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ENGL 3009

6 April 2025

Gender Discrimination in Science Academia

As a woman pursuing a career in science, I have become more aware of the historical injustices faced by female scientists whose contributions were either overlooked or credited to their male counterparts. Learning about important scientific heroines like Rosalind Franklin, whose work was crucial to the discovery of DNA structure, Lisa Meitner, who played an important role in discovering nuclear fission but was excluded from receiving the Nobel Peace Prize, and Katherine Johnson, whose mathematical skills were essential to NASA's success yet remained largely unrecognized for years, has ignited my passion to learn more about the ongoing challenges women face in science, technology, engineering, and mathematics (STEM). These examples of injustice made me question whether gender discrimination in scientific research and academics persists today and if so, to what extent. This interest led me to explore the gender discrepancies that women in science encounter, particularly in hiring and faculty positions. In order to learn more about the topic, I consulted two peer reviewed journal articles that conducted controlled studies, one TEDTalk video that explored the lack of women in scientific leadership positions and the effects it causes, and used a chapter from a book that dives into gender and diversity issues in higher education practices. From these sources I hoped to learn whether or not gender discrimination is still a prevalent issue in the field of science. After reading many articles and various other sources, I've learned that they all unanimously agree that gender bias still exists and it still affects women's career outlooks to this day. I also learned that the reasons as to

why this gender discrimination still occurs and possible ways to mend the gap, are still being researched.

In order to examine how systemic biases impact the careers and representation of women in the field of science I used search engines like OneSearch and Google Scholar to find my sources. I first began my research very broadly focusing on gender gaps in STEM in general but that was too broad. I then refined my search to focus on hiring processes for post doctoral research labs and faculty positions such as assistant professors or professors. I searched for phrases such as, "Gender discrimination in STEM", "Gender bias in higher education", and "Gender bias in post doc research labs". As I found resources I began to see research that has been conducted to bridge the gender gap and I felt the need to include those findings as well because the sources all agreed that this is imperative to stunting the growth of the gender gap. I chose two peer reviewed journal articles because they conducted well designed studies that provided information in a non-biased way. I chose to include a TEDTalk in my research because although it is simple and easy to understand, I believed that the study she referenced from the University of Massachusetts gave good insight to outcomes of having female representation in STEM. Finally, I included a book as a source because it included well supported information about the topic I wanted to discuss.

Gender discrimination in STEM research and higher education faculty positions remains a challenge for women, despite significant strides towards achieving equity. Gender discrimination in the sciences often occurs most in the hiring processes. A study conducted by a group of researchers examined the impact of gender and race stereotypes on the evaluation of post-doctoral candidates in biology and physics. It's important to note that in the sciences, biology tends to be more gender balanced compared to physics, engineering, and mathematics.

The study included 251 STEM faculty members from eight large public universities in the United States. The professors were randomly given one of eight curricula vitae that only varied by the name associated with the candidate, which was designed to reflect gender and race. The professors were made aware that it was a hypothetical CV but were under the impression that the study was to explore efficient formatting of CVs (Eaton et. al 7). The professors were then asked to rate the hypothetical candidates on their competency and hireability.

The finding revealed a significant gender bias, female candidates were consistently rated as less competent and less hireable as male, especially more frequently in physics than in biology (Eaton et.al 10). This bias was found regardless of the candidates qualifications since they were all exactly the same across all eight of the CVs. According to the study conductors, these biases clearly show a deep rooted belief that men are more fit for leadership and research roles in STEM (Eaton et.al 4). They add that these results exhibit how these stereotypes have the ability to impact the careers of women who wish to enter into these fields. Such strong biases like these have the potential to steal well earned positions from qualified women. This study shows significant support to the idea that women are more likely to be rejected from a job they are qualified for, simply because they are not men.

The researchers behind this study provided a list of factors that could have possibly contributed to the gender gap, especially in physics departments. Since physics departments tend to be more male dominated, it is possible that men choose men more often. The faculty that graded the CVs were not gender balanced. The authors explained that the physics professors were 90% men and 65% men in the biology department. This was a major limitation in the study but it further proves the gender gap that exists. It implies that men hold a stronger belief in gender stereotypes than women do, "A large body of research suggests that although both men

and women hold sexist attitudes and gender stereotypes, men hold stronger gender biases than women do"(Eaton et. al 10).

The role that faculty leadership plays in unequal hiring practices is further explored in the article "Elite Male faculty in the Life Sciences Employ Fewer Women" by Jason Sheltzer and Joan Smith. Sheltzer and Smith conducted a study that examined gender discrimination within the life sciences departments at 24 different universities. Their research discovered that elite male faculty (those who have won a major career award or have been elected into the National Academy of Sciences) have trained a lot less women than other male faculty. This study discusses parenthood as a major contributing factor to the exclusion or self removal of women in faculty positions, they claim, "Female scientists with children are significantly less likely to be hired for tenure-track jobs than those without children, whereas male scientists with children are more likely to be hired for tenure-track jobs than male scientists without children"(Sheltzer and Smith 1). This article provides different but equally important reasoning as to why women are excluded from faculty positions. An interesting point made by Sheltzer and Smith is that women can play a part in their minor representation in STEM. In their article they claim that women are less likely to apply to labs run by elite male faculty possibly due to feeling unwelcome or unsupported in these competitive environments. They believe that women can play this role because their current data doesn't show that men show conscious bias but they also don't have enough data to support their self-selection theory (Sheltzer and Smith 4).

The gender gap in science often begins in adolescence when young girls start to disengage from science. As Brenda Skozcelas discusses in her TEDTalk, "Closing the Gender Gap in STEM", this is linked to the way society constructs gender norms and expectations, which can heavily influence young girls' perceptions of their abilities and interests. Skozcelas

advocates for a 3-pronged approach to closing the gender gap in STEM. First she emphasizes the importance of introducing STEM to children at an early age, ensuring that both boys and girls are equally exposed to scientific concepts and are encouraged to develop their curiosity. Early experiences with science are crucial for fostering an interest in STEM subjects. Secondly, Skozcelas argues that raising awareness about the diverse career opportunities and highlighting the achievements of women in science is essential for encouraging young women to pursue STEM careers. Lastly, and most important to the topic at hand, Skozcelas stresses the importance of female mentors in STEM fields (Skozcelas 2:51-7:30). Female mentors play a critical role in retaining women in STEM professions and facilitating their career advancements. In her TEDTalk she quotes from a study conducted at the University of Massachusetts in which they found, "One hundred percent of female engineering students remained in the program after the first year if they had a female mentor,eighty-nine percent continued with no mentor, and only eighty-two percent continued with a male STEM mentor" (Skoczelas 8:01-8:11). The presence of female mentors can create a more inclusive and supportive atmosphere and can help bridge the gap that exists.

Institutional policies also play a role in contributing to gender bias in STEM research and academia. In the book, *Leading Change in Gender and Diversity in Higher Education from Margins to Mainstream,* the authors examine the challenges faced by marginalized people, including women and the "leaky pipeline" that leads to underrepresentation in higher education (CohenMiller, et al 290). The book emphasizes the necessity of research practices that give diversity and inclusion top priority. As research has shown, "Higher rates of female faculty retention create role models and belongingness for female students and change the nature of research, teaching and mentoring that students experience. And a better climate for women

encourages recruitment and retention of female students who then may begin to see STEM as a more welcoming field. These institution-focused roles are also critical because they can impact inequitable policies and procedures" (CohenMiller, et al 284). The authors are highlighting the need for institutions to recognize the gender bias in STEM and change the environment to make it more inclusive for women and other minorities.

Gender discrimination in science research and higher education faculty positions remains a prevalent issue. This is evident by the multiple studies that highlight biases in hiring, research/professor leadership, and institutional policies. The research shows that female candidates are often seen as less competent and less hireable compared to males competing in the same field. The lack of female mentors and representation can influence these unhealthy societal norms even further and discourage women from trying to achieve a career in the scientific field. Through this research, it became clear that while great progress has been made for women in fields like biology, deep rooted biases still impact the career outlooks of women in STEM.

Works Cited

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