



CLIMATE CONTROL: **GENDER AND RACIAL BIAS IN ENGINEERING?**

EXECUTIVE SUMMARY

JOAN C. WILLIAMS

Distinguished Professor of Law, Hastings Foundation Chair,
Director of the Center for WorkLife Law, University of California,
Hastings College of the Law

SU LI, Ph.D.

Director of Research on Organizational Bias,
University of California, Hastings, Center for WorkLife Law

ROBERTA RINCON, Ph.D.

Society of Women Engineers

PETER FINN

Society of Women Engineers



This research project is
made possible by the
Society of Women Engineers
Corporate Partnership Council.

WORK LIFE LAW
UC Hastings College of the Law

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“When you walk through the doors of [an oil & gas] corporation, you would think you had taken a step back ... into the 1950s. When we wring our hands and ask why more women do not study STEM in schools, perhaps we should also look at how women are treated in the workplace after we get those STEM credentials. ... Look for companies with women in the boardroom. ... And hope that there are far fewer men trying to get you in the bedroom. ... Thank you so much for conducting this survey.” (*white woman*)

Over 3,000 respondents completed the Workplace Experiences Survey launched by the Society of Women Engineers and the Center for WorkLife Law at the University of California, Hastings College of the Law. Around one-third (897) of respondents left comments—a strikingly high number. The number and tone of comments show engineers’ intense interest in, and strong reaction to, the topic of implicit bias in engineering. The survey asked respondents whether they had been met with the basic patterns of gender and racial bias that have been documented, over and over again, in social psychology studies.

LARGE GENDER GAPS WERE REPORTED FOR THREE PATTERNS OF BIAS

Prove-It-Again Bias: 61% of women vs. 35%¹ of white men reported that they have to prove themselves repeatedly to get the same levels of respect and recognition as their colleagues.

“Women have to look more professional and demonstrate technical prowess at all times to receive the same respect as a male engineer who is just an average engineer.” (*white woman*)

¹ All comparisons are statistically significant based on two sample t-tests, unless noted otherwise.

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Tightrope Bias: Women engineers reported that a narrower range of behavior was accepted in women than men. Women often walk a tightrope, navigating both pressures to behave in feminine ways and pushback for behavior seen as “too masculine.”

- Women engineers were less likely than white men to say they could behave assertively (51% vs. 67%) or show anger without pushback (49% vs. 59%).
- Women (33%) were more likely than white men (16%) to report pressures to let others take the lead; were more likely to report doing more “office housework,” such as finding a time everyone can meet, taking notes, or planning office parties (55% vs. 26%); and were less likely to report having the same access to desirable assignments (65% vs. 85%).

“I was always told I was too aggressive when my male counterparts were recognized as [being] assertive.” (*white woman*)

“The overall culture still needs to change. ... Just last year they hired a new female and one of the managers was telling me how happy they were about hiring her because she really clean[s] up after the guys and keeps the lab tidy.” (*white woman*)

Maternal Wall Bias: Nearly 80% of men said having children did not change their colleagues’ perceptions of their work commitment or competence; only 55% of women did.

“My colleagues assume I am a slacker because I have children, even when I come in evenings or weekends to make up time that I have to miss due to my children. Also I don’t feel like I can talk about my children without being judged.” (*African-American woman*)

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Three separate regression analyses showed that, after controlling for many other variables, women still reported more Prove-It-Again, Tightrope, and Maternal Wall bias. Evidence for the fourth basic pattern of gender bias, Tug of War, was weaker.

LARGE RACIAL GAPS WERE REPORTED FOR TWO PATTERNS OF BIAS

Prove-It-Again Bias: 68% of engineers of color (men as well as women) reported having to prove themselves repeatedly, as compared to 35% of white men.

“Being from an international background, not white bread American raised, we have to work harder.” (Latino man)

Tightrope Bias:

- Engineers of color were less likely than white men to say they could behave assertively (49% vs. 67%) or show anger without receiving pushback (45% vs. 59%).
- Engineers of color were more likely than white men to report pressures to let others take the lead (39% vs. 16%) or do office housework (52% vs. 26%) and were less likely to report having the same access to desirable assignments (55% vs. 85%).

“I feel discriminated not only by my gender but also by my cultural heritage. There are very few opportunities extended to someone like me. I am given the work but not the credit for successful outcome. ... The message I get over and over is that I am capable of getting things done right but I don't deserve the right to be promoted—even if the additional responsibilities were given to me.” (Latina woman)

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Although clearly some Latino engineers reported bias, two separate regression analyses showed that, after controlling for many other variables, Asian- and African-American engineers reported more Prove-It-Again and Tightrope bias than their white counterparts, but the effects for Latinos disappeared.

AGE EFFECT SHOWN FOR ONE PATTERN OF BIAS

Regression analysis showed that, after controlling for many other variables, engineers aged 55-64 reported higher Prove-It-Again bias than engineers below 35 years old.

For virtually every workplace process, either women or engineers of color reported experiencing more bias than their men or white counterparts, and a few effects emerged for age.

The survey also asked whether engineers believed that they were fairly treated at work with respect to hiring, promotions, performance evaluations, access to networking and mentoring, and compensation.

Women respondents were more likely than white men to report:

- As compared to my colleagues, I work more but get paid less (40% vs. 29%).
- I feel I get less honest feedback on my performance than my colleagues (29% vs. 20%).

Women respondents were less likely than white men to report:

- I have had as much access to formal or informal networking opportunities as my colleagues (67% vs. 84%).

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- I have been given the advancement opportunities and promotions I deserve (62% vs. 71%).
- My performance evaluations have been fair (77% vs. 83%).

Regression analysis showed that, after controlling for many other variables, women reported experiencing higher levels of bias in hiring, networking/sponsorship, and promotion than their male counterparts.

Engineers of color were more likely than white men to report:

- As compared to my colleagues, I work more but get paid less (48% vs. 29%).
- I feel I get less honest feedback on my performance than my colleagues (35% vs. 20%).

Engineers of color also were less likely than white men to report:

- I have had as much access to formal or informal networking opportunities as my colleagues (64% vs. 84%).
- I have been given the advancement opportunities and promotions I deserve (53% vs. 71%).
- My performance evaluations have been fair (69% vs. 83%).

Regression analysis showed that, after controlling for many other variables, African-American engineers reported higher levels of bias in networking, promotion, and mentoring/sponsorship than their white counterparts. Asian-American engineers reported more bias in performance evaluations than their white counterparts.

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Survey respondents also reported age bias: After controlling for many other variables, engineers over 45 reported higher levels of bias in performance evaluations and mentoring/sponsorship than their younger counterparts (below 35 years old); engineers over 55 reported higher levels of bias in promotions than below 35 years old. In addition, engineers with between two and 10 years of experience at their current companies reported hiring bias, compared with those with less than two years of experience at their companies, after controlling for many other variables.

Even small amounts of bias in basic business systems can have large effects. One computer-simulation study found that even if bias accounts for as little as 1% of the variance in performance ratings, bias can have large effects in reducing the representation of women over time, especially in high-level positions.²

THE TOPIC OF BIAS IS CONTROVERSIAL IN ENGINEERING

While 16.8% of the comments by male engineers expressed the view that diversity is threatening the quality of the profession and that women now have unfair advantages, or similar sentiments, only 3.6% of male lawyers made these kinds of comments in a similar survey.³

“Merit is vastly more important than gender or race, and efforts to ‘balance’ gender and race diminish the overall quality of an organization by reducing the collective merit of the personnel.” (white male engineer)

² Martell, R. F., Lane, D. M., & Emrich, C. (1996). Male-Female Differences: A computer simulation. *American Psychologist*, 51(2), 157-158.

³ Williams, J. C., & Li, S. Forthcoming. Understanding in-house and law firm lawyers' workplace experiences survey. Center for WorkLife Law, UC Hastings College of the Law.