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# A Study of Gender Wage Disparities at a Progressive Liberal Arts College

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## Abstract

Although more women are employed full-time than men at the University of North Carolina at Asheville, the greatest concentration of female faculty are employed in the lowest rank as a lecturer. On the contrary, male faculty are concentrated at the highest rank as a professor. Gender wage inequality in higher education persists primarily through occupational segregation and systematic sorting based on gender, where women are concentrated in lower-paying positions relative to men. In 2022, according to the American Association of University Professors, full-time female faculty members made 82 cents for every dollar male faculty earned. By highlighting indicators driving wage differentials at UNCA, my study will determine whether the results are consistent with gender wage gaps at similar universities. Women are often steered into disciplines that traditionally pay less such as the Arts and Humanities whereas more lucrative disciplines such as Science, Technology, Engineering, and Mathematics tend to be male dominated. Using data from the UNC Salary Information Database, I analyze earnings differences among UNCA faculty by sex using a series of ordinary least squares (OLS) regressions. I control for age, race, departmental division, and rank to avoid omitted variable bias. Gender was determined using the Gender API which sorts names by gender through normalizations. Race was determined by employing the Namsor API which classifies names by race using artificial intelligence to transcribe data through name morphology. I hypothesize that a gender wage gap is likely to exist among faculty at UNCA and will be more prevalent based on rank and departmental division due to occupational segregation between departments and systematic sorting based on gender among faculty ranks.

# Introduction

Gender wage inequality is measured by dividing women's annual earnings by men's annual earnings. This provides us with how much women are paid relative to men. Full-time women faculty earned 82% or 82 cents for every dollar men made in 2022 according to the Association of University Professors (AAUP 2023). This recurring differential shows up across nearly all industries in the labor market. The pay gap persists even in the largest occupations for women. For instance, in 2017, women who were first line supervisors of retail sales workers earned only 74% the median earnings of men. When looking at registered nurses, who are at the upper end of the gender pay ratio, women only earned 92% the median earnings of men (Miller and Vagins, 2018, 14-17). In addition, the pay gap is even more pronounced for women of color. For instance, the racial composition of the faculty at UNCA consists of 7.2% Hispanic, 23.5% Black, 60.6% White, and 8.6% Asian. When each race is broken down by gender and pay gap, we see that:

- Of the 7.2% Hispanic faculty, 62.5% are women and 37.5% are men, with a pay gap of 10.09%.
- Of the 23.5% Black faculty, 61.5% are women and 38.5% are men, with a pay gap of 6.68%.
- Of the 60.6% White faculty, 46.3% are women and 53.7% are men, with a pay gap of 1.15%.
- Of the 8.6% Asian faculty, 73.7% are women and 26.3% are men, with a pay gap of 5.57%.

It is interesting to note that UNCA employs more women of color as faculty than their male counterparts for Hispanic, Black, and Asian races. More importantly though is the pronounced gender pay gap existing among those women of color between them and their male counterparts of the same racial demographic. The intersection of race and gender biases makes women of color more vulnerable to even worse pay inequalities than would be anticipated by the additive effect of race and gender separately. Research suggests that the phenomena where males on average are paid more than their female colleagues can be attributed to systemic sexism and discrimination, motherhood penalties and societal expectations placed on gender roles of females, as well as occupational segregation where women are steered towards lower paying fields.

A trend of gender wage inequality in higher education has been found by numerous studies of higher education around the world. For instance, the gender pay gap is 1.5 times larger in academia than in industry for scientists and engineers holding doctorate degrees (Ding, Atsushi, and Rajshree, 2021, 1019). It is ironic how colleges that take pride in progressive ideals are not exempt from gender wage inequality among their employees. My study will focus on discovering whether there are gender disparities across positions, departmental divisions, and rank at the University of North Carolina Asheville, as well as how racial/ethnic composition may influence them. The University of North Carolina Asheville has a faculty that is 60.6% White with a slightly higher percentage of women, 53.4%, being employed than men, 46.6% (University of North Carolina Asheville, n.d.). Using data from the UNC Salary Information Database, an

OLS regression analysis will be conducted to determine whether gender wage inequality exists at the University of North Carolina Asheville or not. My preliminary expectations included: gender wage gaps will be the smallest among the lowest paid positions due to “minimum” and “living” wages being the same for both men and women. Racial disparities are prevalent in the UNC system increasing the gender wage gap for BIPOC women due to institutional discrimination carried over from generations of structural racism. A raw gender wage gap of 3.56% was also found among faculty at the University of North Carolina Asheville when not controlling for race, age, departmental division and rank.

## Literature Review

Gender wage disparities exist in nearly all industries in the labor market. The pay gap persists even in the most female-dominated occupations (Miller and Vagins, 2018, 14-17). In Sloane, Hurst, and Black’s study “College Majors, Occupations, and the Gender Wage Gap,” they show that generations of college-educated women in the United States systematically sort into majors that lower their potential earnings relative to men (Sloane, Hurst, and Black, 2021). Blau and Kahn reiterate this point in their study “The Gender Wage Gap: Extent, Trends, and Explanations,” that despite the more recent occupational gains of women, gender differences in occupation contribute to a larger pay gap in 2010 than in 1980. Prior to these occupational gains for women, the gender pay gap was perceived to be driven by human capital factors such as discrepancies in education and work experience (Blau and Khan, 2017, 802-807). Whereas in more recent years, the narrative surrounding the causes of the gender wage gap has shifted, focusing on occupational segregation as the key driver of inequality. As Blau and Kahn highlight, “…not only do men and women work in different occupations, they also tend to be employed at different levels of the hierarchy within occupations…” ultimately suggesting that occupational steering and the concentration of women in inferior positions are driving the disparities (Blau and Khan, 2017, 828).

This gender inequality has also been found at the top of the academic ladder in the most progressive institutional frameworks (Doucet, Smith, and Durand, 2012, 69). For instance, in Bachan and Bryson’s study “The Gender Wage Gap Among University Vice Chancellors in the UK,” they explore trends in the gender wage gap in a high earning, often male dominated vice chancellor position across institutions in the United Kingdom (UK). Using a combination of ordinary least squares (OLS) fixed effect models and Gelbach’s (2016) decomposition method, they found how the closing of the gender wage gap in the highest income distribution can converge more rapidly if the typical age of the women in that position exceeds that in which normal young childbearing responsibilities are associated (Bachan and Bryson, 2022). Although Blau and Kahn’s findings do suggest the wage gap is currently larger at the top of the wage distribution, this study demonstrates how once women are above a normal expected childbearing age, the motherhood penalty no longer governs discrepancies in compensation. Although still prevalent, one could attribute the closing of the gender wage gap among Vice Chancellors being due to an older average age of the people in the position. An

older average age can be interpreted as a proxy for more work experience therefore resulting in higher pay.

On the contrary, in Brown and Trout's study "Sex and Salaries at a Canadian University: The Song Remains the Same or the Times They Are a Changin'?" they reevaluate gender wage gaps at the University of Manitoba. The university issued a payout in 1994 to all 1993 University of Manitoba Faculty Association (UMFA) female employees after evidence of a gender pay gap was brought forth by the faculty union. In 1994, there was an estimated 24% salary gap between men and women prompting the university to take this action. Brown and Trout revisit the gender wage gap from 1993-2003, where they find the gap has remained constant, and reexamine it again from 2003-2013 to find that it seems to have shrunk by half, placing it at 12%. Using only full-time teaching staff data from 1993, 2003, and 2013, they utilized the Blinder-Oaxaca/Wellington-Blinder-Oaxaca methods of decomposition to demonstrate that the leading components for salary gaps were large differences in positioning by sex (Brown and Trout, 2017). In other words, like Bachan and Bryson's study, men were found to be more represented at higher ranks while women were concentrated at lower ranks. This study ties into my analysis of UNCA by highlighting the impact of occupational segregation in academia and explaining how it can drive gender disparities. My analysis of the University of North Carolina Asheville demonstrates similar results because of women unfortunately being concentrated at lower ranks.

In Humphries, Johnston, and Nelson's study "Regression Analysis of the Gender Wage Gap in Academia," they examine gender wage gaps through the lens of occupation and industry instead of using education/work experience as the key indicators to explain the differentials. The authors looked at the difference in pay between men and women in academia at a regional university in Louisiana. Unlike Brown and Trout's study, where a gender wage gap was evident, they ultimately found that women at this institution were paid more than men. The discipline and rank in which the faculty were in was found to play a predominant role in wage levels, meaning women must have been in higher ranks than men at this college (Humphries, Johnston, and Nelson, 2023). This directly contradicts the findings in Brown and Trout's study where men were found to be more represented at higher ranks while women were concentrated at lower ranks. Leading components for salary gaps were still driven by large differences in positioning by sex except women in this case were being concentrated at higher positions while men were at the lower ranks (Brown and Trout, 2017). The institution in the study is public like UNCA and I plan on following similar avenues in determining whether there is a gender wage gap here at home in Western North Carolina.

Studies have shown that the intersection of race and gender has resulted in pronounced gender wage inequalities particularly for women of color. Women of color face far worse economic outcomes and mobility when compared to their white colleagues. In "Race, Gender, and the Wage Gap: Comparing Faculty Salaries in Predominately White and Historically Black Colleges and Universities," Renzulli, Grant, and Kathuria did their analysis using Integrated Postsecondary Education Data System (IPEDS) data from the 2001-2002 survey for 9,900 postsecondary institutions. Using OLS regressions and a

decomposition of the pay gap by gender, they find a smaller gender wage gap at Historically Black Colleges or Universities (HBCUs) than in Predominately White Institutions (PWIs). Some potential root causes included recruitment or retention biases, women may be less competitive than African American men in the PWI and elite HBCU markets, and rank may play a role in the gender wage gap through delayed promotions. The smaller gender wage gaps at HBCU's can also be attributed to the racial wealth gap where Black men are paid less than their white counterparts (Renzulli, Grant, and Kathuria, 2006, 491-510). This study highlights how the interaction between race and gender can further drive gender disparities for women of color particularly in predominantly white institutions (PWIs) such as UNCA. Despite UNCA's predominant progressive agenda, I found more pronounced gender wage gaps between women and men of color.

In more recent years, women's equity has made strides in the academic arena with payouts from several large institutions of higher learning acknowledging pay-gaps after lawsuits filed by faculty encouraging them to do so. For instance, Syracuse University settled a lawsuit by paying out five female faculty $3.7 million in 2021. In 2020, Princeton University paid out about $1.2 million to 106 female full professors while Northern Michigan University gave $1.46 million to four female professors. Currently at Vassar College, a former women's college, five female professors are suing the institution claiming a gender wage gap has existed for full-time professors for the last 20 years and has widened over time. Accusations also include a rigged evaluation and promotion process at Vassar where women at all ranks are given lower merit ratings in annual reviews further demonstrating the discrimination taking place (Zahneis, 2023).

## Theory Overview

The statistical method used for my econometric model to detect gender disparities at the University North Carolina Asheville was a series of ordinary least squares (OLS) regressions. The data that was utilized in my analysis came from the University North Carolina Salary Information Database current as of June 30, 2023 (UNC Salary Information Database, 2023). The key outcome variable of interest used to detect gender inequalities was wage (i.e., employee annual base salary). Using numerous control variables representing various races, departmental divisions, faculty ranks, and gender I found a raw gender wage gap and verified the strongest determinants of inequality at the University of North Carolina Asheville.

The economic theory I employed to examine the gender wage gap at the University of North Carolina Asheville consists of occupational segregation's role in explaining pay differentials across departmental divisions particularly regarding the female-to-male ratio in each rank. Occupational segregation occurs when people of various races and genders are disproportionately represented in different kinds of jobs therefore resulting in very different wages, benefits, and working conditions (Mason and Zuguar. 2023). For example, in my study at UNCA, I found that women are overrepresented in the lowest paying rank with the least amount of upward mobility as lecturers. Of these lecturers, the majority were found to be working in the Humanities division which happens to be

the lowest paying division as well. One could interpret this overrepresentation as a disgraceful inheritance of institutional discrimination against women in the workplace.

Departments at the University of North Carolina Asheville are grouped under three main divisions: Natural Sciences, Humanities, and Social Sciences. These three divisions are used in my analysis in lieu of each specific department due to the small sample size of many departments on campus. I anticipated that the divisions with a higher concentration of female employees would have a lower average pay over-all as was suggested by Doucet, Smith, and Durand's study "Pay Structure, Female Representation and the Gender Pay Gap among University Professors," where they find that the level of female representation in a given context is negatively related to compensation when all else being held equal (Doucet, Smith, and Durand, 2012, 66-67). I also explored the impact of race and gender on wage differentials as well. I expected women of color at the University of North Carolina Asheville to face larger pay gaps than their white colleagues as is suggested in the study "The Simple Truth about the Gender Pay Gap," where women of color are more vulnerable to even worse pay inequalities than would be anticipated by the additive effect of race and gender separately (Miller and Vagins, 2018, 17).

## Data and Methods

My analysis of the gender wage gap at the University North Carolina Asheville utilized the UNC Salary Information Database. The UNC Salary Information Database was exported as an Excel (CSV) file. The CSV file provided by the UNC Salary Information Database is sorted into the following columns: institution name (the abbreviation for the UNC system institution supplying the data record), last name (the employee's last name, also referred to as family name or surname), first name (the employee's first name, also referred to as given name), init (the employee's middle initial), age (the employee's age), initial hire date (the most recent date that marks when the individual started employment; if employment is broken by termination, then rehired date is provided), job category (description of the JCAT Code), employee annual base salary (the base salary, excluding benefits, that an individual would earn in one calendar year before any deductions or taxes are taken into consideration; this field represents the "permanent, recurring salary" of an individual), employee home department (home organization, department, associated with a person's employee record), and primary working title (for an employee's primary job, the working title of the employee in that position) (UNC Salary Information Database, 2023).

Following similar methods to Terrence Zhang's study, "Does a Gender Wage Gap Exist at the University of Florida?" I began my preliminary analysis by organizing the data by removing duplicate entries, removing part-time faculty to narrow my analysis to full-time faculty members, and consolidating job-titles and departments by rank. To assign gender, I utilized the Gender API website which allows you to upload a CSV file with the first and last name of each person. The Gender API processes the names through normalizations and provides an enriched file containing the gender of

each name, the accuracy of the gender assigned to each name, and the number of samples it pulls from to determine the gender by name. I systematically went through and manually looked up each UNCA employee whose gender assignment fell below an acceptable accuracy level to verify that the employee's sex in question was correct (Gender API, 2023). In Santamaría and Mihaljević's study, they found that the Gender API exhibited the lowest fraction of inaccuracies, at 7.9%, when comparing against other name-to-gender inference services. In addition, the study showed that the Gender API achieves the smallest proportion of non-classified names, at 3% (Santamaría and Mihaljević, 2018).

To determine the race of the UNCA faculty, I utilized the Namsor website which allowed me to upload a CSV file with the first and last name of each person. Namsor uses machine learning to predict an individual's most probable race based on their first and last name. The Namsor API classifies names by race using artificial intelligence to transcribe data through name morphology (Namsor, 2023). Namsor assigns a given name a specific probability of belonging to one of four categories of races: White, Black, Asian, or Hispanic. It then assigns the ethnic background to the name by selecting the one of the four categories of races with the highest probability (Krishnan, Singer, & Zhang, 2023). In Sebo's study, he found that "…Namsor is accurate in determining the continent of origin of individuals from their first and last names, especially when using the modified variable and restricting the analysis to names with inference accuracy greater than or equal to 50%..." (Sebo, 2022).

Once the data was cleaned and organized by race and gender, I moved onto the statistical analysis in Stata. I began to investigate the data in a clearer manner by creating dummy variables for each race (1 if black and 0 if not, etc.) and gender (1 if female and 0 if male). These variables each took a value of "0" if they were not satisfied and "1" if they were satisfied. A similar process was taken to organize the data by rank (1 if lecturer and 0 if not, etc.) and division (1 if natural science and 0 if not, etc.) as categorical variables. This allowed me to specifically calculate the effect they produced on our outcome variable "wage," to see what drives gender wage disparities, racial inequality, and occupational segregation. The main outcome variable employed was the natural log(wage) while controlling for gender, race, age, division, and rank. In addition, a table of summary statistics has been generated for gender, race, average age, and average wage for the university as a whole, by each division, and by each rank. These statistics allowed me to determine whether a concentration of a certain race, or women, in a certain division/rank affects the base annual salary for UNCA employees.

Following similar methods to Sloane, Hurst, and Black's study, the ordinary least squares (OLS) regression below was run on data for UNCA employees to see how controlling for age, race, division, and rank affects salaries differently based on gender (Sloane, Hurst, and Black, 2021, 242).

**Equ. 1 (See Table 7 in Results):**

$$\ln(\text{wage}) = B_0 + B_1\text{gender} + B_2\text{race}\ldots + B_3\text{age} + B_4\text{division}\ldots + B_5\text{rank}\ldots + E_i$$

I hypothesize that the coefficient on the gender variable will be negative and significant due to a legacy of discrimination towards women in the workplace increasing the likelihood of a gender wage gap being present. I anticipate that the coefficient on the race variable be negative and significant for Hispanic and Black races due to previous research suggesting a trend of racial disparities among those demographics. I expect that the age variable will have a positive effect on the natural log of wage due to age acting as a proxy for work experience (i.e., the older someone is the more work experience they have, meaning the more money they make). For the division variable, I expect the coefficient on the Humanities and Social Sciences variables to have a less positive effect on the natural log of wages due to the departments that make up these divisions traditionally having a higher ratio of females to males. While the coefficient on the Natural Sciences variable I expect to have a more positive effect on the natural log of wages due to Science, Technology, Engineering, and Mathematics (STEM) fields typically being more male dominated. Finally, for the rank variable, I anticipate that the higher up the faculty ladder the more positive the effect of the coefficient will have on the natural log of wage. With the lecturer rank having the smallest effect, then growing more with assistant professor, then even more with associate professor, and finally with the professor rank having the largest impact.

| Table 1a: Summary Statistics | Summary Statistics Full Sample | | | Summary Statistics Women | | | Summary Statistics Men | | |
|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. |
| Female | 221 | 0.534 | 0.5 | - | - | - | - | - | - |
| Male | 221 | 0.466 | 0.5 | - | - | - | - | - | - |
| Salary | 221 | 77,571 | 17,311 | 118 | 76,260 | 17,373 | 103 | 79,074 | 17,200 |
| Hispanic | 221 | 0.072 | 0.26 | 118 | 0.085 | 0.28 | 103 | 0.058 | 0.235 |
| Black | 221 | 0.235 | 0.425 | 118 | 0.271 | 0.446 | 103 | 0.194 | 0.397 |
| White | 221 | 0.606 | 0.49 | 118 | 0.525 | 0.501 | 103 | 0.699 | 0.461 |
| Asian | 221 | 0.086 | 0.281 | 118 | 0.119 | 0.325 | 103 | 0.049 | 0.216 |
| Age | 221 | 49.606 | 9.89 | 118 | 49.034 | 9.769 | 103 | 50.262 | 10.035 |
| Humanities | 221 | 0.371 | 0.484 | 118 | 0.381 | 0.488 | 103 | 0.359 | 0.482 |
| Natural Sciences | 221 | 0.294 | 0.457 | 118 | 0.263 | 0.442 | 103 | 0.33 | 0.473 |
| Social Sciences | 221 | 0.335 | 0.473 | 118 | 0.356 | 0.481 | 103 | 0.311 | 0.465 |
| Lecturer | 221 | 0.235 | 0.425 | 118 | 0.28 | 0.451 | 103 | 0.184 | 0.39 |
| Assistant Professor | 221 | 0.181 | 0.386 | 118 | 0.195 | 0.398 | 103 | 0.165 | 0.373 |
| Associate Professor | 221 | 0.285 | 0.453 | 118 | 0.263 | 0.442 | 103 | 0.311 | 0.465 |
| Professor | 221 | 0.299 | 0.459 | 118 | 0.263 | 0.442 | 103 | 0.34 | 0.476 |

| Table 1b: Distribution Across Sex | Distribution of Women | | | Distribution of Men | | |
|---|---|---|---|---|---|---|
| Variable | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. |
| Hispanic | 16 | 0.625 | 0.5 | 16 | 0.375 | 0.5 |
| Black | 52 | 0.615 | 0.491 | 52 | 0.385 | 0.491 |
| White | 134 | 0.463 | 0.5 | 134 | 0.537 | 0.5 |
| Asian | 19 | 0.737 | 0.452 | 19 | 0.263 | 0.452 |
| Humanities | 82 | 0.549 | 0.501 | 82 | 0.451 | 0.501 |
| Natural Sciences | 65 | 0.477 | 0.503 | 65 | 0.523 | 0.503 |
| Social Sciences | 74 | 0.568 | 0.499 | 74 | 0.432 | 0.499 |
| Lecturer | 52 | 0.635 | 0.486 | 52 | 0.365 | 0.486 |
| Assistant Professor | 40 | 0.575 | 0.501 | 40 | 0.425 | 0.501 |
| Associate Professor | 63 | 0.492 | 0.504 | 63 | 0.508 | 0.504 |
| Professor | 66 | 0.47 | 0.503 | 66 | 0.53 | 0.503 |

| Table 2: Divisions | Average Salary Full Sample | | | Average Salary Women | | | Average Salary Men | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | *Pay Gap |
| All Divisions | 221 | 77571 | 17311 | 118 | 76260 | 17373 | 103 | 79074 | 17200 | 3.56% |
| Humanities | 82 | 71370 | 16429 | 45 | 70319 | 16550 | 37 | 72650 | 16417 | 3.21% |
| Natural Sciences | 65 | 77753 | 13204 | 31 | 75737 | 12999 | 34 | 79590 | 13312 | 4.84% |
| Social Sciences | 74 | 84284 | 19022 | 42 | 83012 | 18923 | 32 | 85953 | 19325 | 3.42% |

| Table 3: Humanities Division | Average Salary By Rank Full Sample | | | Average Salary By Rank Women | | | Average Salary By Rank Men | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | *Pay Gap |
| Lecturer | 23 | 50854 | 4041 | 15 | 50742 | 4382 | 8 | 51063 | 3582 | 0.63% |
| Assistant Professor | 10 | 68102 | 3079 | 9 | 68231 | 3237 | 1 | 66942 | - | -1.93% |
| Associate Professor | 24 | 77393 | 6318 | 7 | 80333 | 10823 | 17 | 76183 | 2850 | -5.45% |
| Professor | 25 | 85771 | 13932 | 14 | 87628 | 4896 | 11 | 83407 | 20584 | -5.06% |

| Table 4: Natural Sciences Division | Average Salary By Rank Full Sample | | | Average Salary By Rank Women | | | Average Salary By Rank Men | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | *Pay Gap |
| Lecturer | 16 | 60497 | 6032 | 10 | 60630 | 6790 | 6 | 60276 | 5105 | -0.59% |
| Assistant Professor | 13 | 75822 | 6588 | 7 | 77227 | 5783 | 6 | 74183 | 7618 | -4.10% |
| Associate Professor | 17 | 84564 | 8171 | 8 | 82595 | 7087 | 9 | 86314 | 9070 | 4.31% |
| Professor | 19 | 87509 | 9468 | 6 | 90032 | 6359 | 13 | 86345 | 10628 | -4.27% |

| Table 5: Social Sciences Division | Average Salary By Rank Full Sample | | | Average Salary By Rank Women | | | Average Salary By Rank Men | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | *Pay Gap |
| Lecturer | 13 | 59591 | 6499 | 8 | 57468 | 6297 | 5 | 62986 | 5822 | 8.76% |
| Assistant Professor | 17 | 77198 | 11451 | 7 | 75096 | 11784 | 10 | 78668 | 11606 | 4.54% |
| Associate Professor | 22 | 89590 | 15940 | 16 | 87637 | 13388 | 6 | 94798 | 22017 | 7.55% |
| Professor | 22 | 99044 | 14277 | 11 | 99898 | 13206 | 11 | 98190 | 15877 | -1.74% |

| Table 6: Race | Average Salary By Race Full Sample | | | Average Salary By Race Women | | | Average Salary By Race Men | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variable | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | Obs | Mean | Std. Dev. | *Pay Gap |
| Hispanic | 16 | 73573 | 14313 | 10 | 70603 | 16806 | 6 | 78522 | 7694 | 10.09% |
| Black | 52 | 75334 | 17476 | 32 | 73316 | 17775 | 20 | 78561 | 16927 | 6.68% |
| White | 134 | 78507 | 18021 | 62 | 78020 | 17813 | 72 | 78926 | 18312 | 1.15% |
| Asian | 19 | 80466 | 13525 | 14 | 79235 | 14434 | 5 | 83913 | 11222 | 5.57% |

**Note (for Tables 2-6 above):**
*Pay Gap = 100 X [(Men Average Salary – Women Average Salary) / Men Average Salary]*

The summary statistics show that women have an average annual salary of $76,260 and men have an average annual salary of $79,074 when not controlling for age, race, rank, or division at the University of North Carolina Asheville, with a small pay gap of 3.56%. For instance, using Nerd Wallet's online investment calculator, if women faculty at UNCA were to invest the average lost wages of $2,184 a year annually for 30 years using a conservative 5% expected rate of return, they would end up losing out on roughly $191,080 on their retirement (NerdWallet, 2023). This has exponential effects on women's lost income over the course of a lifetime. This indicates that women have less to put away in retirement savings, not to mention the lack of compounded interest that should have accumulated otherwise.

The University of North Carolina Asheville has a higher population of women, 53.4%, being employed as faculty than men, 46.6%. UNCA is made up of three main faculty divisions: Humanities, Natural Sciences, and Social Sciences. The Humanities division has the lowest average salary and consists of the following departments: Art, Arts and Ideas, Africana Studies, Ancient Mediterranean Studies, Drama, English, Humanities,

Languages and Literatures, History, Music, Philosophy, and Religious Studies. The Natural Sciences division's average salary fell in the middle of the other two divisions and consists of the following departments: Atmospheric Science, Biology, Chemistry, Computer Science, Environmental Studies, Mathematics, New Media, and Physics. The Social Sciences division has the highest average salary and consists of the following departments: Economics, Education, Health & Wellness, Interdisciplinary Studies, International Studies, Management & Accountancy, Mass Communication, Political Science, Psychology, Sociology & Anthropology, and Women, Gender and Sexuality Studies. The Humanities division makes up 37.1% of the UNCA faculty, with the Natural Sciences division making up 29.4%, and the Social Sciences consisting of 33.5%. The Humanities and Social Sciences have more women employed than men. The Natural Sciences has more men employed than women and the largest pay gap out of the three divisions when not broken down by rank.

Regarding rank, UNCA faculty consists of the following: 23.5% who are lecturers, 18.1% who are assistant professors, 28.5% who are associate professors, and 29.9% who are professors. Women faculty make up most of the lower ranks (63.5% of lecturers are women and 57.5% of assistant professors are women) while men faculty make up most of the top ranks (50.8% of associate professors are men and 53% of professors are men). This suggests that women faculty at UNCA are concentrated into lower paying positions relative to men. A greater percentage of women faculty being hired into non-tenure track lecturer roles implies that women are being pigeon-holed into positions that pay less and offer limited upward mobility. In addition, the women who are lecturers are also concentrated in the Humanities division, the least paid departmental division on campus (33 lecturers are women and 15 are in the Humanities division, 45%). Consequently, the lecturer rank has the least amount of job security, meaning women are being placed at a higher rate into a more dispensable role. This concentration further highlights a legacy of gender bias and discrimination in hiring practices at the institutional level. Occupational segregation in society has devalued disciplines such as the Humanities due to them being viewed as more caring/nurturing, terms often associated with feminine qualities. It is not by happenstance that the highest percent of women in the lowest paid position have been systematically sorted there (Zhavoronkova, Khattar, and Brady, 2022).

When breaking up each division's average salary between genders by rank, I noticed that the Social Sciences division, which on average is the highest paying, had the most pay gaps where men earned more than women across every rank except professor (where women professors earned 1.74% more than men). On the contrary, in the lowest paying division, women earned more than men across all ranks in the Humanities division except for lecturers (where the pay gap was minimal at 0.63%). But because women are concentrated as lecturers in this division, they earn less over-all. Similarly, women earned more than their male colleagues across all ranks in the Natural Sciences division except for the associate professor position (where men associate professors earned 4.31% more than women). The Social Sciences division ultimately had the largest pay gaps where men earned more than women across similar ranks with men

making 8.76% more as lecturers than women, 4.54% more as assistant professors, and 7.55% more as associate professors.

# Results

**Table 7: Equ. 1 Ordinary Least Squares Regressions**

| VARIABLES | (1) Model All | (2) Model Women | (3) Model Men |
|---|---|---|---|
| **Female** | 0.00892 | | |
| | (0.0175) | | |
| **Age** | -2.76e-05 | 0.000316 | -0.000123 |
| | (0.00123) | (0.00107) | (0.00232) |
| **Hispanic** | 0.00567 | 0.0296 | -0.0349 |
| | (0.0249) | (0.0359) | (0.0503) |
| **Black** | 0.0102 | 0.0117 | 0.0211 |
| | (0.0230) | (0.0238) | (0.0422) |
| **Asian** | -0.0184 | -0.0224 | -0.0114 |
| | (0.0266) | (0.0305) | (0.0549) |
| **Humanities Division** | **-0.146*** ** | **-0.118*** ** | **-0.200*** ** |
| | (0.0219) | (0.0252) | (0.0456) |
| **Natural Sciences** | **-0.0469** ** | -0.0102 | **-0.0896** ** |
| | (0.0218) | (0.0282) | (0.0357) |
| **Assistant Professor** | **0.262*** ** | **0.279*** ** | **0.230*** ** |
| | (0.0233) | (0.0264) | (0.0433) |
| **Associate Professor** | **0.391*** ** | **0.402*** ** | **0.388*** ** |
| | (0.0202) | (0.0284) | (0.0276) |
| **Professor** | **0.469*** ** | **0.518*** ** | **0.418*** ** |
| | (0.0234) | (0.0272) | (0.0372) |
| **Constant** | **11.00*** ** | **10.95*** ** | **11.06*** ** |
| | (0.0595) | (0.0578) | (0.116) |
| **Observations** | 221 | 118 | 103 |
| **R-squared** | 0.699 | 0.810 | 0.588 |

**Robust standard errors in parentheses**

***** p<0.01, ** p<0.05, * p<0.1**

**Note (for Table 7 above):**

*White has been omitted to serve as the comparison variable for Race.

Social Sciences has been omitted to serve as the comparison variable for Division.

Lecturer has been omitted to serve as the comparison variable for Rank.*

According to the regression results from Model 1 (Model All), which focuses on the effect that gender, age, race, division, and rank have on compensation for faculty at UNCA, the coefficient on the “Female” variable, which shows how being a woman impacts faculty’s wages compared to being a man, would suggest that being a woman

actually has a positive impact on compensation at UNCA if the results were statistically significant. The coefficient on the “Humanities Division” variable, that shows how being in the Humanities division effects faculty’s wage compared to the Social Sciences division, indicates that faculty in this division earn 14.6% less than those in the Social Sciences at a statistically significant level of 99%. The coefficient on the variable “Natural Sciences Division”, which shows how being in the Natural Sciences division effects faculty’s wage compared to the Social Sciences division, indicates that faculty in this division earn 4.69% less than those in the Social Sciences (the highest paying division) and is statistically significant at a level of 95%. The coefficient on the variable “Assistant Professor”, which shows how the assistant professor rank affects faculty’s wage compared to the lecturer rank, implies that assistant professors earn 26.2% more than lecturers and is statistically significant at a level of 99%. The coefficient on the variable “Associate Professor”, which shows how the associate professor rank affects faculty’s wage compared to the lecturer rank, implies that associate professors earn 39.1% more than lecturers and is statistically significant at a level of 99%. The coefficient on the variable “Professor”, which shows how the professor rank affects faculty’s wage compared to the lecturer rank, implies that professors earn 46.9% more than lecturers and is statistically significant at a level of 99%.

The regression results from Model 2 (Model Women), focus on the effect that age, race, division, and rank have on compensation for women faculty at UNCA. The coefficient on the “Humanities Division” variable shows how being in the Humanities division affects women’s wages when compared to women’s wages in the Social Sciences division. This indicates that women faculty in this division earn 11.8% less than women faculty in the Social Sciences (the highest paying division) and at a statistically significant level of 99%. The coefficient on the variable “Assistant Professor”, which shows how the assistant professor rank affects women faculty’s wage compared to women at the lecturer rank, implies that women assistant professors earn 27.9% more than women lecturers and is statistically significant at a level of 99%. The coefficient on the variable “Associate Professor”, which shows how the associate professor rank affects women faculty’s wage compared to women in the lecturer rank, implies that women associate professors earn 40.2% more than women lecturers and is statistically significant at a level of 99%. The coefficient on the variable “Professor”, which shows how the professor rank affects women faculty’s wage compared to women in the lecturer rank, implies that women professors earn 51.8% more than women lecturers and is statistically significant at a level of 99%.

The regression results from Model 3 (Model Men), focus on the effect that age, race, division, and rank have on compensation for men faculty at UNCA. The coefficient on the “Humanities Division” variable shows how being in the Humanities division affects men faculty’s wage compared to men’s wages in the Social Sciences division. This indicates that men faculty in this division earn 20% less than men faculty in the Social Sciences (the highest paying division) and at a statistically significant level of 99%. The coefficient on the “Natural Sciences Division” variable, which shows how being in the Natural Sciences division affects men faculty’s wage compared to men in the Social Sciences division, indicates that men faculty in this division earn 8.96% less than men in

the Social Sciences and at a statistically significant level of 95%. The coefficient on the variable “Assistant Professor”, which shows how the assistant professor rank affects men faculty’s wage compared to men in the lecturer rank, implies that men assistant professors earn 23.0% more than men lecturers and is statistically significant at a level of 99%. The coefficient on the variable “Associate Professor”, which shows how the associate professor rank affects men faculty’s wage compared to men in the lecturer rank, implies that men associate professors earn 38.8% more than men lecturers and is statistically significant at a level of 99%. The coefficient on the variable “Professor”, which shows how the professor rank affects men faculty’s wage compared to men in the lecturer rank, implies that men professors earn 41.8% more than men lecturers and is statistically significant at a level of 99%.

When comparing Model 2 (impacts on women faculty compensation) to Model 3 (impacts on men faculty compensation), the coefficient on the “Humanities Division” variable had a negative impact on wages when compared to the Social Sciences for both women and men models, with the men model having a stronger negative impact by 8.2 log points. The coefficient on the “Natural Sciences Division” variable had a negative impact on wages when compared to the Social Sciences for both women and men models, although the negative impact was only statistically significant for the men model. The coefficient on the “Assistant Professor” variable had a positive impact on wages when compared to lecturers for both women and men models, with the women model having a stronger positive impact by 4.9 log points. The coefficient on the “Associate Professor” variable had a positive impact on wages when compared to lecturers for both women and men models, with the women model having a stronger positive impact by 1.4 log points. The coefficient on the “Professor” variable had a positive impact on wages when compared to lecturers for both women and men models, with the women model having a stronger positive impact by 10 log points. The stronger positive impact on women assistant professor, associate professor, and professor compensation implies a potential pay disparity at the lowest lecturer rank where women faculty are more concentrated than men.

## Conclusion

Explanations for the gender wage gap, where men on average are paid more than their female counterparts, range from sexism in the workplace to motherhood penalties and discriminatory expectations placed on the gender roles of women in our society. Occupational segregation, the steering of women toward lower paying fields (rank and departmental divisions in our case), has been suggested by the literature to be a driving force in pay differentials. Academia, as has been shown in previous studies, is unfortunately not exempt from this phenomenon. The summary statistics suggest a 3.56% gender pay gap between men and women faculty at UNCA without controlling for age, rank, departmental division, and race. Contrary to my expectations, after controlling for gender, age, rank, departmental division, and race, I found no strong evidence from my regressions indicating gender differences in pay at the University of North Carolina at Asheville. However my findings do suggest there are patterns of occupational segregation among ranks where women

are more heavily concentrated at the lower lecturer rank, particularly in the Humanities division.

This directly ties into the literature's more recent explanation of the gender wage gap being driven by the systematic sorting of women into lower paying positions as opposed to a lack of human capital factors such as education or work experience (Blau and Khan, 2017, 802-828). Some causes of this systematic sorting / occupational segregation among faculty at UNCA may be due to societal biases placed on women embedded in the institutional systems, policy choices, and campus operations (Zhavoronkova, Khattar, and Brady, 2022). The non-tenure track lecturer rank in which women make up the strongest majority (63.5%) happens to be the poorest paying faculty position offering the least amount of upward mobility at UNCA. The lecturer role also has a stronger negative impact on compensation for women when compared to that of men of similar stature for all ranks. Surprisingly, the largest pay gap between men and women by rank among the three departmental divisions for lecturers (at 8.76%) happens to be in the highest paying Social Sciences division. Furthermore, in the lowest paying Humanities division, men lecturers still earned more than women lecturers but, at a minimal rate (0.63%). Since women are more concentrated as lecturers in this division, they earn less over-all. This coincides with my previous notion of occupational segregation, where the more women there are in a specific departmental division/rank, the less the pay is going to be. Rank, in addition to the gender composition of the departmental division, is where the patterns of pay discrepancies were detected suggesting that the systematic sorting based on gender among faculty ranks is where the problem lies. Future research of gender pay inequality at the University of North Carolina at Asheville should scrutinize hiring decisions, promotion policies, and employee evaluation processes for new faculty to determine whether women are being placed in lower ranks because of more women applicants or if gender bias is at play in the interview screening process.

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