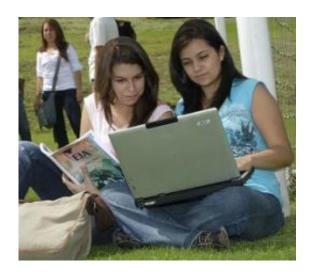# How gendered beliefs funnel women away from science and engineering

February 17 2011, By Susan Fisk

Tech career aspirations for women have stalled. Credit: comunicaciones

Women earned only 18% of all Computer Science degrees and made up less than 25% of the workers in engineering- and computer-related fields in 2009. These statistics stand in stark contrast to the gains they have achieved in law, medicine, and other areas of the workforce. While this dearth of women in the science, technology, engineering, and math (STEM) fields is often attributed to lack of innate ability or desire on the part of women, the director of the Clayman Institute for Gender Research at Stanford, sociology professor Shelley Correll, sees this explanation as incomplete. And she offers a competing one: stereotypes.

During her recent talk, "How Gender Stereotypes Influence Emerging

Career Aspirations," Correll detailed the ways in which negative stereotypes about women can hinder their performance, depress their self-assessments of ability, and bias the evaluations made of them by key decision makers. She asserts that the combination of these effects can subtly influence women's aspirations and career decisions, funneling them away from degrees and careers in male-dominated STEM subjects.

Correll explained that extensive empirical research on stereotype threat has demonstrated that if a person is exposed to a negative stereotype about a group to which they belong (e.g. women, Asians, African-Americans), they will then perform worse on tasks related to the stereotype. This is problematic for women in the STEM fields, as there are many societal beliefs about how women do not have strong mathematical ability and about how men make better engineers and scientists. Thus, if you tell women that they generally score lower on math and spatial tests than men, they actually score lower on those tests than they would have had the stereotypes not been made salient.

This has significant implications for real-world situations; for instance, researchers found that having women indicate their gender before taking the AP Calculus exam was enough to trigger stereotype threat and significantly suppress their scores. Researchers calculated that if the gender question were moved to the end of the exam, 4,700 more women in the United States would have received AP Calculus credit that year.

In addition to decreased performance, Correll's own research shows that negative stereotypes can lower self-assessments of ability and lead individuals to judge their performance by a harsher standard. In a laboratory experiment Correll performed, male and female students completed a 'contrast sensitivity' task, in which they had to determine whether a given image was composed of more black or white squares. Unbeknownst to the subjects, 'contrast sensitivity' is a bogus task: there is no correct answer, as all images have the same amount of black and

white. However, this allowed Correll to give all subjects the same score and to control the stereotypic beliefs associated with 'contrast sensitivity' performance.

She found that when subjects were told that men had higher 'contrast sensitivity' ability, women rated their aptitude lower (even though all participants were given the same score), held their performance up to higher standards, and reported lower interest in entering fields requiring skill in 'contrast sensitivity' than men. According to Correll, these effects make women less likely to enter STEM fields because they are less likely to, "… believe they have the skills necessary for that career in order to develop preferences for the career."

However, when subjects were told that woman and men had the same 'contrast sensitivity' ability, these disparities disappeared and there were no gender differences in ratings of aptitude, assessments of competence, or interest in fields requiring 'contrast sensitivity' ability. This demonstrates the powerful effects of negative stereotypes on the psyche. Beyond diminishing performance, stereotypes decrease self-assessments of ability, lowering the likelihood that women will enter STEM fields.

But how can change occur when gender stereotypes are everywhere? The first thing to keep in mind is that these effects are situational. For this reason, Correll says it is important to avoid the knee-jerk reaction that women should to be fixed, and to focus instead on organizations. "We need to understand that stereotypes affect not only people's own judgments of their competence, but they also affect the judgments of others." For instance, an experimental study on the evaluation of engineering internship applicants found that the same resume was judged by a harsher standard if it had a female, versus a male, name.

Correll, who has advised organizations as diverse as Facebook, the National Science Foundation, and Cornell University on how to attract

and retain women, named three key things that organizations can do to affect change. First, they can control the messages they are sending, by making sure there are no negative gendered beliefs operating in the organization. Second, they can make performance standards unambiguous and communicate them clearly because, "When people don't know what to do, gender stereotypes fill in the gaps." Last, organizations can hold gatekeepers in senior management accountable for reporting on gender disparities in hiring, retention and promotion of employees.

Correll remains optimistic about increasing the representation of women in STEM fields: "We can affect interest if we can figure out what's causing people to be less interested."

Provided by Stanford University

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