employer have similar effects on salary by gender. Productivity has a similar impact on the salaries of both men and women. In the

11. Work experience is not entirely exogenous; it can be affected by when the individual received the Ph.D., the employment history, and fertility decisions.

next section the analysis considers changes in the gender salary differential over time.

B. Estimates of the Changes in the Gender Salary Gap over Time

Previous research shows significant changes in the gender earnings differential in academia over time (Ransom and Megdal 1993). We examine these salary differentials by estimating separate models for each survey year using the salary decomposition in Equation 1 to examine trends in the salary differential over time. We use the specification given in Model 2 and add controls for children and marital status in the years they are available.[12] The average salary gap, along with the salary decomposition weighted by male and female coefficients and standard errors are reported in Table A4 in Appendix 2. The salary gap and decomposition are also adjusted using survey weights because weighted mean endowments are significantly different from unweighted mean endowments. The weights also account for differences in the sampling frame over time.[13] In order to examine the changes in the average gender salary differential over time, estimates for each survey year are plotted in Figures 1A through 1H.

The top graphs in Figure 1 plot the average gender salary differential over time. The bottom graphs plot the corresponding salary decomposition weighted by the male coefficients. The underlying models for Figures 1A and 1B include dummy variables for academic rank. In 1997, men employed with tenure or on the tenure track earned 15.7 percent more on average than similarly employed women. This salary differential decreased to a low of 11.3 percent in 1993 and increased to 13.7 percent in 1995. Figure 1B shows the salary decomposition as a function of endowments (differences in average characteristics) and coefficients (often interpreted as discrimination). Between 1977 and 1995, most of the gender salary gap can be explained by differences in endowments. After 1991, differences in coefficients become negative, favoring women relative to men and decreasing the observed gender salary gap.

Previous research by Ginther and Hayes (1999) has shown that the majority of the gender salary gap in 1993 disappears when separate salary regressions are estimated for each academic rank. We replicate those estimates for each year in the cross-sectional samples in order to examine whether the gender salary gap may be explained by differences in endowments captured by rank. These results are presented in Figures 1C through 1H. Figures 1C and 1D show the gender salary gap and corresponding Oaxaca decomposition for assistant professors. The salary gap

12. The specification used is similar to Model 2 in Table 3. The natural logarithm of real wages is regressed on a constant, age in the survey year, a quadratic in work experience since Ph.D., and dummies for field of study, African American, other race, doctorate quality, employer quality, employer type, primary work activity, and government support. Variables for number of children and an indicator for children under six are included in the years available. The text indicates whether rank is controlled for using dummy variables or whether models have been estimated separately by rank. Productivity is not included because the data are missing from four of the nine survey years.

13. A data appendix available from the authors by request evaluates the effect of survey weights on the parameter estimates and contains unweighted versions of Figures 1A through 1H.

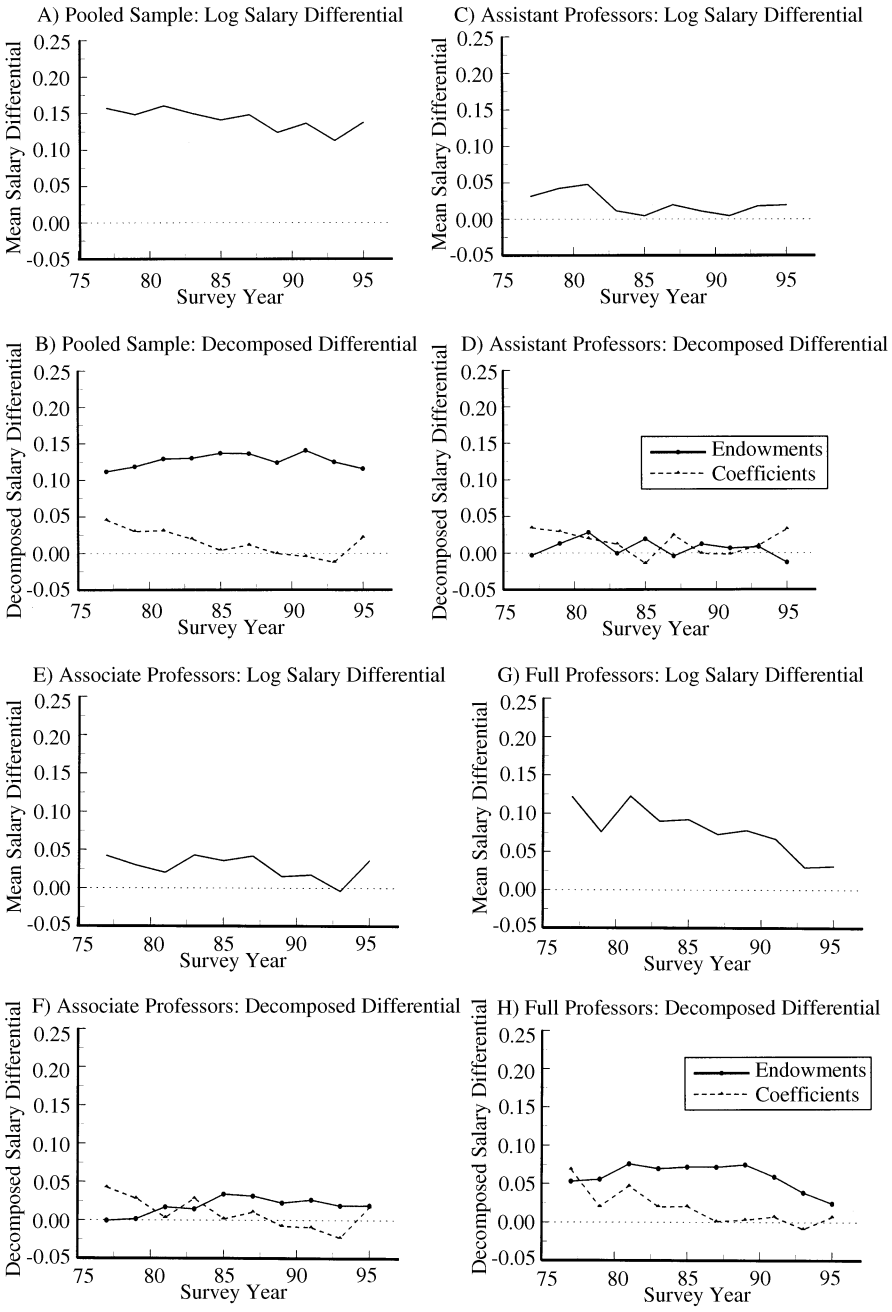

Figure 1
Salary Decompositions: 1977–95 SDR Humanities Doctorates

decreased from more than 15 percent in 1977 for the estimates that pool rank in Figure 1A to a high of only 5 percent for assistant professors in Figure 1C. The gender salary gap for assistant professors is not significantly different from zero by 1995. The salary decomposition in Figure 1D shows that, in 1977, the entire salary gap is explained by differences in coefficients. By 1995, differences in coefficients remain but are no longer statistically significant.

Similar results are apparent for associate professors in Figures 1E and 1F. In 1977, male associate professors earned 4 percent more in salary than their female counterparts. By 1995, male associate professors earned a 3.6 percent salary premium over their female counterparts; however, this estimate is not statistically significant at the 5 percent level. Prior to 1985, differences in coefficients favoring male associate professors explain a significant portion of the gender gap. After 1985, differences in coefficients are not significantly different from zero. Thus, the small gender salary gap between male and female associate professors is explained by differences in endowments.

Figures 1G and 1H show the gender salary gap for full professors. The salary gap for full professors is larger over time than for the lower academic ranks. In 1977, male full professors earned a 12.2 percent salary premium over female full professors. By 1995, this gap fell to 3 percent and was not statistically significant. The decomposed salary differential in Figure 1H shows the decreasing effect of coefficients on the gender salary differential over time. After 1985, the coefficients become small and are not statistically significant. Male full professors have higher average endowments, explaining 2–7 percent of the gender salary differential from 1985 to 1995.[14]

Similar to previous results reported in Ginther and Hayes (1999), most of the gender salary differential over time is explained by academic rank. The salary differences reported in Figures 1C through 1H indicate that the gender salary gap was not large at the beginning of the survey for assistant and associate professors. In 1995, the gender salary differential is not significantly different from zero for all ranks. Thus, on average, if gender discrimination exists for academics in the humanities it is not operating through salaries. We now consider another source of gender difference in academic employment outcomes.

C. Estimates of the Probability of Promotion to Tenure

The importance of rank in explaining the gender salary gap leads us to examine whether differences in the probability and duration of promotion exist by gender. We begin by estimating probit models of the probability of being promoted to tenure using the full Longitudinal Sample. Our basic specification is similar to that in Model 3 of Table 3 because we assume the variables that affect salaries will also affect promotion. There are some differences in the specification: variables for Ph.D. institution are omitted because preliminary estimates show these variables are not statistically significant in promotion models. We add variables to control for number of

14. Salary differences are quite similar when using unweighted data. While the salary gap is somewhat smaller when using unweighted data, these estimates are subject to more variation due to changes in the sampling frame.

employers, and the proportion of time unranked, unemployed, and in nonacademic jobs because these variables are likely to have a significant impact on promotion and they allow us to control for breaks in service.[15]

These estimates are presented in column one of Table 4. Being African American, working at a private institution, having many employers, being unranked or unemployed, or having nonacademic jobs have a negative and significant effect on the probability of being promoted. Being older with more experience, having children, working at a liberal arts college, publishing articles, reviews, books, and other publications over one's career have positive and significant effects on the probability of being promoted. Finally, being female decreases the probability of being promoted by almost 7 percent, a result that is significant at the 1 percent level.

The remaining columns of Table 4 show how the probability of promotion changes for the 1975–79 and 1980–89 cohorts. We examine differences across cohorts because market conditions for humanities doctorates have changed significantly between 1975 and 1995—over time employment opportunities for humanities doctorates have diminished. The Modern Language Association has conducted eight surveys of Ph.D. granting institutions between 1977 and 1994. During that time, the number of new English Ph.D.s fell by 15 percent while the unemployment rate for new Ph.D.s increased from 7 to 11 percent. In 1994, new foreign language Ph.D.s have an unemployment rate of 10 percent up from a 3 percent rate in 1986 (Modern Language Association 1998).

In the cohort analysis of Table 4, our results show significant changes in the factors affecting promotion across cohorts. Publications are more important for promotion in the most recent cohort. Having young children decreases the probability of promotion in the 1975–79 cohort but has a smaller and insignificant effect in the most recent cohort. Experience has a large positive effect on promotion in the most recent cohort, while having a negative and insignificant effect in the earlier cohort. Primarily working as a teacher increases the probability of promotion for the most recent cohort. The penalty for number of employers, unranked, and time spent unemployed is larger in the most recent cohort. The importance of these variables in the most recent cohort most likely reflects the changing market conditions for humanities doctorates. As competition for permanent jobs has increased, labor market attachment and productivity have increased in importance.

Table 5 reports the estimated probability of promotion by gender. The first column of Table 5 reports the difference in the predicted promotion probability between males and females in the full sample and by cohort, using the probit estimates. The promotion gap is 8 percent in favor of men in the full sample. This gap is as high as 8.7 percent in favor of men in the 1975–79 cohort and decreases to 7.3 percent in the 1980–89 cohort. The second column in Table 5 reports the linear probability estimates using the same empirical specification given in Table 4. These estimates

15. We regress an indicator for promotion on a constant, age in 1995, years of experience and its square, number of employers, and average productivity with additional dummies for female, African American, other race, foreign born, and children present. The remaining variables measure the proportion of years an individual is observed as: married, having children younger than the age of six; working at a top college, top university, or private institution; primarily working in teaching, management or other activities; receiving government support; time spent unranked or unemployed. All specifications include additional controls for field of study. The first specification includes controls for cohort.

Table 4
Probit Estimates of Probability of Promotion, 1977–95 Survey of Doctorate Recipients, Longitudinal Sample[a]

Variable	Full Sample	1975–79 Cohort	1980–89 Cohort
Female	−0.068**	−0.065**	−0.059
	(0.017)	(0.019)	(0.032)
Age in 1995	0.007**	0.004**	0.010**
	(0.002)	(0.002)	(0.003)
African American	−0.078*	−0.098**	0.006
	(0.038)	(0.045)	(0.063)
Other race	0.017	0.031	−0.028
	(0.040)	(0.037)	(0.081)
Foreign born	−0.032	−0.023	−0.031
	(0.027)	(0.030)	(0.047)
Proportion of years married	−0.029	0.005	−0.072
	(0.024)	(0.027)	(0.042)
Children = 1	0.049*	0.045	0.036
	(0.023)	(0.025)	(0.043)
Proportion of years with children younger than six	−0.073	−0.130*	−0.042
	(0.041)	(0.066)	(0.063)
Experience	0.085**	−0.073	0.261**
	(0.014)	(0.197)	(0.043)
Experience squared	−0.002**	0.002	−0.010**
	(0.001)	(0.005)	(0.002)
Proportion of career working at			
Private institution	−0.097**	−0.073**	−0.127**
	(0.021)	(0.023)	(0.036)
Liberal arts/college	0.140**	0.125**	0.176*
	(0.049)	(0.050)	(0.090)
University	0.043	0.072	0.027
	(0.050)	(0.051)	(0.092)
Proportion of primary work as			
Teaching	0.077	−0.011	0.159*
	(0.044)	(0.056)	(0.073)
Management	0.062	0.001	0.096
	(0.061)	(0.070)	(0.109)
Other activity	−0.124	−0.160*	0.014
	(0.078)	(0.078)	(0.172)
Government support over career	−0.078	−0.050	−0.126
	(0.047)	(0.046)	(0.093)
Number of employers	−0.084**	−0.058**	−0.115**
	(0.010)	(0.009)	(0.021)

Table 4 (*continued*)

Variable	Full Sample	1975–79 Cohort	1980–89 Cohort
Proportion of time spent			
Unranked	−0.446**	0.372**	−0.583**
	(0.047)	(0.051)	(0.090)
Unemployed	−0.766**	−0.547**	−1.065**
	(0.133)	(0.125)	(0.297)
Nonacademic job	−0.357**	−0.358**	−0.191
	(0.071)	(0.073)	(0.145)
Average publications			
Articles	0.041*	0.005	0.079*
	(0.022)	(0.025)	(0.038)
Books	0.208**	0.237**	0.224*
	(0.065)	(0.087)	(0.104)
Chapters	0.050	0.046	0.016
	(0.042)	(0.049)	(0.070)
Reviews	0.056*	0.043	0.090*
	(0.024)	(0.030)	(0.039)
Other publications	0.021*	0.050	0.023
	(0.009)	(0.030)	(0.013)
No publications	0.001	0.017	0.022
	(0.027)	(0.025)	(0.055)
Field of study			
History	0.082**	0.077**	0.062
	(0.026)	(0.022)	(0.059)
Performing arts	0.066*	0.053	0.076
	(0.028)	(0.026)	(0.057)
Philosophy	0.064*	0.046	0.056
	(0.029)	(0.028)	(0.061)
English	0.094**	0.069*	0.088
	(0.025)	(0.024)	(0.053)
Languages	−0.021	−0.008	−0.048
	(0.032)	(0.032)	(0.060)
Ph.D. 1975–79	−0.045		
	(0.037)		
Sample size	2,581	1,482	1,099

[a] Coefficients standardized to report a change in probability for a small change in continuous and a unit change in dummy variables. Standard errors in parentheses clustered on individual. ** indicates statistically significant at the 1 percent level; * indicates statistically significant at the 5 percent level.

Table 5
Salary Decomposition of Predicted Linear Probability of Promotion, 1977–95 Survey of Doctorate Recipients, Longitudinal Sample[a]

	Probit Estimate of Promotion Gap	Linear Probability Estimate of Promotion Gap	Male Promotion Structure	
			Endowments	Coefficients
Full sample	0.079	0.080	0.030	0.050
By cohort				
1975–79	0.087	0.088	0.031	0.057
1980–89	0.073	0.070	0.035	0.035

[a] Probit and linear probability estimates of the promotion gap are based on the specification in Table 4.

are quite similar to the probit estimates and can be decomposed using Equation 1. These results appear in the remaining columns of Table 5. Using the male promotion structure, differences in coefficients explain the majority of the gender promotion gap, providing some evidence that gender discrimination in the humanities may be operating through the mechanism of promotion. The effect of gender falls by almost 2 percent between the earlier and later cohorts. However, the analysis in Tables 4 and 5 indicates that differences in the probability of promotion by gender remain.

D. Estimates of the Duration of Promotion to Tenure

Given the importance of promotion as a mechanism for unequal treatment, we now consider whether differences in the hazard rate of promotion exist by gender. We continue to use the full longitudinal sample and the two cohorts for our duration analysis. We take an initial look at gender differences in the hazard of promotion using two hypothesis tests in Table 6. Our analysis begins with an estimate of the empirical survival functions for men and women working full-time in academia. The first row of Table 6 presents the test statistics for the log-rank test on the Kaplan-Meier survival curve estimate. We reject the null hypothesis that the survival functions are the same for men and women at less than a 1 percent level of significance for the full sample, the 1975–79, and 1980–89 cohorts. Thus, without controlling for covariates, the hazard of not being promoted differs by gender.

As a second test of differences in promotion, we estimate a proportional hazards model of promotion regressed on a dummy variable for gender. We can interpret the risk ratios in the second row of Table 6 as the effect of being female on the hazard of promotion relative to being male. The risk ratio on gender is less than one and significant using the full sample, indicating that the likelihood in any given year of female promotion is 78.7 percent of their male counterparts. The disadvantage for women is largest in the first cohort; the female hazard is only 76.7 percent of the male hazard—an estimate significant at the 1 percent level. However, risk ratio

Table 6
Estimates Comparing Survival and Hazard of Promotion by Gender, 1977–95 Survey of Doctorate Recipients, Longitudinal Sample[a]

Test	Full Sample	1975–79 Cohort	1980–89 Cohort
Log rank test	28.085**	21.116**	7.925**
Survival curve homogeneity	(0.0001)	(0.0001)	(0.005)
Risk ratio estimate			
Female promotion duration	0.787**	0.767**	0.816**
(No covariates)	(0.0001)	(0.0001)	(0.006)
Female promotion duration	0.795**	0.778**	0.824**
(Demographic, productivity covariates)	(0.0001)	(0.0001)	(0.0137)

[a] Probability values in parentheses. ** indicates statistically significant at the 1 percent level; * indicates statistically significant at the 5 percent level.

estimates improve somewhat for women in the most recent cohort: the female hazard is 82 percent of the male hazard.

The above estimates do not account for differences in academic field, demographic and employer characteristics, and productivity. We use the same specification in Table 4 in order to examine the differences between men and women in the duration to promotion to tenure in Table 7.[16] The first model in Table 7 pools both genders and includes controls for demographic characteristics, marital status, children, employer characteristics, primary work activity, and average productivity. In the pooled model, age, children, working at a college, primary work as a teacher, and average number of books and chapters published have positive and significant effects on being promoted. Foreign born, years married, employment at a private institution, number of employers, having unranked positions, and being unemployed or employed in a nonacademic job decrease the hazard of promotion. The risk ratio on gender is less than one and significant, indicating that in any given year the female chance of promotion is 20 percent lower than that of their male colleagues after controlling for these characteristics. Controlling for productivity, demographic and employer characteristics only reduces the gender difference in promotion by just over 1 percent.

The second and third models in Table 7 estimate the hazard model separately for men and women. Estimates for the male sample indicate that age, children, college, and other publications have positive and significant effects on the likelihood of promotion; while foreign born, young children, private institutions, number of employers, being unranked or unemployed, and having a nonacademic job reduces that

16. Separate estimates not reported here use the discrete probit hazard model. These estimates impose the same normality assumption used in the wage and promotion probability estimates. These estimates have the same sign as the proportional hazards model coefficients indicating that our results are robust given the additional normality assumption.

Table 7
Duration of Promotion to Tenure in the Humanities, 1977–95 Survey of Doctorate Recipients, Longitudinal Sample[a]

Variable	Pooled	Male	Female
Female	0.795**		
	(0.048)		
Age in 1995	1.039**	1.041**	1.037**
	(0.004)	(0.006)	(0.005)
African American	0.849	0.882	0.811
	(0.090)	(0.133)	(0.124)
Other race	1.113	1.019	1.142
	(0.111)	(0.173)	(0.149)
Foreign born	0.872*	0.827*	0.911
	(0.071)	(0.096)	(0.105)
Proportion of years married	0.925	0.881	0.948
	(0.067)	(0.106)	(0.089)
Children = 1	1.132*	1.379**	0.891
	(0.061)	(0.089)	(0.088)
Proportion of years with children younger than six	0.805	0.726*	0.990
	(0.119)	(0.155)	(0.199)
Proportion of career working at			
Private institution	0.805**	0.859*	0.746**
	(0.055)	(0.076)	(0.080)
University	1.099	1.194	1.048
	(0.149)	(0.197)	(0.234)
College of liberal arts	1.482**	1.471*	1.554*
	(0.147)	(0.194)	(0.232)
Proportion of primary work as			
Teaching	1.406**	1.234	1.663*
	(0.135)	(0.176)	(0.217)
Management	1.565**	1.402	1.836*
	(0.178)	(0.237)	(0.279)
Other activity	0.918	0.741	1.220
	(0.282)	(0.390)	(0.416)
Government support over career	0.935	0.929	0.966
	(0.135)	(0.185)	(0.203)
Number of employers	0.706**	0.738**	0.677**
	(0.033)	(0.046)	(0.047)
Proportion of time spent			
Unranked	0.106**	0.093**	0.133**
	(0.216)	(0.306)	(0.304)
Unemployed	0.045**	0.043**	0.043**
	(0.552)	(0.908)	(0.722)
Nonacademic job	0.219**	0.161**	0.287**
	(0.269)	(0.369)	(0.401)

Table 7 (*continued*)

Variable	Pooled	Male	Female
Average publications			
Articles	1.106	1.093	1.109
	(0.055)	(0.081)	(0.080)
Books	1.482**	1.391	1.873*
	(0.156)	(0.200)	(0.265)
Chapters	1.311**	1.166	1.316
	(0.106)	(0.153)	(0.157)
Reviews	1.064	1.028	1.198*
	(0.050)	(0.065)	(0.091)
Other publications	1.036	1.070*	0.986
	(0.025)	(0.033)	(0.040)
No publications	1.006	1.151	0.907
	(0.077)	(0.113)	(0.107)
Field of study			
History	1.055	1.022	0.995
	(0.099)	(0.149)	(0.137)
Performing arts	1.267**	1.154	1.358*
	(0.096)	(0.146)	(0.132)
Philosophy	1.089	1.048	1.114
	(0.099)	(0.143)	(0.149)
English	1.078	1.048	1.098
	(0.092)	(0.144)	(0.121)
Languages	0.932	0.877	0.935
	(0.091)	(0.142)	(0.121)
Ph.D. 1975–79	1.086	1.044	1.130
	(0.054)	(0.078)	(0.078)
Sample size	2,581	1,316	1,265

[a] Coefficients are exponentiated and reported as Risk Ratios. Standard errors in parentheses. ** indicates statistically significant at the 1 percent level; * indicates statistically significant at the 5 percent level.

likelihood. Estimates for the female sample differ sharply with few similarities: the coefficients on age, college, and unemployment are similar in magnitude and direction of the effect for both men and women. However, the coefficients have a larger negative effect for women working at a private institution, the number of employers, being unranked, or having a nonacademic job. Women are rewarded relative to men for teaching and management and for publishing books and reviews. Most notably, having children decreases the hazard of promotion for women. These differences in estimated risk ratios indicate that the hazard of female promotion is not proportional to male promotion.

To understand how these different estimates affect the hazard function of being promoted, we estimate a smoothed version of the baseline hazard function for men

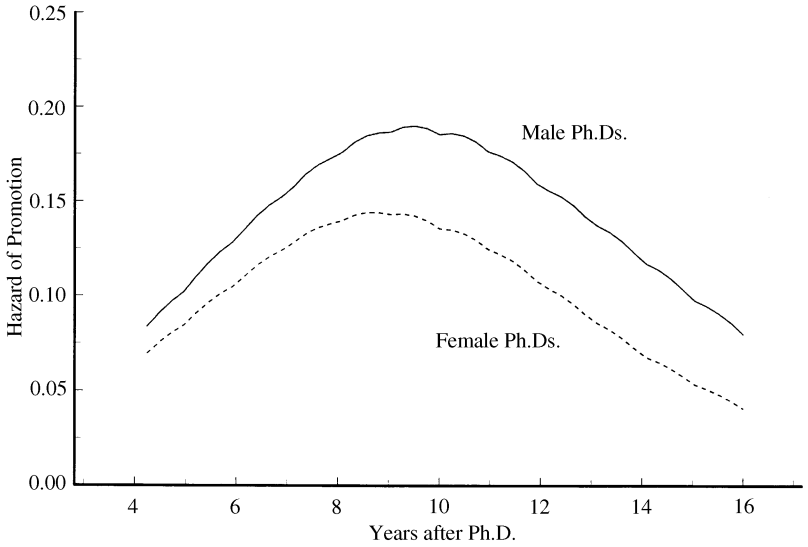

Figure 2
Hazard Rate of Promotion: Humanities Ph.D.s by Gender, Full Sample

and women separately. These results are presented in Figure 2. The hazard of promotion is regressed on the covariates in Table 7. Each baseline hazard is evaluated at the average characteristics of men and women in the sample. The estimated hazard function is then smoothed using a nonparametric kernel density estimator given in Allison (1995).

In Figure 2, we again note that the male and female hazard functions are not proportional in the full sample. The peak of the male hazard function occurs at 9.5 years after the completion of the doctorate where men have a 0.19 hazard of being promoted. The peak of the female hazard function occurs a year earlier at 8.5 years after the completion of the doctorate, where women have only a 0.14 hazard of being promoted. Even though the hazard rate peaks a year earlier for women, it lies below the male hazard rate in every year. Differences in the peak of the hazard rate may be a result of differences in the quality of men and women who are promoted. If there is gender discrimination in obtaining a tenure track job, this could lead to women on the tenure track being of higher average quality than men, resulting in a shorter peak duration to promotion.

We can decompose gender differences in promotion as a function of differences in average characteristics and coefficient estimates between men and women in Figure 3. Graph A in Figure 3 shows the baseline hazard estimated using the average male characteristics and the male and female hazard function coefficients. The solid line in Graph A is the same estimate presented for men in Figure 2. Holding male characteristics constant and using the female coefficients lowers the hazard of male promotion by 0.01 at the peak of the function.

We perform the same thought experiment in Graph B where baseline hazard is

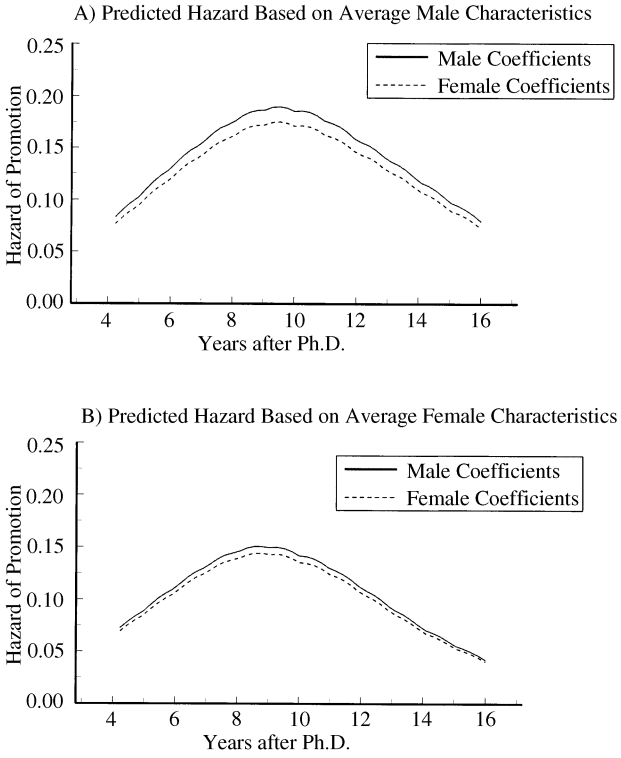

Figure 3
Hazard Rate of Promotion: Humanities Ph.D.s, Full Sample

estimated as a function of average female characteristics. The dashed line in Graph B corresponds to the estimate presented for women in Figure 2. Using the male coefficients to estimate the hazard of female promotion increases the hazard 0.01 at the peak of the function. Thus, using the estimated female coefficients lowers the average male hazard of being promoted while using the male coefficients increases the average female hazard of being promoted.

Finally, we consider whether the same differences in the hazard of promotion are evident for the two cohorts. Estimates of the hazard of promotion to tenure by cohort are presented in Table 8. We can examine the effect of gender after controlling for covariates in each cohort by returning to the bottom row of Table 6. In the 1975–79 cohort, the female hazard is only 80 percent of the male hazard—a result that is significant at the one percent level. In the most recent cohort, the female hazard improves to 82 percent of the male hazard. Controlling for covariates increases the female hazard of promotion by 1 percent.

Results in Table 8 indicate significant differences in coefficient estimates for men and women across cohorts. Coefficient estimates on age, number of employers, unemployment, private institutions, and nonacademic jobs are similar for men and

Table 8
Duration of Promotion to Tenure in the Humanities, 1977–95 Survey of Doctorate Recipients, Longitudinal Cohort Samples[a]

Variable	1975–79 Pooled	1975–79 Male	1975–79 Female	1980–89 Pooled	1980–89 Male	1980–89 Female
Female	0.778**			0.824**		
	(0.063)			(0.078)		
Age in 1995	1.038**	1.036**	1.039**	1.040**	1.048**	1.035**
	(0.005)	(0.008)	(0.007)	(0.006)	(0.010)	(0.009)
African American	0.771*	0.896	0.658**	1.032	0.832	1.229
	(0.114)	(0.164)	(0.163)	(0.149)	(0.233)	(0.202)
Other race	1.120	0.789	1.388	1.055	1.633	0.702
	(0.139)	(0.236)	(0.178)	(0.192)	(0.274)	(0.287)
Foreign born	0.850	0.823	0.879	0.914	0.832	1.075
	(0.089)	(0.121)	(0.136)	(0.119)	(0.169)	(0.175)
Proportion of years married	0.954	0.889	1.015	0.880	0.874	0.887
	(0.089)	(0.143)	(0.118)	(0.103)	(0.165)	(0.142)
Children = 1	1.063	1.315*	0.810	1.275*	1.439**	0.974
	(0.077)	(0.116)	(0.112)	(0.102)	(0.148)	(0.154)
Proportion of years with children younger than six	0.943	0.830	1.229	0.676**	0.638*	0.830
	(0.201)	(0.259)	(0.347)	(0.159)	(0.211)	(0.263)
Proportion of career working at						
Private Institution	0.781**	0.819*	0.748**	0.824*	0.959	0.715**
	(0.071)	(0.099)	(0.108)	(0.087)	(0.125)	(0.129)
University	1.154	1.322	0.999	0.975	0.959	1.215
	(0.192)	(0.267)	(0.287)	(0.239)	(0.300)	(0.426)
College or liberal arts	1.486*	1.417	1.580	1.478	1.420	1.890
	(0.189)	(0.262)	(0.286)	(0.235)	(0.295)	(0.420)

Table 8 (*continued*)

Variable	1975–79 Pooled	1975–79 Male	1975–79 Female	1980–89 Pooled	1980–89 Male	1980–89 Female
Proportion of primary work as						
Teaching	1.152	0.992	1.464	1.819**	1.666	1.991*
	(0.187)	(0.243)	(0.299)	(0.200)	(0.268)	(0.322)
Management	1.413	1.158	1.851	1.555	1.915	1.317
	(0.233)	(0.311)	(0.368)	(0.288)	(0.392)	(0.455)
Other activity	0.710	0.443	1.159	1.956	1.983	2.019
	(0.345)	(0.482)	(0.510)	(0.523)	(0.728)	(0.780)
Government support over career	0.855	0.739	1.077	1.100	1.396	1.032
	(0.167)	(0.235)	(0.253)	(0.231)	(0.317)	(0.359)
Number of employers	0.734**	0.756**	0.715**	0.645**	0.697**	0.584**
	(0.039)	(0.056)	(0.057)	(0.061)	(0.086)	(0.091)
Proportion of time spent						
Unranked	0.085**	0.077**	0.090**	0.127**	0.092**	0.188**
	(0.294)	(0.413)	(0.423)	(0.331)	(0.481)	(0.458)
Unemployed	0.049**	0.053**	0.037**	0.017**	0.008**	0.043*
	(0.647)	(1.062)	(0.861)	(1.083)	(1.901)	(1.357)
Nonacademic job	0.147**	0.116**	0.174**	0.414*	0.249*	0.815
	(0.341)	(0.464)	(0.510)	(0.451)	(0.645)	(0.691)
Productivity						
Articles	1.116	1.045	1.128	1.176*	1.111	1.441*
	(0.087)	(0.151)	(0.118)	(0.075)	(0.094)	(0.159)

Books	1.113	0.981	1.368	2.354**	2.388**	2.265
	(0.233)	(0.319)	(0.384)	(0.216)	(0.264)	(0.426)
Chapters	1.446*	1.045	2.326**	1.155	1.170	0.857
	(0.152)	(0.213)	(0.276)	(0.149)	(0.223)	(0.245)
Reviews	1.005	0.995	1.056	1.125*	1.075	1.297*
	(0.080)	(0.103)	(0.143)	(0.061)	(0.075)	(0.119)
Other publications	0.966	0.962	0.941	1.038	1.061	1.005
	(0.065)	(0.095)	(0.093)	(0.028)	(0.038)	(0.045)
No publications	1.125	1.318*	0.983	0.831	0.791	0.859
	(0.094)	(0.137)	(0.135)	(0.145)	(0.229)	(0.199)
Field of Study						
History	1.138	1.106	1.069	1.009	0.995	0.904
	(0.126)	(0.195)	(0.173)	(0.162)	(0.245)	(0.234)
Performing arts	1.167	1.019	1.317	1.564**	1.458	1.588*
	(0.122)	(0.191)	(0.165)	(0.158)	(0.234)	(0.228)
Philosophy	1.024	0.961	1.161	1.185	1.128	1.033
	(0.123)	(0.183)	(0.182)	(0.170)	(0.243)	(0.263)
English	1.062	0.966	1.063	1.187	1.183	1.161
	(0.116)	(0.190)	(0.150)	(0.155)	(0.235)	(0.217)
Languages	0.982	0.945	0.937	0.885	0.730	0.937
	(0.115)	(0.181)	(0.155)	(0.153)	(0.242)	(0.204)
Samples size	1,482	750	732	1,099	566	533

[a] Coefficients are exponentiated and reported as Risk Ratios. Standard errors in parentheses. ** indicates statistically significant at the 1 percent level; * indicates statistically significant at the 5 percent level.

women and across cohorts. However, children have a positive and significant effect on the promotion of men while having a negative and insignificant effect for women in both cohorts. Young children have a negative and significant effect for men and a negative and insignificant effect for women. Teaching is positive and significant for women in the most recent cohort. In the 1975–79 cohort chapters in books is the only productivity variable that has a positive and significant effect in the pooled and women samples. Having no publications is positive and significant for men in the earliest cohort. Productivity matters more in the most recent cohort, with articles, books, and reviews having a positive and significant effect in the pooled estimates. The increasing importance of productivity is most likely the result of increased competition for permanent academic positions in the humanities. The coefficient on articles and reviews is greater in magnitude for women than for men; the coefficient on books is larger for men than for women, and is statistically significant for men.

Figure 4 decomposes gender differences in promotion by cohort as a function of differences in average characteristics and coefficient estimates between men and

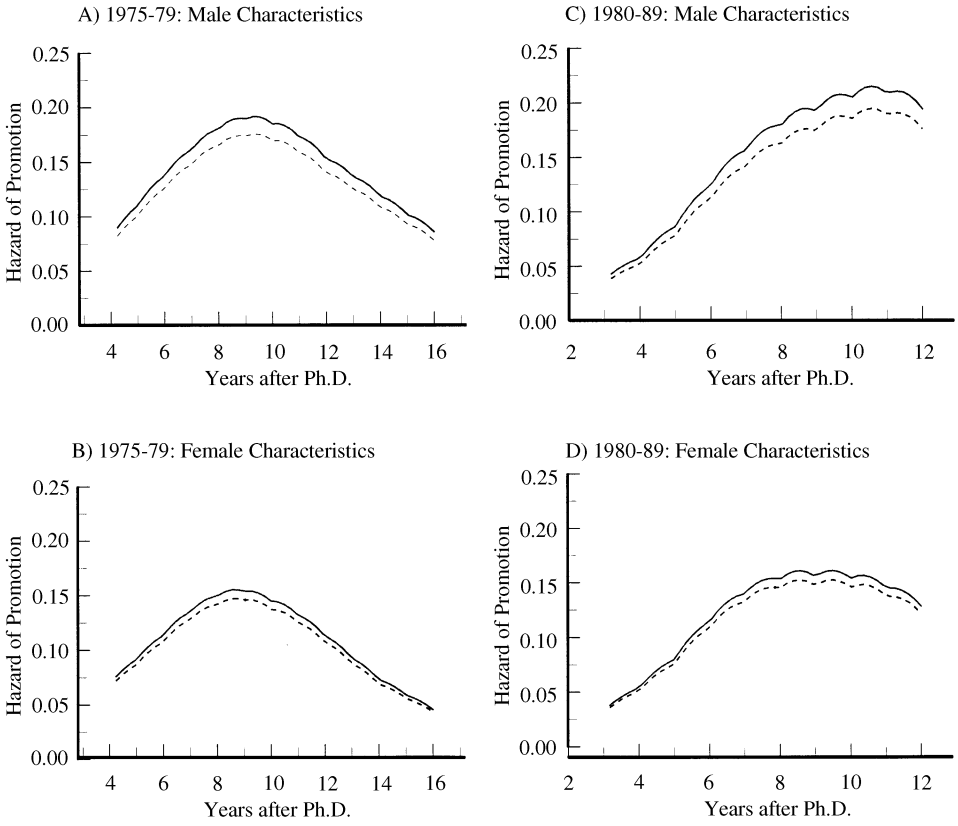

Figure 4
Predicted Hazard of Promotion, by Cohort

women. The top row of graphs in Figure 4 shows the baseline hazard estimated using the average male characteristics and the male and female hazard function coefficients. Holding male characteristics constant and using the female coefficients lowers the hazard of male promotion by about 0.02 at the peak of the hazard for each cohort. The bottom row of graphs in Figure 4 shows the baseline hazard estimated using the average female characteristics and the male and female hazard function coefficients. Holding female characteristics constant and using the male coefficients increases the hazard of female promotion by 0.01 at the peak of the hazard for each cohort.

E. Accounting for Gender Differences in Promotion

Although gender salary differences in the humanities are explained by academic rank, significant gender differences in the probability and duration to promotion persist and remain unexplained by observable characteristics. If discrimination is a problem for faculty in the humanities, it operates through promotion differences. In order to examine the factors that account for gender differences in promotion, we evaluate differences in the linear probability coefficients and their relative contribution to the explained and unexplained promotion differential in Table 9.[17]

One potential explanation for gender differences in promotion is women's preferences for children. Most women are the primary caregivers of children, and these choices could affect productivity and promotion. In both the linear probability and duration models estimates presented in Table 9, coefficient estimates on children and young children differ in sign and significance between men and women; men have positive coefficients while women have negative coefficients. Both men and women have negative coefficients on the proportion of time spent with young children; however, the coefficient is larger for men. The total effect of children on the promotion probability is obtained by adding these effects together in the explained and unexplained columns of Table 9. 0.8 percent of the 2.9 percent explained promotion difference is due to children and young children; at most 4.2 percent of the 5.9 percent unexplained difference (using female coefficients) is due to children. It is also useful to consider the counterfactual where all women are assumed to be childless. We examine this counterfactual by first setting the number of children equal to zero in the female linear probability model and solving for the promotion probability. If all women in the sample had no children, the promotion probability would only increase by one percentage point. In a second approach, the bottom panel of Table 9 compares estimates of the gender difference in promotion for the full sample to gender differences in the promotion probability for all men and women without children. Women without children are 6 percent less likely to be promoted compared with the 8 percent difference for the full sample. Using this approach, children decrease the overall promotion rate of women by at most two percentage points. Although the presence of children reduces the probability and increases the

17. Explained differences (given by the first term in Equation 1) are mean differences in observable characteristics weighted by the male (female) coefficients. Unexplained differences (given by the second term in Equation 1) are differences in the parameters weighted by female (male) observable characteristics.

Table 9
Variables Contributing to the Explained and Unexplained Promotion Differential and the Gender Promotion Difference for All Men and Women without Children[a]

	Linear Probability Coefficients		Male Coefficients		Female Coefficients	
Independent Variable	Male	Female	Explained	Unexplained	Explained	Unexplained
Age in 1995	0.004*	0.007**	0.3%	14.8%	0.6%	14.5%
Children = 1	0.075**	−0.008	−1.5%	−3.7%	0.2%	−5.3%
Young children	−0.097	−0.035	0.7%	0.7%	0.2%	1.1%
Experience[b]	0.132**	0.078**	0.4%	−34.2%	0.3%	−34.0%
Proportion private institution	−0.029	−0.112**	0.1%	−3.2%	0.4%	−3.5%
Proportion liberal arts	0.088*	0.119	−0.2%	1.4%	−0.3%	1.5%
Number of employers	−0.047**	−0.092**	−0.1%	−7.4%	−0.2%	−7.3%
Average articles	0.061*	0.025	−0.3%	−1.2%	−0.1%	−1.3%
Average books	0.070	0.315**	−0.1%	2.2%	−0.6%	2.7%
Average chapters	−0.043	0.076	0.0%	1.5%	0.0%	1.5%
Average reviews	0.012	0.066*	−0.1%	1.2%	−0.4%	1.6%

Average other publications	0.030*	0.004	−0.6%	−0.6%	−0.1%	−1.1%
No publications	0.015	−0.012	0.1%	−0.4%	−0.1%	−0.3%
Total effect publications			−1.0%	2.8%	−1.3%	3.1%
Total differential[c]			−2.9%	−5.0%	−2.0%	−5.9%

Promotion Difference for All Men and Women without Children

			Male Promotion Structure	
	Probit	Linear Probability	Endowments	Coefficients
Full sample of men and childless women	0.062	0.062	0.021	0.040
Full sample	0.079	0.080	0.030	0.050

[a] ** indicates statistically significant at the 1 percent level; * indicates statistically significant at the 5 percent level in the probit model.
[b] The coefficients and the effects of experience on the promotion gap are the sum of coefficients on experience and experience squared.
[c] These variables do not add up to the total differential explained and unexplained because they are a subset of the entire specification.

duration to promotion for women, it does not entirely explain gender differences in promotion.

Productivity differences provide another explanation for why women are less likely to be promoted. It is widely reported that women publish less than men (Schneider 1998). Estimates in Tables 2 and 9 allow us to examine the effect of productivity differences on promotion. When we examine average productivity in Table 2, differences between men and women are small at best. Men in the sample author on average more books, reviews, and other publications, but the average difference never exceeds 0.2. In addition, the duration and linear probability coefficient estimates in Table 9 are larger for women relative to men. Women's promotion probabilities are enhanced relative to men's for each book, chapter, and review published. Using female coefficients in Table 9, differences in publication add 1.3 percent to the explained promotion difference while reducing unexplained differences by 3.1 percent; these effects are smaller if we use the male coefficients. In order to understand the effect of publications on women's promotion, we set the female promotion probability equal to the male's and solve for the average number of publications required by women to obtain the same promotion probability as men. Women would have increased productivity on average by more than two standard deviations: they would need to author either 0.34 more books, or 1.2 more chapters, or 0.1 more reviews, or 3.5 more articles each year of their careers in order to have the same promotion probability as men. This said, it is important to keep in mind that publications are measured with error in this study, and coefficient estimates in the linear probability model are biased toward zero for both men and women. Thus, productivity will likely have a larger impact on promotion than indicated in this study. However, our results suggest that the promotion rewards to publishing are higher for women than for men. This outcome may reflect the selection of women onto the tenure track.

Table 9 includes additional variables that significantly contributed to the explained and unexplained gender promotion difference. Age favors women, reducing the unexplained promotion difference by 15 percent. However, experience is the single largest factor contributing 34 percent to the unexplained promotion difference. The male coefficient is almost twice that of the female coefficient.[18] Women are also penalized relative to men by being employed at private institutions or having a larger number of employers. Using the linear probability coefficients and assuming a counterfactual of one employer for all women, the promotion gap narrows to 0.02. Thus, women who have more than one employer are penalized in the promotion process. It could be that women spend more time in adjunct positions prior to entering the tenure track; as a result they would have more employers and work experience. However, Table 2 indicates no significant gender differences in years of work experience or number of employers. Women spend slightly more time in unranked positions, an indicator of adjunct status.

The results in Table 9 show that even though women have on average the same years of experience and the same number of employers, they are treated less well

18. Experience is measured as actual years of work experience in 1995 since receiving the Ph.D.

than their male colleagues. Presence of children explains at most 2 percent of the gender promotion difference while differences in productivity have little net effect.

V. Conclusion

In their study of faculty salaries and appointments, the AAUP claims that ''substantial disparities in salary, rank, and tenure between male and female faculty persist'' (Benjamin 1999). A cursory examination of the data shows a persistent salary gap between male and female humanities academics over time. However, our examination of gender salary and promotion differences clarifies this finding and calls some of the AAUP claims into question at least in the humanities.

We examined gender salary differences between 1977 and 1995. By 1995, the average gender salary difference for tenure-track assistant, associate, and full professors is not significantly different from zero. These results stand in stark contrast to gender salary differences in the sciences. A recent study by Ginther (2001) uses the SDR to examine gender salary and promotion differences in the sciences. Ginther finds large salary differences: in all ranks, men earn more on average than women. This difference is especially pronounced for full professors; female full professors in the sciences earned 14 percent less than their male colleagues in 1995.

Why have women in the humanities fared better than women in the sciences? First, there are more women in the humanities. In 1995, 32 percent of humanities academics with tenure or on the tenure track were women, while women continue to be underrepresented in the sciences (Ingram and Brown 1997). It could be that by achieving a critical mass in the humanities, women have also achieved earnings parity with their male colleagues. This explanation is substantiated by the decrease in the humanities gender salary gap over time while the number of women has increased. Second, academics in the humanities earn less than academics in the sciences. Thus, it costs less to pay men and women the same in the humanities. Although the gender salary gap in the humanities is negligible in 1995, the large gender salary disparities reported by the AAUP are most likely the result of grouping all academic ranks and fields together. Men are more likely to have a higher rank and to work in the sciences—both factors that contribute to the gender salary gap.

Given the importance of academic rank in salary determination, we examined gender salary differences in the probability and duration to promotion. Our results are consistent with the AAUP's findings. We found small and persistent differences. Probit and duration model estimates indicate that women are less likely to be promoted and take longer to be promoted than men. Separate analysis by cohort shows a slight decline in the gender promotion gap over time. These gender promotion differences are somewhat larger than those reported for academics in the sciences. Thus, if gender discrimination is a significant problem for academics in the humanities, it operates through the mechanism of promotion, which in turn has a direct effect on salaries.

Promotion differences are largely affected by differences in the treatment of women with respect to children, number of employers, and work experience. Women with children are less likely to be promoted than childless women. Other researchers

have found evidence that colleges and universities are inhospitable to family concerns. Thornton (2000) evaluated the parental leave policies of 81 colleges and universities. She found that 35 percent of the institutions surveyed do not comply with federal parental leave mandates. However, preferences for children do not explain the entire gender promotion differential. Women are treated differently than men with respect to number of employers and years of work experience as well, and work experience is not entirely a function of women's preferences.[19]

Although we have pinpointed the variables that contribute to the unexplained promotion differences, it is not clear what factors explain the underlying cause of these differences. Market conditions for academics in the humanities alone do not provide an adequate explanation of the gender promotion gap. In the humanities, there are few employment opportunities outside of educational institutions combined with an oversupply of humanities doctorates. In 1995, 4.4 percent of female and 1.7 percent of male recent humanities doctorates were unemployed. These market forces would combine to keep salaries and promotion rates low for humanities doctorates. However, market structure does not explain why women are less likely to be promoted than men.

Concluding that discrimination is the underlying cause of the promotion gap requires assuming that we have controlled for all the variables related to promotion, and we cannot do so. For example, we cannot control for the quality of the book publisher or the number of citations an author receives. If women produce lower quality work, this may explain part of the promotion gap. However, limited evidence contradicts this conjecture. Even though women tend to publish less than men, their work tends to be more widely cited (Schneider 1998). Although we cannot control for every possible factor that could explain the promotion gap, in turn, we cannot rule out discrimination as an underlying cause of the gender promotion differences.

Taken together, these results suggest a shift in focus on the part of researchers and academic administrators. Researchers need to examine salary differences within the context of promotion instead of quantifying the salary gap alone. In addition, several academic institutions conduct periodic reviews of gender pay differentials. The research presented in this paper suggests that these energies are perhaps misplaced. If salary differences are largely explained by rank—as the results from this sample of humanities doctorates demonstrates—then a thorough investigation of the promotion process is called for. Given limited resources, researchers and administrators should continue to monitor these trends by examining how institutions promote faculty. Furthermore, academic institutions should evaluate the effect of parental leave policies on the promotion of women. To the extent that trends in gender salary and promotion differentials are similar in nonacademic labor markets, continued research on the glass ceiling confronting women is warranted.

19. Women may have breaks in service due to childbirth, for example, but these are accounted for in the specification of the promotion models.

Appendix 1
Variable Definitions

Table A1
Variable Definitions for Selected Variables, 1977–95 Survey of Doctorate Recipients, Cross-Sectional Sample

Variable	Definition	Years Available
Log salary	Annualized salary deflated by personal consumption expenditures deflator, 1992 base year.	1977–95
Age	Survey year less birth year.	1977–95
Other race	Indicator variable for those who report not being white or African-American.	1977–95
Foreign born	Prior to 1993, based on reported citizenship in longitudinal sample. 1993–1997 based on each year's reported citizenship.	1977–95
Married = 1	Available starting in 1979. Indicator variable for being married in a given year.	1979–95
Child = 1	Indicator variable for children under the age of 18.	1979–1981 1985, 1989–95
Young child = 1	Indicator variable for children under the age of 6 after 1979; under age of 7 for 1979.	1979–81 1985–95
Experience	Reported years of experience since Ph.D. used. Imputed as years since Ph.D. for the following years: 1977–79, 1983, 1993.	1977–95
Ph.D. from top tier institution	Top and second tier based on rankings from the Carnegie Foundation for the Advancement of Teaching.	1977–95
Ph.D. from second tier institution	Top and second tier based on rankings from the Carnegie Foundation for the Advancement of Teaching.	1977–95
Employed at Top college	Top and second tier based on rankings from the Carnegie Foundation for the Advancement of Teaching, interacted with Carnegie ranking as comprehensive or liberal arts institutions.	1977–95

Table A1 (*continued*)

Variable	Definition	Years Available
Top university	Top and second tier based on rankings from the Carnegie Foundation for the Advancement of Teaching, interacted with Carnegie ranking as research university or doctoral granting institutions.	1977–95
Private institution	Indicator for employer is a private educational institution.	1977–95
Primary work activity		
Research	Primary work reported as applied or basic research, computer applications, development, or design indicator.	1977–95
Teaching	Primary work reported as teaching indicator.	1977–95
Management	Primary work reported as management indicator.	1977–95
Other activity	Years primary activity not research, teaching, or management indicator.	1977–95
Productivity		
Articles	Article in a refereed journal during past two years.	1983, 1987–95
Books	Books authored, coauthored, or edited during past two years.	1983, 1987–95
Chapters in books	Chapter in a scholarly book during past two years.	1983, 1987–95
Reviews	Book review in a refereed journal during the past two years.	1983, 1987–95
No publications	Indicator for no publications during past two years.	1983, 1987–95

Table A2
Variable Definitions for Selected Variables, 1977–95 Survey of Doctorate Recipients, Longitudinal Sample

Variable	Definition
Years to promotion	1975–91: Actual year promoted less year of Ph.D. Imputed as first year Observed with tenure less year of Ph.D. for 1993–95 SDR. Also imputed for individuals who report tenure year prior to Ph.D.
Tenured	Indicator for tenure reported.
Work experience 1995	Reported years of work experience since Ph.D. In 1995.
Proportion of career working at	
Top college	Years meeting condition divided by total years in survey. Top and second tier based on rankings from the Carnegie Foundation for the Advancement of Teaching, interacted with Carnegie ranking as comprehensive or liberal arts institutions.
Top university	Years meeting condition divided by total years in survey. Top and second tier based on rankings from the Carnegie Foundation for the Advancement of Teaching, interacted with Carnegie ranking as research university or doctoral granting institutions.
Private institution	Total years working at private institution divided by total years in survey.
Proportion of primary work as	
Research	Years primary work reported as applied or basic research, computer applications, development, or design, divided by total years in survey.
Teaching	Years primary work reported as teaching divided by total years in survey.
Management	Years primary work reported as management divided by total years in survey.
Other activity	Years primary activity not research, teaching, or management divided by total years in survey.
Government support over career.	Years reporting government support of research divided by total years in survey.
Number of employers	Total number of employers observed.
Proportion of time spent	
Unranked	Years working full time in academia without reporting rank of assistant, associate, or full professor rank.
Unemployed	Years not working full time.
Nonacademic job	Years working full time outside of academia.
Average publications (computed from variables in 1983, 1987–95 SDR)	
Average articles	Sum of articles observed divided by last reported year of experience.
Average books	Sum of books observed divided by last reported year of experience.
Chapters in books	Sum of chapters observed divided by last reported year of experience.
Reviews	Sum of reviews observed divided by last reported year of experience.
Other publications	Sum of other publications not categorized above including exhibitions of work and performances divided by last reported year of experience.
No publications	Indicator for no publications reported.

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