Introduction

The task for this paper is an exploration of gender equity within the faculty at the University of North Carolina at Chapel Hill. In pursuit of this, this report will define gender equity, describe an index created to evaluate this definition as it is applied to the faculty in each department in the UNC College of Arts and Sciences and discuss the implications and limitations of the results of this study.

Gender equity in academia is an issue that impacts who chooses to study what, as well as the educational and career outcomes of graduates. These factors affect the quality and ranking of the education that an institution offers, which makes the case for taking an introspective look at the distribution of male and female faculty roles within an institution. While gender equity may be defined in varying ways, the end goal of this concept is to create spaces in each department and degree program where students and professors of all backgrounds can reach their highest potential in their desired fields of study.

The first step in reaching a meaningful conclusion about gender equity among the faculty at the University of North Carolina at Chapel Hill is to define this term. There are three factors chosen to define equitable representation of men and women in each department; the differences in tenure track status between men and women in each department, the wage differential between men and women within each department, and the differences in distribution of men and women in leadership positions within each department. These three core dimensions of gender equity demonstrate job stability, earning capacity, power of the different genders, and the equity of rank between male and female professors within each department. The methodology section of this paper will fully define the metrics used to evaluate and weigh these three aspects of gender equity.

Methodology

To calculate our gender equity index, we created three metrics. For each metric, a higher score implies better gender equity while a lower score implies worse gender equity.

The first metric focused on salary equity. To calculate this metric, we first calculated the median salary for male and female faculty members for each UNC College of Arts and Sciences department. We chose to use the median to control for outliers since it is a resistant measure. We then subtracted the median male wage from the median female wage for each department. A negative value indicates that males in the department make more than the females in the department on average. To assign a salary equity score, we then utilized a piecewise mapping function. A score of zero was awarded to departments where the median female salary was higher than the median male salary. We assigned a score of zero instead of a positive score because it is not necessarily a sign of equity if female professors make more than male professors, it is more a sign that it is less likely that the department is inequitable. To capture the nuance of this metric, we then assigned a score of -0.5 if the salary difference was less than 10% of the median female salary, and a score of -1 if it was greater than 10% of the median female salary. This penalizes departments that have a larger disparity in salaries. This metric can be visualized with the equation below.

$$\text{Salary Equity} = \begin{cases} 0 & \text{if Salary Difference} > 0 \\ -0.5 & \text{if Salary Difference} \leq 0.1 \times \text{Median Female Salary} \\ -1 & \text{if } 0.1 \times \text{Median Female Salary} < \text{Salary Difference} \leq 0 \end{cases}$$

Our second metric focused on equity amongst tenure track positions. We defined tenure-track positions as Assistant Professor, Associate Professor, and Professor. To calculate this metric, we first calculated a UNC-wide benchmark where we calculated the gender split for each tenure track rank. We then calculated a similar metric for each UNC department. We then

subtracted our department-specific breakdowns with the UNC benchmark and normalized the scores by the maximum difference in the department. This resulted in a score between -1 and 1 for each rank for each department. Lastly, for each department, we averaged the three scores together to get the score for our second metric. This metric can be formulated with the equation below.

$$\text{Tenure-Track Equity} = \frac{1}{3}\sum_{j=1}^{3}\frac{(\text{Percent Female}_j - \text{UNC Benchmark}_j)}{\text{Maximum Difference}}$$

The last metric we calculated was a leadership equity score. We first analyzed whether the department had a male or female department chair. If the department chair was female, we assigned the department a score equal to the percentage of their department that is female. If the department chair was male but there were more male than female professors in the department, we assigned a score of zero. If the department chair was male but there were more females than males in the department, we assigned a score of -0.5.

$$\text{Leadership Equity} = (1 \times \text{Female Chair} \times \text{Percent of Department Female}) + (0 \times \text{Male Chair} \times \text{Percent of Department Male}) + (-0.5 \times \text{Male Chair} \times \text{More Females than Males})$$

Lastly, to aggregate each of these three metrics, we used a weighted sum. We felt that salary data is subjective so we weighed it 10% less than the other two metrics. To aggregate our three metrics, we used the formula below

$$\text{Gender Equity Index}_i = (0.20 \times \text{Salary Equity}_i) + (0.30 \times \text{Tenure-Track Equity}_i) + (0.30 \times \text{Leadership Equity}_i)$$

Results

Metric 1 consisted of salary differences. The results reveal that humanities departments have the highest salary scores, which indicates lower levels of inequity. In the top 10 departments, the median salaries for women are higher than the median salaries for males.

Departments such as Anthropology, Music, and Classics, have relatively balanced median salaries for both men and women. However, the gap widens between men and women, with women earning far more in departments like Applied Physical Sciences, Geography, and Environmental Sciences and Engineering. In contrast, social sciences departments like Political Science, report a $19,645 difference between men's and women's salaries, with men earning more. The highest salary difference is in the Sociology department, with women earning a median salary of $123,994 and men earning $181,318.

Metric 2 measured tenure track differences, comparing the differences in the percentage of women in a department with UNC's benchmark for that role. This was then divided over the maximum difference and normalized to create an average score. UNC's benchmark for professors is 38%, 45% for assistant professors, and 50% for associate professors. Departments rank differently based on their score for each of the three roles. When comparing just the average score, Sociology is the most equitable with a normalized score of 0.61. This sharply contrasts the previous metric, in which Sociology ranked last. When examining tenure-track differences, humanities departments were again at the forefront in terms of equity. Departments such as African, African American, and Diaspora Studies, Romance Studies, and Dramatic Art rank at the top of the list. It is important to note, however, that these departments are comparably smaller than other departments in the College of Arts and Sciences at UNC. The only STEM field that has a notable score for metric 2 was Biochemistry. Departments with the lowest scores for this metric are Computer Science (-0.55), Applied Physical Sciences (-0.5), and Statistics (-0.44).

The third metric measured leadership position differences, looking specifically at the percentage of women in chair positions in their department. For this metric, Women and Gender Studies (WGST) ranks the highest. Women and Gender Studies is a unique case though, as the

department only has women faculty. Therefore, this department is not able to be factored into either of the first two metrics and thus, falls off the overall gender equity index. Other departments that rank highly for this metric are humanities departments like Romance Studies (67%), Asian and Middle Eastern Studies (64%), and American Studies (62%). Departments that rank low for this metric are STEM fields like Applied Physical Sciences at 18%, Statistics at 19%, and Computer Science at 21%. These departments all had male department chairs.

Overall, the gender equity index aggregates the three metrics, with a 20% weight for salary differences, a 30% weight for tenure track differences, and 30% for leadership differences. Based on these calculations, the English and Comparative Literature department was found to be the most equitable department in the College of Arts and Sciences. It has a high ranking for the salary metric, a mid-level ranking for the tenure metric, and excelled for the leadership metric. Other humanities departments like Anthropology, Romance Studies, and Art History, also consistently rank high across the other three metrics, indicating high gender equity. Notably, the only STEM field that ranks high for the overall gender equity index was Biochemistry. This department ranked high for the tenure track metric but was mid-level for the other two metrics. Departments that were most inequitable, according to the index, are Mathematics, Linguistics, and Computer Science. Several social science departments, including Philosophy, Public Policy, and Economics, also received lower equity rankings.

Discussion

These gender disparity trends have lasting impacts on UNC, specifically targeting three areas of the academic experience: individual academic tracks, potential candidates for employment, and overall academic experiences. Within the academic tracks, it is noted that having less representation within the field's staff and professors is directly correlated with

women being less likely to hold a degree in that field (Magliano, 2020). It is very important for women to be in contact with other women who are higher ranking, such as tenured, early on in their education track to continue wanting to major in that concentration. Overall, less representation within the academia leads to less representation and diversity in the recent graduates. This creates an issue with the hiring pools, as there are less diverse options to pick from, leading to a positive feedback loop where more people who are diverse tend to leave the major for a different one, making an even less diverse hiring pool, which then pushes the last remaining minorities to leave the group as they do not see a future in their field. This lack of diversity, leads to a lack of diverse thought, perspectives, and experiences, which affects the education quality of all those in the concentration, even those represented by the majority of the staff. Students want different perspectives to be brought in to fight against the echo-chamber, allowing for more ideas and conflict to arise which can strengthen their resolve and understanding on the subject matter. Overall, diversity in academia leadership positions not only leads to improvements for the minorities represented in the student body, but also improves the academic value to the ones represented by the majority.

There are some limitations to the group's study. Our dataset doesn't look into race, which is also another determinant factor for income as well (Bowdler, 2022). Hispanic and Black adults earn less than white and Asian adults, showing that there is an intersectionality between race, gender, and income, which is not reflected in the UNC database. The second limitation is that the comparison is just against income, the data does not reflect a candidate's qualifications and whether they are paid on a scale that reflects that merit. Income may be skewed in different departments in comparison to a candidate's prior experiences that make the difference in pay a necessity to compensate that person for their past accomplishments and experiences. A true

income comparison is able to hold constant meritocracy impact, as it could skew data with the income disparity. Lastly, the dataset does not look at national trends, and can be punishing UNC for having a less than 50% gender-split diversity breakdown, when in reality the numbers could be even more skewed on a national scale and UNC had been working on bringing in as many diverse candidates as possible into the field.

In relation to the identified areas of growth, a continuation of this study would look at how to address the gender disparities caused by people not graduating in a concentration or field. Since the study identified a 50/50 gender split as an ideal gender metric, there are many fields that need increased representation in the staff to create a more diverse graduating class. How does the field get stimulated to create that diverse graduating class? Future researchers can look upon potential policy that could address that disparity, and look at which is most efficient and effective. The policy could push for more minority representation in the faculty, creating a purposeful inequitable group with excessive minority representation to stimulate the diversity amongst the young professionals, or they could push for more people to graduate in that field through support programs, even when the faculty may not reflect the potential diverse graduating class. Both policy options could work, but there could be better options that future researchers identify.

Works Cited

Bowdler, Janis, and Harris, Benjamin. (2022, July 21). *Racial Inequality in the United States*. U.S. Department of the Treasury. https://home.treasury.gov/news/featured-stories/racial-inequality-in-the-united-states#:~:text=In%20addition%2C%20Black%20and%20Hispanic,as%20shown%20in%20Figure%204..

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