

Privilege, Bias, and Graduate School Admissions



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Across clinical, translational, and basic science research, the influence of bias and confounding variables on data collection and analysis are well accepted, and great care is taken to reduce bias and understand any confounds. In much the same way, implicit bias and privilege heavily influence both who applies to graduate school and who gets accepted. But while study designs have evolved, the pervasive influence of privilege on graduate school admissions remains.

One of the first roadblocks to getting into graduate school is the financial burden of applying. It costs over \$200 just to take the GRE, and in order to score well, many students invest in study materials and prep courses, which can cost thousands of dollars.¹ Given these financial barriers, it should not be surprising that GRE scores often correlate with students' socioeconomic status. But GRE scores are not only reflective of the privilege inherent in wealth, but also white privilege and male privilege. Studies from the University of Florida, Stanford, University of Missouri, and New York University have found that the GRE underpredicts the graduate school success of minority students and women over 25.¹ While the GRE is often looked to as an "objective" way to measure students' aptitude, it has been shown to be a poor predictor of scientific productivity and only a moderate predictor of first semester graduate school grades by studies from the University of North Carolina and Vanderbilt.²

The financial barriers to applying to graduate school extend beyond the GRE, as the costs of application fees and interview travel can quickly compound. Likely as a result of this, on average, those who become scientists come from

wealthy backgrounds. In an analysis of National Bureau of Labor Statistics data, NPR found that physical, life, and social scientists' average annual household income during childhood was between \$70,000 and \$74,999.³ Scientists came from a higher average income bracket than physicians, dentists, general managers, and even CEOs. Additionally, you are far more likely to become a scientist if your parents are scientists. More specifically, you are 456 times more likely to be a physical scientist if your parents are too.⁴ With a large number of those accepted to graduate school coming from wealthy backgrounds, or with family ties enabling more research opportunities, there is a clear need to recruit applicants from outside of these small pools.

In addition to the financial barriers to applying to graduate school, problems within the culture of science may discourage students of color and white women from applying. When deciding what to study as an undergraduate or what career to pursue after graduation, students may avoid STEM despite interest or talent, if they feel they would be unwelcome in the field. When no one looks like you in the portraits of deans and department chairs at an institution, it is hard to feel like you belong. In the United States, a majority of women in STEM fields report having to provide more evidence of competence than others to prove themselves, with rates varying significantly by race, ranging from 63% of white women to 77% of black women.⁵ This intersectionality cannot be ignored when considering the level of bias applicants have to overcome.

Even if those from less privileged backgrounds decide to apply to graduate school, the way in which we evaluate applications often biases our evaluations against them. Recommendation letters amplify male privilege, with male applicants more likely to be described as a "brilliant scientist" or "one of the best students I've ever had" than their female counterparts.⁶ In addition to being less likely to have an "excellent" letter, female candidates are also more likely to be described in terms of relationship-building, such as "caring" and "nurturing."⁶ While these are not negative qualities, they are not as valued within the scientific community as characteristics more common in recommendations for men, like "confident" and "intellectual."

Another important metric for evaluating applicants is the number and quality of research experiences. While exposure

to research is important, the large number of unpaid research positions put students who cannot afford to work for free at a distinct disadvantage. The persistence of these unpaid positions are problematic not only because they exploit the labor of students, but also because unpaid positions decrease the number of paid jobs available, as this free labor will “undercut” the cost of paid work.⁷ The work students do as unpaid interns may still have significant scientific merit, but how can we reward them for their work without punishing those who are not privileged enough to pursue such opportunities?

So how can we improve the graduate school admissions process to reduce the action of privilege on who goes into science? First, we must ensure that those who sit on graduate school admissions committees are aware of how the traditional ways in which we evaluate candidates preferentially select for candidates who are wealthy, white, and male— independent of aptitude.

Many programs have begun to institute implicit bias training for admissions committee members, which aims to educate committee members about the implicit or “unconscious” biases that we all hold. This is a good first step, but beyond introducing the concept of implicit bias, admissions meetings must be structured in a way that empowers members to call out bias when they see it. As implicit bias is unconscious, even with training it can be difficult to see when we are behaving in biased ways. If admissions committees encourage input from all members independent of institutional hierarchy and work to ensure the membership of the committee is diverse, it may increase the attention given to biases.

But before the admissions committee meeting, graduate school programs could work to improve their admissions process. Many programs offer application fee waivers for low-income students, but the information on fee waiver availability and how to request one is often difficult to find. Eliminating application fees would enable students to apply based on program interest, not ability to pay. It may also prevent low-income students from being discouraged from applying before even beginning the application.

To prevent the exploitation and undue advantage of unpaid research work, when offering research work to undergraduates, institutions nationwide should ban uncompensated research positions. Instead only research positions for pay or course credit should be offered. Should this be too difficult, perhaps graduate admissions committees could decide to not permit the inclusion of unpaid research work on students’ CVs, in order to discourage students from pursuing such work and remove the advantage of such experiences.

We also need to reconsider what makes a “strong” application. As those with wealth and/or family connections are more likely to excel in the more traditional admissions metrics (GRE, research experiences, extracurricular activities), we need to expand what we consider worth including in an application. Beyond research experiences, we could suggest including service or labor jobs, hobbies, and unique skills on CVs. Most recommendation letters come from professors and research mentors—what if we similarly encouraged letters from retail employers, coaches, or mentees? While working a service job may not demonstrate pipetting skills, it can certainly show an applicant’s work ethic, skill at optimizing a task, and ability to work as part of a team.

Finally, graduate schools should consider changing the way in which candidates are interviewed. Multiple studies have found that unstructured interviews are one of the worst predictors of job performance and are often biased by interviewers looking for candidates like themselves.⁸ If interviewer bias skews interview scoring in favor of candidates like themselves, how can we expect to increase diversity in science? The *Harvard Business Review* suggests a few changes to interviews⁸:

- 1) structure interviews, so candidates are all asked a standard list of questions;
- 2) have candidates perform a work sample test related to the work they will perform;
- 3) get rid of group interviews; and
- 4) compare responses horizontally, that is, across all candidates one question at a time.

In addition to these suggestions, I would encourage graduate schools to offer videoconference interviews for initial interviews. This would make it easier for applicants with disabilities and/or families to interview, as well as saving applicants money on travel expenses.

We in academia need to work to construct a more inclusive pipeline into careers in science that doesn’t limit the opportunity to pursue graduate training to a small subset of people. When thinking about who would make a good scientist, we would do well to remember the words of Stephen Jay Gould: “I am somehow less interested in the weight and convolutions of Einstein’s brain than in the near certainty that people of equal talent have lived and died in cotton fields and sweatshops.”

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