GENDER DISCRIMINATION IN THE STEM WORKFORCE – HOW DOES IT AFFECT WOMEN’S CAREER ADVANCEMENT?
The case for diversity and gender equity

The challenges we face as a nation are diverse and complex. Driving real innovation and lifting productivity levels will require a STEM workforce that is not only well-trained, motivated and committed in the long-term but also diverse and inclusive. Research shows that workplace diversity is linked to significant business benefits such as organisational performance, effectiveness, profitability and revenue generation. Diverse teams consistently outperform on innovation, problem-solving, flexibility, and decision-making (King, J., 2005).

Why is the need for diversity and gender equity an issue for the STEM workforce more than in other areas?

Many of the barriers that face professional women in STEM are not unique to the STEM professions. They can however be exacerbated by:

- the precarious employment that characterises roles that are contingent upon grant-based funding which underpins most research in Australia;
- the historical stereotyping of STEM professionals as predominantly male or masculine;
- workplace cultures and systemic practices particular to the practice of science and research which directly or indirectly create disproportionate disadvantage for women; and
- disturbingly high rates of harassment and bullying on the basis of gender in STEM workplaces.

How are professional women in STEM disadvantaged and how should it be addressed?

While ensuring a strong supply of work-ready STEM graduates from universities is critical, equally important is the issue of removing the obstacles, barriers and biases which operate as disincentives for women remaining in the STEM workforce. So as well as initiatives to encourage women and girls into STEM fields, a proper solution will require addressing a range of complex factors that operate to disadvantage women in employment generally as well as the factors particular to the STEM workforce that operate to create disadvantage and lead to attrition from the sector.

A 2015 Professionals Australia study, The Slower Track: Women in the STEM Professions Survey, with over 400 respondents, found widespread barriers to women’s career advancement. Among the key findings were:

- 4 out of 10 respondents did not believe they received equal compensation for work of equal value compared to their male professional colleagues;
- 7 out of 10 respondents said that taking maternity/parental leave was detrimental to their career;
- 2 out of 10 respondents said they had been sidelined for promotion because they had taken a career break;
- almost 4 in 10 agreed or strongly agreed that clients respect the professional opinion or advice of men and women equally; (3 out of 10 disagreed);
- half said lack of access to senior roles for women had detrimentally impeded their career advancement;
- almost 4 out of 10 said they felt like they had to “become one of the boys” if they wanted to “fit into” their workplace;
- half of respondents reported having been directly discriminated against during the course of their employment, with the large majority of these on the basis of their gender; and
- 1 in 4 reported that they had been sexually harassed in the course of their employment.

The report found that addressing the complexities of “the slower track” for women in the STEM professions is not only a matter of justice and equity, but that providing for the optimal attraction, development and retention of women in the STEM workforce across Australia was needed for Australia to fully realise its productivity potential and innovative capability into the future.
Stereotyping and the changing nature of sexism

A recently released report from the Office of the Chief Scientists explores the myths that exist about women in STEM. “False perceptions about women’s aptitude, interest and experience in science, technology, engineering and mathematics are holding back progress in science, and society,” say authors Roslyn Prinsley, Amber Beavis and Nicholas Clifford-Hordacre (Busting Myths about Women in STEM).

They make it clear that gender does not drive innate ability but social expectations shape performance as evidenced by participation rates in cultures where they are welcome in the disciplines.

Kelly Hopewell, who works as a process engineer for her local council, said that while she felt she had been pretty lucky in not experiencing blatant problems with discrimination in the workplace, she did agree that women who ‘become one of the boys’ or who exert typically ‘male’ stereotypes in their persona (such as being strong, loud and opinionated) did seem to go further in their careers.

Robyn Porter, the current President of Professional Scientists Australia, who trained in Chemistry, Physics and Maths, and has worked in several different roles in public and private sector, said that in some ways sexism isn’t as blatant as it used to be. “I can remember doing my degree and being told girls can’t do electronics – they are incapable of doing it – that was the attitude of one of my lecturers. I was perhaps a naive student who didn’t understand what rights I had then and didn’t fight it,” she said. “It’s not as blatant now,” she added.

Other things are changing for the better. She said that it had been many years since she lost out on a job to someone simply because they were male. “I haven’t had the instance of being discounted because I’m a female, but I do know it does exist.” She said there might be process changes that could eliminate subtle gender biases in recruitment, such as is done for some major orchestras, where people audition behind a screen and the recruiters do not know their gender. “If we could do something like that in the STEM field that would be really good,” she said. “Blind CV applications perhaps.”

Why is there a choice between science or family?

Professor Sharon Bell, Honorary Professor at Australian National University and formerly Deputy Vice Chancellor at Charles Darwin University, wrote in the Conversation that while women are playing increasing roles in science today there are still barriers that prevent them from achieving success comparable to their male colleagues. A study by the Department of Industry, Innovation, Science, Research and Tertiary Education (DISRTE) in 2011 showed that as academic levels rose the proportion of women in those positions dropped – despite more women initially starting out in science fields at the bachelor level.
Bell says the manner in which most science research careers are currently constructed means that women hit the wall at the post-doctoral career stage, leaving many to branch into related fields in industry.

A survey of 1,300 respondents, undertaken as a part of the Women in the Science Research Workforce found three times the number of women than men have taken significant periods of leave during the course of their careers, with a significant number stating this had affected their career progression.

She also said that as an intensive period of research productivity in the post-doctoral career stage was key to establishing a career as an independent researcher – this disadvantaged women as it was usually a critical stage for family formation.

“We would no longer assert that there is a choice to be scientists or have a family,” she said, and supporting women to fit the model of the ‘ideal scientist’ is not the solution. Rather women should have the same opportunities as men to shape society and their own lives.

“Although the research tells us that scientists are motivated by their passion for their field of study this passion is sustained through adequate research funding, secure employment opportunities, equitable pay, and career pathways that enable mobility between the academy and industry,” she said. And limiting these clearly impacts on sustaining passion for a job. She also said that options for supporting women’s careers within institutions and organisations include strategies for mentoring and skills training, parental and carers leave and return to work provisions, remuneration equity, employment and retention strategies and child care support.

Unconscious gender bias

A study into unconscious gender bias amongst STEM professionals, undertaken by Professionals Australia, found it is widespread in STEM workplaces. There is a range of types of unconscious bias including:

- in-group bias, which causes us to be more comfortable with and favour people like us, that is, of the same gender, background, experience, interests or personality type;
- the halo effect, which causes us to allow the physical characteristics of others to affect our judgement of their other qualities, for example a belief that physically attractive people are more trustworthy, or that there are tasks that women cannot do;
- anchoring bias, which causes us to rely too much on an irrelevant piece of data or belief. For instance, if a person had previously hired a woman and it turned out badly, they therefore believed that every woman would work out as badly;
- minority pool bias, which causes interviewers to evaluate more negatively applicants who comprise a minority of the applicant pool; and
- confirmation bias, which causes us to look for the data and information that agrees with our pre-existing beliefs and to disregard any data that goes against them.

Types of bias

The study found that in-group and confirmation bias were by far the most common forms of unconscious bias in STEM workplaces. This means that biases and discrimination may be self-perpetuating and require intervention to ensure a broad pool of talent is be considered, for example, at the recruitment stage.
Respondents reported that unconscious bias was embedded in their organisation’s workplace culture and decision-making processes.

Impact of unconscious bias

1. Unconscious bias has negatively impacted my performance appraisals
   - Disagree or strongly disagree: 13.8%
   - Neither agree nor disagree: 48.3%
   - Agree or strongly agree: 31%

2. Unconscious bias has negatively impacted my promotion opportunities
   - Disagree or strongly disagree: 7.1%
   - Neither agree nor disagree: 58.6%
   - Agree or strongly agree: 34.3%

3. Unconscious bias has negatively impacted my earnings
   - Disagree or strongly disagree: 10.4%
   - Neither agree nor disagree: 28.6%
   - Agree or strongly agree: 62.1%

4. Unconscious bias has negatively impacted my opportunities to network with professional colleagues
   - Disagree or strongly disagree: 13.8%
   - Neither agree nor disagree: 62.1%
   - Agree or strongly agree: 24.1%

5. Unconscious bias has negatively impacted my career advancement
   - Disagree or strongly disagree: 13.8%
   - Neither agree nor disagree: 27.6%
   - Agree or strongly agree: 58.6%

Respondents also reported that unconscious bias had negatively impacted their performance appraisal, promotion opportunities, earnings, opportunities to network and career advancement generally.

The report into unconscious gender bias proposed possible solutions at the workplace level and recommended:

1. **training** - while not a complete solution it does have an important role in helping people identify their unconscious biases and understand how they impact their organisational decision-making;
2. **implementing reflective practices** - these include recruitment panels discussing their own biases before interviewing candidates; and
3. **accountability** - The key to changing organisational practices is accountability in decision-making, and it is critical that proper monitoring becomes part of people management processes to ensure any biases can be identified, investigated and addressed.
Other issues at the workplace level

A range of other issues can affect the career advancement of professional women in the STEM workforce.

These may include:

- lack of access to mentoring;
- lack of access to female senior role models;
- scientific organisations perceiving themselves as meritocracies despite having inbuilt practices that consciously or unconsciously create disadvantage for women. Where an organisation considers itself meritocratic, the myth of a level playing field may exist in spite of differential access to promotion and other career advancement opportunities;
- the “prove it again” syndrome which can require women to provide more evidence of competence than their male counterparts to be regarded as equally capable;
- stigma associated with requesting family leave – female and male STEM professionals can be regarded as less committed to their science and research if they request family leave or other flexible work arrangements; and
- a workplace with a culture of reward for long hours and full-time work.

Wider discrimination

A 2016 report into diversity in Australian workplaces, carried out by the insurer Lloyds, found that nearly half of LGBTI (Lesbian, Gay, Bisexual, Transexual and Intersexual) people hid their sexual identity at work. It also found that one in five Australians reported discrimination because of their skin colour.

Another member of Professional Scientists Australia, Ganesh Surit, was born in Sri Lanka and came to Australia when he was 15. He did three years of high school and then university here before entering the workforce as an engineer. After ten years of employment he has found himself unemployed though, and has found it very difficult to even get an interview for jobs for which he is very qualified. He said that he was aware that of his colleagues at a major energy firm, where he last worked, of those who had been made redundant like him, “pretty much everyone who came from an overseas background is struggling to find employment”.

He did say though that he had not personally experienced active racial discrimination in the workplace, but wondered if having a foreign-sounding surname made it harder to get a job interview. He cited one colleague who had changed his name to an Anglo-sounding name and then started getting job interviews, and from that managed to get a job – albeit at a lower level than he would have wanted. He said that his father, who was a scientist, had also experienced subtle discrimination in the 1990s. “All the jobs he went for they asked for Australian experience. Basically what they were saying was that any experience you got overseas was discounted. What is the point of attracting highly-skilled people if their international skills are not recognised here?”

Workers with disabilities

While almost one in five Australians state they have some kind of disability, PWC has found that Australia has one of the poorest employment rates for people with disabilities across the developed world, ranking 21 out of 29.

Possible solutions to gender bias

Disadvantage for women in the workforce is complex and requires a range of targeted solutions. In broad terms, the solutions must be considered at the policy and workplace levels to address:

- the entrenched under-representation of women in senior, management and board positions;
- the over-representation of women in lower-paid, lower status, less secure roles;
- a gendered earnings differential or pay gap;
- the gendered distribution of unpaid caring responsibilities; and
- workplace cultures that discriminate against or marginalise women.
More specifically, solutions could include:

- identifiable metrics such as gender targets for hiring, promotion, mentoring and committee representation with accountability and/or performance bonuses for meeting targets;
- assistance or training with salary negotiation;
- gender neutral job ads and blind screening of applicants for both the organisation and/or the agency responsible for selection and recruitment processes;
- training in gender equity and unconscious bias for staff and managers;
- performance evaluation based on key performance indicators rather than general or behavioural descriptors, and ensure measures of success don’t disadvantage women (for example, in the case of researchers applying for funding, consider whole of career publications or best 5 years of publications rather than publications over latest 5 years. It is essential to ensure the application process provides a mechanism for extending the time window over which productivity is assessed where there has been a career disruption);
- negotiation of family-friendly policies as part of enterprise bargaining;
- options for job-sharing and other flexible work practices;
- a management or organisational culture which regards those with other work/life responsibilities as lacking professionalism or commitment;
- family support including affordable childcare;
- equal access to conferences and other professional development opportunities;
- scheduling meetings and key business activities at times that do not disadvantage those with carer responsibilities;
- providing for career breaks and return to work;
- addressing the stereotyping of STEM professionals at both the primary and secondary school levels and beyond; and
- addressing the high level of gender-based harassment in STEM workplaces.

In the case of gender, race, sexual choice and disability, any form of discrimination - whether conscious or unconscious, personal or institutional - leaves us a poorer, less equitable nation by not allowing the best-suited people to take up jobs and advance their careers by merit. The cost and impacts of that - social and economic - affect everyone.
Where to get more information:

Women in STEM in Australia: what is the current state of play, what are the key issues and why does it matter?; A report by Professionals Australia.

Professionals Australia 2015 Women in the STEM Professions Survey Report “The Slower Track”

Unconscious bias – what is it and why is it important in the STEM context?

Women in Science Research Workforce toolkit
Women in Science Australia
Gender and sexuality diversity
PWC report on Disability in Australia
Busting Myths about Women in STEM (Occasional paper, Issue 13).
Unconscious and systemic bias in IT

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Note: Names in the Science and Research Career Insights Series may have been changed to protect an individual’s identity.
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