The **Near-Peer** Effect

In fields with few women, a certain type of mentoring can boost success.

BY SARAH SHEMKUS

ILLUSTRATIONS BY ISABEL ESPANOL FOR THE BOSTON GLOBE

SABRINA ASSOUMOU knew she wanted to be a doctor from a young age. Shadowing her uncle, a family physician, she was inspired by the way he built trust and helped his patients in a largely immigrant community in Brooklyn. Then, during college, a summer program at the National Institutes of Health introduced her to the scientific side of medicine, and she added research to her career goals.

As she pursued this ambitious path, however, she had very little company. An immigrant from the Ivory Coast, Assoumou was often one of the few women—and the only woman of color—in her classes and workplaces in the United States. "When you don't see other people who look like you, it's a little hard to keep going," she says. "There's so many times when I was like, 'Is this the right thing for me?'"

Assoumou's moments of doubt are recognizable to many women who have attempted to build careers in male-dominated fields, from medical research to corporate leadership. But recent research from the University of Massachusetts Amherst suggests that simple interventions at key educational and career moments can help expand female presence in these fields by preserving women's confidence and belief that they belong.

The challenge is a tough one: In science, technology, engineering, and mathematics—the STEM fields—women hold just 34 percent of the jobs, according to the National Science Foundation. "There are times it's just staggering what the imbalance continues to be," says Jacqueline Ashmore, executive vice president of engineering for New Leaf Energy, a renewable energy development company based in Lowell. Women make up slightly less than half of entry-level corporate employees, and this gap grows wider the further up the ranks you look, according to McKinsey's Women in the Workplace 2021 study. At the highest executive levels, fewer than 1 in 4 positions are filled by women.

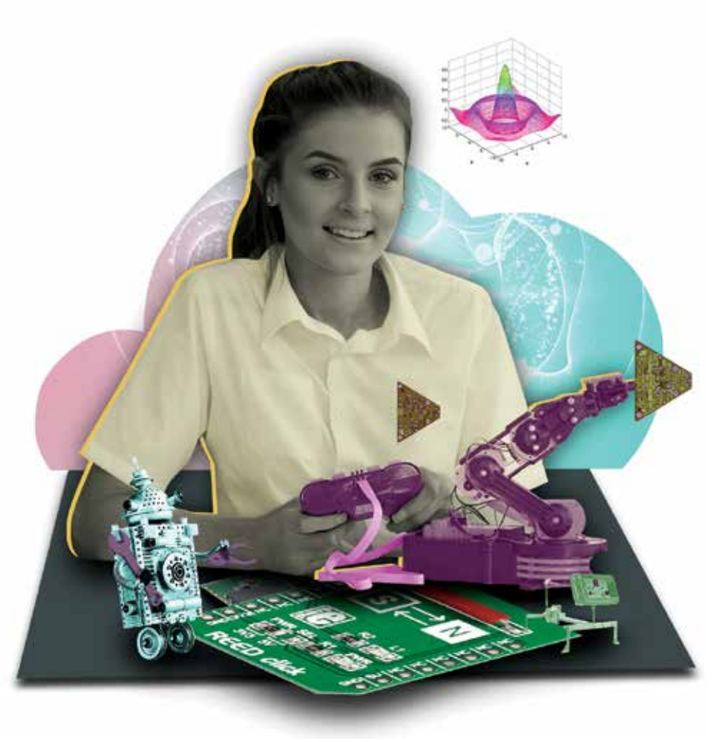
And these gaps matter. There's the question of basic fairness: A girl who wants to build a business or design a skyscraper shouldn't find her goal harder to reach than a boy with the same ambitions. A society that values equality shouldn't allow half of its population to be vastly underrepresented in the highest levels and fastest growing sectors of its workforce, says Nilanjana Dasgupta, principal investigator of the Implicit Social Cognition Lab at UMass Amherst. "We should care because, to the extent that we believe in equal opportunity for all, making sure that the people in this country are represented in the careers of the present and the future is the right thing to do," she says.

But there are also practical reasons—and financial motivations—to make gender parity a priority. Adding more women into the mix can improve creativity and innovation, research indicates, and a more diverse workforce can help attract and retain top talent. Firms with women in the top financial leadership positions have been found to outperform the market average, and companies with gender-diverse boards have been found in some studies to be more profitable than those with more homogenous ones.

Why then do these disparities persist? Researchers who have studied and debated this question for years point to a range of causes, including lack of female role models, implicit and explicit biases about women's ambitions and abilities, and entrenched systems that favor men.

Dasgupta, a professor of psychological and brain sciences, sees at the root of many of these dynamics a handful of fundamental psychological needs that all people share: needs to belong, to feel competent, and to have purpose. When these needs are unmet at school or in the workplace—whether because of an overtly sexist boss or the gnawing absence of female peers—students and employees are likely to go elsewhere in search of satisfaction.

Dasgupta's research, however, suggests there are ways to help prevent these disruptions with measures that can protect women and other underrepresented groups from threats to their core psychological needs. Forming bonds with a near-peer mentor — someone slightly older or more advanced in a program or professional level — and paying attention to important transitional moments are two key approaches. These targeted interventions, which she calls "social vaccines," can help satisfy core needs and create cascading benefits for women in male-dominated fields. Small successes early on pave the way for further achievement, she says. "Then you are just on a different trajectory."



AT THE LAB, Dasgupta focuses on what makes people pursue or give up a certain educational or career path, and what can be done to influence those feelings and choices.

In one recent study, Dasgupta's team found the conventional concept of mentoring can be harnessed to make the most significant impact. They followed 150 women who entered an undergraduate engineering program as first- or second-year students at UMass Amherst. Some participants were randomly assigned to meet over the course of a year with a mentor who was at least a third-year student in the program—half of the mentors were men and half were women—while other students in the study were not paired with a mentor. The goal was to determine whether mentorship improved women's attitudes toward their place in engineering and retention in the field, overall social and emotional wellbeing, and whether the mentor's gender made a difference in these outcomes.

> Small successes early on pave the way for further achievement, social psychologist Dasgupta says. "Then you are just on a different trajectory."

At the end of the first year, all of the students paired with female mentors were still majoring in engineering, as compared with 82 percent of the students with male mentors and 89 percent with no mentors. Participants mentored by women reported a greater sense of belonging in their field, and higher estimates of their own abilities in engineering. These effects were still seen a year later, after the mentoring relationships had come to an end.

Pleased with the results, Dasgupta and her fellow researchers decided to keep following the students to see how long the effects would endure. The last time the researchers checked in with the subjects, a year after graduation, those who'd had female mentors were still more likely to be in a STEM field—and to feel confident and comfortable there. These latest results are pending publication in a peer-reviewed journal; the initial findings were published in the Proceedings of the National Academy of Sciences in 2017.

This long-lasting impact seems to be the result of a relatively modest mentoring experience: On average, mentors and mentees met just four times over the course of the research study. That the effects continued after graduation was an unexpected—and very welcome—discovery, Dasgupta says. "Imagine, four one-hour meetings with a senior has these benefits that last for five years."

New Leaf Energy's Jacqueline Ashmore has seen the need for purpose play out in her own career path. After studying math as an undergraduate, she made the leap to engineering for her doctorate, influenced in part by the work she'd be doing with her advisor, using fluid dynamics to help create fiberglass strands with different practical properties. "It wasn't all academia and publishing journal papers," she says.

> "It is so much easier to go to someone who is at your stage and ask honest questions," Dr. Assoumou says.

Another of Dasgupta's studies, which is being prepared for submission to peer-reviewed journals, focuses on first-generation college students interested in biology. A portion of the participants were grouped together in a cohort, living and taking classes together, meeting with mentors, and participating in the same seminar. As compared with other first-generation students in biology, the students in this cohort got better grades and reported both greater confidence in their science abilities and more motivation to continue in the field.

A year after the cohort program ended, the effects persisted: Participants continued to major in biology at higher rates than the control group and had even closed the achievement gap between first-generation students and students in the honors program in terms of their comfort within their major.

While Dasgupta's research has focused on students, the potential implications are much broader. Consistently, finding ways to enhance people's feelings that they are not alone in a field and have the skills to handle the rigors of the work has a powerful protective effect on their motivation to persevere through challenging circumstances.

The results suggest that women should broaden their thinking about what a suitable mentor looks like, Dasgupta notes. Having the support of the vice president of marketing can certainly help open doors, but there are less obvious psychological benefits to connecting with mentors who are only slightly further along in their studies or careers. Mentees can better see themselves in these "near-peer" examples that demonstrate where they might be in a year's time, bolstering the crucial feeling of belonging.

Top: Nilanjana Dasgupta, principal investigator of the Implicit Social Cognition Lab at UMass Amherst. Bottom: Sabrina Assoumou, physician scientist at Boston Medical Center and the Boston University School of Medicine.

"That person lights the path," Dasgupta says. "The more senior and older the mentor is, the less the student is able to see themselves."

Timing of interventions is also vital, she adds, pointing to the importance of transitional moments: the beginning of college or graduate school, the early years of a career, the times when a woman is promoted. These are the moments—surrounded by new people, new expectations, and new challenges—in which women's self-perceptions of belonging and competence are most likely to falter. "That transition period is key to putting people on the right trajectory," Dasgupta says. "If there is a time to intervene where you can get the most bang for your buck, that is it."

Dr. Assoumou has seen these dynamics at work on her path to her current roles as a practicing physician at Boston Medical Center, a professor at Boston University's School of Medicine, and a medical researcher. Shortly after joining the faculty in 2011, she decided to participate in a program matching early career professors with others at the same stage in their careers, allowing the cohort to learn from each other's experiences navigating new territory.

"It is so much easier to go to someone who is at your stage and ask honest questions," Dr. Assoumou says. "Sometimes realizing other people are going through the same thing and learning from what they did to overcome that particular obstacle is so powerful."

Employers can also make choices to capture the benefits Dasgupta's research points to by organizing employee groups and in-house mentorship programs designed to foster these near-peer connections.

Ashmore, who leads the mentoring programs at New England Women in Energy and the Environment, has done just that in her role at New Leaf. An in-house program pairs new employees with a mentor for a six-month stint. Mentees can choose whether they'd prefer to work with a man or a woman. The company is also doing active outreach to women to learn more about what female employees want and need to help them along their career paths.

It remains necessary work, Ashmore says, while gender disparities are still so stark in so many fields. "We've become more aware of the challenges," she says, "but there is still a ton of progress to be made." ■

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