# Achieving Gender Equity: How can women move beyond bias and barriers? 

## Presenter:

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#### Abstract

: Women face unconscious bias and other barriers to success in the fields of science and engineering. Documented by a landmark National Academy of Sciences study in 2007, women are broadly under-represented in STEM faculty and other leadership positions at academic institutions and professional societies. Unconscious bias is part of the problem facing women, however women can also contribute to the unintended prejudices against them by displaying certain behaviors that confront social expectations. With a view to increase awareness of these issues in order to move beyond barriers in STEM, this workshop will examine the social science literature on these issues.

\section*{Summary}

\section*{What are the problems?}

This workshop will begin with a brief presentation of the main barriers to women in STEM as published by the US National Academies of Science. [1]


Some of the main findings of the NAS study were the following (paraphrased directly from [1], pps. 2-3):

1. Women are equally qualified: they have the ability and drive to succeed in science and engineering.
2. Women are lost at every educational transition.
3. Although the pipeline of women has reached gender parity in several fields, women at top research institutions represent only $\sim 15 \%$ of the full professors.
4. Women are likely to face discrimination in every field of science and engineering.
5. Most people - both women and men - hold implicit gender biases.
6. Evaluation criteria contain arbitrary and subjective components that disadvantage women.
Although documenting the academic realities of women was extremely useful, one of the disappointing aspects of the NAS study was that few solutions were proposed.

Towards identifying strategies for women to overcome the barriers documented above, the workshop will continue with a discussion of findings from the peer-reviewed social science literature that document how social expectations influence prejudices against women.

## Who is discriminating?

This is the first issue that will be presented. It is important to recognize that both men and women hold implicit biases. Although this was raised in the NAS report, a recent study showed that science faculty of both genders equally discriminate against women as compared to men applicants with identical CVs. [2] A female applicant was offered the job less often, conferred a lower starting salary, and was deemed to be less qualified.

## Expectation Bias

The workshop will discuss three aspects of expectation bias: self-reporting, the confidence gap, and gender differences in anger perception.

## 1. How does self-reporting impair women? [3]

This study investigates whether performance-related expectations in the field of mathematics were biased by gender. When asked to self-report their performances, the key finding was that women under-reported their abilities whereas men over-reported their abilities. If employers are unaware of this tendency, the reporting differences can erroneously lead to the perception that women are less talented for the task as compared to men.

## 2. The Confidence Gap $[4,5]$

Related to this issue of gender-dependent self-reporting tendencies is the observation that women are generally less self-assured than men. The existence of this phenomenon, its origins and its implications will be discussed using data from an influential article published in The Atlantic and a new book on the topic of confidence in the workplace.

## 3. Can an angry woman get ahead? [6]

This study examines status conferral as it relates to gender and expression of emotion in the workplace. The study shows that men who expressed anger in a professional context were conferred higher status than women expressing anger. Moreover, women's emotions were attributed to internal characteristics whereas men's reactions were attributed to external circumstances.

## How can we support women? [7]

One of the most important indications of success in STEM comes in the form of speaking invitations to scientific conferences. However, a recently published a study demonstrated that the proportion of female speakers at scientific symposia depends on the presence of females on the organizing committee. One implication from this study is that conveners should include women on the organizing committee.

## Literature Cited to be presented and discussed:

1. Beyond Bias and Barriers: Fuffilling the Potential of Women in Academic Science and Engineering (2007) Committee on Maximizing the Poteintial of Women in Acadmic Science and Engineering, Committee of Science Engeineering and Public Policy, Institute of Medicine, Policy and Global Affairs, National Academy of Sciences, \& National Academy of Engineering, Washington, DC: National Academies Press.
2. Science faculty's subtle gender biases favor male students (2012) Moss-Racusin, C.A., J.F. Dovidio, V.L. Brescoll, M.J. Graham, \& J. Handelsman, Proc Natl Acad Sci U S A 109: 16474-9.
3. How stereotypes impair women's careers in science (2014) Reuben, E., P. Sapienza, \& L. Zingales, Proc Natl Acad Sci U S A 111: 4403-8.
4. The confidence code: The science and art of self-assurance--What women should know (2014) Kay, K. \& C. Shipman, New York: HarperBusiness. 256.
5. Kay, K. \& C. Shipman, The confidence gap, in The Atlantic2014, Atlantic Media Company: Washington, DC.
6. Can an angry woman get ahead? Status conferral, gender, and expression of emotion in the workplace (2008) Brescoll, V.L. \& E.L. Uhlmann, Psychol Sci 19: 268-75.
7. The presence of female conveners correlates with a higher proportion of female speakers at scientific symposia (2014) Casadevall, A. \& J. Handelsman, MBio 5: e00846-13.
