

# Male biology students consistently underestimate female peers, study finds

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p>Female college students are more likely to abandon studies in science, technology, engineering and math (STEM) disciplines than their male classmates, and new research from the University of Washington suggests that those male peers may play a key role in undermining their confidence.

Published this week in the journal *PLOS ONE*, the study found that males enrolled in undergraduate [biology](#) classes consistently ranked their male classmates as more knowledgeable about course content, even over better-performing female students.

The over-ranking equated to males ranking their male peers smarter by three-quarters of a GPA point\* than their equally-performing female classmates, showing what researchers say amounts to a clear and consistent [gender bias](#). Female students, on the other hand, repeatedly showed no significant bias in whom they picked as knowledgeable.

"This shows that there is a huge inequity in who male students think is strong in the class materials," said lead author Dan Grunspan, a doctoral candidate in the UW Department of Anthropology.

"Males were consistently nominated as being more knowledgeable by their male peers, regardless of performance."

The study involved surveying around 1,700 UW students enrolled in the same undergraduate biology course. Students in three classes were asked

to name the classmates they considered strongest in their understanding of class materials at multiple points in the course. Additionally, instructors were surveyed on which students were most outspoken in class—an effort to determine which students would be most visible to other students as knowledgeable, given the large class size. More males than females were considered outspoken by the instructors, the researchers found.

Even after accounting for differences in performance and outspokenness, male students got more recognition from other males than their female peers did, and the finding was consistent across 11 different class surveys. For an outspoken [female student](#) to be nominated by males at the same level as a male student, her performance would need to be more than three-quarters of a GPA point\* higher than the males.

"Using UW's standard grade scale, that's like believing a male with a B and a female with an A\* have the same ability," said co-lead author Sarah Eddy, who participated in the research as a UW postdoctoral biology researcher and is now a research scientist at the University of Texas, Austin.

On the other hand, females nominated their male and female peers almost equitably across all the surveys, after controlling for differences in performance and outspokenness. The researchers determined that the female bias was so small it could have arisen by chance, and they estimate that gender bias among male students was 19 times stronger than among females. The top three most-nominated students in all classes were male, even though there were also outspoken female students in the class with the same grades.

The findings are troubling, said Eddy, since peer support is a key factor in retaining women in STEM fields.

"To stay in STEM you have to believe you can do it, and one of the things that can convince you of that is your peers saying you can do it," she said.

"Helping students find peers who believe in them is really important, especially for women, because they're not likely to get that from males in their class."

The paper grew from research Eddy and other UW biology colleagues were doing on gender disparities in biology education. A previous study by the group found male students entering biology with the same GPA level as their female peers performed better in introductory biology. They also found that female students generally felt less comfortable speaking up in class.

Grunspan, meanwhile, was doing research on how undergraduates form study networks. He initially wasn't focused on the gender makeup of those networks, but noticed a pattern of [male students](#) viewing their male peers as being stronger in course materials. As he dug further into the data, that pattern became even more pronounced.

"I realized that there was a really big problem," Grunspan said.

"Something is going on in the classroom that is either being influenced by currently held implicit biases or that is helping build implicit biases. We need to be thinking about what that means for the future.

"Students are the future policymakers in the country," he said. "They are the people who will someday be responsible for hiring and making other important decisions. Because these are millennials showing this pattern, it means the age-old problem of gender bias may not go away simply because we have a new generation in charge."

Previous research has focused on gender biases among faculty in STEM

disciplines, but less is known about how current college students perceive women in STEM and how their views might impact female students. The researchers focused on biology, since [females](#) and males enroll equally in biology courses at the undergraduate level. The gender bias their study revealed, they say, could be even more pronounced in other STEM disciplines.

"Given that we typically think of biology as a STEM field without a gender gap, you could imagine that other fields like physics or mathematics or engineering, which numerically are very dominated by [males](#), would have an even stronger effect than what we're finding," Eddy said.

The researchers say gender bias in the classroom could be mitigated through simple measures such as fostering female study groups, using randomized class lists to call on students to participate and creating small-group discussions to establish a less intimidating environment for women.

But changing systemic gender biases, Eddy acknowledged, is a difficult challenge. The study's authors and their colleagues are addressing that challenge through ongoing research that they hope will help inform inclusive teaching practices.

"As science instructors at the college level, you can only affect so much," she said. "There's been at least 18 years of socialization. You do what you can to interrupt that."

Other co-authors are Sara Brownell, an assistant professor of biology at Arizona State University, Tempe; Benjamin Wiggins, an instructional coordinator in the UW Department of Biology; Alison Crowe, a member of the UW Biology Education Research Group; and Steven Goodreau, a UW associate professor of anthropology.

\*Note: the researchers are in the process of correcting an error in the study. The over-ranking of male [students](#) by their male peers equated to a GPA increase of .765, as reported in the Results section of the study, not .57, as reported in the Abstract section at the start of the study.

**More information:** Daniel Z. Grunspan et al. Males Under-Estimate Academic Performance of Their Female Peers in Undergraduate Biology Classrooms, *PLOS ONE* (2016). [DOI: 10.1371/journal.pone.0148405](#)

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