

## Are We There Yet? Biases in Hiring Women Faculty Candidates

There's quite a debate in the popular press right now on the topic of how women are faring in the academic STEM fields. On one hand, we have a Nobel Laureate unapologetically calling for single sex laboratories<sup>1</sup> because "girls" distract male scientists, and on the other hand, we have a group of human ecology researchers claiming a significant hiring preference for women over men in STEM faculty positions. The former example can be discounted because the statements are clearly those of one individual; the latter, however, is an extensive scientific study published in *PNAS*<sup>2</sup> and merits thoughtful discussion.

The *PNAS* article, coauthored by Wendy M. Williams and Stephen J. Ceci, reports on five hiring experiments in which current faculty were presented with fictional faculty candidates, each having equivalent qualifications, differing only in gender. The outcome of this work showed a 2:1 hiring preference for women candidates compared to their male counterparts by nearly all of the applicant reviewers. These results, contrary to popular wisdom, have received a lot of press coverage and have initiated vibrant discussion.

In fact, if you look at the data related to the hiring of assistant professors in chemistry between 2001 to 2013,<sup>3</sup> the reported 2:1 preference does seem reasonable, but only if male and female applicants each made up half the applicant pool (which they do not). So, why do not we see this apparent 2:1 preference in our hiring numbers? Unfortunately, there are some aspects of Williams and Ceci's experimental design that fail to realistically simulate the actual faculty hiring process, thereby presenting what we consider an optimistic impression of gender equity in STEM hiring.

One design issue is that the professional narratives and CVs used in the gender comparison study represented only "off-scale" candidates. This is not particularly realistic and in this case, may have made it easier for participants to make the honorable choice to improve gender equity. Previous studies (like this one<sup>4</sup>) that have used more realistic qualification levels for male and female candidates revealed an unconscious bias against women candidates; when we're a little less clear that an applicant's success is assured, perhaps we put our faith disproportionately in the male candidates. Another potential issue with the Williams and Ceci work is that the applicant reviewers knew that the candidates were hypothetical, whereas other studies specified that actual candidates were being considered for real positions. It seems reasonable to assume that applicant reviewers might respond more virtuously when they know they are participating in a hypothetical situation.

Also disturbing is that Williams and Ceci claim that it is the continued discussion of the apparent gender bias that is the real source of our "pipeline" problem; they assert that women are not applying for tenure-track faculty positions in larger numbers because we're telling them that there's no point, when they would actually find a hiring preference.

Adding to this discussion, an objective means of documenting gender bias was highlighted in a recent editorial,<sup>5</sup> describing an online software tool developed for predicting the likelihood of becoming a principal investigator. When trained on the same

objective citation/publication data, the calculator results in a significantly lower probability for earning PI status when the candidate is a woman versus a man.

Despite the concerns raised, these gender-based studies show us that there is valuable information that both reviewers and applicants can use to improve current gender inequity among chemistry faculty. Contributing factors in determining whether or not a female applicant gets hired can include conveying an unconscious bias by those of us who write supporting letters. Women candidates themselves should consider carefully how they assemble their CVs, since female applicants that appear "off-scale" do seem to fare well against similarly qualified male candidates.

What is the take away message here? As members of the scientific community, we need to be careful that conclusions like those in the *PNAS* article do not perpetuate erroneous perceptions. It is encouraging that when applicant reviewers are presented with equally "off-scale" male and female candidates, they aim to improve gender equity among faculty. Nonetheless, together we need to continue to raise awareness about inequities in hiring (as well as promotion and leadership roles) by openly discussing these various studies and working to overcome our own unconscious biases.

In fact, there has been some very encouraging progress in this area; *C&E News*<sup>3</sup> reported that the number of women assistant professors in the top 50 chemistry departments has increased from 17% in 2001 to 30% in 2013. Even so, we have a long way to go, especially when we consider other underrepresented groups in chemistry. As our goal should be the most creative and productive science possible, we hope that everyone agrees that diversity among scientists will only improve our scientific, technological, economic, and social impacts.

Christy Haynes

University of Minnesota

Jonathan Sweedler, Editor-in-Chief, *Analytical Chemistry*

### AUTHOR INFORMATION

#### Notes

Views expressed in this editorial are those of the author and not necessarily the views of the ACS.

### REFERENCES

- (1) <http://www.theguardian.com/uk-news/2015/jun/10/nobel-scientist-tim-hunt-female-scientists-cause-trouble-for-men-in-labs>, accessed June 12, 2015.
- (2) Williams, W. M.; Ceci, S. J. *Proc. Natl. Acad. Sci. U. S. A.* **2015**, *112* (17), 5360–5365.
- (3) Rovner, S. L. *Chem. Eng. News* **2014**, *92* (14), 41–44.
- (4) Moss-Racusin, C. A.; Dovidio, J. F.; Brescoll, V. L.; Graham, M. J.; Handelsman, J. *Proc. Natl. Acad. Sci. U. S. A.* **2012**, *109* (41), 16474–16479.
- (5) Sweedler, J. V. *Anal. Chem.* **2014**, *86* (15), 7159–7159.

Published: July 9, 2015

