

Has Academia Become More Gender-Fair for Women? Findings From an Adversarial Analysis of Gender Bias

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Pursuing a career in science, technology, engineering, and mathematics (STEM) has historically required women to confront significant gender bias within the world of academia. But it's important to update our perceptions of this gender bias so that women are not needlessly discouraged from pursuing these careers today, according to Stephen J. Ceci (Cornell University), Shulamit Kahn (Boston University), and Wendy M. Williams (Cornell University) in [*Psychological Science in the Public Interest*](#).

Ceci, Khan, and Williams's analysis of hundreds of existing studies covering six aspects of academic life relevant to tenure-track professors suggests that the academy has indeed taken significant steps toward gender equality. Data from 2000 to 2020 indicate that women researchers are now equally likely as their male peers to be awarded grant funding, to have their journal articles accepted for publication, and to receive strong letters of recommendation. Moreover, they are more likely than men to be hired for tenure-track positions.

"Our country desperately needs the contributions of talented women scientists," Ceci said in an

interview with APS. “Happily, the realities of today no longer support the belief that these jobs are pervasively biased against women. In our view, this message is worth spreading. More women might become scientists if they knew that the job was not riddled with sexism.”

These findings, Ceci said, suggest that academia now offers a largely gender-fair, and in some cases female-advantaged, environment:

- Women who earn PhDs and apply for tenure-track positions are often more likely to be hired than their male peers, the authors found through a review of existing studies and their own analysis of data from the National Science Foundation.
- Grants are awarded to women and men at approximately equal rates, the authors found from a meta-analysis of 39 studies including data from more than 2 million applications to 27 grant agencies.
- Scientific articles where women are the first or last authors were about as likely to be accepted for publication as those written by men, according to the authors’ meta-analysis of 33 articles on journal acceptance rates.
- When the researchers compared the findings of nine studies that analyzed letters of recommendation written from 1990 to 2017 for the fields of psychology, physics, biology, medicine, chemistry, and geoscience, they found no gender bias. Compared to letters written for men, letters written for women after the year 2000 were no shorter, raised no more doubts about women’s ability to do a job, and used no different words to describe applicants.

These findings come with important caveats: Women are still less likely to apply for tenure-track positions and grant funding than men and have shorter average career lengths, leading them to generate a smaller body of research. This suggests that systemic factors may be primary in limiting modern women academics’ career trajectories. For example, women continue to bear a disproportionate responsibility for child-rearing and other family obligations because of both pregnancy and societal expectations related to caregiving and are more likely than men to leave academia entirely or to seek out employment that offers greater work/life balance at the cost of lower pay, the researchers noted.

Ceci and colleagues also identified two areas of academic life in which both gender bias and systemic factors continue to hinder equitable outcomes for women:

- From a review of previous research and their own analysis of data from the American Association of University Professors, the authors found that there is still a salary gap between male and female tenure-track professors. However, this gap appears to be 60% to 80% smaller than the media commonly report, measuring around 3.6% for academics in similar fields and with similar experience.
- Through a review of existing meta-analyses, the authors found that women academics receive lower teaching evaluations from students despite being equally effective educators, as assessed by more objective measures of student learning such as grades.

Acknowledging the areas in which academia has become more welcoming of women could help free up resources that could be used to address these and other inequities, Ceci, Khan, and Williams wrote. Studies suggest that women are less likely to negotiate for a higher salary than men, for example, so regularly auditing faculty pay in order to equitably adjust salaries across a department could help narrow

the pay gap, the researchers suggest. Additionally, universities could help limit the influence of biased student teaching evaluations by focusing on more objective measures of student learning when offering professors raises, promotions, and tenure.

“Given the substantial resources directed toward reducing gender bias in academic science, it is imperative to develop a clear understanding of when and where such efforts are justified and of how resources can best be directed to mitigate sexism when and where it exists,” the authors wrote.

Notably, Ceci, Khan, and Williams completed this project through a nearly 5-year adversarial collaboration, an approach to research that embraces viewpoint diversity as a method of countering ideologically driven assumptions about a topic. This collaboration required the researchers to challenge each other’s opposing perspectives on gender bias in academia in order to provide a more objective, evidence-based analysis of the subject.

A need for more flexible, balanced workplace cultures

In an accompanying commentary, [Anne Preston \(Haverford College\)](#) acknowledged that Ceci and colleagues’ work signals a positive shift for women researchers. She noted, however, that academic careers continue to be structured in ways that discourage women from entering or remaining in scientific fields, often leading them to escape the “rat race” for tenure by pursuing career paths that offer greater work/family balance at the cost of lower wages and underemployment. Preston suggested that universities could help address some of these concerns by offering more formal mentoring programs and supporting more flexible paths to tenure-track positions and for financing research.

“The changes should be heralded but not taken for granted,” Preston wrote. “To make academic careers in science truly welcoming to women so that more women enter and fewer leave these careers, systemic change has to occur.”

In a second commentary, [Alexandra Garr-Schultz \(University of Connecticut\)](#), [Gregg A. Muragishi](#), [Therese Anne Mortejo](#), and [Sapna Cheryan \(University of Washington\)](#) suggested paying further attention to how masculine defaults shape life in academic institutions. Norms that favor stereotypically masculine traits such as independence, competitiveness, and self-promotion over stereotypically feminine traits like interdependence, warmth, and collaboration can disadvantage not only women but people of color and those who are lesbian, gay, bisexual, and transgender or nonbinary, Garr-Schultz and colleagues wrote.

“Mitigating masculine defaults is going to take intentional effort and isn’t likely to happen overnight, but as academics, we have a vested interest in making academic STEM disciplines as welcoming and inclusive as they can possibly be,” Garr-Schultz said in an interview. These efforts could include removing unnecessary masculine defaults or balancing them with other values. No matter the approach, Garr-Schultz and colleagues stressed that interventions should be empirically evaluated to ensure that they are effective and don’t exacerbate existing disparities.

References

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