

Inequity in the academy: A case study of factors influencing promotion and compensation in American universities

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Abstract

The literature on higher education in the United States has maintained a place for the specific topic of discrimination against women in the American academy. Institutional restrictions, invisible ceilings, hidden hierarchies—all of these have entered into the discussion surrounding both the failure of women to progress through the academic ranks in numbers consistent with those of their male colleagues, as well as the perceived disparities in salary between men and women at all academic ranks.

This paper utilizes a case study approach in exploring the progress of female academicians at a large, Midwestern university in terms of both salary parity and rates of promotion to senior academic ranks. The salaries and rates of promotion for male and female academicians over the past 2 decades were examined for an analysis of trends across time. In addition, a variety of factors were introduced into the analyses to aid in explaining existing differences, both in terms of compensation and promotion rates. If these factors reflect the state of American universities more generally, the pressing question to be addressed is whether existing differences between male and female academicians are due to entrenched institutional biases, or whether such differences reflect other, more societal, factors.

Introduction

The issue of pay disparities between men and women in the United States workforce is an issue receiving ongoing attention in the media. A recent newspaper article, for example, covered the phenomenon of females in CEO positions seeing their pay “shattering the glass ceiling” (Leondis 2010, B8). While the article trumpets the success of a small number of women heading companies in the Standard and Poor’s 500 index, it also notes that women in the workforce more generally have not yet achieved salary parity with their male colleagues. In addition, the broader picture for female CEOs, based on a 2009 survey of 1.1 million CEOs, found that females who headed companies made about 75% of that earned by males who headed companies (Leondis 2010, B9). In more general pay comparisons, an examination of median weekly earnings for women versus men found that in the United States, the median weekly earnings for women were 79% of those for men in the first quarter of 2010. This compares to the median weekly earnings for women being 76% of those for men in the first quarter of 2000 (Mantell 2010, D2). While that reflects improvement in the pay disparities between men and women, it still leaves a gender gap of greater than 20%. Somewhat more positive news was found in the results of a study of the federal workforce conducted by congressional investigators. They discovered a declining difference in men’s and women’s annual salary for employees of the federal government, so that in the period from 1988–2007, the gender gap in salary went from 28 cents to 11 cents. The Government Accountability Office declared this decline as having occurred in large part due to

the increasing similarities between men and women in terms of such things as experience and educational attainment (Mantell 2010, D2). This news is heartening, but it still leaves a significant pay gap. In total, these pay gaps raise questions about the underlying factors that account for existing disparities.

Inequities in Salary and Promotion in the Academy

While it is tempting to believe that the wage differentials faced in the United States by female workers generally do not extend to the ivory tower of higher education, the literature on higher education in the United States has maintained a place for the specific topic of discrimination against women in the American academy. Certainly there is discussion of perceived disparities in salary between men and women at all academic ranks. In addition, there is discussion of the failure of women to progress through the academic ranks in numbers consistent with those of their male colleagues. Those two topics are related, since progression through the academic ranks generally results in higher pay for the individual. While the reasons for these disparities in both pay and promotion are not always transparent, the disparities themselves are quite clear.

Salary Differentials

As Porter, Toutkoushian, & Moore (2008) note, a “sizable wage gap” between men and women in academe has been the topic of reports in both the national media and academic journals (465). This wage gap has persisted over time, and the exact size of it is debatable. Nonetheless, the National Center for Education Statistics for 2004-05 found that the average male faculty salary was \$69,337, versus a \$56,926 salary for the average female faculty. That difference approaches 22% (Porter et al. 2008, 465).

These findings correspond to data analyzed in a report issued by the American Association of University Professors on gender inequity in the academy (West and Curtis 2006). The AAUP data analyses were based on data from the U.S. Department of Education’s Integrated Postsecondary Education Data System (IPEDS) and AAUP’s own annual Faculty Compensation Survey (FCS) (West and Curtis 2007, 15). When average salaries were considered in that report, female professors earned 81% of their male colleagues in 2005-06 across all ranks and all institutions (West and Curtis 2006,11). Other sources also corroborate these numbers, as for example a published report that women’s average salary as a percent of men’s average salary at universities granting doctorates is 78.1% (Diverse Digits 2009, 5).

While some of the reported pay differentials are attributable to higher numbers of males at the rank of full professor, there still exist pay disparities within ranks (Porter et al. 2008,465). For example, AAUP reported in 2002-03 that female full professors earn 11.2% less than male full professors; female associate professors earn 6.9% less than male associate professors; and female assistant professors earn 7.6% less than male assistant professors (Toutkoushian and Conley 2005, 2).

Interestingly, the AAUP report notes that salary discrepancies between men and women have remained the same since the late 1970’s (West and Curtis 2006,11). Other research also

finds stubborn differences between the salaries of male and female professors. For example, Toutkoushian and Conley (2005, 2) point to unexplained wage gaps in the late 1980's and early 1990's as being comparable to those levels found in the mid-1970's. According to Christman (2003,5), the U.S. Department of Education found that in the fall of 1992, female full-time faculty averaged lower salaries than their male counterparts by about \$10,000. Seven years later, the difference had shrunk—but only to \$9,741 (Christman 2003, 5). At that time, 66% of full-time female faculty earned base salaries of less than \$40,000, while 37% of male faculty did; 5% of women reported salaries of \$60,000 or more, while 19% of men did (Christman 2003, 5).

Promotion Differentials

The American Association of University Professors (AAUP) 2006 report included analyses of promotion rates between male and female professors. The findings of this study include the following:

- a) female faculty are less likely to be in full-time positions, and
- b) female faculty are underrepresented in tenure-track positions. All of this is despite increases in the number of women completing doctoral degrees (West and Curtis 2006, 6-8).

The specifics of the report are instructive. In terms of the numbers of women in tenure-track and tenured positions, women claimed 45% of the tenure-track positions and 31% of the tenured ones (West and Curtis 2006, 9). The picture is complicated when a breakdown of type of institution is made. When examining associate degree colleges, women comprise 47% of tenured full-time faculty. At baccalaureate and masters degree institutions, however, the percentage of tenured full-time faculty who are women is roughly one-third, and when doctoral institutions are considered, tenured full-time female faculty are only about a quarter of the faculty (Banerji 2006, 27). Another measure of promotion differentials by gender in the academy involves examining the proportion of women as full professors. When all types of institutions are considered, women occupied 24% of the full professorships in AY2005-06 (West and Curtis 2006, 10). That number drops to 19% when examining full professorships at doctoral universities (Banerji 2006, 27).

Reasons for Inequities

A variety of reasons are explored in the literature to help explain the differentials in pay and promotion found in the academic world. For the most part, though, the reasons fall into three categories. First, it has been argued that women may bring different worker characteristics to their academic positions than do men, and those worker characteristics are valued differently and are thus subject to different compensation and promotion opportunities. A second set of reasons, not unrelated to the first, concerns the possible effect of childbirth and childrearing responsibilities in interrupting the career trajectory of women in a way that they do not for men. A third set of reasons examines the possibility that academic institutions, not unlike non-academic institutions, are biased in the ways that they perceive and compensate value to the organization. From this perspective, women come up short in both pay and promotion because

of the policies and procedures that govern such issues as starting salaries, pay increases, promotion attainment and workload assignments.

These three categories—worker characteristics, childbearing/rearing responsibilities and institutional bias—are not mutually exclusive, however, the following sections will attempt to parse each of them as an individual contributor to the problem of differential pay and promotion rates between males and females in the academic world. The focus of this paper will be primarily on worker characteristics, thus a thorough discussion of all possible factors contributing to pay and promotion differences is beyond its scope. Nonetheless, a brief overview of childbearing/raising and institutional bias factors will be undertaken to help set the stage for a discussion of how worker characteristics as a sole explanatory factor for gender disparities falls short in explaining the totality of pay and promotion disparities between male and female academicians.

Worker Characteristics—Human Capital Theory

In examining worker characteristics, Porter, Toutkoushian and Moore (2008) refer to the “human capital theory” in their analyses of the pay differentials between male and female academics in the United States (467). This theory supposes that human capital is based on particular characteristics that individuals bring to the workplace, and that compensation is based on the presence (or absence) of these characteristics. Human capital theory acknowledges that differences in pay between groups may exist, but that the statistics describing those differences may or may not take into account the potential differences in worker characteristics that could help to explain the pay differences. If there are differences that still exist after valued worker characteristics are taken out of the salary equation, they are referred to as the “unexplained wage gap” (Porter et al. 2008, 467).

The kinds of characteristics that are typically examined in the academic world include experience, educational attainment, research productivity and primary teaching field, which may be used to make a case for market-driven arguments supporting existing salary differentials (Porter et al. 2008, 469). Type of institution and geographic area are controlled for in these analyses because both influence salary and promotion. Rank may also be used if the analyses are aimed at uncovering salary differentials, but those analyses using rank may be problematic because they often provide lower estimates of the unexplained wage gap because of the potential gender bias found in academic ranks (Porter et al. 2008, 469). The choice of rank as a factor is complicated by the recognition that rank can be used as a gross estimate of research productivity.

National studies have demonstrated time and again that, even controlling for the factors noted above, “sizable and statistically significant unexplained wage gaps remained between male and female faculty at every point of time considered” (Porter et al. 2008, 469). In addition, several studies examining changes over time note that the unexplained wage gap decreased from the 1960’s to the mid-1970’s and then remained constant through the 1990’s (Porter et al. 2008, 469). It should be noted, however, that work by Toutkoushian and Conley (2005, 23) demonstrates that there have been decreases in pay differentials between men and women with

similar qualifications, but overall women earn, on average, between 4 and 6% less than men in academe—several thousand dollars per year, which amounts to noticeable sums over the course of a career. The largest gaps are at Research I and II institutions, while unexplained wage gaps in Doctoral I and II institutions, as well as those in Liberal Arts institutions, are no longer significant (Toutkoushian and Conley 2005, 20)

Career Interruptions

If human capital is the driving force behind pay and promotion decisions in the academy, then career interruptions that lessen the individual's productivity may also reduce an individual's human capital. Mason and Goulden (2004) have studied the issue and find it puzzling that while close to one-half of the Ph.D's awarded in this country go to women, advancement continues to lag for women in terms of moving forward to senior academic ranks at the same rate as men. They also note that many women with Ph.D's are dropping out of the race entirely.

The focus of this research (Mason and Goulden 2004) is on whether babies matter when it comes to men and women on the tenure track. Their conclusion is that babies do matter, in part because a woman's reproductive years coincide with their years in graduate school, as a postdoctoral fellow, and as an assistant professor. Since the average age for receiving a Ph.D is 33, and many professors do not secure tenure before 40 (Mason and Goulden 2004), it appears as though women in the academy feel forced to make a choice between moving up the academic ladder or having a family. Men do not appear to face the same choice. As the authors note, "Married with children' is the success formula for men, but the opposite is true for women, for whom there is a serious 'baby gap'" (Mason and Goulden 2008). The inference is that women who are climbing the academic ranks are more likely to choose not to have children, while those who remain in the junior academic ranks (or who opt out of the academic life entirely), have chosen to have families which then diminishes their human capital in the workplace, in that their skills and productivity suffer from time spent away from the workplace. Men do not appear to face that same issue.

Institutional Discrimination

The idea that academic institutions might discriminate against women in pay and promotion is not a new one. From this perspective, discrimination in the "real-world" is mirrored in the academic world. For example, it is often the case in academia, as it is in industry, that salary information is not widely shared among departmental colleagues. The processes by which salaries are initially awarded and then increased often remain somewhat mysterious. Promotion decisions in academia, as in industry, may also be shrouded in mystery. The specter raised by a lack of transparency in these processes is that differences in pay and promotion rates do not correspond solely to differences in productivity as one would expect if worker characteristics were the only thing that influenced wage and promotion rates.

Christman (2003) raises specific issues that pertain to institutional reasons for women attaining lower salaries and rates of promotion in academic settings that include a) being hired at

lower salaries than men, b) being considered outsiders in academe, c) doing research that is devalued, d) serving on too many committees, and e) having heavier advising and teaching loads.

Probert (2005) has examined 2 extensive data sets in attempting to tease out the reasons why differential rates of promotion for male and female academics exist in the Australian system, and her work examines some of the issues raised by Christman (2003). While Probert (2005) does not discuss salary equity specifically, the overlap between promotion and salary more generally makes inferences about salary inequity possible. Her work confirms the hypothesis that men and women are unequally distributed through the academic hierarchy (far fewer women employed above Level C and underrepresented at Levels D (associate) and E (professor), much like the similar pattern of employment found in the UK and US (51).

Probert's (2005, 57) work found, somewhat surprisingly, that women are at least as likely to be successful as men in obtaining promotion. Despite their success when they do apply for promotion, however, women are less likely to apply for promotion (63% of men to 53% of women in the UNSW survey). The reasons for this are not clear, but some possibilities might include the fewer formal qualifications and work experience (human capital) brought to the job by women, as well as an approach to climbing the career ladder that is characterized as less intense.

Other issues historically mentioned as reasons for a lack of promotion, such as workload differences and research productivity, were examined. In terms of workload, regardless of whether the measure was numbers of lectures, numbers of papers graded, or coordination responsibilities, workloads were found to be roughly comparable between men and women. Areas of difference were found, though with women indicating more time spent on activities characterized as "student welfare and pastoral care" (Probert 2005, 60), while men indicated more time spent on areas of conference organization and management and consultancies. In terms of research productivity, men had greater productivity, even when both discipline and rank were held constant. While it is not entirely clear that Australian data can be superimposed on the American faculty experience, this data partially supports Christman's (2003) that the academic experience for women is at least somewhat different than it is for men.

Case Study Overview

The purpose of this paper is to try to understand the issue of gender differentials in salary and promotion rates in the confined context of a single, typical example of an American university. To facilitate this, we have chosen a university with a long history of monitoring gender (in)equity as it has evolved over almost 20 years in terms of both salary parity and rates of promotion to senior academic ranks. The goal here is to illustrate what gender (in)equity looks like in a single place across a period of time, with the possibility of better understanding the national picture from our depth analysis. A brief history of the early gender issues will first be provided, followed by analyses that examine in greater detail changes in pay and promotion rates across the last decade. A discussion of the findings will examine the possible reasons for gender inequity, as well as some suggested remedies.

Background

The target of our analyses is a large, Midwestern university. It enrolls more than 38,000 students across 8 campuses, and it offers both a comprehensive array of undergraduate majors as well as a variety of master's and doctoral programs. Total tenured/tenure-track faculty across the system exceed 850. For the sake of clarity, our analyses in this paper will be confined to the university's main campus, which enrolls more than 24,000 students with 662 tenured and tenure-track faculty. Approximately 43% of those faculty members are female, while 57% are males.

The faculty at this university has been unionized for more than 30 years under the auspices of the American Association of University Professors (AAUP). The maturity of the chapter means that there has been at least one active AAUP committee over many of those years that concerned itself specifically with monitoring the challenges of gender equity across pay and promotion rates. A report by Johnson and Kovacevich (1994) details some of this history of the early efforts by the chapter's AAUP Committee on the Status of Women (Committee W) to investigate and monitor gender equity issues. They note that the issue has been a problem since at least 1982. Early findings revealed that few women were to be found in the ranks of senior academicians with proportionately higher salaries. The initial efforts to change this included individual salary reviews, appeals by both Committee W members and faculty groups to the administration, and the publicizing of relevant reports of inequity beginning in 1987 (Johnson and Kovacevich 1994, 2).

Results

Gender Lawsuit

The efforts became much more public and organized in December 1993, when one female faculty member filed a complaint with the United States Department of Labor's Office of Federal Contract Compliance Programs (OFCCP) (Johnson and Kovacevich 1994, 2). The heart of her complaint was that discrimination against women existed at her institution with regard to hiring, firing, salary and promotion. OFCCP gathered data over the next year and a half through meetings with Committee W representatives. The Johnson and Kovacevich (1994, 3) report notes that Committee W focused specifically on salary and promotion discrimination and chose not to focus on possible discrimination in hiring or dismissal of women faculty. The data used in Committee W's analyses was provided by the university administration.

In March, 1995, OFCCP's Notification of Results of Investigation found that the evidence provided did, in fact, suggest that discrimination in faculty promotion rates by gender at the University existed. And, because discrimination in promotion was found to exist, the OFCCP believed that discrimination in salary also existed. In November, 2000, a letter from the Regional Director of the OFCCP, Region V to the University President detailed a settlement. In Part II, subsection 1: Specific Provisions-Violation, the report notes, "OFCCP found that [the University] discriminated against female faculty due to sex systematically with respect to

promotion to Associate Professor and in three specific instances to Full Professor...” (2-brackets added).

In fairness, the conciliation agreement between the U.S. Department of Labor Office of Federal Contract Compliance Programs and the University notes that, “This agreement does not constitute an admission by [the university] of any violation of Executive Order 11248, as amended, and implementing regulations. Throughout the course of this investigation, [the university] has specifically and continuously denied that its policies or decisions have resulted in any violation whatsoever of the nondiscrimination or affirmative action provisions of its Federal contracts of any other federal nondiscrimination provision. This Agreement is entered into by [the university] for the sole purpose of avoiding the time and expense of further administrative proceedings” (Part I: subsection 3-brackets added). Nonetheless, the University agreed to award a total of \$219,900 in “monetary relief, including back pay, interest, and retirement contributions and other equitable relief ...” (Part II, subsection 1:d).

The question that this paper addresses is whether the problems in compensation and promotion that prompted the lawsuit in 1993 have been adequately addressed in the 10 years since the conciliation agreement. The AAUP and its members have continued to monitor the twin issues of promotion rates and salary equity with regard to gender in the last decade.

Committee W Report

In February, 2002, Committee W reported on gender inequality to the local AAUP chapter (Seeberg 2002). A summary of the findings is instructive. Overall, the difference between female and male faculty average salaries in 2000-01 was \$11,154, where female faculty were earning 83 cents to every dollar earned by male faculty during that time period. While 45 male professors earned more than \$90,000, only 2 female professors earned above that mark. Setting the stage for our later analyses, Seeberg (2002) noted at the time that even after taking into account the types of issues that invariably arise when discussing salary differences (i.e. rank, years in rank, years since receipt of highest degree earned, starting salary, and year of hire) “significant inequities” remained (2).

In terms of potential gender effects with regard to promotion, Seeberg (2002) found significant underrepresentation of women at the rank of Full Professor. While 49% of Assistant Professors and 45% of Associate Professors were women, only 16 percent of Full Professors were female (1,8). While these data are perhaps too close in time to the conciliation agreement of 2000, and thus the university may not have had sufficient time to address the concerns of promotion and salary inequity across gender, the numbers are an anchor from which comparisons to more in-depth analyses can be made.

In order to bring into sharper focus the progress that has been made, as well as the problems that remain, with regard to gender inequity in salary and promotion rates, we did a more detailed analysis of salary and promotion data at two points in time, the 2001-2002 and the 2009-2010 academic years. The data used here is routinely provided by the University to the local AAUP chapter. In the analysis, we focus on what factors account for differences in salary

by gender and how changes in these factors provide a more nuanced picture of the apparent improvements for women.

Empirical Analyses—Salary

Table 1 shows the average salary by gender for both years. In 2002, the average female faculty salary was \$12,343 lower than the average male salary, with women earning 82.5 cents per dollar men earned. By 2010 the absolute gap had increased by almost one thousand dollars but due to salaries rising faster for women than men, the relative gap had shrunk to 84.4 cents per dollar.

Table 1: Average Salary by Gender

	2002	2010
Female Average Faculty Salary	\$58,117	\$72,129
Male Average Faculty Salary	\$70,460	\$85,436
Difference (Female – Male)	- \$12,343	- \$13,307
Female Salary per \$1 of Male Salary (Female/Male)	0.825	0.844

There are a variety of factors, correlated with gender, which may lead to the expectation that salaries of female faculty members would be lower than the salaries of male faculty members; means for the variables in our sample are presented in Table 2. Females at the University we examine are more likely to be in the colleges of Nursing and Education and less likely to be in Business or Arts & Sciences; given salary differences by college (within the University), this may contribute to the salary gap. Similarly, since salaries increase with years of experience, and males at the University have on average 6.7 more years experience in 2002, part of what is being captured in the gender difference may be differences in experience.

Table 2: Sample Means by Gender for Variables that May Affect Salary

Variable	2002			2010		
	Females	Males	Difference	Females	Males	Difference
Black	6.7%	3.3%	3.4	3.8%	03.5%	0.3
Other race	8.8%	10.2%	-1.4	13.2%	14.7%	-1.5
College - Arts & Sciences	35.4%	51.7%	-16.3	33.4%	51.5%	-18.1
College – Business	5.0%	9.6%	-4.6	5.2%	9.9%	-4.7
College – Education	16.7%	10.2%	6.5	24.4%	13.6%	10.8
College –Technology	0.0%	1.8%	-1.8	0.3%	2.1%	-1.8
College – Nursing	10.8%	0.3%	10.5	6.3%	0.0%	6.3
College - Lib. & Media	4.6%	1.0%	3.6	5.2%	1.9%	3.3
College – Communications	0.4%	2.0%	-1.6	11.5%	6.9%	4.6
College - Fine & Professional Arts	27.1%	23.4%	3.7			
College - Public Health				0.7%	2.4%	-1.7

College – Arts				12.2%	8.5%	3.7
College – Architecture				0.7%	3.2%	-2.5
Have a Ph.D.	74.6%	80.7%	-6.1	72.8%	80.3%	-7.5
Years since degree	13.5	20.2	-6.7	15.7	20.4	-4.7
Rank of Assistant Professor	42.9%	25.6%	17.3	46.7%	31.9%	14.8
Rank of Associate Professor	40.8%	31.2%	9.6	36.2%	32.0%	4.2
Rank of Full Professor	16.3%	42.9%	-26.6	17.1%	37.1%	-20.0

In order to better understand what factors are leading to the gender differences, we estimate a series of Ordinary Least Square regressions, with salary as the dependent variable and the explanatory variables presented in Table 2 (race, college, whether the individual has a Ph.D., years since degree, and rank) as independent variables. For ease in presentation, Table 3 only presents the coefficient estimate on the gender dummy variable; the full set of coefficient estimates are available from the authors. For each model specification, the table also indicates which other control variables are included in the model. We begin by describing the results for 2010 and follow with a discussion of changes over time. Model 1 only includes the gender dummy variable, with no other controls, and thus the coefficient estimate is the sample mean difference in salary of \$13,307.

Table 3: OLS Regression Results (Annual Salary as Dependent Variable)

	Model 1 Gender	Model 2 Race	Model 3 Ph.D	Model 4 College	Model 5 Exper.	Model 6 Rank	Model 7 No Rank	Model 8 Full
2010 Results for the Female Variable	- 13307** (1819)	- 13260** (1818)	- 12788** (1812)	-10960** (1763)	- 7088** (1595)	-6246** (1429)	-4080** (1394)	-2511** (1155)
2002 Results for the Female Variable	- 12342** (1600)	- 12273** (1610)	- 11382** (1550)	-11786** (1799)	- 4055** (1346)	-4018** (1157)	-3025** (1215)	-1818* (1013)
Controls for Race	No	Yes	No	No	No	No	Yes	Yes
Controls for Ph.D.	No	No	Yes	No	No	No	Yes	Yes
Controls for College	No	No	No	Yes	No	No	Yes	Yes
Controls for Experience	No	No	No	No	Yes	No	Yes	Yes
Controls for Rank	No	No	No	No	No	Yes	No	Yes

Note: The coefficient estimate for the Female dummy variable is presented with the standard error in parenthesis. ** indicates the coefficient estimate is statistically significant at the 5% level and * indicates significant at the 10% level

Model 2 includes controls for race and Model 3 includes controls for whether the faculty member has a Ph.D.; in neither model does the coefficient estimate on gender change much. Although female faculty at this University are less likely to have a Ph.D., and having a Ph.D. is significantly related to salary, the lack of a Ph.D. does not explain much of the gender difference in salary. Model 4 includes dummy variables for what college the faculty member is in; while the coefficient estimate on gender falls a bit when college is included (from \$13,307 to \$10,960), even controlling for college there is still more than a \$10,000 difference in salary by gender. In other words, the differences in salaries are not being driven by differences in race, having a Ph.D., or the College with which a faculty member is affiliated.

In Model 5, years of experience (measured as years since Ph.D. and years since Ph.D. squared) is included in the model and the coefficient estimate on gender falls from \$13,307 to \$7088; one important reason female faculty at this institution have less salary is because they have less experience. Model 6, which uses rank rather than years of experience, presents a similar story—more experienced and higher ranking faculty, who are predominantly male, are contributing to almost half of the salary difference.

Models 7 and 8 include the control variables simultaneously. In Model 7, all variables except rank are included in the model. Promotion in rank is generally determined by a faculty member's faculty colleagues and administrators. If bias by these individuals results in women being less likely to be promoted, with all else being equal, then it would not be correct to control for rank in a regression analysis of salary. Nonetheless, rank can serve as a crude measure of productivity. Because of these competing concerns, we choose to present the results both ways, and so consider Model 7, without controls for rank, to be an upper bound on the gender difference in salary, while Model 8 is the lower bound. In both models, gender continues to have a negative and statistically significant coefficient estimate with women earning \$2,500 to \$4,080 less per year, even after controlling for race, college, Ph.D., and years of experience.

Given that the average salary for females in 2010 is \$58,117, the coefficient estimates from Models 7 and 8 suggest that women are making between 4.3% and 7.0% less than comparable males at the University. While this is certainly much less than the \$13,307 absolute difference in salary, it still suggests that the University has not addressed the gender gap in compensation. For a female faculty member who teaches for 35 years, this disparity results in a reduction in the net present value of lifetime earnings of \$87,885 to \$142,800; given that retirement income is also based on earnings, the lifetime loss of income for someone who retires after 35 years service and lives to 80 is approximately \$120,000 to \$200,000.

In comparing the results from 2002 to 2010, two important points emerge. First, as a result of relative increases in experience, it would be expected that the pay gap would shrink, but this did not happen. During this time period, a number of male Full Professors retired (the percent male faculty who were Full Professors fell from 42.9% to 37.1%), while female professors became relatively more experienced (15.7 years since degree in 2010 compared to 13.5 in 2002). In Model 5, which controls for experience, it can be seen that experience accounts for about half of the gender difference in 2010 (the coefficient estimate on female is -6,246

compared to -13,307 in the model with no control); this is much less than the role of experience in 2002 where more than two-thirds of the gender difference is experience (coefficient estimate on female goes from -12,342 to -4,018 when experience is included). However, despite the increase in experience, the wage gap widened from 2002 to 2010.

The second important result from comparing results in 2002 and 2010 is that when human capital factors are controlled for, the wage gap for females becomes larger over this time. In Model 7, examining the upper bound limit, the gap increases from \$3,025 to \$4,080, indicating a 35 percent increase in the unexplained wage gap over this time period. In Model 8, the lower bound limit demonstrates an increase in the gap from \$1,818 to \$2,511, a similar increase of 38 percent.

Empirical Analyses—Promotion

The literature discussed in this paper indicates that in addition to salary differences, there often are promotion differences by gender. At the University we examine, currently 53.6 percent of the Assistant Professors are female, 46.4 percent of the Associate Professors are female, but only 26.1 percent of the Full Professors are female. In order to examine potential promotion differences by gender, we estimate a hazard model indicating the years to promotion at the University. Following the human capital model of the salary analysis, we examine the time to promotion in a model with no control variables and controlling for the human capital variables. Unfortunately, a change in the software system used by the University does not allow a hazard model to be estimated in 2010, but we present the results for 2002 and 2009.

**Table 4: Summary of Survival Analysis Results 2002 and 2009
Probability of a Male receiving a promotion relative to a female**

	Promotion to Associate		Promotion to Full ^b	
	Model 1 Gender	Model 8 All Controls	Model 1 Gender	Model 8 All Controls
2002 Odds of a male being promoted relative to female	1.49** (<.0001)	1.16 (.222)	2.00** (<.0001)	1.47* (.066)
2009 Odds of a male being promoted relative to female	1.07 (.597)	1.04 (.789)	1.97** (<.0001)	1.41* (.074)

Note: The odds provided are 1/hazard ratio on the female variable from a hazard model estimation; level of statistical significance is given in parenthesis. ** indicates the odds ratio is statistically significant at the 5% level and * indicates significant at the 10% level

Model 1 indicates the odds of a male being promoted relative to the odds for a female with no controls, while model 8 includes the human capital factors (race, college, having a Ph.D., and years since degree). In 2002, males are 49 percent more likely than female to be promoted to Associate Professor (odds are 1.49 for males for every 1 for females) when no controls are included, but human capital variables account for much of this difference. With the human capital controls, the gender odds fall to 16 percent and are not statistically significant. By 2009,

the promotion rates are virtually the same for males and females even when no controls are included, with no statistically significant difference. However, there is a very different story for promotion to Full Professor. In both years, males are about two times as likely to be promoted as females (exactly 2 times in 2002 and 1.97 times as likely in 2009). Human capital explains about half of this difference, but even with the human capital controls, males are more than 40 percent more likely to be promoted to Full Professor (47 percent in 2002 and 41 percent in 2009). In summary, while there is no difference in the likelihood of a female being promoted to Associate Professor, there is a large difference in the likelihood of being promoted to Full Professor. While about half of the difference in promotion rates to Full Professor is due to human capital factors (especially years since degree), there is still a significantly higher probability that males will be promoted to Full Professor once those factors are taken into account, and this gap has not closed very much over the decade.

Discussion

The comparisons across almost a decade of data indicate differences in the salaries paid to men and women at our case study university, as well as differences in rates of promotion. The average differences in salary and rank are partially explained by factors involved in the human capital theory (experience, education, discipline, and rank/productivity), where women bring less of the characteristics traditionally valued in the academy to the academic workplace than do their male counterparts. To mitigate these types of differences, there are a number of potential strategies. For example, women can be encouraged to finish the education considered appropriate for their field and obtain the experiences that are valued by the university community. It would be expected, for example, that if having a Ph.D or other terminal degree is considered *de rigueur* for one's chosen field, then obtaining that degree will result in greater recognized human capital in the academic job market. In the same vein, if women are choosing fields that are less prestigious, and thus less well-compensated, then encouraging girls from a young age to develop their interests in fields more valued in the academy should ultimately produce more equity in pay and promotion rates in academic settings.

Nonetheless, there remain discrepancies in salaries and promotion rates between men and women after those human capital factors are taken into account. Not surprisingly, our findings are congruent with national data, which has also pointed to discrepancies in salary (Porter et al. 2008, 465) and promotion rates (West and Curtis 2006, 6-8) for female faculty. What is surprising is that after more than 20 years of the university administration at our case study institution being aware of the issues, and 10 years after this university settled a lawsuit over gender discrimination in salary and promotion, faculty at this institution still experience these same discrepancies.

Since the discrepancies here cannot be fully explained by the human capital theory, other explanations are possible. Two main reasons that emerge in the literature for helping to explain why female faculty are paid less than comparable male faculty include both issues of career interruption and institutional bias. While our data set does not permit analyses of these variables,

we would suggest that consideration of these factors and their contributory influence on pay and promotion rates is a necessary step to addressing these discrepancies.

Career interruptions

As mentioned previously (Mason and Goulden 2004), the career interruption perspective notes that children make a difference to female faculty in terms of their ascension to senior academic ranks (and presumably to their salaries as well) in a way that is not seen in the promotion rates and salaries of male faculty. Time taken for pregnancy, childbirth, and raising children impacts women differently than men, and those career interruptions then have an impact on the human capital that women bring to their academic positions. Their experience suffers and their research productivity suffers, and both of those variables are typically found to influence salary increases and promotion opportunities

In addition, once the choice to have children is made, time spent on childcare and other household responsibilities is different for men and women. The numbers vary depending on the study, but the general finding is that women are spending more time on housework and childcare than are men (Mason and Goulden 2004; Probert 2005, 62). In a real sense, because we view academic work being flexible and thus compatible with child-rearing responsibilities, we have trouble seeing this type of work as a double-edged sword. Probert (2005, 69) argues that perhaps academicians are too flexible and cannot exert the “power of absence.”. It is difficult for academics to argue that they have to be in the actual workplace for many hours. Unlike more traditional work, where time spent in the office is valued and recognized, academic work is often done in places other than the university. It may make it more difficult for the female academic to argue that she must be absent from her household responsibilities in order to get her professional work done because she does not have to go to the office to do it. Thus, those in more traditional employment get to avoid family work and increase their visibility at work because of the demands of typical office employment. Women in academic positions get the flexibility of being able to work at home, with the double-edged sword being that time-consuming family work may erode professional work time in significant ways (Probert 2005, 70).

If being female and being a tenure-track faculty member are incompatible, then West and Curtis (2006, 14) believe that universities should adopt family-friendly policies. While many universities express commitment to such policies, though, Probert (2005) argues that those efforts may not be enough. For example, while Australian universities have family-friendly policies in the form of paid/unpaid maternity leave, access to part-time employment, and special support to get faculty back to working on their research, women in her research identified other issues that conflicted with their academic lives. These included difficulties finding convenient childcare and problems with academic scheduling, both of which made it difficult to fulfill their parental responsibilities (Probert 2005,61-69).

Mason & Goulden (2004) suggest that stopping the tenure clock for childbirth, developing more generous childbirth leaves, having a period of modified duties available after childbirth, and providing onsite childcare would assist faculty in managing work and family

responsibilities. Programs like these are reportedly in place at the University of California and have been for over 2 decades, but there is a record of low participation in that time. Typical issues that are reported by faculty are that they a) did not know the programs existed, b) they were confused over eligibility requirements, and c) they feared that using the policies would result in retribution (Mason & Goulden, 2004). Newer proposals include flexible part-time options for tenured/tenure-track faculty for up to five years, a guarantee of high-quality childcare slots for tenured/tenure-track faculty, the establishment of school-break childcare and summer camps and better marketing of these programs to those likely to participate (Mason & Goulden, 2004).

One caveat to these types of programs is that women who take advantage of them risk being seen as less committed to their careers and are thus relegated to second-class status in their working environment. Interestingly, there is little discussion of these issues as they pertain to fathers, as it continues to be assumed that women will shoulder the majority of childcare and household tasks while men channel their full ambition in the workplace. It is not clear that any of the solutions proposed to the problem of career interruptions for family reasons would modify these perceptions. Unless men are also able and willing to avail themselves of family-friendly policies, thus changing the cultural view of women as largely accountable for family life, it will be impossible to develop strategies that allow for a successful combination of work and family-life in the academy without detrimental and disproportionate effects on women's promotion potential and earnings power.

Institutional Discrimination

The topic of institutional biases encompasses a number of possibilities, but they are often discussed in terms of the processes and procedures that influence initial appointments, workload assignments, awarding promotions, determining salaries, and other factors. If the issues surrounding pay and promotion disparity are due to institutional policies and procedures, then solutions are beyond the scope of changes made by individual faculty members. Instead, the very notion of institutional discrimination requires an institutional approach where academic organizations take a close look at the practices governing hiring and salary negotiation, salary increases and merit pay procedures, promotion criteria and processes, workload assignments, and other policies relevant to salary and promotion decisions.

Such policy changes can make a difference. As but one example, Probert (2005,57),in her study of the Australian system, noted that women are as successful, and sometimes even more successful, in their bids for promotion than men, despite their beliefs to the contrary. These success rates occur despite women placing greater weight on teaching and less on research in their promotion applications when compared to men. Changes in the Australian university-system, where now there is explicit recognition of teaching, appear to have been successful at eliminating promotion bias (Probert 2005, 58).

In a broader sense, institutions need to take a hard look at what they do and how they do it with an eye towards examining policies which are not intended to discriminate, but nonetheless

have discriminatory implications as their end result. Not only is it possible that an individual institution's policies may not reflect equity, those policies may not accurately reflect the importance of the variety of work in which faculty engage to the mission of the institution. For example, Ernest Boyer (1990) was an advocate for expanding what universities value in the work of their faculty. Boyer writes of "scholarships," rather than just "scholarship." The distinctions he makes point to expanding our definition of what academic work means and valuing that work that is not part of the traditional definition of scholarship i.e. creating new knowledge. In his view, the scholarship of teaching is a valuable part of the academy, as are scholarships that rely on the application of knowledge to solve real-world problems and those that integrate knowledge within and between disciplines. If Boyer is correct in valuing different scholarships, then women should theoretically be doing better in the areas of pay and promotion. The disciplines that have traditionally appealed to women, such as nursing and education, are often those that rely heavily on the "scholarship of application." And, if women truly are more oriented to the teaching mission of the academy, then being able to utilize those interests to produce scholarship in teaching should benefit not only their standing in the university community, but also their ability to leverage that standing for promotion and for greater earnings potential. Ultimately, even the most research-driven institution is dependent to a large degree on undergraduate students for their existence. It is a disservice to the students and to the faculty who engage with them, to adhere to a narrow view of university work where only research superstars are feted, promoted and compensated according to their worth to the institution. While they indeed contribute a great deal to the institution, they are not solely, or perhaps even largely, responsible for the existence of most institutions of higher education.

Conclusion

The twin issues of pay and promotion disparities between male and female faculty in university-settings reveal a complicated and interwoven fabric of potential contributory factors. Only some of those factors have been explored in this paper, including differences in human capital contributions brought to academic positions by men and women, the differential effects of career interruptions in the form of children to men and women, and the possibility that institutional policies and procedures systematically treat male and female faculty differently in terms of pay and promotion potential. Even within these categories, there are additional variables that might reasonably be expected to influence those disparities. Further work can illuminate the role of these variables.

In all, though, it appears as though there is a need for continuing conversation and new ways of thinking. Perhaps more importantly, there is a need for those new ways of approaching the problem to result in changes to the university community that strengthen its existence and relevance in the coming years. Re-evaluations should include discussions about what is important to faculty positions and how to encourage individuals to reconsider the human capital attributes that are valued in the academy. Those discussions should also examine the real and disproportionate impact of children on female faculty and their professional lives. Our ideas

about what should be valued in university settings and whether it makes sense to overvalue research at the possible expense of teaching and applying knowledge to solve real-world problems should be part of the evaluation process, as should discussions of policy and procedure with a focus on whether there is institutional bias towards women. Such bias, when it exists, is likely the result of a long history of the academy being male-dominated rather than a malicious attempt to discriminate against women. Nonetheless, the academy is no longer male-dominated. It is incumbent on academic institutions to ensure that men and women work on a level playing field.

As women are currently outnumbering men at the baccalaureate level, while also earning one-half of the Ph.Ds granted in the United States, they are engaging in the time-honored American tradition of getting an education and “paying one’s dues” in order to move up the ladder toward greater prosperity and economic security. If education and experience are part of the equation for success in the academic world, then women who obtain these credentials should be expected to move ahead in that world. West and Curtis (2006, 7), however, note that an analysis at one research university suggested that without any change in their current hiring and retention trends, women would never make up more than 34 percent of tenure-track faculty and that number would take 40 years to achieve. Our analyses also indicate that women’s gains in the academic world have been slow to come. Parity in pay and promotion that is commensurate with women’s credentials will require changes to the current academic practices that govern these outcomes. Without changes to those practices, we expect to be writing a similar paper in 10 years that tells more of the same sad story of gender inequality in the American academy.

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