



A Multi-Million Dollar Opportunity: How Social Psychology Can ADVANCE the Participation of Women Faculty in STEM

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People are talking about broadening the participation of women and minorities in the American science, technology, engineering and mathematics (STEM) workforce. You know a topic is “hot” when it lands on a hit television show, and just recently *The Big Bang Theory* devoted an episode to the lead male science characters puzzling over how to get more women into science (watch a clip [here](#)).

Pop culture aside, operating under the (research supported) assumption that diversity is a wonderful thing (e.g., Herring, 2009), numerous initiatives – and most importantly, resources – are being dedicated to understand ways to change the culture of science to be more inclusive. Typically, the people who researched and contributed most to this lofty goal were people working within STEM. People like computer scientist Anita Borg, whose lived experience as a solo woman in engineering motivated her to articulate the problems and possible solutions within the leaky STEM pipeline (Borg, 1999). But these talented trailblazers were not social scientists. The scholars who know best how to study people and the social world were not integral to discussions on how to diversify STEM. As recently as

2012, when we were awarded our NSF-Institutional Transformation grant to broaden the participation of women faculty in STEM at Montana State University, social science was regarded as a “supplement” to the grant proposal and ancillary to cultural transformation. But the [latest solicitation](#) for which letters of intent are due this fall reads: “The Institutional Transformation (IT) track is meant to produce large-scale comprehensive change and serve as a locus for research on gender equity and institutional transformation for academic STEM... The proposed strategies must be based on and justified by relevant social science research.”

NSF ADVANCE is rolling out the red carpet to social psychologists! These NSF ADVANCE-IT grants are multimillion dollar, 5 year, cooperative agreements aimed at creating, sustaining, and studying ways to broaden the participation of women faculty in STEM. Social psychological science has much to offer in methodological and theoretical tools to design, measure, test, analyze, and interpret the impact of cultural transformation on the recruitment and retention of women faculty, as well as the benefits of enhancing faculty diversity. This is why this summer I organized a symposium on *Using Social Psychological Science to ADVANCE the Participation of Women STEM Faculty* at the 2014 meeting of the Association of Psychological Science. I wanted to inspire others to get involved, not just as consultants, but also as PIs and Co-PIs who can break new theoretical and applied ground within social psychology to study – and help solve – this incredibly important and persistent problem.

The symposium featured four ADVANCE grant social psychology faculty researchers. The first presentation by myself and co-authors Sara Rushing, Al Zale, Ian Handley, Joy Honea, Elizabeth Shanahan, and Martha Potvin, was based on our work at Montana State University. I discussed our [ADVANCE Project TRACS: Transformation through Relatedness, Autonomy and Competence Support](#). Our grant is holistically informed by Self-Determination Theory (SDT, Deci & Ryan, 2000), which posits that effective functioning and personal growth emerge when psychological needs are situationally supported. We wanted to design and test an SDT intervention for faculty search committees. The intervention enhanced three things: 1) competence of the search committee by delivering concrete strategies for conducting a broad search, 2) autonomy of the search committee by illustrating how unconscious bias can undermine decision making, and 3) perceived relatedness of the position for job finalists by having them meet with a faculty Family Advocate to discuss work-life integration. We were able to randomly assign search committees to our intervention because of a windfall of 23 STEM searches happening in one year (2012-13). Results were exciting: the intervention was successful in significantly

increasing the number of women candidates considered and offered a tenure track position. Effect sizes were moderate to large. Intervention searches were more than 6 times more likely to make an offer to a female candidate, and she was more than 5 times more likely to accept the offer if ADVANCE was involved. All told, even though we only intervened with a sample of searches, 50% of the STEM hires – exact parity – were women.

Increasing the number of women faculty in STEM is important, because as the second presentation by Danielle Young and her co-authors Laurie Rudman, Helen Buettner, and Meghan McLean revealed, there is a causal positive effect of knowing and identifying with women faculty in STEM on undergraduates. Grounded in research on implicit associations and role models, this research comes out of Rutgers University Faculty Advancement and Institutional Re-imagining ([RU FAIR](#)) NSF-ADVANCE grant. The study, just published in *Psychology of Women Quarterly*, analyzed 320 surveys from students of 24 engineering and chemistry professors. Results showed to the extent that women faculty in engineering and chemistry were viewed as “role models” by their students, those students endorsed fewer gender stereotypes and held lower implicit cognitions about the masculinity of science. Fewer stereotypes about science was positively associated with women students’ considering a career in STEM. Undoing the stereotypical image of a scientist doesn’t just help women, but helps men, too. See the recent [Science blog by Adam Ruben](#), a white male Ph.D., who confessed he too is limited and suffering from the restrictive stereotypes about scientists. Broadening the participation of women by transforming the culture of academia can benefit everyone!

Recruitment of women faculty in STEM is important, but once recruited, attention must focus on the social context in which she works. In the third presentation by Adrienne Carter-Sowell and co-authors Rebecca Thompson and Carla Zimmerman, social belonging is key to retention and well-being. This team draws from the literature on social ostracism (see Williams, 2007) to understand how being severely outnumbered is a form of social invisibility. Data collected in 2009 and 2013 as part of the [Texas A&M ADVANCE Center](#) showed women faculty experienced more isolation and hostility in the university working environment compared to men, and such social exclusion and marginalization was an important predictor of burnout and turnover intention.

The final presentation by Shannon McCoy and co-authors Lauren Hawthorne, Amy Blackstone and Susan Gardner centered on the very classic social psychological theoretical notion (think Kurt Lewin, 1951, and the more contemporary Diekmann et al., 2010) that a “lack of fit” between one’s gender role and one’s profession contribute to women STEM faculty’s stress and poorer emotional well-being. Using data from 225 faculty collected

through their [ADVANCE Rising Tide Center at the University of Maine](#), these authors set out to test whether women for whom gender was less central to their social identity might be protected from the lack-of-fit they experience in STEM. Indeed, their results showed that gender identity was an important moderator of the effects of faculty gender and department type, such that for women faculty in STEM (and men faculty in non-STEM departments), the less they identified with their gender, the lower their work-related stress and the better their emotional well-being. These last two presentations suggest that social science cannot stop once women are hired.

At the end of the final presentation, Dr. McCoy concluded with a slide titled: “Want to Collaborate?” and our discussant, Beth Mitchneck, the current NSF Program Officer for ADVANCE, jumped up with “Yes, please collaborate!” She pointed out that NSF wants to know more about what works, why it works, and how to sustain the impacts of ADVANCE on women’s recruitment and retention. This is where social psychologists come in. As a field, we are debating the ins and outs of “big data” collaborations and “replication research.” Faculty centered diversity and equity research is, as [Moss-Racusin and colleagues \(2014\) point out](#), incredibly rare. We as faculty don’t often use our science to turn inward and address our own social context. And, as Dr. Mitchneck asked, does an intervention that works at one university generalize to others? Before we can consider generalizability, we must first establish some basic effects. And herein is the call to action for social psychologists to take our theoretically based experiments into the field that is our own academic institution.

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