

## SCIENTIFIC COMMUNITY

# U.S. Study Shows Unconscious Gender Bias in Academic Science

Most U.S. professors like to think that they are working hard to overcome the persistent gender imbalance in academic science. They certainly don't consider themselves to be part of the problem. But a new study by a team at Yale University suggests that they're wrong, and that gender bias is deeply rooted in the community.

Last year, a team at Yale University asked 127 professors at six U.S. research universities to judge the merits of a recent college graduate who was hoping to become a lab manager before heading to graduate school. The participants were sent identical resumes, except that half were ostensibly from a female candidate and the other half from a male applicant. The participants—tenured or tenure-track faculty members in the departments of biology, chemistry, and physics—were significantly more likely to hire the man, pay him a higher salary, and see him as more worthy of mentoring. That bias was equally strong among female and male scientists, and did not vary by age, race, or discipline.

Studies of gender bias in science abound, and a multitude of factors, including lifestyle choices, preferences for nonscience disciplines, or even differences in ability, have been offered as possible reasons. This study comes down on the side of “preexisting subtle bias” that is unintended but no less real.

“The debate often gets bogged down in other issues,” says Corinne Moss-Racusin, lead author of the study published by the *Proceedings of the National Academy of Sciences (PNAS)*. “But this eliminates one line of defense. We hope that providing people with inescapable evidence of bias will be the missing piece of the puzzle” in prompting universities to find better ways to address the problem.

Apart from its intrinsic value, understanding the bias within academia is also an essential foundation for any effort to broaden participation in science by women and underrepresented minorities. The stronger the bias, the higher the barrier facing women who want to have a successful career in science. “[T]he current results suggest that subtle gender bias is important to address because it could translate into large, real-world disadvantages in the judgment and treatment of female science

students,” the authors write. They note that it's also the first attempt to directly measure the bias of a representative sample of the U.S. academic community toward the next generation of scientists.

Microbiologist Jo Handelsman, who co-authored the study with psychologist John Dovidio and Moss-Racusin, their postdoc, says that the results shouldn't make faculty



**Rethinking science.** Diversity is one of the many topics covered in Jo Handelsman's student workshops on “scientific teaching.”

members feel guilty. Rather, they simply highlight the pervasive culture within the community that discounts the value of women. Changing those entrenched beliefs won't be easy, Handelsman adds, but the study provides a place to start.

“The first step is to talk about it, and the fact that unconscious bias can contribute to decisions that we all make,” Handelsman says. “And that's a big step. We're not accusing them of a conscious prejudice or of any venal behavior. But we are saying that they need to be more aware of the effect of this unconscious bias.”

The participant pool was deliberately chosen to mirror the demographics of the academic community. Four out of five respondents were white, with an average age of 50. Three in five were full professors, with the remainder almost evenly split between assistant and associate professors. The applicants were depicted as promising, including having co-authored a journal article with their faculty adviser, but not brilliant, so as not to overshadow the bias being measured.

The team has been working on ways to correct that bias by appealing to the emotional as well as intellectual sides of their academic colleagues at Yale. One project involves local playwrights and artists presenting works that portray successful women and minorities in science. “Art is a good way to reach people emotionally,” Handelsman says. She said that studies have also demonstrated the value of visual priming—showing a positive image of an African American, for example, before judging a pool of job candidates that includes minority candidates—in correcting an unconscious bias.

“Scientists crave data,” she notes. “But when you just give them data, they want to know what it feels like. We'd like to do an experiment that examines whether engaging people's emotions might be more persuasive than just giving them the facts.”

The *PNAS* study was funded by the Howard Hughes Medical Institute (HHMI) in Chevy Chase, Maryland, which for the past decade has supported Handelsman's efforts to improve the quality of undergraduate instruction. “We're not just looking at the learning environment,” Handelsman explains. “If faculty members are treating women differently, they will be disadvantaged not only in the classroom but in every step of their academic training.”

David Asai, who runs the HHMI program, says he thinks the study delivers a sobering message both to organizations like his and to the scientific community as a whole. “Clearly, our efforts to date haven't fixed the problem,” Asai says. “The idea of unintended bias is not new. What is new is their analysis of scientists exhibiting this bias.”

“The study addresses an important issue,” Asai says, “and that's improving the persistence of all students in science. Everybody thinks that someone else is contributing to the problem. But the only way to make science better is if we all own the challenge.”

—JEFFREY MERVIS