

Have Academic Libraries Overcome the Gender Wage Gap? An Analysis of Gender Pay Inequality

Quinn Galbraith, Adam Henry Callister, and Heather Kelley

This report draws upon two data sets to examine the gender wage gap among member institutions of the Association of Research Libraries (ARL). The first data set consists of 35 years of salary survey data collected by ARL and is used to provide trend data on the gender wage gap from 1980 to 2014 as well as present an in-depth look at the wage gap in 2014. After controlling for variables such as years of experience, position, and type of library in the 2014 ARL Salary Survey data, results revealed that women on average made approximately 2 percent less than their male counterparts in 2014. The second data set comes from a survey of ARL institutions conducted by the researchers in 2015 and is used to explore the influence of additional variables on the gender wage gap that were not found in the ARL Salary Survey data. Results from both data sets suggest a substantial difference between the gender wage gap in ARL institutions and the workforce as a whole.

In recent years, the gender wage gap has become a highly politicized issue frequently addressed by both prominent political figures and the media in general. Among references to the provocative “women earn 78 cents to every \$1 that men earn” statistic¹ and a frenzy of heated rebuttals based on the notion that those who talk about the wage gap are simply “manipulating statistics... to convince women that they are the victims of systematic societal discrimination,”² there has arisen a general sense of confusion about the real effect of gender on wage allocation. Not surprisingly, media outlets have been more than willing to educate the average layman on their own view of how to approach this issue through a plethora of overtly one-sided articles such as “The Gender Wage Gap Myth and 5 Other Feminist Fantasies,”³ “Five Ways to Win an Argument about the Gender Wage Gap,”⁴ or the openly pointed “Why Men Need to Believe in the Wage Gap.”⁵ As a result of the polarizing nature of this debate, many people have come to view references to a gender wage gap with a learned sense of either bitter injustice or decided skepticism—effectively hearing only what they want to from reports about gender wage gap statistics.

Not to be outdone by wage-gap activists’ “78 cents” statistic, proponents of the idea that there is no real gender wage gap have all but glorified the concept of an adjusted wage gap as the definitive explanation for the discrepancy in pay between men and women. In this context,

*Quinn Galbraith is Sociology & Family Life Librarian in the Harold B. Lee Library at Brigham Young University; email: quinn_galbraith@byu.edu. Adam Henry Callister is an undergraduate research assistant at Brigham Young University; email: adamhenrycallister@gmail.com. Heather Kelley is a research assistant in the Harold B. Lee Library at Brigham Young University; email: heatherkelley@outlook.com. *Special thanks to Jessica Mansfield for her significant contributions in editing this paper and Labor Economist Brigham Frandsen, PhD, for his consulting assistance. ©2019 Quinn Galbraith, Adam Henry Callister, and Heather Kelley, Attribution 4.0 International (<https://creativecommons.org/licenses/by/4.0/>) CC BY 4.0.*

the “78 cents” statistic is a simple comparison of mean salaries known as a *raw* wage gap, while an *adjusted* wage gap is a model that considers other variables thought to influence wages. In theory, this adjusted wage gap allows researchers to account for how much, if any, of the reported difference in wages could reasonably be attributed to gender bias. The reasoning here is that, because men and women make different life and career choices, and thus differ in factors such as profession, years of experience, and education level, these variables should be controlled for when comparing mean male earnings to mean female earnings. Due to the fact that many adjusted wage gap models that control for such variables report a gap substantially smaller than the popularized raw wage gap statistic, skeptics of the existence of a gender wage gap have been quick to assert that any perceived difference in mean male and female wages can be accounted for by factors other than discrimination.

Those who side with the idea that there is a gender wage gap are quick to respond to the adjusted wage gap argument by referencing the fact that, although adjusted wage gap models substantially reduce the pay gap between men and women, they still often show a sizable and unexplained difference in pay. This leads many to conclude that the difference in pay between men and women left over after controlling for other variables that affect wage in an adjusted wage gap model should be attributed to the existence of pay discrimination in the workforce. Of course, opponents of this view argue that the remaining unexplained difference is not the result of pay discrimination but is due instead to the inability of adjusted wage gap models to take into account every possible factor that could affect wage and differences in the way that men and women respond to labor market incentives.⁶

Regardless of whether or not people believe that the difference in wages between men and women is due to gender bias, there is a general consensus on the existence of sizable raw and adjusted wage gaps between men and women across almost every profession in the United States.⁷ Although limited in scope, prior research within the field of library science on the topic has revealed findings that differ from the general perception of the gender wage gap found in the literature.⁸ As suggested by such research, there is little to no gender wage gap among academic librarians. Such a finding ultimately raises questions regarding what makes job seekers and employers in the labor market for academic librarians different from other professions. It has been suggested that both the nature of library science as a female-dominated profession⁹ and the large number of leadership positions filled by women in library science¹⁰ contribute to greater gender equality within the profession. However, it is still unclear as to which, if any, of the factors distinguishing employees and employers in the field of library science from the rest of the workforce can be attributed to causing greater gender equality in terms of pay allocation.

Literature Review

A review of previous research regarding the gender wage gap within academic libraries suggests a significant difference between the effect of gender on wage allocation among academic librarians compared to the workforce as a whole. One study of 357 college graduates working as librarians found that, when controlling for variables such as marital status, number of children, sector of work, and education level, gender and race did not have any significant impact on earnings.¹¹ While the data set for the sample in this study was drawn from a large population of college graduates, the study is limited by a lack of distinction “between employment in academic, public, private, and/or special libraries.”¹² Similarly, a study that reviewed data from various library associations including ARL, the American Library Association (ALA),

and the Association of College and Research Libraries (ACRL) found no statistically significant difference in pay between male and female academic library directors,¹³ ultimately concluding that, due to its advancements in gender equality, library science as a profession “is a model by which other professions in which women are—or can become—the majority should judge themselves.”¹⁴ Although this study provides an overview of advancements made in gender equality within library science as compared to other professions, it is largely an explanatory review of the advancements with limited statistical analysis rather than a study of a specific data set focused exclusively on understanding the gender wage gap. Additionally, this study considers only the raw aggregate data published yearly by ARL in its analysis and is therefore only able to report a raw wage gap instead of both a raw and an adjusted wage gap.

In the context of the gender wage gap as a whole, these findings suggest that the field of library science differs substantially from other professions in regard to the wage gap. In contrast to the relatively high degree of wage equality within academic libraries suggested by these two studies, data from the US Census Bureau in the year 2015 revealed that female workers in the United States made on average only 79.6 percent of what male workers made.¹⁵ The existence of such a large gender wage gap has motivated research into several different factors related to gender and wage that reveal a variety of potential causes for a disparity in pay between men and women. Provided below is a brief review of the literature related to three of the main factors shown to influence pay discrepancies between men and women in an effort to construct a clearer picture of how this study fits into both prior research within the field of library science as well as the broader context of the gender wage gap as a whole.

Motherhood Penalty

One popular explanation for the gender wage gap stems from the idea that raising children limits a woman’s potential for advancement in the workforce and ultimately her overall career success. This aptly termed “motherhood penalty”¹⁶ is believed by many to account for a large part of the difference in experience and pay between male and female employees. An investigation of the literature on this topic reveals that motherhood is overwhelmingly viewed as imposing negative consequences on a woman’s career.¹⁷ One study of both male and female professionals, which examined the effect of parenthood on career success as defined by monthly income, work responsibility, and leadership status, concluded that, while parenthood plays a significant role in the decision of women to reduce their workload, it does not have a comparable effect on men.¹⁸ This suggests that any hindrance to career development caused by parenthood is primarily borne by mothers, not fathers. In this way, motherhood is often tied to an inevitably “discontinuous career pattern” created by taking time off or reducing work hours to take care of children, whereas the demands of fatherhood are not seen to have as large an effect on workload.¹⁹ This disparity in the toll that parenthood exacts on mothers compared to fathers can lead to mothers gaining less work experience and fewer opportunities for career advancement than fathers.²⁰ According to some research, this occurrence ultimately results in a pay discrepancy between men and women in the workforce.²¹

Beyond the negative consequences of motherhood on a woman’s work experience, some research also indicates that companies are less interested in hiring and promoting working mothers as compared to working fathers and childless employees.²² This implies that, aside from the logistical setbacks associated with motherhood, there may also be negative social perceptions of working mothers that impact a mother’s competitiveness and achievements in the job market.

Within the context of academic libraries, research on the effect of the motherhood penalty on female librarians is both limited and discordant. In one study of tenure-track and tenured librarians in ARL libraries, having children was shown to make it harder for women to achieve tenure.²³ However, in another study of female academic library directors, motherhood was not shown to be a significant hindrance for women in obtaining leadership positions.²⁴ Both the limited scope of these two studies and their seemingly contradictory results suggest that the subject merits further research.

Salary Negotiation

Another explanation for the gender wage gap centers around gender differences related to salary negotiation. Research suggests that these differences stem from a learned social expectation of both salary level and negotiation habits among women. Predefined expectations about how much women should be paid or how they should act in a salary negotiation process affect the perception of both employers seeking to hire women and women themselves.²⁵

From the perspective of women seeking employment, research shows that women tend to have lower salary expectations than men.²⁶ These lower expectations may imply that women are often more willing to accept an initial salary offer with little or no negotiation as compared to men. Beyond the initial salary negotiation for women seeking employment, research also suggests that women are less likely to negotiate raises when already employed.²⁷ In an experiment where participants had to decide whether or not to initiate a negotiation for a raise, only 28 percent of female participants compared to 42 percent of male participants chose to initiate a negotiation.²⁸ A possible solution to this difference in salary expectation and subsequent willingness to negotiate wage is that of promoting greater wage transparency in an effort to equalize salary expectation and incentivize more women to negotiate for a higher salary. However, a study of college seniors preparing to enter the workforce revealed that even when provided with average salary offers and the range of salary offers for their profession, women still reported a lower salary expectation than men.²⁹

Added to this expectation of a lower salary is the idea that employers expect that they will need to pay men more than women to successfully contract employees as well as the notion that employers treat men differently from the way they treat women in a negotiation setting.³⁰ Similar to the way that assumed social expectations seem to limit a woman's perceptions about how much she should be paid, these same expectations may also influence how an employer handles salary negotiation with female employees compared to male employees.

Within academic libraries, research conducted on the salary negotiation habits of male and female librarians has been consistent with general findings on the topic. Based on survey data of professional librarians employed in ARL institutions, men were shown to be more likely to negotiate salary and to be more successful in salary negotiations than women. However, this finding did not hold true for female librarians in high management positions.³¹ Additionally, another study of librarians showed that men are more successful at obtaining a higher salary when they change jobs.³² The results of these studies suggest that women in librarianship face similar challenges related to salary negotiation as women in other fields do.

Position

A third factor commonly believed to influence the gender wage gap is the relatively low percentage of women that hold leadership positions in their fields compared to men³³ as well as the

more limited access that female employees have to higher-level positions and overall career advancement than male employees do.³⁴ These findings, compounded with the fact that leadership positions tend to be accompanied by higher wages, suggest that the lack of female representation in higher-level positions may contribute to a pay difference between the two genders. A study analyzing data from 384 public sector chief procurement officers found evidence supporting the idea that a lack of female leadership contributes to the gender wage gap by showing that “gender affects the amount of authority that is delegated to an employee, which, in turn, affects the variance in pay between men and women.”³⁵ Further research suggests that female employees are not only less likely to advance to higher-level positions than their male counterparts, but are also more likely to experience greater disadvantages based on their gender as they advance through the ranks. This is often referred to as the “glass ceiling effect” and is thought to account for the widening wage gap between men and women as they advance in their careers.³⁶

Some suggest that having more women in leadership roles will reduce the gender wage gap because the women in leadership roles would receive a salary increase and would be more likely to equitably distribute salary increases between male and female subordinates.³⁷ However, research studying the effect of female managers on the pay of their subordinates has produced conflicting results. One study on the topic found that greater representation of women in management did reduce the gender wage gap and that “the promotion of women into management positions may benefit all women.”³⁸ At variance with these results, another study concluded that there are “no significant differences between male and female managers in terms of gender-based wage inequality among their employees.”³⁹ While these contradictory findings leave the effect of female managers on the pay of their subordinates unclear, further research also suggests that women gain no wage advantage when working in a female-dominated profession, concluding that, “in terms of earnings, men are uniformly advantaged in male-dominated, female-dominated, and balanced jobs.”⁴⁰

Research within academic libraries on this topic reveals insights into female leadership in general but does not clearly tie these findings to the issue of the gender wage gap. In a study using data from both ARL and Liberal Arts I libraries, the percentage of females in director-level positions was compared to the overall percentage of female librarians to analyze the level of female representation in leadership over a 32-year span. The study concluded that, “since the 1970s, women have succeeded in almost erasing the gender gap in academic library administration.”⁴¹ While the results of this study give a clearer picture of the increased amount of female leadership in academic libraries, the effects of this more equalized composition of leadership on the pay of male and female librarians in general are still unclear.

Methods

To contextualize the difference in mean salary between men and women, the percent difference—mean female earnings as a percent of mean male earnings—is reported rather than the actual dollar difference in mean salaries. In this context, if the mean female salary is 100 percent of the mean male salary, then there is no difference in pay between men and women. The lower the percentage, the larger the wage gap. For example, if the mean male salary was \$100,000 and the mean female salary was \$95,000, the raw gender wage gap would be reported as females making 95 percent of what males make. While this number is informative, it does not by itself establish the existence of pay discrimination. As previously described in the literature review, such a disparity could be attributed to differences in human capital as well as other factors that

influence wage allocation. To provide a clearer picture of the actual pay difference between males and females, these factors should be accounted for using an adjusted wage gap model that can be thought of as an estimate of what a person of one group would earn compared to a person of the comparison group with the same characteristics (such as position, years of experience, institution, and other factors).

This analysis of the gender wage gap draws upon two sets of data. The first includes data on the salary, gender, years of experience, race, institution, and position of all employees of ARL libraries from 1980 to 2014. This dataset is used to give an in-depth analysis of the wage gap in 2014 as well as to provide information about the general trend of the wage gap over a 35-year span. Although ARL publishes this data annually in aggregate form, it has never before been used to find an adjusted gender wage gap which controls for institution, position, and years of experience. The second set of data is from a survey of ARL librarians conducted by the researchers in 2015 to explore other potentially influential factors affecting the gender wage gap that were not accounted for in the 2014 ARL Salary Survey data.

Survey Creation and Sample Selection

ARL Salary Survey data. Each year ARL sends its member libraries a salary survey. Each library designates a survey coordinator who responds to the survey for all applicable employees within their organization. Since this information is highly confidential, data collected from this survey are only publicly available in aggregate form. However, as a visiting program officer with ARL, the primary researcher was granted access to the raw ARL Salary Survey data from 1980 to 2014, excluding information on ARL deans and directors.

Since all ARL member libraries respond to the survey, the number of respondents should equal close to 100 percent of the applicable population. For 2014, this survey yielded data on 119 ARL institution and 9,337 librarians, of which 62.88 percent were female and 37.12 percent were male. As the ARL Salary Survey is administered to all ARL libraries, the data can effectively be thought of as a census for the population of ARL library employees. Theoretically, any differences in the data should represent the actual population difference. However, because observations reveal salary fluctuations and noise from year to year, the data are viewed as a sample of ARL librarians instead of a census. For this reason, tests of significance are reported as if the data had been drawn from a larger population.

The researchers' 2015 survey. The 2015 survey consisted of additional questions created to measure a variety of variables that were not included in the 2014 ARL Salary Survey data but that may influence wage discrepancies between men and women. This survey was reviewed and approved by the researchers' university Institutional Review Board.

Libraries for the 2015 survey were selected through emailing the directors of 110 ARL libraries across the United States and Canada to invite them to participate in a survey that would "measure variables that relevant literature indicates may explain gender and minority salary difference." Participation was incentivized by offering a custom report of the data to the library director of each school. These reports compared the survey results of each individual school to the collective results of the survey. Of the 110 ARL libraries, 44 agreed to participate in the study. The researchers sent each participating director a link to the survey as well as an invitation letter, which the directors were asked to forward to all of their professional librarians. To protect the integrity of the data, researchers had each participant first confirm that they were a professional librarian by affirming that they met certain criteria specific to

professional librarians within their library. To encourage participants to complete the survey, they were given the opportunity to enter a drawing for an iPad.

The 2015 survey, which covered 44 different institutions, yielded a total of 1,182 results, of which 1,109 responses were usable. Responses were automatically filtered out if either sex or salary was not answered. Additionally, the few respondents who were deans and directors were removed from the survey sample primarily for consistency with the 2014 ARL Salary Survey data, which does not include information on them. Furthermore, to increase the integrity of the model, only the salaries of full-time employees were assessed for both the 2015 survey data and the 2014 ARL Salary Survey data. In all, 71.05 percent of the participants in the 2015 sample were female and 28.95 percent were male.

Model Specifications

After consultation with a PhD labor economist about the most relevant variables that affect wage, regression models were developed to analyze salary differences while accounting for a number of different variables. The model used to measure salary differences between men and women was defined as:

$$\ln(\text{salary}) = \beta_0 + X\beta + \varepsilon.$$

In this model, $\ln(\text{salary})$ represents the natural logarithm of the respondents' yearly salary, β_0 represents the intercept of the equation, β is a vector of coefficients that ties each of the explanatory variables to salary, and ε is a vector of random error terms. X is a matrix of explanatory variables that could affect respondents' salary. This matrix included years of experience, years of experience squared, institution worked at, job position, indicators for law and medical librarians, and an indicator of sex. Race was not included in this model, as a recent study using the same data set found that race did not influence salary in ARL libraries.⁴² Dummy variables were used for each institution and job position. The standard errors were clustered at the institutional level and used to compute confidence intervals and determine significance of variables. Clustering was used, as it allows for arbitrary correlation among respondents at the same institution but assumes independence between institutions. This was done because the hypothesized factors that could be causing a discriminatory gender wage gap, such as hiring culture, should remain relatively consistent for all observations at a given institution. Without cluster correction, the standard error associated with the estimated coefficients would be too small, giving a false sense of precision. The coefficient for the gender variable was then converted to a percentage using the formula $100 - 100 * \exp(\beta_{\text{female}})$. The analyses of the 35 years of ARL Salary Survey data and the 2015 survey data employed this regression technique to estimate the effect of gender on salary. Using the added information collected from the 2015 survey, an adjusted wage gap model was run that controlled for marital status, children, children at home, and highest degree earned, in addition to the variables accounted for in the model using the ARL Salary Survey data.

Results

Based on the 2014 raw ARL Salary Survey data, female librarians in ARL institutions made on average 96.24 percent of what male librarians earned. This raw wage gap equates to an average pay difference of \$2,938.89 yearly, which is statistically significant at the $p < .01$ level ($p = 3.286 \times 10^{-8}$). However, when institution, type of library (medical or law), years of experience,

years of experience squared, and position were controlled for using a multiple linear regression model, females made on average 97.83 percent of what males made, equating to females earning an average of \$1,700.04 less than males annually. However, even though controlling for these variables reduced the size of the wage gap, this difference was still significant at the $p < .01$ level ($p = 4.201 \times 10^{-8}$).

TABLE 1
Regression Models Using 2014 ARL Salary Survey Data

	N = 9,337			
	log (salary)			
	(1)	(2)	(3)	(4)
Male	0.035***	0.030***	0.022***	0.022***
	(0.008)	(0.007)	(0.006)	(0.004)
Experience		0.026***	0.021***	0.020***
		(0.001)	(0.001)	(0.001)
Experience ²		-0.0003***	-0.0003***	-0.0003***
		(0.00002)	(0.00002)	(0.00002)
Law				0.027**
				(0.013)
Medical				-0.059***
				(0.013)
Constant	11.185***	10.879***	10.902***	10.781***
	(0.015)	(0.016)	(0.022)	(0.018)
Institution?	No	No	No	Yes
Position?	No	No	Yes	Yes
Clustered SE?	Yes	Yes	Yes	Yes
R ²	0.003	0.266	0.418	0.663
Adjusted R ²	0.003	0.266	0.417	0.658
Residual Std. Error	0.293 (df= 9,335)	0.251 (df = 9,333)	0.224 (df = 9,316)	0.172 (df = 9,196)
<i>Note:</i> * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$				

The data from the 2015 survey of ARL institutions yielded a slightly larger raw wage gap, revealing that women made on average 93.40 percent of what men made, a result that is significant at the $p < .01$ level ($p = .001317$). Applying the same linear regression model used on the ARL data to the 2015 survey data reduced the gap to 97.80 percent. This gap is no longer significant at the $p < .01$ level but is still significant at the $p < .05$ level ($p = .001317$). Further, using additional variables collected from the 2015 survey, a model was constructed that controlled for marital status, children, children at home, and highest degree earned, in addition to the variables included in the previous model. Controlling for these additional variables further reduced the gap to only 98.57 percent, a difference that is not statistically significant ($p = .1527$).

In an examination of the 2015 survey data looking specifically at the effect of motherhood on wage, results showed that female librarians with children had a higher mean salary than

TABLE 2
Regression Models Using Researchers' 2015 Survey

	N = 1,109			
	log (Salary)			
	(1)	(2)	(3)	(4)
Male	0.063***	0.022**	0.020*	0.014
	(0.024)	(0.010)	(0.011)	(0.011)
Experience		0.021***	0.020***	0.020***
		(0.002)	(0.002)	(0.002)
Experience ²		-0.0003***	-0.0002***	-0.0002***
		(0.00004)	(0.00004)	(0.00004)
Children at Home				0.023*
				(0.013)
Constant	11.130***	11.073***	10.786***	10.193***
	(0.033)	(0.052)	(0.025)	(0.060)
Institution?	No	Yes	Yes	Yes
Position?	No	Yes	Yes	Yes
Marital Status?	No	No	Yes	Yes
Education?	No	No	No	Yes
Clustered SE?	Yes	Yes	Yes	Yes
R ²	0.011	0.733	0.737	0.741
Adjusted R ²	0.010	0.719	0.722	0.724
Residual Std. Error	0.277 (df = 1,107)	0.147 (df = 1,045)	0.147 (df = 1,038)	0.146 (df = 1,033)
<i>Note:</i> * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$				

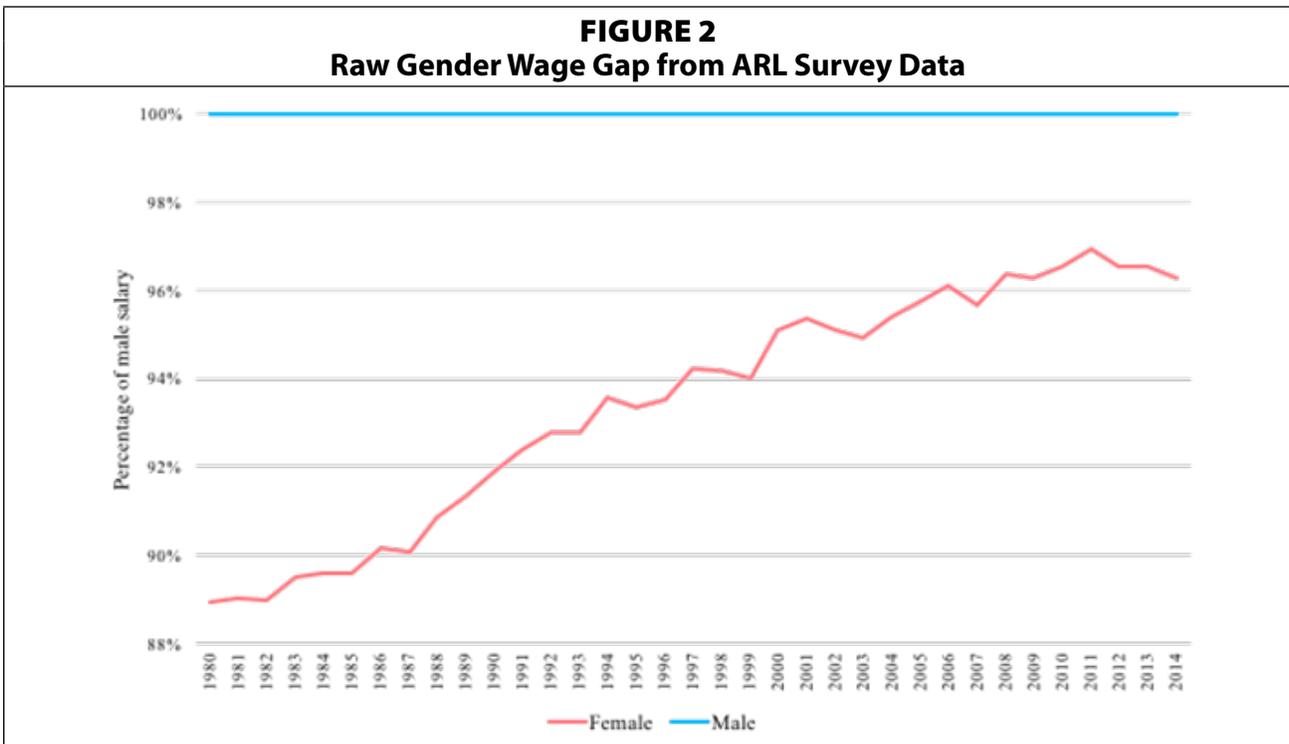
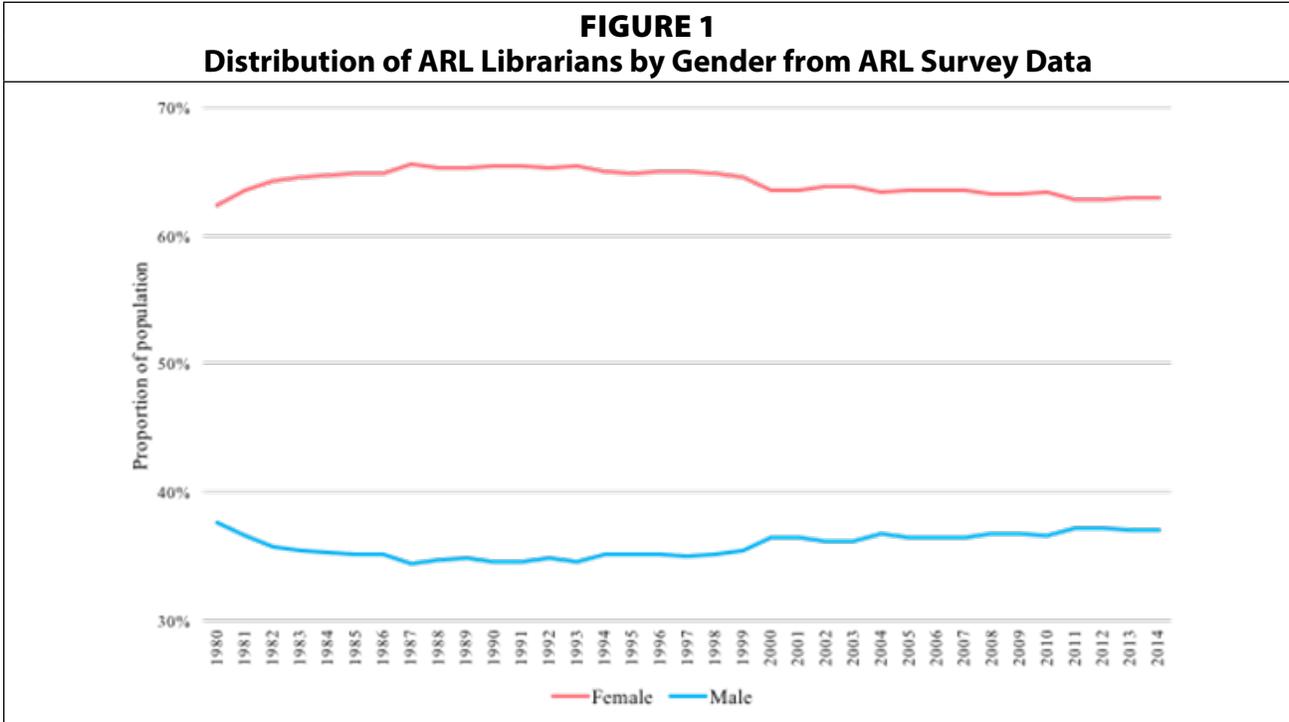
TABLE 3
Gender Wage Gap In ARL Libraries

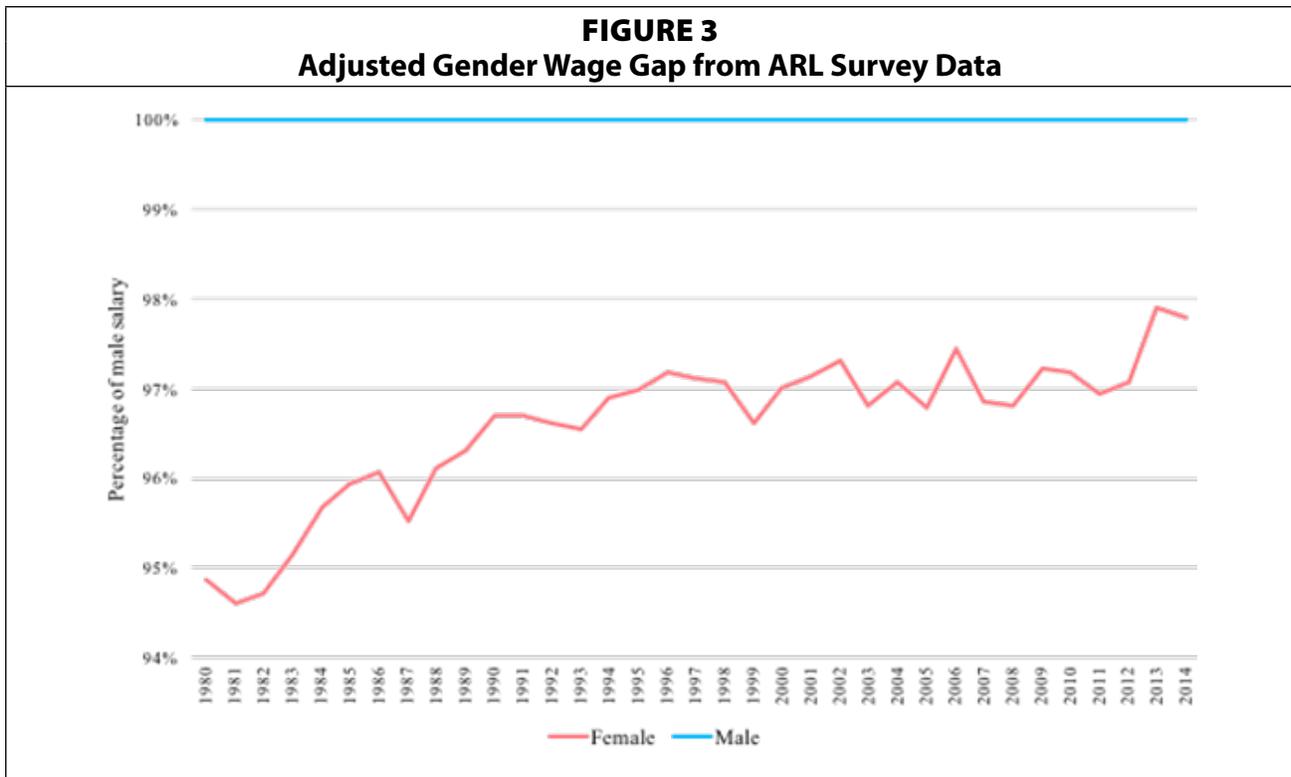
	Results Summary			
	2014 ARL Survey Data (As Percentage of Average Male Salary)	(Dollar Difference)	The Researchers' 2015 Survey (As Percentage of Average Male Salary)	(Dollar Difference)
Raw Wage Gap	96.24%	\$2,938.89	93.40%	\$5,008.12
Adjusted Wage Gap Model including:	97.83%	\$1,700,04	97.80%	\$1,670.95
Years of Experience Squared				
Institution/ Type of Library				
Position				
Adjusted Wage Gap Model Adding:			98.57%	\$1,083.99
Children at Home				
Education				
Marital Status				

female librarians without children. This finding is further explored in a study examining the effects of motherhood on wage allocation conducted using this same 2015 survey data from ARL institutions.⁴³

An analysis of trends related to wage and gender using 35 years of ARL Salary Survey data was also conducted. This analysis showed that the percentage of female versus male librarians in ARL institutions has remained fairly constant since 1980, with females making up around 65 percent of librarians (see figure 1).

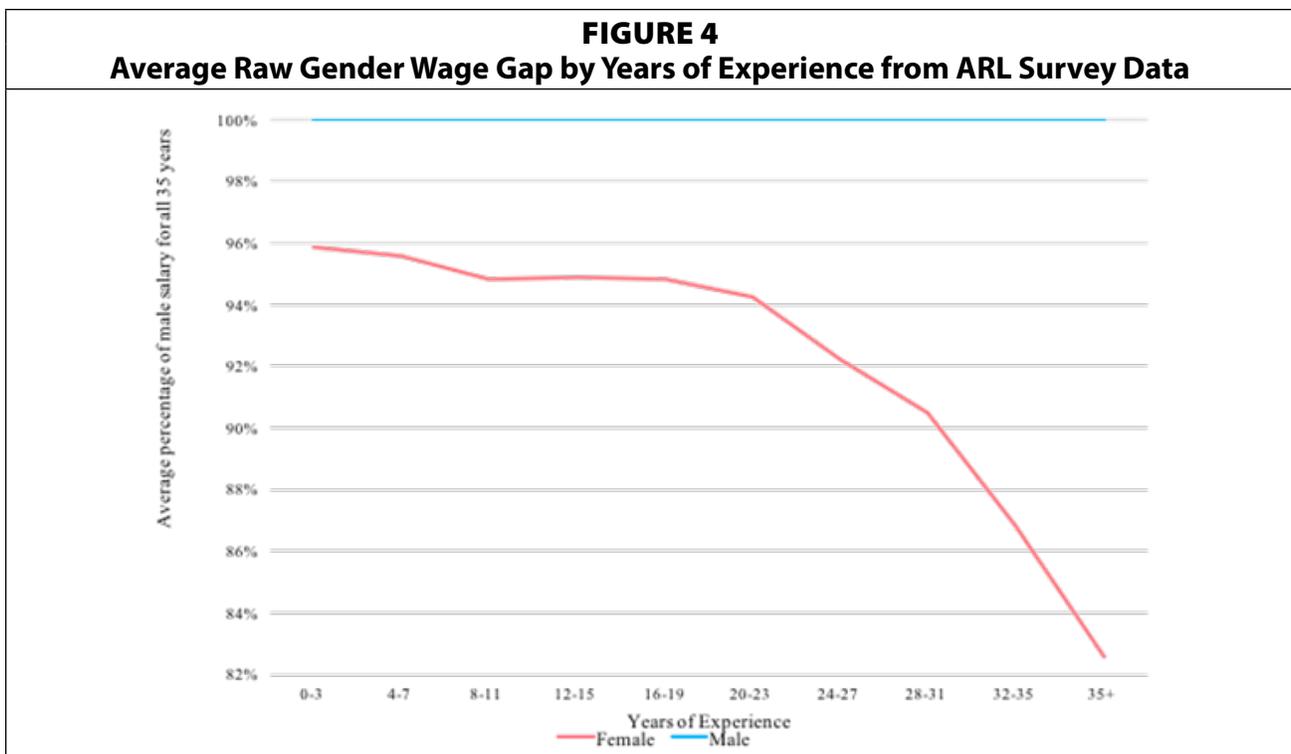
The trend analysis also revealed that the raw gender wage gap has decreased substantially since 1980 (see figure 2). This same trend is evident in the adjusted gender wage gap as





well. However, as expected, the adjusted wage gap is consistently smaller than the raw wage gap (see figure 3).

Additionally, findings showed that, as years of experience increased, the average raw gender wage gap increased as well. Figure 4 shows that from 1983 to 2014 women with zero to three years of experience made approximately 96 percent of what men with zero to three years of experience made and that women with 35 or more years of experience made approximately 83 percent of what men with 35 or more years of experience made.



Discussion

The most striking finding from this analysis is how minimal the gender wage gap is in academic libraries compared to other professions. The findings revealed relatively small raw wage gaps in both the 2014 ARL Salary Survey data and the 2015 survey data, which were further reduced when other variables affecting wage were controlled for. The resulting adjusted wage gap in the 2014 ARL Salary Survey data was minimal compared to other professions,⁴⁴ and the adjusted wage gap in the 2015 survey was not statistically significant. The results drawn from these data sets suggest that there is something inherently different about the population of librarians in ARL institutions in regard to the effect of gender on wage allocation compared to the workforce as a whole.

Some factors that might influence this seemingly greater amount of gender equality within academic libraries compared to other professions are the ratio of female to male librarians within academic libraries, the relatively homogenous nature of the population of people who work in academic libraries, and the high level of education typical of academic librarians. The approximate 3:2 ratio of women to men in academic libraries qualifies it as a female-dominated profession, but not to as extreme a degree as professions such as nursing or elementary education. This implies that men are not the majority in librarianship, but neither are they such a rarity that they become specifically sought after. Similarly, the fact that professional academic librarians tend to be a relatively homogenous population in regard to education level and career stability⁴⁵ could contribute to an overall increased level of wage equality within the profession. Additionally, the researchers' 2015 survey of 1,109 participants showed that an overwhelming 99.37 percent of the academic librarians sampled have at least a master's degree. It is thought that this finding is typical of most academic librarians on a general level since job seekers in the labor market for academic librarians are normally required to have completed a master's degree in library science or another graduate-level degree. This high level of education common among academic librarians may also contribute to a more equalized pay distribution between the two genders.

Ultimately, the disparate nature of the findings regarding the gender wage gap within academic libraries compared to the workforce as a whole, coupled with the lack of current research on these topics, warrants further investigation. Such an inquiry has the potential to not only reveal findings relevant to the labor market for academic librarians but also to increase understanding of the gender wage gap as a whole. Due to the fact that the gender wage gap among academic librarians is substantially smaller than the gender wage gap in other professions, an analysis of how academic librarians differ from workers in other professions in regard to factors that influence wage allocation could reveal areas of improvement in terms of wage equality in other professions.

The results of this study also offer interesting insights into already existing theories about the gender wage gap as a whole. Evidence of the wage gap between men and women increasing with years of experience seems to be consistent with the idea of a glass ceiling preventing women from advancing at the same rate as men. In contrast to the concordance between this finding and already existing ideas about the wage gap, findings regarding the effect of motherhood on salary reveal a trend different from previous research. Contrary to what was anticipated based on current academic literature, motherhood was not shown to have a significant effect on the wage of female librarians. In fact, simply based on raw wages, female librarians with children had a higher mean salary than their childless counterparts.

The reasons behind this disparate finding are still unclear, suggesting a well-warranted need for further research into the effect of motherhood on female librarians.

Conclusion

In regard to wage, the state of gender equality within ARL institutions appears to be extremely positive, especially when compared to the workforce as a whole. Based on this analysis, after accounting for institution, years of experience, years of experience squared, type of library, and position, the gender wage gap among librarians in ARL institutions is minimal compared to other professions. Additionally, accounting for other variables thought to affect wage (marital status, children, children at home, and highest degree earned) further reduces the gender wage gap.

These findings suggest that there are factors that make the population of ARL librarians studied in this report different from the workforce as a whole in regard to the gender wage gap. Future research regarding the gender wage gap among research librarians should be aimed at identifying such factors and explaining how they contribute to greater wage equality in academic libraries. Due to the high level of wage equality present in ARL institutions relative to other professions, it is possible that such research would yield results relevant to an understanding of how to improve the state of the gender wage gap in the workforce as a whole.

Notes

1. "The Gender Wage Gap—78 Cents Project," *78 Cents Project*, available online at <https://www.78centsproject.com/the-gender-wage-gap/> [accessed 2 March 2018].
2. Karin Agness Lips, "Don't Buy into the Gender Pay Gap Myth," *Forbes* (Apr. 2016), available online at <https://www.forbes.com/sites/karinagness/2016/04/12/dont-buy-into-the-gender-pay-gap-myth/#5f844ad82596> [accessed 2 March 2018].
3. Christina Hoff Sommers, "6 Feminist Myths That Will Not Die," *Time* (Sept. 2014), available online at <http://time.com/3222543/wage-pay-gap-myth-feminism/> [accessed 2 March 2018].
4. Heidi Hartmann, Ariane Hegewisch, Barbara Gault, Gina Chirillo, and Jennifer Clark, "Five Ways to Win an Argument about the Gender Pay Gap," *Institute for Women's Policy Research* (Sept. 2016), available online at <https://iwpr.org/publications/five-ways-to-win-an-argument-about-the-gender-wage-gap/> [accessed 2 March 2018].
5. Julia Carpenter, "Why Men Need to Believe in the Wage Gap," *CNN Money* (Feb. 2018), available online at <https://www.cnn.com/2018/09/30/success/gender-belief-gap/index.html> [accessed 2 March 2018].
6. Claudia Goldin, "How to Achieve Gender Equality," *Milken Institute Review* Q3 (2015): 24–33.
7. "An Analysis of the Reasons for the Disparity in Wages between Men and Women," *CONSAD Research Corporation* (Jan. 2009), available online at www.consad.com/content/reports/Gender%20Wage%20Gap%20Final%20Report.pdf [accessed 3 April 2018].
8. Darren Sweeper and Steven A. Smith, "Assessing the Impact of Gender and Race on Earnings in the Library Science Labor Market," *College & Research Libraries* 71, no. 2 (2010): 171–83; Marta Mestrovic Deyrup, "Is the Revolution Over? Gender, Economic, and Professional Parity in Academic Library Leadership Positions," *College & Research Libraries* 65, no. 3 (2004): 242–50.
9. Barbara B. Moran, Elisabeth Leonard, and Jessica Zellers, "Women Administrators in Academic Libraries: Three Decades of Change," *Library Trends* 58, no. 2 (2009): 226–27.
10. Mickey Zemon and Alice Harrison Bahr, "Career and/or Children: Do Female Academic Librarians Pay a Price for Motherhood?" *College & Research Libraries* 66, no. 5 (2005): 401.
11. Sweeper and Smith, "Assessing the Impact of Gender and Race on Earnings in the Library Science Labor Market," 178.

12. Sweeper and Smith, "Assessing the Impact of Gender and Race on Earnings in the Library Science Labor Market," 175.
13. Deyrup, "Is the Revolution Over?" 242.
14. Deyrup, "Is the Revolution Over?" 249.
15. "Female to Male Earnings Ratio of Workers in the U.S. from 1990 to 2015," *U.S. Census Bureau* (2015), available online at <https://www.statista.com/statistics/203459/female-to-male-earnings-ratio-of-workers-in-the-us/> [accessed 2 March 2018].
16. Anja-Kristin Abendroth, Matt L. Huffman, and Judith Treas, "The Parity Penalty in Life Course Perspective: Motherhood and Occupational Status in 13 European Countries," *American Sociological Review* 79, no. 5 (2014): 993–1014.
17. Abendroth, Huffman, and Treas, "The Parity Penalty in Life Course Perspective," 993–1014; Stephanie J. Graves, Jian Anna Xiong, and Ji-Hye Park, "Parenthood, Professorship, and Librarianship: Are They Mutually Exclusive?" *Journal of Academic Librarianship* 34, no. 3 (2008): 202–10; Rebecca Glauber, "Marriage and the Motherhood Wage Penalty Among African Americans, Hispanics, and Whites," *Journal of Marriage and Family* 69, no. 4 (2007): 951–61; Amy J.C. Cuddy, Susan T. Fiske, and Peter Glick, "When Professionals Become Mothers, Warmth Doesn't Cut the Ice," *Journal of Social Issues* 60, no. 4 (2004): 701–18; Julie Kmec, "Are Motherhood Penalties and Fatherhood Bonuses Warranted? Comparing Pro-Work Behaviors and Conditions of Mothers, Fathers, and Non-Parents," *Social Science Research* 40, no. 2 (2011): 444–59; Andrea E. Abele and Daniel Spurk, "The Dual Impact of Gender and the Influence of Timing of Parenthood on Men's and Women's Career Development: Longitudinal Findings," *International Journal of Behavioral Development* 35, no. 3 (2011): 225–32.
18. Abele and Spurk, "The Dual Impact of Gender and the Influence of Timing of Parenthood on Men's and Women's Career Development," 230.
19. Abele and Spurk, "The Dual Impact of Gender and the Influence of Timing of Parenthood on Men's and Women's Career Development," 230.
20. Abendroth, Huffman, and Treas, "The Parity Penalty in Life Course Perspective," 993–1014.
21. Abendroth, Huffman, and Treas, "The Parity Penalty in Life Course Perspective," 993–1014; Abele and Spurk, "The Dual Impact of Gender and the Influence of Timing of Parenthood on Men's and Women's Career Development," 225–32; Glauber, "Marriage and the Motherhood Wage Penalty Among African Americans, Hispanics, and Whites," 951–61.
22. Cuddy, Fiske, and Glick, "When Professionals Become Mothers, Warmth Doesn't Cut the Ice." 701–18; Kmec, "Are Motherhood Penalties and Fatherhood Bonuses Warranted?" 444–59.
23. Graves, Xiong, and Park, "Parenthood, Professorship, and Librarianship," 202–10.
24. Zemon and Bahr, "Career and/or Children," 394–405.
25. Hannah Riley Bowles and Linda Babcock, "How Can Women Escape the Compensation Negotiation Dilemma? Relational Accounts Are One Answer," *Psychology of Women Quarterly* 37, no. 1 (2012): 80–96.
26. Bowles and Babcock, "How Can Women Escape the Compensation Negotiation Dilemma?" 80–96; Beth Ann Martin, "Gender Differences in Salary Expectations When Current Salary Information Is Provided," *Psychology of Women Quarterly* 13, no. 1 (1989): 87–96.
27. Bowles and Babcock, "How Can Women Escape the Compensation Negotiation Dilemma?" 80–96; Karin Hederos Eriksson and Anna Sandberg, "Gender Differences in Initiation of Negotiation: Does the Gender of the Negotiation Counterpart Matter?" *Negotiation Journal* 28, no. 4 (2012): 407–28.
28. Eriksson and Sandberg, "Gender Differences in Initiation of Negotiation," 407–28.
29. Martin, "Gender Differences in Salary Expectations When Current Salary Information Is Provided," 87–96.
30. Bowles and Babcock, "How Can Women Escape the Compensation Negotiation Dilemma?" 80–96.
31. Elise Silva and Quinn Galbraith, "Salary Negotiation Patterns between Women and Men in Academic Libraries," *College & Research Libraries*, 79, no. 3 (2018): 324–35.
32. Judith Schiek Braunagel, "Job Mobility of Men and Women Librarians and How It Affects Career Advancement," *American Libraries* 10, no. 11 (1979): 645.
33. David A. Matsa and Amalia R. Miller, "Chipping Away at the Glass Ceiling: Gender Spillovers in Corporate Leadership," *American Economic Review* 101, no. 3 (2011): 635–39.
34. Robin J. Ely, Herminia Ibarra, and Deborah M. Kolb, "Taking Gender into Account: Theory and Design for Women's Leadership Development Programs," *Academy of Management Learning & Education* 10, no. 3, (2011): 474–93.
35. Mohamad G. Alkadry and Leslie E. Tower, "Covert Pay Discrimination: How Authority Predicts Pay Differences between Women and Men," *Public Administration Review* 71, no. 5 (2011): 740.
36. David A. Cotter, Joan M. Hermsen, Seth Ovadia, and Reeve Vanneman, "The Glass Ceiling Effect," *Social*

Forces 80, no. 2 (2001): 655–81.

37. Philip N. Cohen and Matt L. Huffman, "Working for the Woman? Female Managers and the Gender Wage Gap," *American Sociological Review* 72, no. 5 (2007): 681–704.

38. Cohen and Huffman, "Working for the Woman?" 681.

39. Andrew M. Penner, Harold J. Toro-Tulla, and Matt L. Huffman, "Do Women Managers Ameliorate Gender Differences in Wages? Evidence from a Large Grocery Retailer," *Sociological Perspectives* 55, no. 2 (2012): 365.

40. Michelle J. Budig, "Male Advantage and the Gender Composition of Jobs: Who Rides the Glass Escalator?" *Social Problems* 49, no. 2 (2002): 258.

41. Moran, Leonard, and Zellers, "Women Administrators in Academic Libraries," 215.

42. Quinn Galbraith, Heather Kelley, and Michael Groesbeck, "Is There a Racial Wage Gap in Research Libraries? An Analysis of ARL Libraries," *College & Research Libraries*, (preprints, 2018).

43. Heather Kelley, Quinn Galbraith, and Jessica Strong, "Working Moms: Motherhood Penalty or Motherhood Return?" manuscript forthcoming.

44. "An Analysis of the Reasons for the Disparity in Wages between Men and Women," *CONSAD Research Corporation*.

45. Julie Still and Zara Wilkinson, "The Use of Librarians as Occupational Study Populations in Social Science Research," *Library Review* 63, no. 1/2 (2014): 2–14.