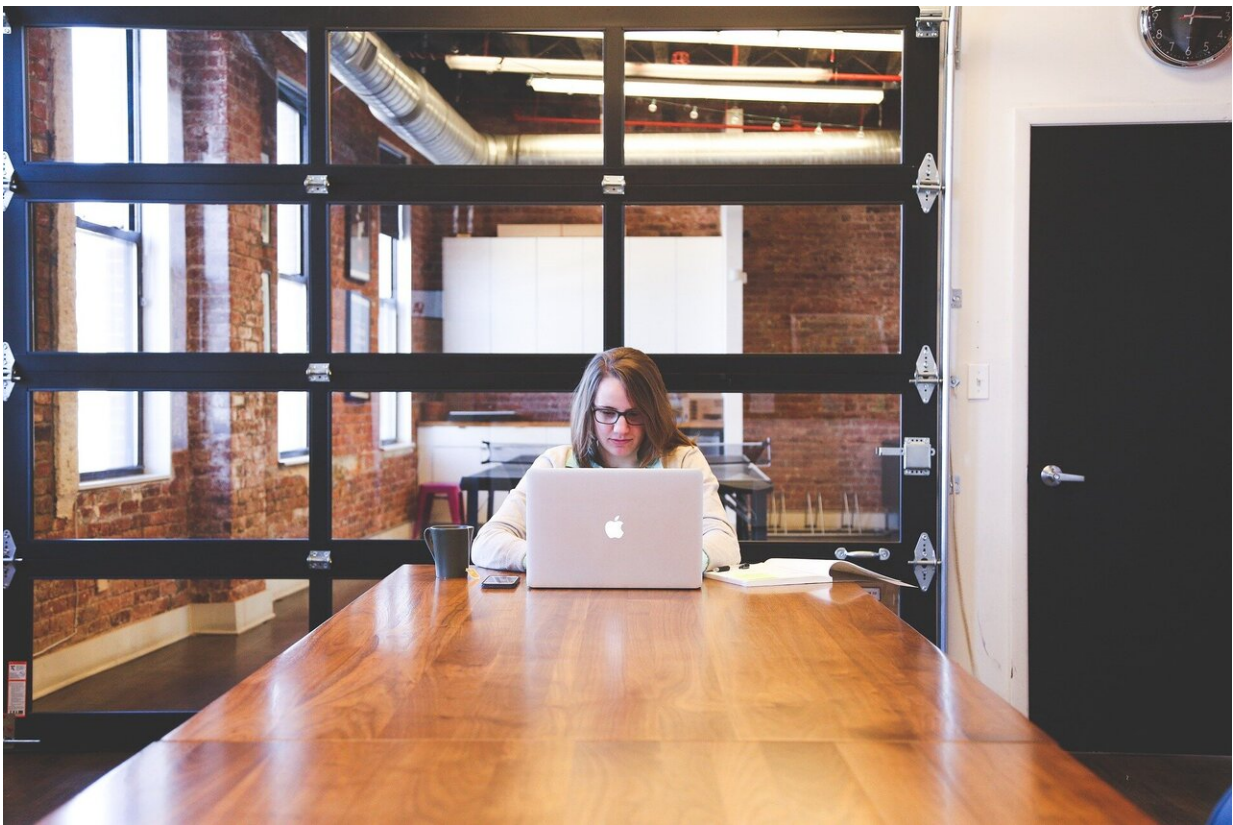


Groundbreaking ideas from women scientists get less attention

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Scientists are less likely to adopt important new ideas in biomedicine introduced by women researchers, a new study has found.

Researchers used a novel way of tracing the flow of ideas to find that even some of the most well-known breakthroughs in biomedical research from 1980 to 2008 had a more difficult road to adoption when research teams were dominated by women.

Specifically, the five-year adoption rate of new ideas from female-majority teams was 23% lower than that of male-majority teams—even among the top 0.1% of ideas.

One issue the study found was that female biomedical scientists aren't as well-connected as men are with other scientists in their field, said Wei Cheng, lead author of the study and a Ph.D. graduate in economics from The Ohio State University.

But women have trouble getting their ideas noticed even by the connections they do have.

"Men are less likely to adopt women's ideas even if they are only a step or two away from the female innovators in the [network](#)," said Cheng, who is now an assistant professor at East China University of Science and Technology.

Preliminary evidence suggests Black and Hispanic scientists may face hurdles similar to those women encounter, said study co-author Bruce Weinberg, professor of economics at Ohio State.

"Although our analysis focused on gender, we found concerning patterns for Black and Hispanic scientists, where their ideas are less likely to be adopted compared with white scientists," Weinberg said.

Their results were published yesterday as a *National Bureau of Economic Research* working paper.

The researchers examined biomedical studies published in scientific journals by U.S.-based scientists between 1980 and 2008 that appeared in the MEDLINE database.

Rather than looking at influential studies, as other research has done, Cheng and Weinberg focused on influential new ideas. They used a computer science technique called natural language processing to find words or phrases (up to three words) representing new ideas in the title and abstracts of the studies in MEDLINE. A new idea was a word or phrase that was used for the first time in an article between 1980 and 2008.

The researchers then calculated how often those words or phrases were repeated by other scientists in the following 10 years as a measure of how influential they were. The study focused on the top 0.1% of ideas (3,430 in total) that were used the most often—in other words, ideas that were "adopted" by other scientists.

"These were the most important new ideas in biomedicine that were originated by U.S. scientists," said Cheng. "These included well-known breakthroughs and advances such as HIV/AIDS and [polymerase chain reaction](#)."

In addition to analyzing the gender, race and ethnicity of the authors of each new idea, Cheng and Weinberg also determined the other scientists who were potential adopters of that new idea. These were scientists who worked in the same biomedical fields as the innovators before the birth of the new idea.

A key part of the study was analyzing each scientist's network of other researchers in the field, because those are the colleagues who would presumably know the most about their work and be most likely to adopt their new ideas.

The closest colleagues in a scientist's network are those they had previously worked with on studies. They are considered one step apart.

Those who hadn't worked together, but had worked with someone in common, were two steps apart in the network, and so on.

Results confirmed that an innovator's new ideas were most likely to be adopted by the scientists closest to them in their network.

Female scientists did not have as many close collaborators in their network as male scientists did, which is one reason their ideas were less likely to be adopted. But that only explained about 32% of the difference between the adoption of ideas from male-dominated teams versus female-dominated teams, Weinberg said.

The majority of the difference (68%) was because, at any given distance in the network, scientists were less likely to adopt new ideas from female researchers. Male scientists were especially less likely to adopt the ideas of female researchers.

Overall, biomedical scientists were most likely to adopt ideas from researchers of the same gender, the results showed. And the fact that there are more male than female researchers in the field partially explains the lower adoption of women's ideas.

So, given these issues, how did the new ideas of female innovators even make the list of top ideas?

Cheng and Weinberg used the fact that teams in [biomedical research](#)—even those that are female dominated—are likely to have at least one or more male researchers. What they found is that the connection that adopters had to new ideas generated from women-dominated teams was more likely to go through the male scientists in the team of innovators.

"We found that women were more likely to be overlooked," Weinberg said.

Weinberg noted that there is no way of objectively rating the value of ideas—in this study they relied on how much the idea was adopted to determine its value.

"It may be that ideas from mostly female teams have to be the best of the best—better than most ideas from male-dominated teams—just to be adopted," he said. "There is no way to know that from our data, but that is one possible explanation."

As with women, the ideas of Hispanic and Black scientists were less likely to be adopted than those of white researchers. And as with women, the difference wasn't only that their network was not as strong as that of white scientists.

"Our results suggest that this gap is not entirely because they are more disadvantaged in terms of network positions," Weinberg said. "Some of it is just that their ideas are less likely to be adopted."

The finding that women scientists are less likely to see their ideas adopted has real-world consequences, particularly in medicine, Cheng said.

"Other research suggests that female researchers are more likely to study health conditions in women," she said.

"If the ideas of female innovators get less attention, that could have important implications for health disparities between men and [women](#)."

More information: Wei Cheng et al, Marginalized and Overlooked? Minoritized Groups and the Adoption of New Scientific Ideas, *National*

Bureau of Economic Research (2021). [DOI: 10.3386/w29179](https://doi.org/10.3386/w29179)

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