

Women benefit from working in woman-dominated teams, study shows

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Parents, educators and business managers will benefit from paying attention to team makeup to ensure that women reach their full potential when engaged in learning teams and other group activities. Credit: UMass Amherst

For years, educators, policymakers and institutional leaders have sounded an alarm about the fact that fewer girls and women enter science, technology, engineering and mathematics (STEM) fields than their male peers, and more girls and women leave, but few attempts have been made to identify and rigorously test remedies that can effectively close the gender gap.

Now a research team led by Nilanjana Dasgupta at the University of Massachusetts Amherst reports one promising intervention, based on their research study of 120 undergraduate [engineering students](#). They found among other things that

[women](#), particularly first-year students, participate more actively and feel less anxious when they are able to work in small groups or "microenvironments" that are mostly female or that have equal numbers of [men and women](#) compared to mostly male groups.

She explains, "The important thing we found in this experiment is that even in learning environments where women are a tiny minority, if we can create work [teams](#) or learning teams, basically small groups with a high percentage of women, those promote women's success by reducing worry and anxiety, increasing women willingness to speak up and 'lean in,' to use Facebook CEO Cheryl Sandberg's phrase. This allows women to speak up and not worry what others think, increases confidence about their ability and ultimately lets them aspire to a career in these fields."

Results of this National Science Foundation-supported study appear today in an early online edition of the *Proceedings of the National Academy of Sciences*.

For this work, the researchers randomly assigned female engineering students to one of three, four-person groups of varying composition, 75 percent, 50 percent, or 25 percent women. Each group had one real study participant, always female, who was unaware that the others were engineering research assistants (RA) trained to behave in a consistent manner. The RAs evaluated the real participants' verbal behavior in the team.

The participant privately reported her worries, anxieties, confidence in her engineering ability, how visible she felt in the group, and her career aspirations after the team work sessions. Dasgupta and colleagues tested competing hypotheses about which gender mix would benefit women most.

The researchers found that in male-dominated fields like engineering where teamwork is common,

the gender composition of small teams plays a major role in women's success. Having a high concentration of women in engineering teams allows women, particularly first-year students, to participate more actively, shrug off worries, feel confident, and aspire toward engineering careers after the team experience compared to other teams where women were a small minority or the only one.

A second interesting finding is that although teams with equal numbers of men and women reduced women's worries and anxieties in engineering, they were not sufficient to encourage speaking up. Only in teams with a majority of female peers did women show a substantial uptick in speaking up, the lead author notes. This was true for first-year students as much as for advanced [students](#).

Dasgupta, "My take on these findings is that gender parity helped in some ways, but it couldn't address all the problems. We often assume that if the playing field is level, with equal numbers of women and men, women will participate. But in fields where strong [gender stereotypes](#) already exist, it's not enough. Overriding gender stereotypes sometimes requires creating 'microenvironments' that have more than gender parity. This may involve the occasional experience of working in small teams with a high concentration of female peers that encourage women to jump in, speak up and help their team solve technical problems."

She adds, "For young women in STEM fields who are a tiny minority in their majors, we need to create work teams or learning teams where they can focus on learning and mastery without worrying about what others think of them. I think these findings have important implication for many male-dominated fields like physical sciences, computing, technology and business. I use engineering as a case in point in this study, but the main take aways can be generalized."

These results have implications for three key groups, the UMass Amherst researcher says. For educators, "it means when teaching involves team learning, which is a big trend now in K-12, college and beyond, in male-dominated fields, we need to pay attention to team makeup to ensure that

women reach their full potential."

For business managers, "it means they should pay attention to the makeup of their project teams to ensure that female employees' talents are being used, not lost, and that women feel empowered to speak up."

For parents, "it means ensuring that their daughters have a critical mass of other girls around them when they are involved in after-school activities and summer programs that focus on science and technology."

More information: Female peers in small work groups enhance women's motivation, verbal participation, and career aspirations in engineering, *Proceedings of the National Academy of Sciences*, www.pnas.org/cgi/doi/10.1073/pnas.1422822112

Provided by University of Massachusetts Amherst

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