Not quite a 'double bind' for minority women in science

May 15 2018, by Jeff Grabmeier

Many studies have shown that both minority and women scientists face disadvantages in reaching the highest levels of their careers.

So it would make sense that minority women would face a "double bind" that would particularly disadvantage them.

But a new study using a massive database of scientific articles suggests that minority women actually face what might be called a "one-and-a-half bind." They are still worse off than other groups, but their disadvantage is less than the disadvantage of being black or Hispanic plus the disadvantage of being a woman.

"There is less disadvantage than you would have thought if you simply added the penalties of being a minority and being a woman," said Bruce Weinberg, co-author of the study and professor of economics at The Ohio State University.

The study appears in the May 2018 issue of *AEA Papers and Proceedings*.

The findings are particularly timely now, said study co-author Gerald Marschke, associate professor of economics at the University at Albany, State University of New York.

"The underrepresentation of women and minorities is a huge concern to policymakers and is the focus of many commissions and initiatives,"

Marschke said.

The researchers used an innovative method to overcome one of the biggest issues in studying the careers of minority women.

"Because of the small number of minorities and the small number of women in some science careers, it is hard to study them, particularly with people who are members of both groups," Weinberg said.

The researchers found a way around this problem by using a convention of the biomedical sciences to their advantage. In the journals where these scientists publish their results, the last author listed on an article is the principal investigator who supported the work and has the highest level of prestige.

"Being listed as the last author is the pinnacle of the research career and has a lot of status that goes along with it," Weinberg said. So the researchers compared how many minorities and women were listed as last author on papers compared to white men.

The study used a massive database of 486,644 articles with two to nine authors published in medical journals by U.S. scientists between 1946 and 2009. Computer software categorized author names by race, ethnicity and gender.

This software also identified individual authors so that the researchers could follow how scientists' authorship position on papers changed over the course of their careers.

Overall, results showed that the probability of being a last author—the prestige position—increased from 18 percent during the first four years of a scientist's career to 37 percent after 25 and up to 29 years.

Black scientists were substantially less likely to be last authors compared to white men after five years into their careers, with a gap of 6 percentage points at 25 to 29 years.

The movement of women and Hispanics into last authorship was even slower, with a gap of 10 percentage points after 25 years in their career.

Marschke noted that women and minorities have fewer publications than white men and controlling for these differences can account for some of the gaps with white men.

"But even after controlling for experience differences you see these gaps," Marschke said.

The researchers also did several statistical analyses to assess the impact of various factors on whether an author would have the last position on an article.

In one such analysis, they found that blacks were 0.4 percentage points less likely than white men to be the last author and women were about 4 percentage points less likely to be listed last.

Given that, it would have been reasonable to assume that the penalty for black women would be at least the sum of those two disadvantages, or 4.4 percentage points, Weinberg said.

But in fact, the findings showed black women were about 3.5 percentage points less likely than white men to receive the last authorship position.

"You lose something for being black and you lose something for being a woman. But you lose less than simply adding those two disadvantages together," he said.

A similar result was found for Hispanic women.

This result was surprising, Weinberg said, partly because the two disadvantages could have been more than just additive.

"Our expectation, based on research that has been done on intersectionality, was that, if anything, the penalties of being a woman and being a minority could have compounded each other, and their position would have been even worse," he said.

Marschke added: "Women who are minorities may feel isolated by their minority status, but unlike minority men, also face the strain of balancing careers and families like white women. But unlike white women, they also have to uphold their roles as women within their culture."

The researchers are now investigating why they found these results and trying to determine if factors like the number of people on a research team and the source of funding may affect how women and minorities fare.

More information: Marschke, Gerald, Allison Nunez, Bruce A. Weinberg, and Huifeng Yu. 2018. "Last Place? The Intersection of Ethnicity, Gender, and Race in Biomedical Authorship." AEA Papers and Proceedings, 108 : 222-27. DOI: 10.1257/pandp.20181111

Provided by The Ohio State University