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Losing half our scientific capacity

A committee assembled by the US National Academies has examined why women scientists and engineers are underrepresented in leadership positions in academic institutions and scientific and professional societies. If the committee's recommendations are implemented, it should improve the working environment for both women and men.

More women are earning PhDs in science and engineering (~50% as of 2005). But that's where the good news ends. Women make up a small proportion of the science and engineering faculty at research universities, and they typically receive fewer resources and less support than their male counterparts.

So why is that the case? Is it, as Lawrence Summers, former president of Harvard, might suggest, because of 'innate differences' between men and women or because women just don't work hard enough? Or maybe, just maybe, might there be unintentional biases and outmoded institutional structures that help explain the lack of top-level female professionals in science and engineering?

In part in response to his comments and the flurry of arguments (both pro and con) that they engendered, the US National Academies formed a committee to review and assess the research on gender issues, to examine institutional cultures and practices in academic institutions, to determine effective practices to ensure women with doctorates have access to a wide range of career opportunities, to determine effective practices for recruiting and retention of women scientists and engineers in faculty positions, and to develop findings and provide recommendations based on these data.

The committee was chaired by Donna Shalala, the current president of the University of Miami, Florida, and former US Secretary of Health and Human Services in the Clinton administration, who was joined by 17 distinguished scientists and engineers in top positions in academic research and university governance. Although the academies put together a truly impressive committee, they inexplicably chose 17 women and only one man. This allowed some (those asked to act as reviewers and others) to summarily dismiss the report as biased. Nonetheless, after several meetings, numerous teleconferences, a public meeting, presentations by nationally recognized experts and helpful reviewer feedback, the committee published a 348-page report on 18 September 2006 entitled 'Beyond bias and barriers: fulfilling the potential of women in academic science and engineering' (available online at <http://books.nap.edu>).

At the 2007 RNA Society meeting in Madison, Wisconsin this past summer, Joan Steitz, who was part of the committee, gave a talk at the first (but not last) Women in Science dinner. There she spoke about the purpose of the committee, its major findings and its recommendations, which sparked many interesting questions and conversations that continued long after her talk was over.

The report generated a number of important findings and, in so doing, dispelled a few commonly held beliefs.

Belief: Women are not as good in math as men.

Finding: Although there are neurological and hormonal differences

between men and women, the real question is whether these lead to significant differences in how men and women perform in science and mathematics. The answer to that question seems to be no.

Belief: Women are not as competitive as men. Women don't want jobs in academe.

Finding: Women have the drive to succeed in science and engineering. Similar proportions of men and women with science and engineering doctorates plan to enter postdoctoral study or academic employment.

Belief: It is only a matter of time before the number of women on faculties increases; it is a function of the number of qualified women there are to choose from.

Finding: Women are lost at each step up the academic ladder. The proportion of women with faculty positions in fields such as chemistry and biological sciences is well below the proportion in the available pool of scientists.

Belief: Academe is a meritocracy.

Finding: Most people, both men and women, hold unintentional biases.

In her talk, Steitz said that one of the most fascinating studies she read was from a group at Wayne State University who studied over 300 letters of recommendation for medical faculty at a large American medical school over three years in the mid-1990s (Trix, F. and Psenka, C. *Discourse and Society* **14**, 191–220, 2003). They found that letters written for female applicants were systematically different from those written for male applicants in terms of the absence of basic information, the percentage of negative language and groupings of possessive phrases. For example, phrases such as 'her training', 'her teaching', and 'her application' (for the position) were most common in letters for female applicants, in contrast to letters for male applicants, where frequently found phrases included 'his research', 'his skills' (or 'abilities') and 'his career'. This last finding tends to reinforce the stereotype of women as teachers and students and men as researchers and professionals. The greatest differences between letters of recommendation for women and men were in the numbers of references to 'her personal life' and 'his publications'.

'Beyond bias and barriers' correctly concluded that to attract the best and brightest minds to science and engineering we must focus on identifying and removing the social, cultural and institutional barriers to success for all, without regard for sex, race or ethnicity.

The report led to a number of recommendations at different levels, from the US Congress to scientific and professional societies. But we can do more individually as well. The next time you sit down to write letters of recommendation, be sure to write about both his and her publications and his and her research (and leave all the personal stuff out). And when you hear someone voicing one of those commonly held beliefs, set the speaker straight. ■