

## Gender segregation in the STEM professions

Professionals Australia's submission to Finance and Public Administration References Committee's Inquiry into gender segregation in the workplace and its effects on women's economic equality

February 2017

### About Professionals Australia

Professionals Australia (formerly the Association of Professional Engineers, Scientists and Managers, Australia) represents over 23,000 professional engineers, scientists, managers, veterinarians, surveyors, architects, pharmacists, information technology professionals, interpreters and translators and transport professionals throughout Australia.

Professionals Australia members are employed across all sectors of the Australian economy. This includes all tiers of government and in a diverse range of industries throughout the private sector including Roads, Rail, Water, Electricity, Information Technology, Telecommunications, Consulting Services, Laboratories, Research, Surveying, Architecture, Retail Pharmacy, Mining, Oil, Collieries, and Manufacturing.

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## Preamble

On 9 November 2016, the Senate referred an Inquiry into gender segregation in the workplace and its impact on women's economic equality to the Finance and Public Administration References Committee, with particular reference to:

- a. the nature and extent of industrial and occupational gender segregation in Australian workplaces relative to comparable jurisdictions, including gender segregation in tertiary education courses;
- b. factors driving industrial and occupational gender segregation in the Australian context;
- c. economic consequences of gender segregation for women, including the contribution of industrial and occupational gender segregation to the gender pay gap;
- d. approaches to addressing gender segregation as it relates to economic inequality and the gender pay gap in comparable jurisdictions; and
- e. remedies appropriate for Australia, including but not limited to:
  - i. measures to encourage women's participation in male-dominated occupations and industries,
  - ii. measures to professionalise and improve conditions in female-dominated occupations and industries, and
  - iii. measures to promote pay equity.

### *Why is gender segregation an issue in STEM 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 historical stereotyping of STEM professionals as predominantly male or masculine;
- the precarious employment that characterises roles that are contingent upon grant-based funding which underpins most research in Australia;
- workplace cultures, systemic practices and unconscious biases 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.

### *Beyond the issue of supply*

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 to women remaining in the STEM workforce. So as well as initiatives to encourage women and girls into STEM education, long-term policy solutions will require addressing a range of complex factors that operate to disadvantage women in the STEM workforce and lead to attrition from the sector.

### *What is gender segregation?*

The 2015 Women in the Science Research Workforce: Identifying and Sustaining the Diversity Advantage report says:

*The patterns of women's participation and success in the science research workforce are well documented. Consistent and enduring patterns of vertical and horizontal segregation of women have been consistently described over the past twenty years. The persistence of tacit, rather than explicit gendered organisational cultures and systems that in small but cumulative ways disadvantage many women, whilst simultaneously advantaging many men,*

*are also well known ... There is a new imperative to do this [to address what is] a significant threat to the attractiveness and sustainability of the science research workforce.<sup>1</sup>*

As outlined in the Women in Science Research Workforce report, women's participation in the STEM workforce is marked by what is referred to as vertical and horizontal gender segregation.

Occupational or vertical gender segregation can be defined as segregation arising where opportunities for career advancement for a particular gender within an organisation are limited. Vertical segregation occurs where women are under-represented at senior, management and leadership levels, and/or over-represented in less senior, less secure and lower paid roles. Vertical segregation contributes to a range of areas of disadvantage for women including the gender pay gap and reduced retirement earnings.

Industrial or horizontal gender segregation can be defined as the concentration of men and women in different kinds of industries, sectors, fields/disciplines and/or specialisations or the uneven representation of women in the different areas of education and the workforce.<sup>2</sup> Horizontal segregation occurs where women are over-represented in less secure and lower paying industries, sectors, fields/disciplines and/or specialisations or conversely under-represented in industries, sectors, fields/disciplines or specialisations characterised by higher rates of pay and employment security.

While we discuss horizontal segregation in the STEM professions in this submission, our main focus and the primary data referred to in this submission is on vertical segregation – that is the factors that are linked with obstacles to career advancement at the workplace level.

### Why should gender segregation be addressed?

The challenges we face as a nation are diverse and complex. Improving productivity and driving real innovation will rely on increasing the rate of women's participation in the STEM workforce and ensuring the STEM workforce is diverse and inclusive. A workforce characterised by diversity brings together a range of people who think differently and approach problems in different ways – and this creates a “diversity advantage” that generates a range of benefits including a thriving innovation culture, a positive impact on the bottom line and incentives to remain in the STEM workforce.

As well as addressing gender segregation as a justice and equity issue, there is growing evidence of the rationale for addressing gender equity issues at the national economic level as well as for the bottom line at the enterprise level.

Goldman Sachs JB Were's report, *Australia's Hidden Resource: The Economic Case for Increasing Female Participation*,<sup>3</sup> estimated that closing the gap between male and female employment would boost Australia's GDP by 11 per cent. A 2009 KPMG report *Understanding the Economic Implications of the Gender Pay Gap in Australia* also found that closing the gender pay gap would result in greater competitiveness and opportunities for growth with better attraction of skilled staff, reduced costs through lower turnover and ensuring individuals with the best skills and knowledge are retained.<sup>4</sup>

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<sup>1</sup> Bell, S. and Yates, L. (2015). Women in the Science Research Workforce: Identifying and Sustaining the Diversity Advantage, Melbourne: L.H. Martin Institute, University of Melbourne, September 2015, p.7.

<sup>2</sup> Carrington, K. and Pratt, A. (2003) “How Far Have We Come? Gender Disparities in the Australian Higher Education System: Information, Analysis and advice for the Parliament.

<sup>3</sup> Goldman Sachs JB Were (2009). Australia's Hidden Resource: The Economic Case for Increasing Female Participation.

<sup>4</sup> Diversity Council Australia (2009). Understanding the Economic Implications of the Gender Pay Gap in Australia.

*Game-changers: Economic Reform Priorities for Australia* - a 2012 report from the Grattan Institute - estimated that increasing female workforce participation by around 6% would increase the size of the Australian economy by about \$25 billion per year.<sup>5</sup> Diverse and inclusive workplaces encourage workforce participation, which in turn drives productivity improvement. The 2015 report *Women in the Science Research Workforce: Identifying and Sustaining the Diversity Advantage* says that "Using (women's) talents to the full at all levels of scientific and technological education, training and employment is an economic necessity, and an investment in Australia's future national development" and puts the position that a multifaceted strategy to broaden participation in the science and technology workforce and to realise the potential of women's participation is needed.<sup>6</sup>

Gender equity and diversity are important factors in determining not only economic success at the national level but financial success at the enterprise level. Research shows that workplace diversity is linked to significant business benefits such as improved organisational performance, effectiveness, profitability and revenue generation. Research shows that diverse teams consistently outperform on innovation, problem-solving, flexibility, and decision-making<sup>7</sup>.

### What are the facts on horizontal segregation in STEM?

The latest OECD data show that just over 30 per cent of tertiary qualifications were awarded to women in STEM fields in OECD countries. In Australia, 33 per cent of STEM tertiary qualifications were awarded to women.<sup>8</sup>

While 50 per cent of undergraduates in the Natural and Physical Sciences, and Agriculture and Environment are female, female undergraduate participation in Engineering and Related Technologies stands at just over 15 per cent. Females are represented at more than 40 per cent in only 7 of the 29 fields of science education.<sup>9</sup>

The differential persists in the workforce with only 28 per cent of the employed STEM-qualified Australian workforce aged 15 years and over being female, compared to 55 per cent for all fields in the tertiary qualified population.<sup>10</sup>

For STEM professionals, horizontal gender segregation is complex with discrete and segmented labour markets at the levels of profession and/or field/specialisation. Workforce participation stands at 14 and 86 per cent for females and males respectively in Engineering and related technologies, and 25 and 75 per cent respectively for females and males in Information and communications technology (ICT). There was less disparity in the Natural and physical sciences where females comprised 47 per cent of the workforce compared with 53 per cent males, however there were significant differences in the participation rates for women in fields/disciplines within science.

Gender distribution also differs greatly based on industry. Women account for only 12 per cent of the STEM workforce in Construction, 17 per cent in Mining, 19 per cent in Utilities and ICT and 21

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<sup>5</sup> Daley, J. (2012). *Game-changers: Economic reform priorities for Australia*, Grattan Institute.

<sup>6</sup> Bell, S. and Yates, L. (2015). *Women in the Science Research Workforce: Identifying and Sustaining the Diversity Advantage*, Melbourne: L.H. Martin Institute, University of Melbourne, September 2015.

<sup>7</sup> King, J. (2005). Benefits of Women in Science, *Science* 308: 601

<sup>8</sup> Roberts, K. (2014). Engaging more women and girls in mathematics and STEM fields: the International evidence. The OECD figures are from 2011 and include both tertiary type A and advanced research programs, accounting for Bachelor degrees, Masters degrees and doctoral research.

<sup>9</sup> *Women in Science: Maximising productivity, diversity and innovation* (2009). Bell, S., O'Halloran, K., Saw, J. and Zhao, Y.

<sup>10</sup> Office of the Chief Scientist (2016). *Australia's STEM Workforce*.

per cent in Professional, Scientific and Technical services. Women are better represented in Health Care at 60 per cent of the STEM workforce, and Education and Training at 41 per cent.<sup>11</sup>

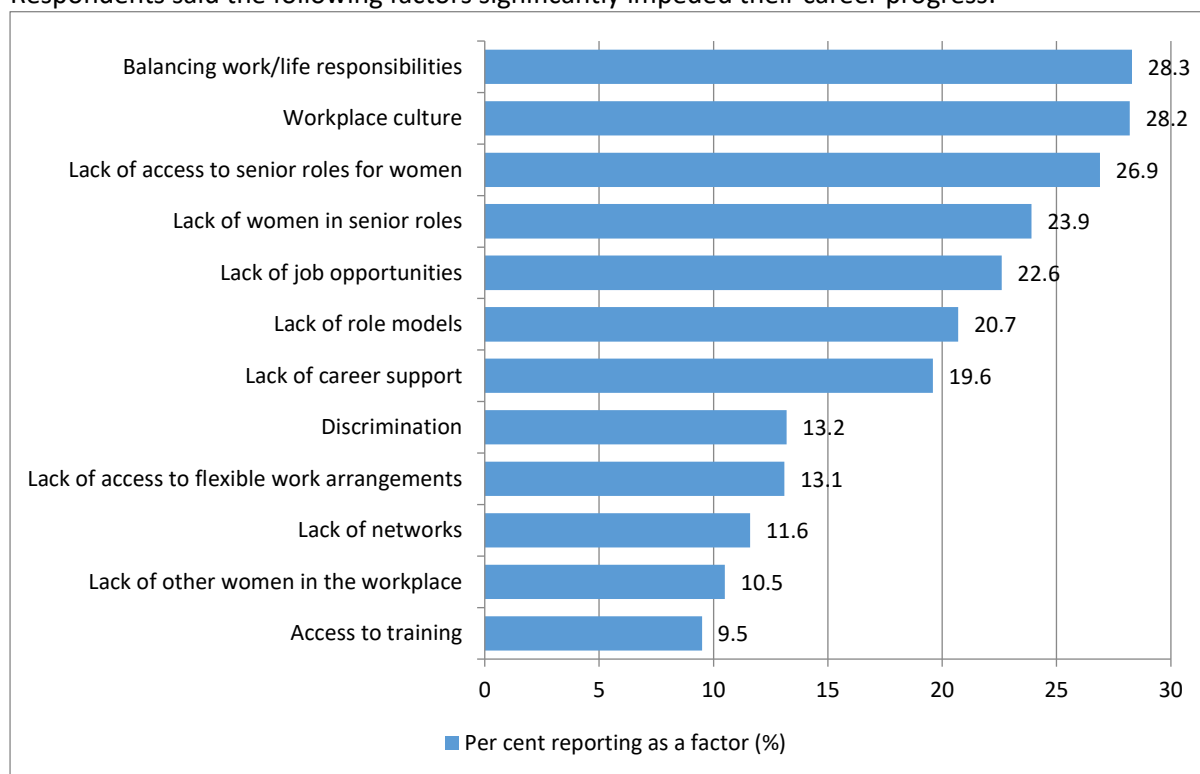
### What are the issues relating to vertical segregation in STEM?

In 2015, Professionals Australia conducted a survey of female members<sup>12</sup> to explore the issues around disadvantage for women in the STEM professions. This submission details selected findings on the issues that contribute to vertical gender segregation in STEM.

#### Barriers to career advancement – an overview

The three greatest barriers to career advancement reported were balancing work/life responsibilities, workplace culture and the lack of access to senior roles for women.

Respondents said the following factors significantly impeded their career progress:



#### Gender pay gap

The 2015 gender pay gap in Australia reported by the Australian Bureau of Statistics stands at 17.3 per cent. The gap is greater still for the Professional, Scientific and Technical Services industry where the differential sits at 22.6 per cent, down on the previous year's figure of 28.0.3 per cent. For Professionals as an occupation, the gap stands at 21.2 per cent.<sup>13</sup>

Our Women in STEM survey found that:

- 40.2 per cent of respondents did not believe they received equal compensation for work of equal value compared to their male professional colleagues; and

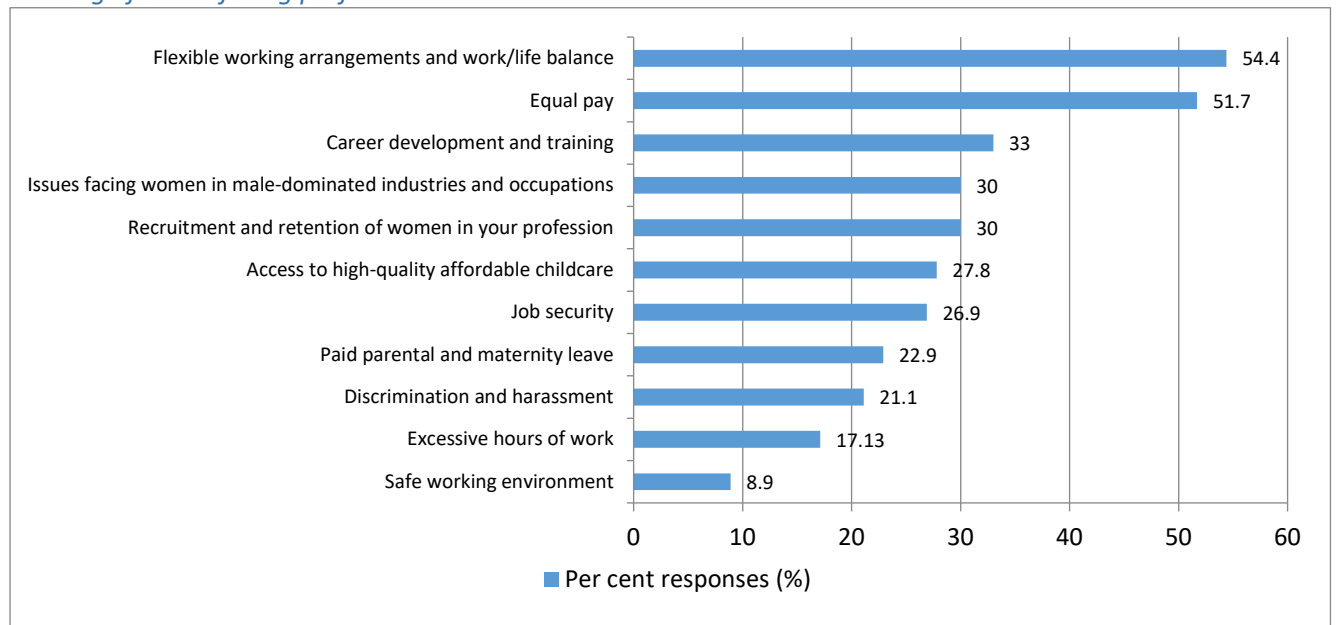
<sup>11</sup> Office of the Chief Scientist (2016). Australia's STEM Workforce.

<sup>12</sup> Professionals Australia (2015). The Slower Track: Women in the STEM professions survey report.

<sup>13</sup> Workplace Gender Equality Agency May 2016 Gender Pay Gap Statistics report based on Australian Bureau of Statistics (2015). Average Weekly Earnings, Australia, May 2015, cat. no. 6302.0.

- Survey respondents ranked pay equity second in importance only to flexible working arrangements/work and life balance as an issue faced by professional women that should be prioritised by government and industry.

*Ranking of issues facing professional women*



The differential earnings for male and female STEM professionals found in the surveys of Engineering, Science and ICT are of interest.

*Note: The figures in this section compare the average weekly earnings of male and female respondents currently employed on a full-time basis. Differences noted mid-career are therefore not attributable to women working part-time.*

**Engineering**

The 2016 Professional Engineers Employment and Remuneration Survey found a pay differential between male and female respondents with female respondents reporting a median total package of \$101,100, 24% lower than their male counterparts at \$133,154.

**Table 1 - Remuneration across years of experience by gender**

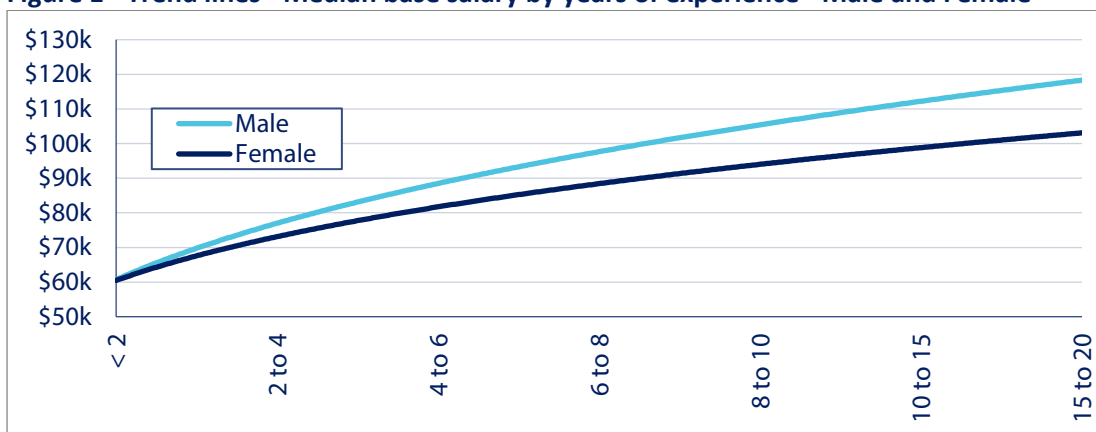
	N	Base Salary				Total Package				
		Lower Quartile	Median	Upper Quartile	Mean	Lower Quartile	Median	Upper Quartile	Mean	
Male	Less than 2	23	\$60,000	\$65,000	\$90,000	\$72,857	\$65,723	\$72,000	\$99,762	\$84,658
	2 to less than 4	27	\$60,000	\$72,313	\$80,000	\$72,687	\$66,507	\$78,000	\$101,500	\$84,945
	4 to less than 6	36	\$77,250	\$86,000	\$95,945	\$85,993	\$89,295	\$100,750	\$112,701	\$105,864
	6 to less than 8	14	\$85,000	\$92,155	\$120,721	\$101,777	\$94,219	\$113,903	\$142,685	\$118,158
	8 to less than 10	24	\$92,500	\$103,000	\$120,500	\$105,468	\$101,288	\$115,533	\$147,888	\$123,144
	10 to less than 15	55	\$98,143	\$120,000	\$135,000	\$119,406	\$112,468	\$131,500	\$165,000	\$138,459
	15 to less than 20	34	\$109,000	\$122,824	\$134,000	\$124,865	\$127,075	\$146,837	\$155,490	\$143,550
	20 to less than 25	27	\$110,000	\$133,330	\$150,000	\$128,057	\$127,429	\$153,615	\$172,500	\$150,977
	25 to less than 30	31	\$118,600	\$145,000	\$175,000	\$149,218	\$147,200	\$159,500	\$224,750	\$181,120
	30 to less than 35	46	\$130,000	\$141,300	\$163,844	\$151,531	\$145,600	\$170,063	\$199,290	\$175,830
	35 or more	30	\$120,000	\$145,000	\$167,000	\$146,425	\$132,000	\$176,000	\$190,500	\$168,396
All Respondents	347	\$90,000	\$117,000	\$140,061	\$118,010	\$102,930	\$133,154	\$168,750	\$138,775	
Female	Less than 2	7	\$57,500	\$61,000	\$75,000	\$64,423	\$63,510	\$68,163	\$86,220	\$72,880



2 to less than 4	4		\$66,167		\$69,834		\$72,453		\$75,043
4 to less than 6	5	\$63,000	\$87,000	\$89,000	\$80,800	\$68,985	\$97,900	\$103,965	\$91,126
6 to less than 8	5	\$80,000	\$96,000	\$96,693	\$91,739	\$88,000	\$118,360	\$120,942	\$108,595
8 to less than 10	SNR								
10 to less than 15	10	\$90,000	\$105,000	\$127,960	\$110,199	\$112,467	\$118,938	\$143,327	\$128,359
15 to less than 20	5	\$90,000	\$92,000	\$108,890	\$103,132	\$99,762	\$102,438	\$122,501	\$114,383
20 or more	SNR								
All Respondents	42	\$69,334	\$90,000	\$109,000	\$92,813	\$84,750	\$101,100	\$124,553	\$106,672

While the gap in reported wages for male and female respondents was narrower at 0 to 4 years of experience, the gap was more pronounced beyond 4 years' experience. Equal pay rates for entry level and early-career roles signal that most organisations provide competitive remuneration at this stage. However, as experience increases the pay gap emerges and widens, suggesting factors relating to career progression for women are impacting their earnings. Barriers preventing the advancement and progression of female engineers can include balancing work/life responsibilities, career breaks, workplace culture, differential access to mentoring and networking opportunities and the lack of access to senior roles for women. These issues impact the progression of women in engineering into higher levels of responsibility and remuneration. Significantly, the pay gap is not attributable to part-time work directly, as the survey results have been drawn from full-time respondents.

**Figure 1 - Trend lines - Median base salary by years of experience - Male and Female**



## Science

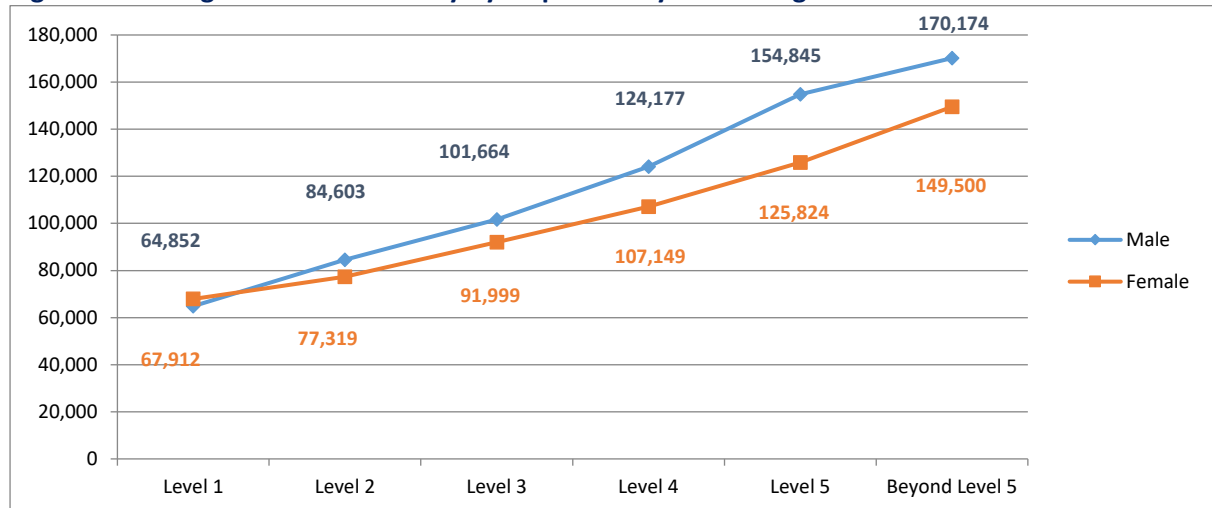
Overall, the survey found the mean base salary reported was \$117,473 for males compared with \$96,748 for females, and the mean total package for males was \$135,929 compared with \$112,385 for females. Female respondents' reported earnings were less than their male counterparts across job functions with the exception of Quality control and production and Computing, and less across all qualification levels.

In 2015, the survey found a significant relationship between responsibility level and gender and their effect on remuneration. While female respondents tended to be paid equivalent to their male peers in lower level roles, male respondents were better remunerated in middle career roles at Levels 3 through 5. The gap increased as responsibility level increased, and did not close until respondents exceeded level 5, typically executive management positions. The 2016 survey found similar results with a significant effect of gender and level on base salary and total package, as well as an interaction between the two suggesting the gender pay gap widens as responsibility level increases. This year however female respondents also reported lower earnings than males at Level 2. Again, the difference in remuneration between male and female respondents reduced beyond Level 5, where roles are generally subject to greater internal and external scrutiny. It is important to note

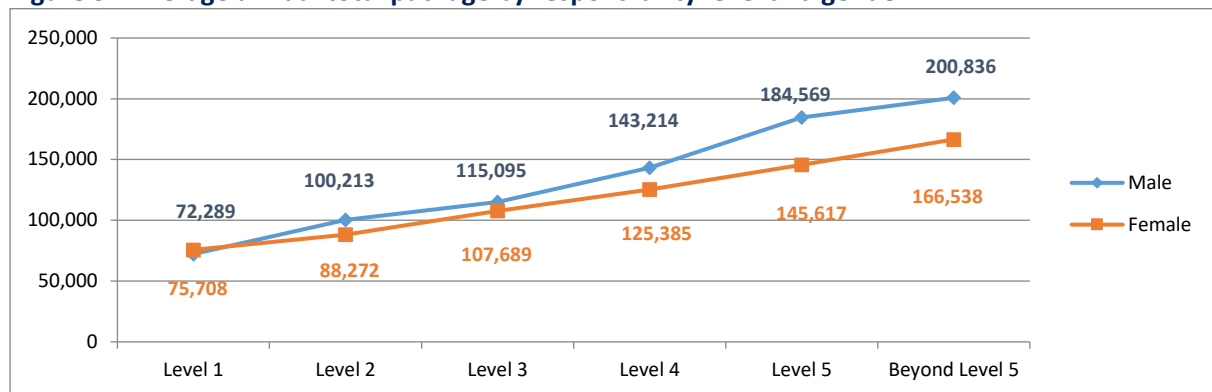
that only scientists employed on a full-time basis are included in this analysis ruling out the impact of part-time working arrangements as a factor in these differences.

The data therefore supports the finding that a gender pay gap exists in the group surveyed, and the gap is unlikely to be attributable to a greater concentration of women in lower levels of responsibility.

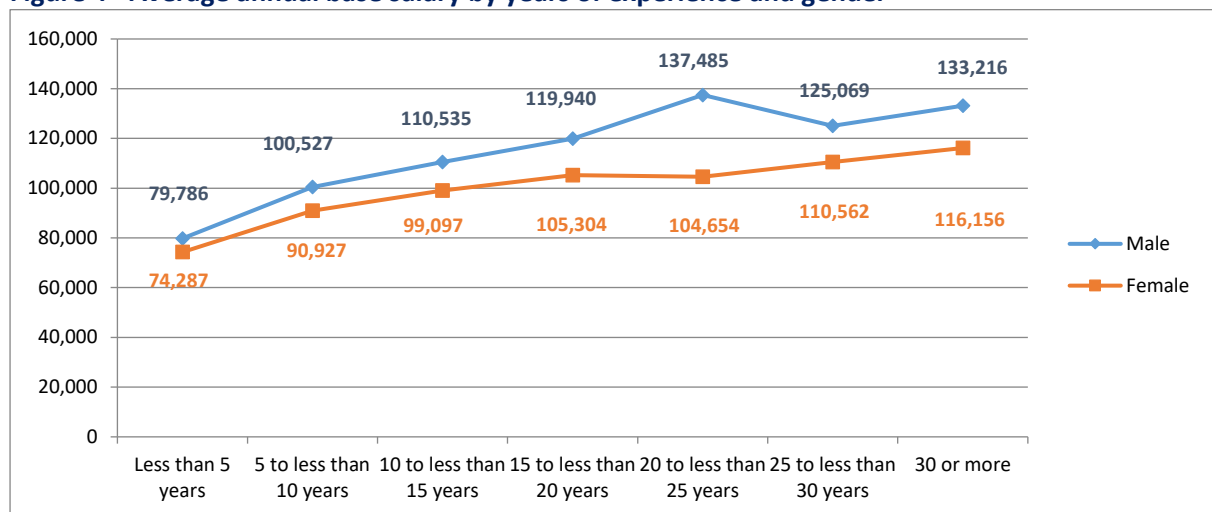
**Figure 2 - Average annual base salary by responsibility level and gender**



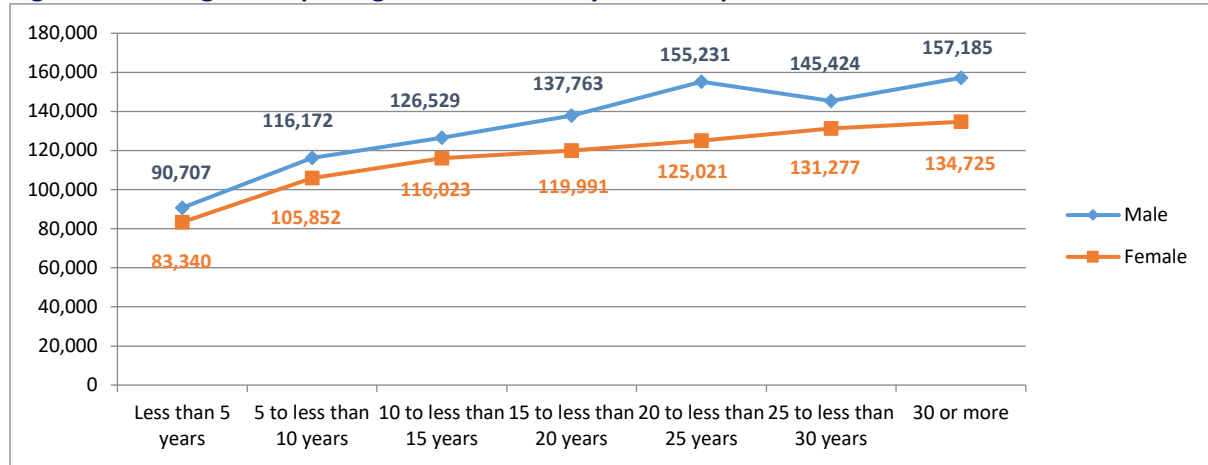
**Figure 3 - Average annual total package by responsibility level and gender**



**Figure 4 - Average annual base salary by years of experience and gender**



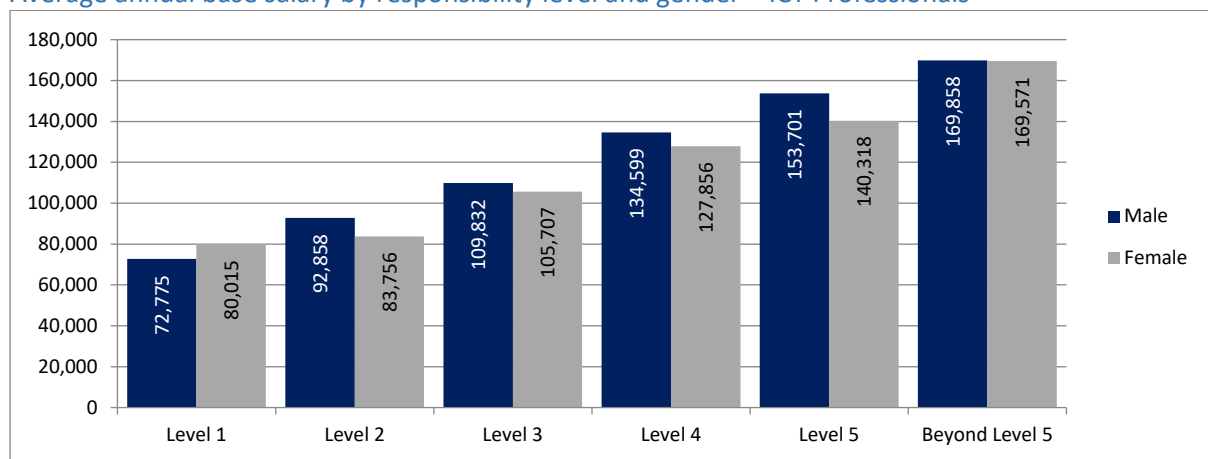
**Figure 5 - Average total package salaries across years of experience**



**ICT**

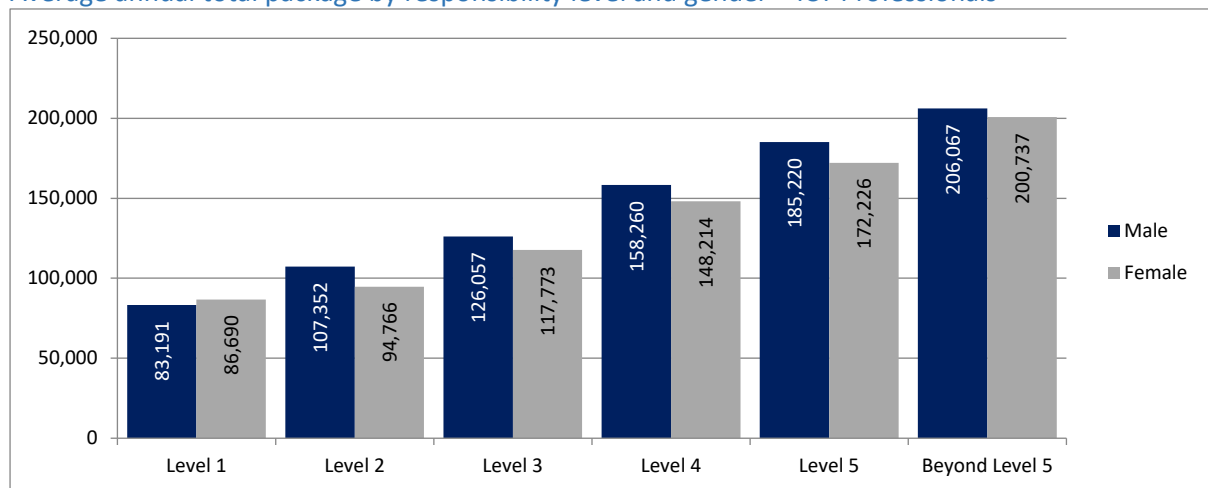
The average income for male respondents reported in the 2015 Professionals Australia/Australian Computer Society ICT Professionals Remuneration Survey was generally higher than for female respondents for levels of responsibility beyond Level 1 and at or below Level 5, a pattern similar to that found amongst both science and engineering professionals.

**Average annual base salary by responsibility level and gender – ICT Professionals**



2015 Professionals Australia/ACS ICT Remuneration Survey

**Average annual total package by responsibility level and gender – ICT Professionals**



## 2015 Professionals Australia/ACS ICT Remuneration Survey

### Retirement savings

Disadvantage in the form of comparatively lower retirement savings can be entrenched as a result of women opting for part-time time work, taking a career break for maternity leave or to accommodate family responsibilities. It can also arise as an outcome of the concentration of women in lower-paid roles, in lower-paid occupations and in lower-paid disciplines within the STEM professions.

The survey found the following in relation to retirement savings:

- 47.4 per cent of respondents said a career break had seriously reduced their retirement savings;
- 49 per cent said working part-time had seriously reduced their retirement savings; and
- 47.7 per cent said access to more flexible work arrangements and therefore full-time work would have meant a reduced impact on their retirement savings.

#### **Respondents' comments:**

- The double-whammy of PhD and maternity leave has seriously impacted my retirement savings.
- My partner is on leave without pay, because we had no childcare in our area – this has impacted both our retirement savings.

### Part-time work and flexible work arrangements

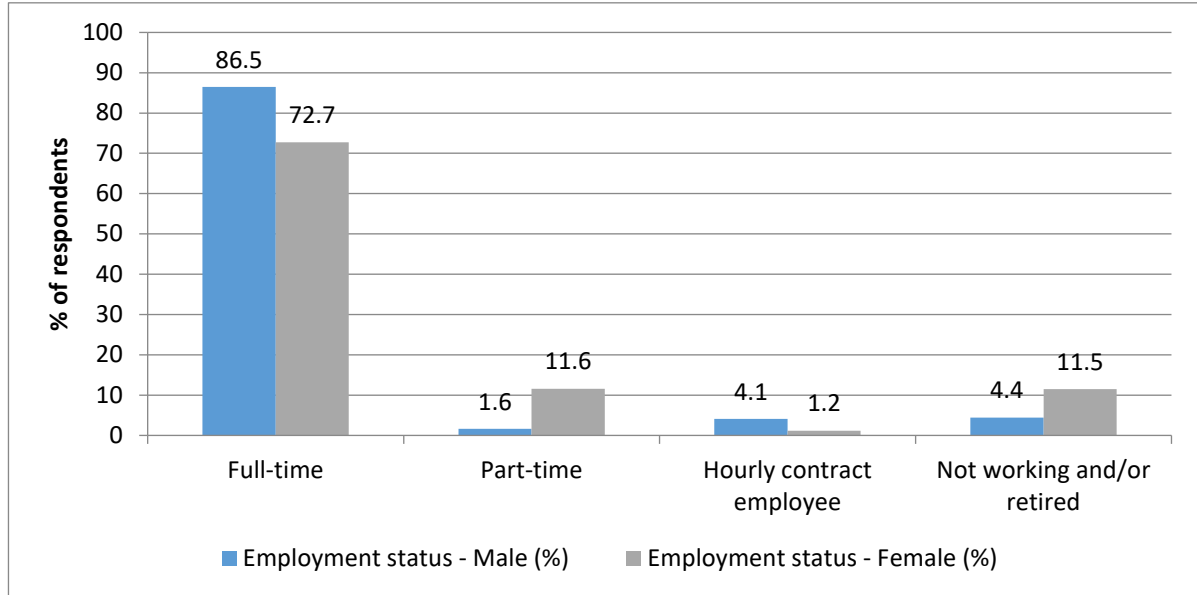
While gaining access to part-time work and flexible work arrangements can help women balance their work and family responsibilities, the arrangements can also be a means of entrenching discriminatory practices and structural bias against those who have primary caregiver responsibilities. The survey found that utilising part-time work and flexible work practices could result in a narrowing of choice, limiting of opportunities and the reinforcement of discriminatory historic work patterns such as the concentration of women in roles and occupations with less responsibility and seniority. Survey respondents confirmed a range of practices operating in their workplaces that had the effect of creating systemic biases and barriers to career advancement for women who opted for part-time or flexible work arrangements.

- Results confirmed a significant differential in the employment status of male and females across the STEM professions with females more likely to be employed part-time than males in Engineering, Science and ICT.
- Women with children were found to be less likely to be employed full-time than those without, confirming that caregiver responsibilities directly impact employment status.
- 61.5 per cent of survey respondents reported that they believed working part-time had negatively impacted their career.
- 23.9 per cent said carer responsibilities had negatively impacted their career.
- 51.2 per cent said they were unnecessarily prevented from undertaking certain types of work because they worked part-time.
- 23.6 per cent said they were seen as not pulling their weight because they used flexible work arrangements.
- 27.2 per cent said lack of access to flexible work arrangements had significantly or moderately impeded their career advancement.
- 25.3 respondents said they had been sidelined for promotion because they worked part-time.
- 40.1 per cent of respondents said they can miss out on information about what is happening in their workplace because they use flexible work arrangements.

**Concentration of women in part-time work arrangements**

Professionals Australia research found a significant difference in the distribution of males and females by employment status across the STEM professions of Engineering, Science and ICT with females significantly more likely to be employed part-time than males.

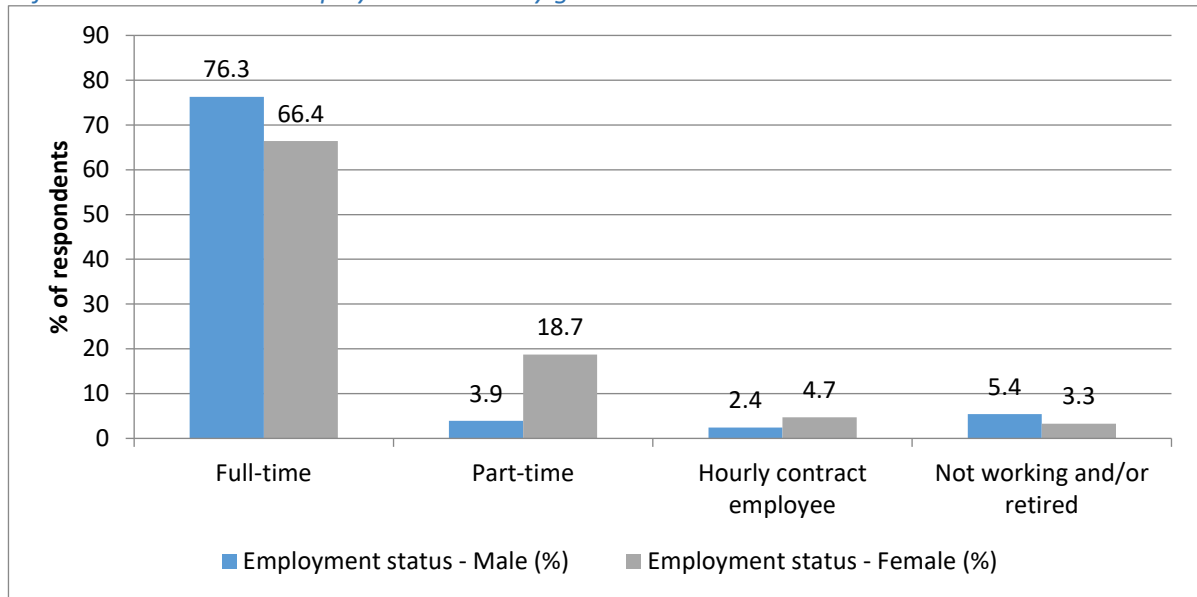
*Professional Engineers - employment status by gender*



2015 Professional Engineer Remuneration Survey

A significant difference emerged in the employment status of male and female Engineering professionals with females more likely to be employed part-time than males (11.6% compared with 1.6% respectively).

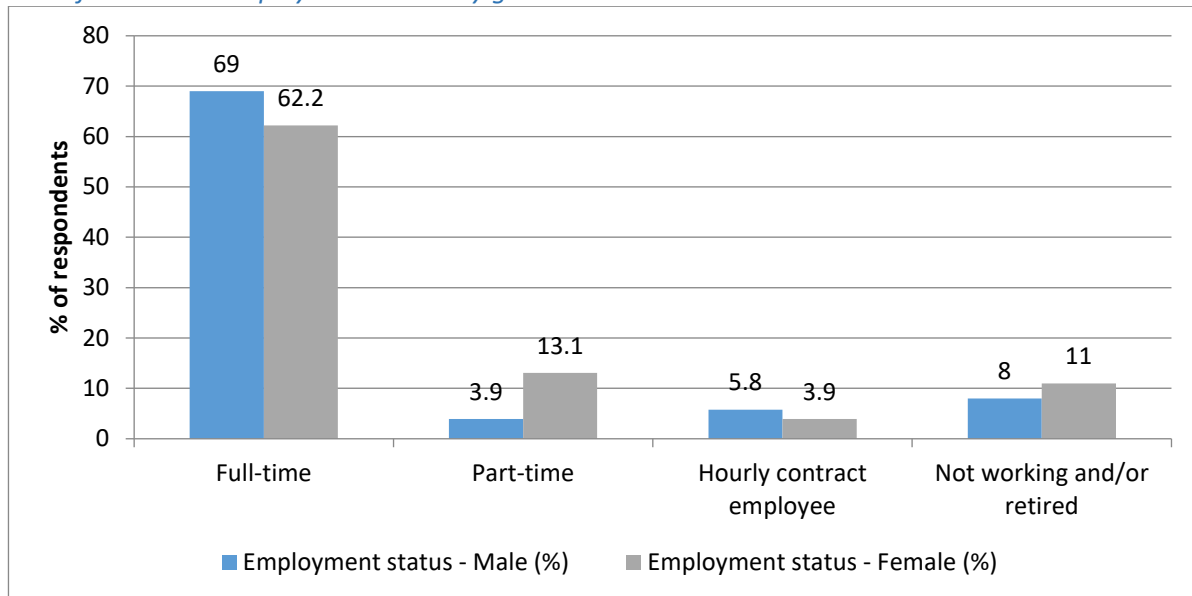
*Professional Scientists – employment status by gender*



2015 Professional Scientists Remuneration Survey

A significant difference emerged in the employment status of male and female science professionals, with females more likely to be employed part-time than males (18.7% compared with 3.9% respectively).

*ICT Professionals – employment status by gender*

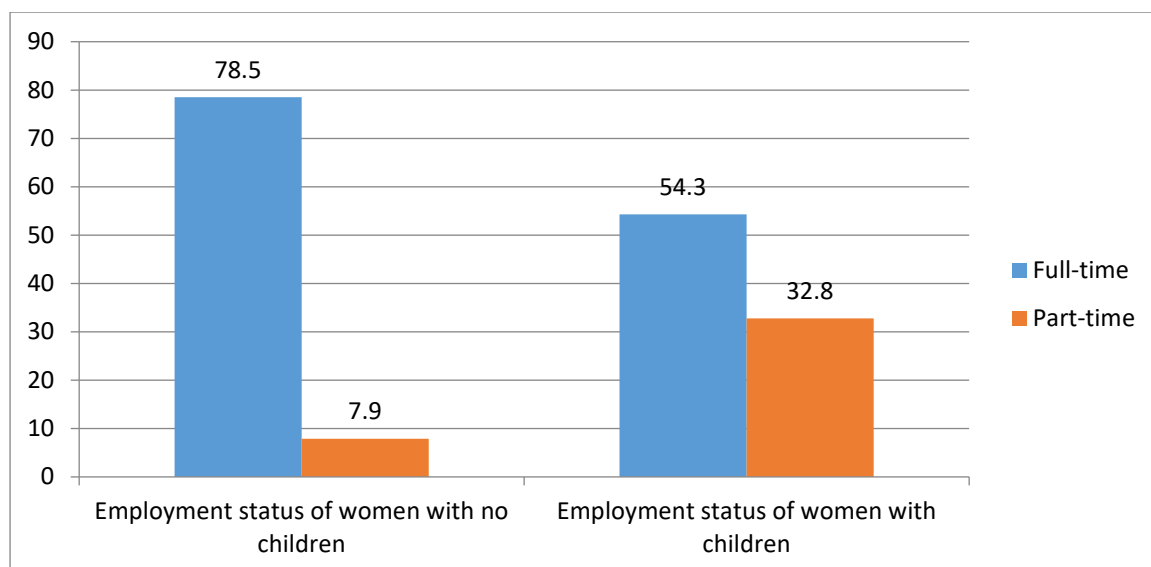


*2015 Professionals Australia/ACS ICT Remuneration Survey*

A significant difference emerged in the employment status of male and female ICT professionals, with females more likely to be employed part-time than males (13.1% compared with 3.9% respectively).

*Carer responsibilities and employment status*

The survey found that women with children were less likely to be employed full-time than those without children suggesting a strong link between caregiver responsibilities and employment status. 78.5 per cent of women without children worked full-time compared to 54.3 per cent with children, while 32.8 per cent of women with children worked part-time compared to 7.9 per cent of women without children.



### Part-time work and the impact on career advancement/promotional opportunities

Survey respondents reported a range of factors that created differential access to career progression. These included advancement strategies that promote from the ranks of full-time staff, differences in access to informal support mechanisms such as mentoring and limited choice about the projects in which part-timers could be involved.

- 65.6 per cent of respondents agreed or strongly agreed that promotions in their workplace were generally drawn from those working full-time.
- 28.6 per cent said that mentoring in their workplace was informal and often after hours making it less accessible.

#### **Respondents' comments:**

- Where I am, the culture is that part-time workers are not to be promoted – even where there are already people working part-time at those levels.
- I regularly see the high-potential males being taken to lunch or into managers' offices where they discuss their projects and get advice on how to solve issues. This never occurs for the women.
- Career progression appears non-existent to part-time employees. You either have to sacrifice family time and work full-time and have a career, or enjoy your kids before they grow up and stay stuck where you were before maternity leave.
- Although my employer has been very flexible about me working part-time (letting me choose how many and which days), part-time employees are not seriously considered for developmental opportunities nor career progression/promotion.
- As a part-timer, you are considered lucky to work part-time and consequently have less say in what projects you would like to work on or be involved in.
- Good projects are not availed to you as a part-timer.
- I have found that mothers are discriminated against for promotions, but not women without family responsibilities.

### Part-time work and access to continuing professional development

Unconscious bias on the part of employers appears to play a role in sidelining women who could otherwise be undertaking further training and professional development activities that would underpin career advancement. This marginalising effect can arise from women working part-time not being offered training, or self-selecting out of the training due to the hours in which it is offered.

- 31.3 per cent of respondents said they were unnecessarily prevented from undertaking training and professional development because they worked part-time.
- 58.2 per cent said the impact on personal or family time prevented them from commencing or completing professional development

#### **Respondents' comments:**

- My post-graduate study was not funded as funding is only given to full-time employees even though my study was directly related to my role.
- The professional development sessions at my work which are run Monday afternoons between 3 and 5pm which is impossible for me to attend due to carer responsibilities (school pick-up). Employer will not provide video for viewing in own time though I have asked.
- My boss did not offer me the company-provided project management training that was offered to many others on equivalent grade to me, saying that I was not a priority as a part-time employee.
- I am occasionally presented opportunities to attend training etc. however I choose not to take them up as it disrupts family life too much.
- I'm not even considered when training is offered - I'm pigeon-holed as not being able to make it but I haven't been offered it.

### Limiting the talent pool

Comments suggest that some employers do not recognise how a failure to offer flexible work arrangements to their workforce including men – or indeed to employ women at all - limits the talent pool from which an organisation's workforce is drawn, and, in turn, limits their diversity

advantage (diverse teams have been consistently shown to outperform on innovation, problem-solving, flexibility, and decision-making<sup>14</sup>).

- 20.5 per cent of respondents said that management in their workplace thinks that work/life balance is only relevant for women with children.

**Respondents' comments:**

- My employer once told me "We don't need to offer flexible employment – everyone wants to work for us."
- Flexibility needs to be granted to men as well. This enables their female partners to return to work/work longer hours. It also means the workplace is not dominated by full-time males and part-time females.
- The problem is not just enabling women to work flexibly, but enabling men to as well. This allows women to return to work to a greater extent and "levels the playing field" as both women and men are working flexibly. My husband requested to work four days per week at the same organisation as myself and the request was declined. The culture is that it is acceptable for women to work part-time but not men.

### Work/life balance

The survey found that even where positive workplace policies existed around work/life balance, cultural issues within workplaces meant that accessing these provisions was often difficult. Comments widely confirmed that opting for work/life balance to take account of carer responsibilities often meant women's career progression was placed "on a slower track".

- 57.7 per cent of respondents agreed that they feel they currently have work and life balance; 24.2 per cent disagreed.
- 48.4 per cent agreed or strongly agreed that the organisation that they work for genuinely encourages work and life/family balance; 25.4 per cent disagreed.
- 64.4 per cent agreed or strongly agreed that their immediate manager genuinely encouraged work and life/family balance.
- 44.4 per cent disagreed or strongly disagreed that in their workplace, managers and senior staff modelled good work/life balance.
- Of those who were considering leaving their current employer, 26.9 per cent said work/life balance was a contributing factor, and of those considering leaving their profession, 30.6 per cent said work/life balance was an important factor.

### The career penalty attached to work/life balance

**Respondents' comments:**

- Making choices to balance work/life means that you are placed on the slower track. Technical roles generally have a limit as to how high you can go and it is hard as a female to be taken seriously in male-dominated work places – you have to work twice as hard just to be considered adequate.
- I was offered a demotion the day I returned from four months' maternity leave to "help with my family flexibility".
- I was told by a manager that if I applied for a job and a male of the same age and experience also applied, he would select the male as they are less likely to take leave in the future to care for children.
- I work four days per week and generally take on a full-time workload i.e. often work outside of my contracted hours to get the job done. I believe that I have been overlooked for promotion opportunities .. despite a willingness to take on a full-time workload and work flexibly to meet requirements of work and home.

### Seeking change

- 44.2 per cent of respondents answered that they would like to use conditions of employment that may assist in balancing work and life that they do not currently access.
- 39.7 per cent indicated they would like to work fewer hours each week. Of these respondents, only 18.1 per cent had broached the issue with their manager; of those that had broached the issue with their manager, 49.3 per cent were dissatisfied or very dissatisfied with the result.

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<sup>14</sup> King, J. (2005). Benefits of Women in Science, Science 308: 601.



**Inconsistency between workplace policies and practice around work/life balance**

- 41.8 per cent of respondents said their employer had good work/life balance policies but the culture of the organisation did not support it.

**Respondents' comments:**

- Though there are systems in place for work-life balance, it is not easy to convince managers that we can be productive using flexible working hours or working from home. It is a complete waste having these systems when they cannot be accessed. Managers need to understand and encourage staff to use such systems to balance work and life.
- While the organisation can have policies regarding flexible work arrangements, it still very much depends on your direct manager or the next level up - it's just the attitude of the next few levels up.
- Our enterprise agreement has the 48/52 leave provisions and working from home and job sharing but it is only available if your immediate boss allows it. The workplace and managers attach their own conditions to it which makes it almost impossible to use.

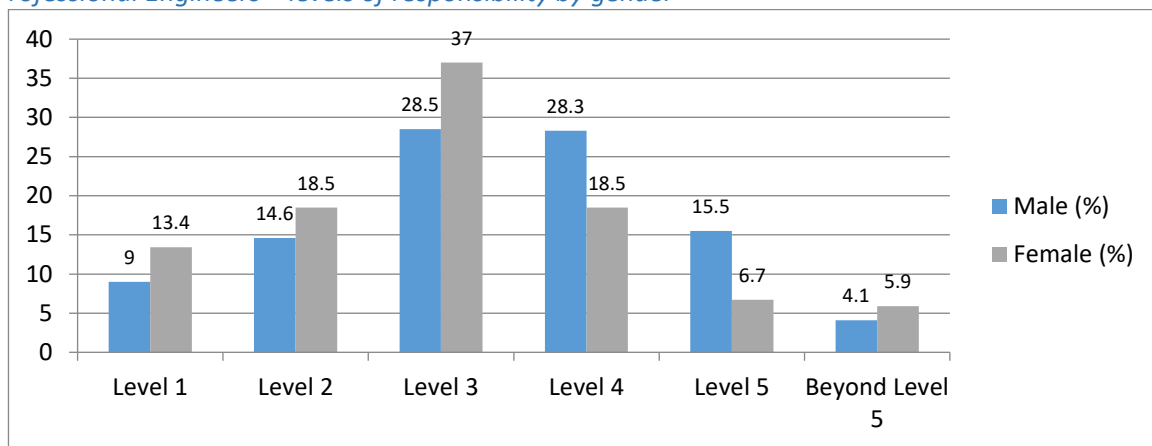
*Role/occupational segregation*

Role or occupational segregation is a form of vertical gender segregation that can manifest as the over-representation of women professionals in lower-paid roles or roles with less responsibility or the under-representation of women in senior, management and leadership roles – both these phenomena appear to primarily arise as a result of part-time work arrangements and the need for flexibility.

**Over-representation of women at lower responsibility levels and under-representation at more senior levels**

The data suggest that across the professions of Engineering, Science and ICT, female respondents were over-represented at the lower levels of responsibility and under-represented at more senior levels.

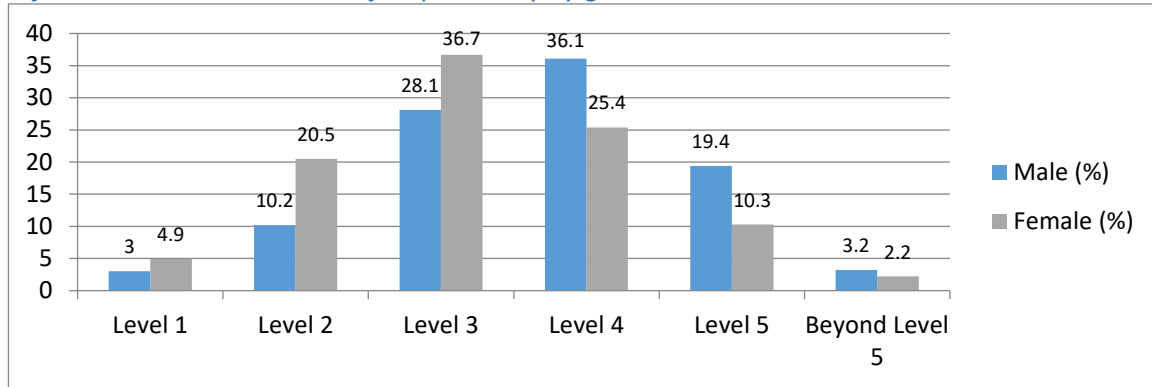
*Professional Engineers – levels of responsibility by gender*



*2015 Professional Engineer Remuneration Survey*

The data suggest that female respondents are over-represented at Levels 1 to 3 and under-represented at Levels 4 and 5 in Engineering.

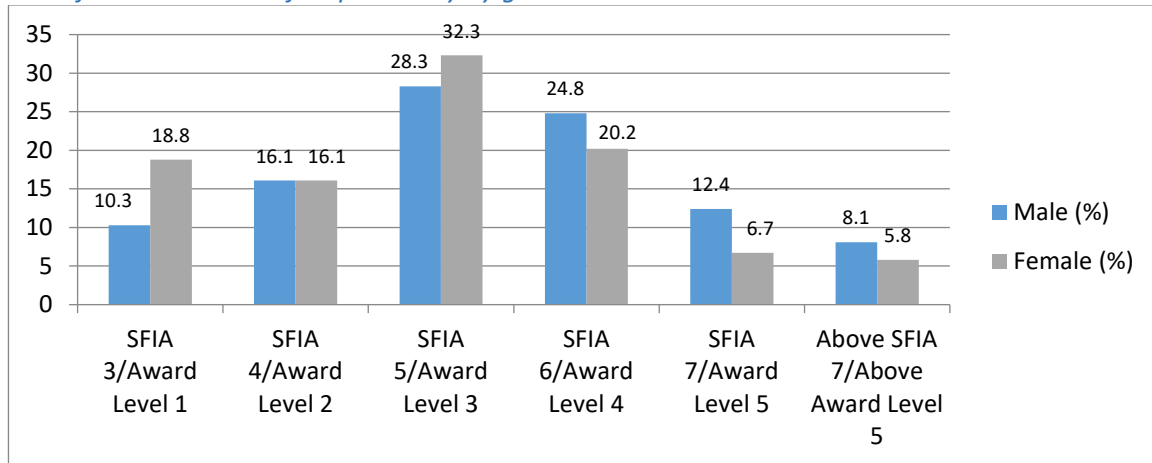
*Professional Scientists – levels of responsibility by gender*



2015 Professional Scientists Remuneration Survey

The data suggest that female respondents are over-represented at Levels 1 to 3 and under-represented at Levels 4 and 5 in Science.

*ICT Professionals levels of responsibility by gender*



2015 Professionals Australia/ACS ICT Remuneration Survey

The data suggest that female respondents are over-represented at SFIA 3 and SFIA 5/Award Levels 1 and 3 and under-represented at SFIA 6 and 7/Award Levels 4 and 5 in ICT.

*Over-representation of women professionals in roles with less responsibility*

Gendered access to part-time work arrangements, the concentration of women who work part-time in less senior roles and the underutilisation of the skills of those opting for part-time work were significant issues for respondents. Many respondents commented that part-time or flexible work arrangements were only available in lower-paid less senior roles.

- 60.2 per cent of respondents said that professional women in their workplace often took up less challenging work roles so they could accommodate family/carer responsibilities.
- 32.1 per cent of professional women said underemployment – defined as engagement in roles which underutilise their professional skills and judgement – in their workplace was a significant issue.

**Respondents' comments:**

- *Prior to maternity leave I held senior roles – when I came back, I was put into low level roles due to my part-time work arrangement.*

- *Many of the passionate female scientists that I know (myself included) have taken less senior roles than they are qualified for, as these are typically offered on a part-time basis. I would ideally like to see part-time senior management/technical positions offered within industry for both men and women.*
- *I have been told that I cannot progress in my workplace structure due to the fact that I work part-time.*
- *I been passed over for interview for roles I am more than qualified for because of taking time away from my career to care for my child.*
- *This industry has women in junior roles doing all the grunt work.*

### *Under-representation of women in senior, management and leadership roles*

The lack of role models, lack of women in senior roles and lack of access to senior roles for women were reported by respondents as detrimental to their career advancement. Survey respondents reported being offered demotion on their return to work from parental leave as a way of accommodating their carer responsibilities – confirming the fairly blunt operation of systemic bias against the advancement of women with carer responsibilities. Survey responses also showed that women self-select out of senior, management or leadership roles as a way of balancing their work and family commitments. These factors operate to reinforce gendered historic work patterns whereby women are concentrated in lower-paid roles with less responsibility and work part-time, and men work full-time in more senior roles with greater responsibility.

- 52 per cent of respondents said that the lack of role models had significantly or moderately impeded their career advancement.
- 49.5 per cent said the lack of women in senior roles had negatively impacted their progress.
- 50.3 per cent said lack of access to senior roles for women had detrimentally impeded their career advancement.

#### **Respondents' comments:**

- *Lack of females in senior management often results in a lack of understanding of work/family balance.*
- *My workplace has never had a woman executive and few women managers at any level. This has definitely had an impact on any advancement opportunities.*
- *There is definitely a lack of women in senior roles in my workplace and I feel that I don't have any role models senior to me who are female.*
- *There are no women in my organisation at a General Manager level in the heavy engineering sections of the company.*
- *The higher up the ladder you go, the less flexible the work hours.*
- *Higher level and supervisory roles within the organisation are filled on a full-time basis and in the past employees with a supervisory role and carer responsibilities have been asked to work at a lower level when requesting part-time hours or access to flex-time provisions.*
- *I have always been given the opportunity to undertake professional development and leadership training but, as a part-time employee, I have chosen not to move into management as I don't believe I can fulfil the role as well as I would like.*
- *Working part-time has definitely impacted my career but this has been a personal choice. I would have been into middle-management positions well before now if I was willing to work full-time.*
- *There are limits on management roles that can be undertaken because I'm not available all week. I have focused more on technical roles, which generally have lower remuneration and recognition.*

### *Career breaks and their impact*

Research confirms that traditional concepts of advancement which value a full-time uninterrupted career trajectory can disadvantage women because they are more likely to work part-time and take career breaks to accommodate carer responsibilities.<sup>15</sup> Whether the issues are characterised as a 'glass ceiling', a 'leaky pipeline' or being placed on a 'slower track', the implications for the STEM workforce in the longer-term are serious. Our survey confirmed these findings with respondents reporting that family responsibilities and career breaks having a significant negative impact on advancement opportunities. Respondents also highlighted the stereotyping of women with carer responsibilities as less committed to their careers, the professional isolation which can accompany a

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<sup>15</sup> Bell, S. (2009). Women in Science in Australia: Maximising productivity, diversity and innovation, Federation of Australian Scientific and Technological Societies, p.41.

career break, difficulties with re-entering the workforce following a career break and the pressure to return from maternity leave early.

- 21.3 per cent of respondents said they had been sidelined for promotion because they had taken a career break.
- 70.3 per cent of respondents said that taking maternity/parental leave was detrimental to their career.
- The stereotyping of women with carer responsibilities as less committed to their careers seriously impacts career advancement.

### Impact on career advancement

#### Respondents' comments:

- *The glass ceiling for women in senior management roles still exists. Senior males can unintentionally discriminate against women moving into senior positions.*
- *It's so much harder for those who have taken a career break! The pay you get when you start is what you are stuck with - you can get incremental increases but never a rebalancing so that you are comparatively earning the same.*
- *Taking time off to have children has been significantly detrimental to my career.*
- *Having two 'significant' periods away from work (just over 12 months in total – six to seven months each time) has had a detrimental effect on my career.*
- *The main issue is that the people still at the workplace are being exposed to opportunities – acting roles, sideways moves, networking – and general exposure of their name and performance. Keeping in touch sounds OK in theory but so many things change even in a short period of time.*

### Professional isolation

#### Respondents' comments:

- *You quickly lose touch with networks. Many things revolve around where you work – if you're not working, you are a bit "out in the wilderness".*
- *I think most women who enjoy their career struggle with leaving the workforce for maternity leave. I have felt isolated because of it, with no real conclusion except to accept that time off will affect my career, advancement opportunities and resultant salary.*
- *My direct supervisor changed but I wasn't told. There was very little communication – email passwords expired and couldn't be changed remotely.*

### Lack of support for reintegration following a career break

#### Respondents' comments:

- *My career break meant I was deskilled. It would have been good to actually receive training on new methods/tests that were implemented while I was absent.*
- *I had to start my career again twice. There was no assistance and my boss moved jobs without telling me. I came back to work to nothing - not even a computer to use.*
- *I have taken two rounds of maternity leave adding up to 2.5 years off work. Each time I came back I had to start my career again from the beginning.*
- *I missed out on technological developments, and being in touch with colleagues – very hard to catch up.*
- *I came back to an unrecognisable workplace after a restructure and lots of redundancies/new hires.*

### Pressure to return from maternity leave

#### Respondent's comment:

- *There was a horrendous level of pressure to return to the workforce before the 12 months of allowable maternity leave.*

### Gender stereotyping around career commitment

“[R]esearch .. [shows] that: ‘there [is] no evidence that women are less committed to their careers than men; that women were just as likely to have a career plan as men; and women were just as eager to attain seniority as men’”.<sup>16</sup>

While there is no evidence that women are less committed to their careers, respondents reported assumptions being made about their commitment to their career once they had carer responsibilities.

#### Respondents' comments:

- *Once a woman has children, I think there is an unconscious bias against them as they are seen to be not as serious about their careers.*
- *Typically men are perceived as being more serious about their careers because they can work longer hours and work late if required.*
- *Managers do not view part-time staff as serious about their role.*
- *I'm not even considered when training is offered or I'm considered last minute to attend training. They pigeon-hole me as not being able to make it but I haven't even been offered it.*

### Culture of the workplace, occupation and industry

Our survey confirmed that a range of practices and policies created workplace cultures which directly or indirectly excluded, marginalised or disadvantaged women. These included a culture which rewarded long working hours, women professionals not being part of the “boy’s club”, women being subject to sexist remarks and the technical expertise of women being regarded less seriously than that of their male colleagues.

- 54.2 per cent of respondents said that workplace culture had detrimentally impeded their career advancement to a significant or moderate extent.
- Of those considering leaving their current employer, workplace, occupation or industry culture was a factor for 24.2 per cent of respondents.
- 41.8 per cent agreed or strongly agreed that their employer has good work/life policies but the culture did not support it
- 44.4 per cent disagreed that in their workplace, managers and senior staff model good work/life balance

### Career advancement in male-dominated professions

When asked whether their employer was proactive in ensuring that men and women had equal opportunity to career advancement:

- 26.7 and 25 per cent of those working in Engineering and ICT respectively answered “rarely” or “never” compared to 21.8 per cent in Science.

These figures confirm that, for respondents, the lack of equal opportunity to career advancement is a significant issue across the STEM professions.

#### Respondents' comments:

- *Being a female professional in a male-dominated workplace is extremely difficult. There are few women colleagues available to support you and fewer male colleagues who will. It is a hard road and you do feel alienated.*
- *I got the impression that a number of companies only interviewed me to see what a female engineer looked like, and I was never a serious contender for the role.*
- *There is still "traditional" or old-fashioned thinking that females are subordinates, support and in administration roles. Many of my male colleagues questioned why I returned to work after 12 months of having my child (and that was in 2004!!).*

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<sup>16</sup> Probert, B., Ewer, P. and Whiting, K. (1998) “Gender Pay Equity in Australian Higher Education.” The National Tertiary Education Union, Melbourne, pp.51-52.

- *My company distinctly lacks female role models in leadership positions.*
- *I was told by my direct manager he would prefer to have a male in my role as there would be less emotional issues in the workplace.*

### Workplace culture – marginalising behaviours

- 37.9 per cent of respondents said they felt like they had to “become one of the boys” if they wanted to “fit into” their workplace.
- 55.5 per cent agreed or strongly agreed that in their occupation, women have to prove themselves, where men are assumed to be capable.
- Only 38.1 per cent agreed or strongly agreed that clients respect the professional opinion or advice of men and women equally; 31.9 per cent disagreed.
- 41.3 per cent said that in their workplace, advice or information of a technical nature was less likely to be listened to if provided by a woman than a man.

#### Respondents' comments:

- *I think there is often an unconscious bias against women progressing in senior positions in a male-dominated field. It feels like a 'boys club' at times and career progression is not always based on merit.*
- *When instructing a colleague and requesting overdue information from them – “you sound like my wife” – would regularly come out.*
- *Women in my industry have to fight for the pay and respect that the men get naturally.*
- *As a young woman, comments were made which made me uncomfortable but I was expected to be a “good sport”.*

### Workplace culture and long work hours

- 30.4 per cent agreed or strongly agreed that the number of hours they have to work limits their capacity to maintain a work/life balance work.

#### Respondents' comments:

- *It is still seen by men that you need to be there 24/7 to get ahead. Engineering typically the longer you work, the more you get ahead. I can no longer do the 50 to 60 hour weeks. On salary, the company wins for every hour over the normal 38 and they reward people for it.*
- *We still seem to work in a society where your value and contribution is measured by your hours in the workplace.*
- *My workplace has a competitive culture with expectation of long hours and single-minded purpose. It's difficult to compete and have a healthy home and family life.*

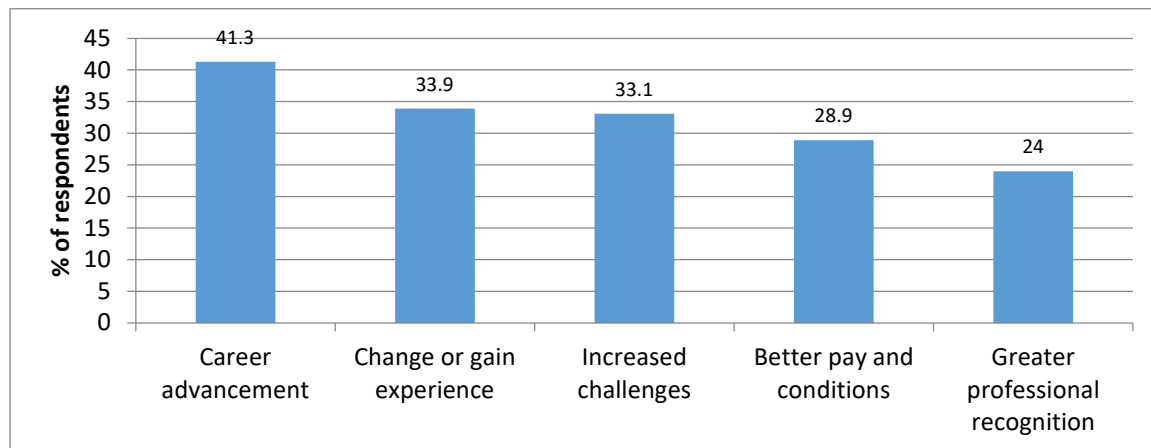
### Attrition and retention of technical professional women

It is clear that the participation of women in the STEM professions and the reduction of attrition rates will be vital to ensuring a sustainable pipeline of skilled and experienced STEM professionals. A failure to do so would represent a failure to realise the dividend from the considerable investment in education and development of professional experience and judgement of women working in the STEM professions.

Respondents who were considering leaving their profession and their current job in the next five years cited the following as the main reasons:

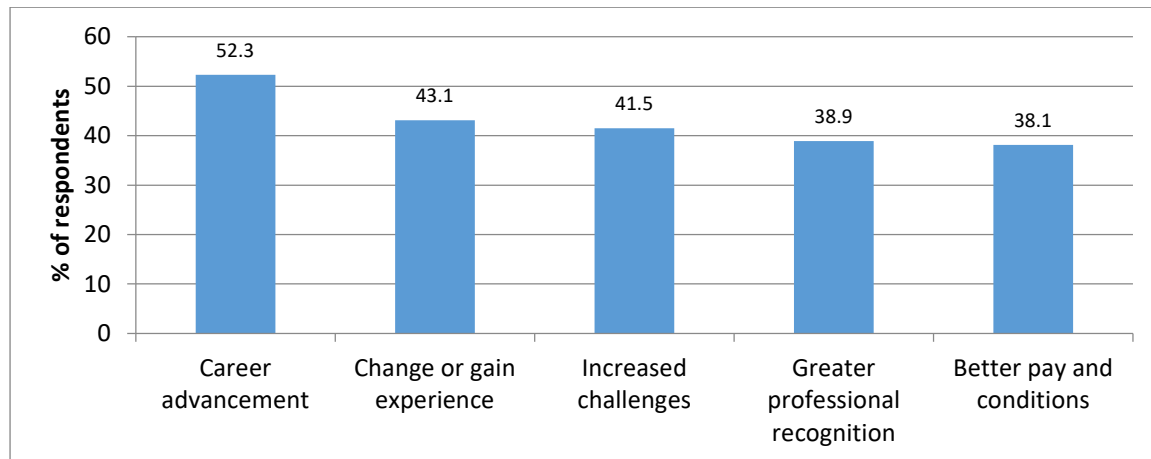
- career advancement;
- the need for change or to gain experience;
- to seek increased challenges;
- for better pay and conditions; and
- for greater professional recognition.

Respondents considering leaving their profession in the next five years cited the following as the main reasons:



*Note: Respondents could select multiple responses.*

Respondents considering leaving their current employer in the next five years cited the following as the main reasons:



*Note: Respondents could select multiple responses.*

Almost a third of respondents (31 per cent) expected to have left their profession within five years. This figure was higher for private sector respondents (75 per cent). 4.9 per cent of respondents expected to be working in their current profession less than 1 year, 9.6 per cent 1 to less than 3 years, 16.5 per cent 3 to less than 5 years, 19.1 per cent for 5 to less than 10 years and 49.9 per cent 10 years or more.

Of those who did not expect to be working in their profession in five years, the top three factors nominated as influencing that expectation were:

- career advancement - selected by 41.3 per cent of all respondents;
- change and/or gain experience – selected by 33.9 per cent of respondents; and
- increased challenges – selected by 33.1 per cent of respondents.

When asked how long they expected to continue working with their current employer, 66.9 per cent answered less than 5 years. At the other end of the spectrum, 14 per cent expected to still be working for their current employer beyond the next 10 years.

Of those that did not expect to be working with their current employer in five years, the top three factors nominated as influencing that expectation were:

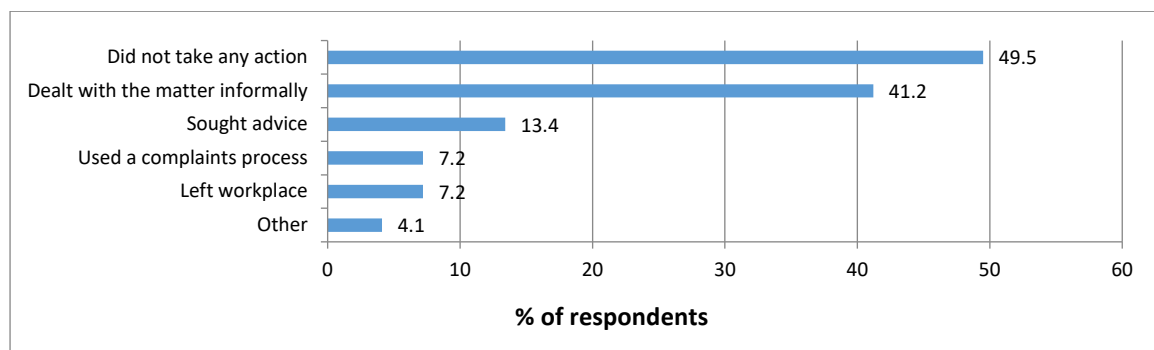
- career advancement – selected by 52.3 per cent of respondents;
- change and/or gain experience – selected by 43.1 per cent of respondents; and
- increased challenges and excitement (41.5 per cent).

The factors influencing respondents' intentions to leave were consistent across leaving their employer and leaving their profession.

### Sexual harassment and bullying

#### Sexual harassment

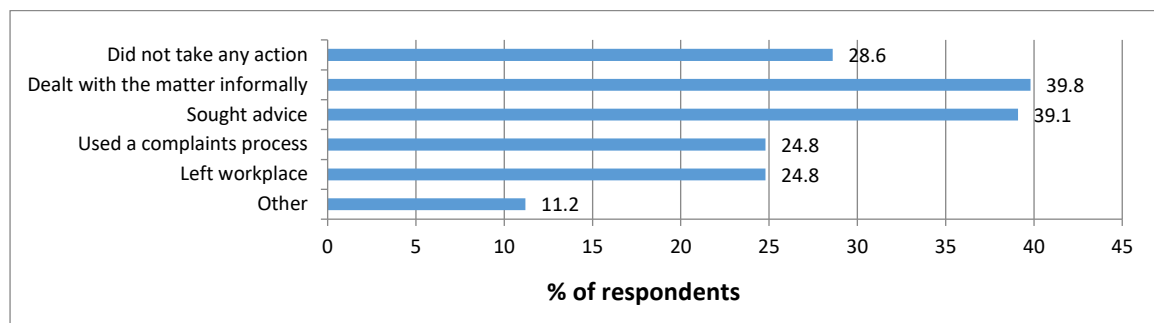
- 25.8 per cent of respondents reported that they had been sexually harassed in the course of their employment.
- Of those that reported they had experienced sexual harassment, only 13.4 per cent of respondents had sought advice on dealing with the matter. A disturbing 7.2 per cent left their workplace and 49.5 per cent took no action at all.



*Note: Respondents could select multiple responses.*

#### Bullying

- 42.1 per cent of respondents reported having been subject to bullying in the course of their employment.
- Of those that reported they had experienced bullying, 39.1 per cent of respondents had sought advice on dealing with the matter. A disturbing 24.8 per cent left their workplace and 28.6 per cent took no action at all.



*Note: Respondents could select multiple responses.*



### *Unconscious bias in STEM*

Unconscious gender bias creates significant disadvantage and contributes to vertical gender segregation in the STEM workforce.

#### What forms can unconscious bias take?

Unconscious bias – also called hidden or implicit bias - comes in a range of forms. Unconscious gender bias expert Mark Toner defines unconscious bias as follows:<sup>17</sup>

- 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, physically attractive people are more trustworthy;
- anchoring bias, which causes us to rely too much on an irrelevant piece of data or belief, for instance, one of the interviewers had previously hired a woman and it turned out badly;
- minority pool bias, which causes interviewers to evaluate more negatively applicants who comprise a minority of the applicant pool;
- confirmation bias, which causes us to use data and information that conforms with our beliefs and to disregard any that doesn't; and
- availability bias, which causes us to grab readily available data to make decisions rather than use all available and relevant data, which will take longer to analyse.

#### Unconscious bias in the STEM context

Our survey<sup>18</sup> found:

- that more than 9 out of 10 respondents had experienced in-group bias in the workplace;
- that well over half had experienced confirmation bias;
- 7 out of 10 respondents agreed or strongly agreed that unconscious bias was embedded in their organisation's workplace culture;
- more than 6 out of 10 agreed or strongly agreed that unconscious bias had negatively impacted their career advancement;
- over 7 out of 10 agreed or strongly agreed that unconscious bias had negatively impacted their opportunities to network with professional colleagues;
- 6 out of 10 agreed or strongly agreed that unconscious bias had negatively impacted their earnings; and
- almost 6 out of 10 agreed or strongly agreed that unconscious bias had negatively impacted their promotion opportunities.

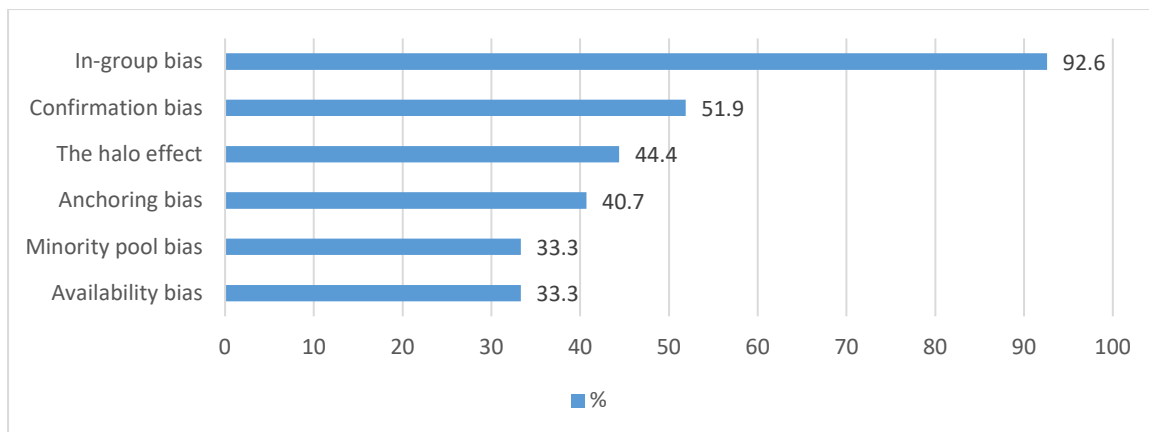
#### What forms of unconscious bias are most prevalent?

In our survey, we asked female professionals about the existence or prevalence of the various forms of unconscious bias as defined by Mark Toner. The results were as follows:

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<sup>17</sup> ATSE Focus magazine, Feb. 2016, p.5

<sup>18</sup> Professionals Australia (2016). Unconscious bias series, Unconscious gender bias in the STEM workforce.



Respondents reported the prevalence of the various forms of unconscious bias as follows:

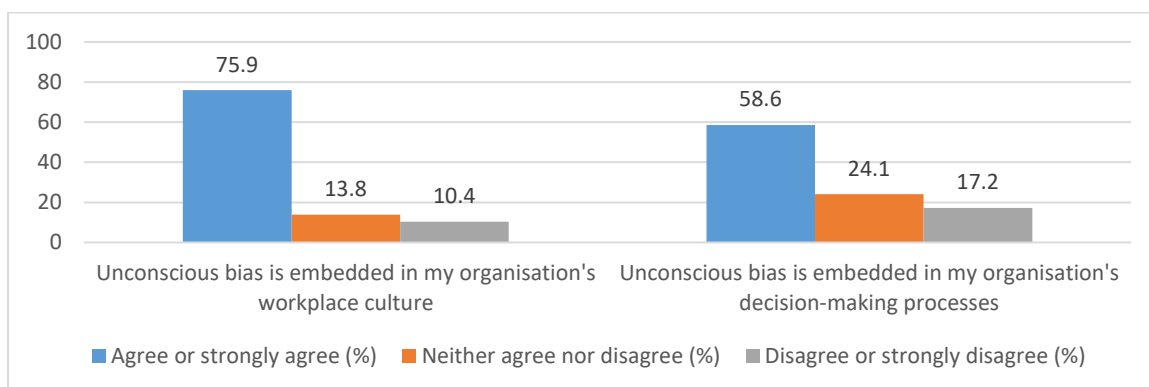
- more than 9 out of 10 respondents reported that they had experienced in-group bias in the workplace;
- well over half said they had experienced confirmation bias;
- over 4 out of 10 had experienced the halo effect;
- over 4 out of 10 had experienced anchoring bias;
- 1 in 3 had experienced minority pool bias; and
- 1 in 3 had experienced availability bias.

While the number of respondents was limited, these figures are nonetheless significant in that they provide evidence of respondents' perceptions of the prevalence of the particular forms of unconscious bias relative to other forms.

We can draw the conclusion that in-group bias was perceived as by far the most prevalent form of unconscious bias.

#### How is unconscious bias manifested in the workplace?

We asked respondents about their perceptions of how unconscious bias was manifested in their workplace.

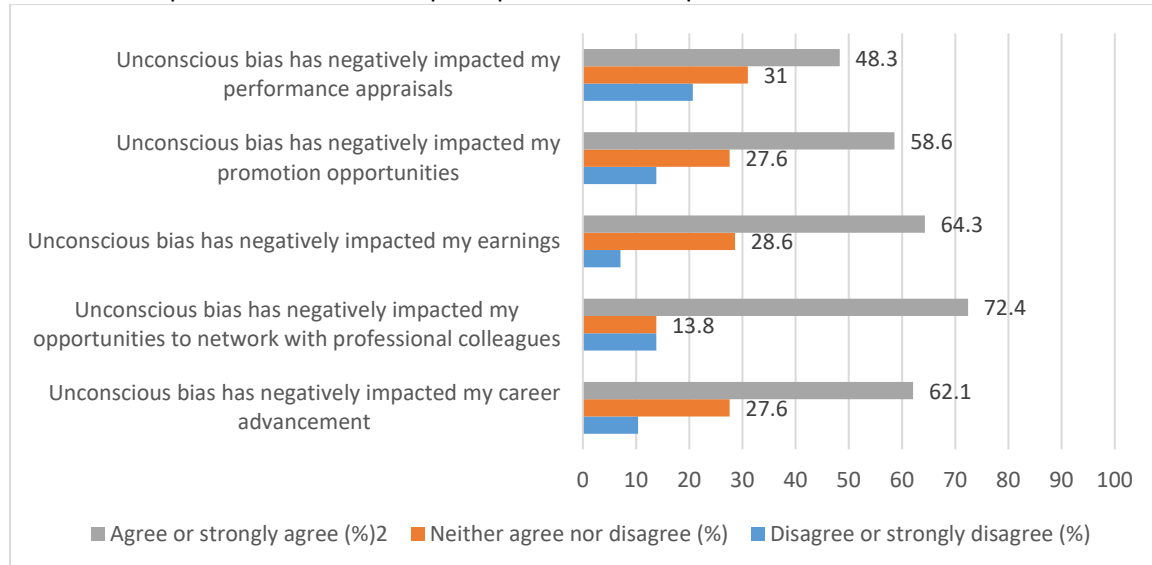


Survey responses were as follows:

- over 7 out of 10 female members agreed or strongly agreed that unconscious bias was embedded in their organisation's workplace culture; and
- almost 6 out of 10 agreed or strongly agreed that unconscious bias was embedded in their organisation's decision-making processes.

## What are the effects of unconscious bias?

We asked respondents about their perceptions of the impacts of unconscious bias on their careers.



Their responses were as follows:

- 6 out of 10 agreed or strongly agreed that unconscious bias had negatively impacted their career advancement;
- 7 out of 10 agreed or strongly agreed that unconscious bias had negatively impacted their opportunities to network with professional colleagues;
- 6 out of 10 agreed or strongly agreed that unconscious bias had negatively impacted their earnings;
- Almost 6 out of 10 agreed or strongly agreed that unconscious bias had negatively impacted their promotion opportunities; and
- Almost half agreed or strongly agreed that unconscious bias had negatively impacted performance appraisal.

## What did respondents tell us about unconscious bias?

### *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 data showed that in-group bias can operate not only in terms of men being more comfortable with other men, but also by women being more comfortable with other women, and particular types of women (for example, women with family responsibilities) being more comfortable with those similar to themselves. The comments confirm that in-group bias is an issue for women in the STEM professions but that that the bias goes beyond gender bias.

### **Respondents' comments:**

- I work in an environment where people like to be with people who think like them. They are concerned about cultural fit but this actually results in similar people being recruited and promoted.
- I work with men and I have noticed that they don't feel comfortable working with me because I don't have the same interest such as sports, cars, body building, etc.
- Engineers pick male engineers and they employ themselves.
- In a situation where a technician was explaining the operation of a scanning electron microscope to a group of scientists, the men were on one side of the room and the women on the other. He directed his talk only to the men.
- I am the only woman civil engineer as a technical specialist in a group, and not a part of boy's club. I can't drink eat and smoke with them as I don't practice such habits.
- I once had an engineering manager say when introducing two new Chief Engineers who were both called John that appointing Johns was his new policy. He was surprised and horrified when I asked if I should change my name. A later

boss appointed a farmer's son as Chief like himself. I have not been considered for promotion since I topped out as Principal Engineer 20 years ago.

- In management, Anglo-Saxon males are preferred.
- Males were in general seen to be more competent at engineering when I did my professional experience (and in courses).
- I was told in a performance review that I needed to consult less and that it was perhaps because I was a female I didn't know how to do this.
- I have noticed that both men and women are affected by in-group bias where managers don't choose the most competent employee for promotion, but the employee that is most similar to themselves.
- As I was one of only two women in a technical group, we were made to do all the administration tasks and thought not capable of doing the technical tasks.
- I've found that men don't like women who are more intelligent than them, who speak their mind and are strong and who aren't part of a boy's club.
- In an all-female environment, I was discriminated against and ridiculed for not favouring time with my family over spending happy hour with my female colleagues.
- [It is common for] people in meetings to not consider your view because you are a female.

### *The halo effect*

*(which causes us to allow the physical and other characteristics of others to affect our judgement of their other qualities, for example, physically attractive people are more trustworthy)*

The data showed that both men and women can prefer to hire attractive people so gender bias can operate both ways. With only female respondents, the results from this survey do not allow for speculation about the comparative prevalence of the halo effect for males and females - but the data confirms that the halo effect negatively impacts women in the STEM professions.

#### **Respondents' comments:**

- [There's an assumption that] pretty, fashionable female engineers can't really be hard core engineers.
- A lot of scientists like cute student girls and are more likely to offer them assistance, or opportunities. Once that time period has passed, you are less likely to be offered any roles in anything.
- Men like attractive women; women like to employ attractive men. This means sometimes you miss out.

### *Anchoring bias*

*(which causes us to rely too much on an irrelevant piece of data or belief, for instance, one of the interviewers had previously hired a woman and it turned out badly)*

#### **Respondents' comments:**

- I took over a job on an industrial site from an obviously disliked female employee and on first meeting an operator being told "not another f\*\*king woman. are you here to nag us as well?". And another did not speak to me for several months as he has disliked the previous female worker.
- I have had a manager only hire women because he wants a "work wife"- clearly not based on their skills.
- In field sampling, my male boss said that males were better because they could pee on the run.

### *Minority pool bias*

*(which causes interviewers to evaluate more negatively applicants who comprise a minority of the applicant/student pool)*

#### **Respondent's comment:**

- *While studying civil engineering, I had a lecturer say that the females in the group should not help put up scaffolding, but only hand out bolts, and referred to females as "nut girls". I found this very offensive, and demanded to help put up the scaffolding. He had presumably based this on prior prejudices about female capabilities.*

### Confirmation bias

(which causes us to use data and information that confirms with our beliefs and to disregard any that doesn't)

#### Respondents' comments:

- *As HR Manager, I reported to a CEO who consistently drew on the data that confirmed his view of not enabling managers (mainly women) to work part time.*
- *When a male co-worker wasn't doing the right thing and I told my manager it was disregarded. I had proof but it wasn't looked at, as the male co-worker's word was worth more than my proof.*
- *[I've been in situations where] shock was exhibited when women engineers actually know more than a male.*

### Availability bias

(which causes us to grab readily available data to make decisions rather than use all available and relevant data, which will take longer to analyse)

#### Respondents' comments:

- *After a new manager decided on the basis of an unfinished report and a capex application written by a previous manager that I was incompetent, all my actions were interpreted through that lens. I never had a chance.*
- *We had a vacancy coming up on the board of the organisation. When I asked a senior member of the team if we had a gender quota, he said he was responsible for getting the last woman hired and that she did not spend enough time on the board, insinuating that all women on boards would be like that.*
- *Yes, a Manager who did not select me to be in his team avoided all female promotion as they would be 'having babies and only wanting to work part-time in the future'.*

According to unconscious gender bias expert Mark Toner, there is little evidence that creating an awareness of an unconscious belief or association is sufficient to address or mitigate it. Dealing with unconscious bias is complex and different biases require different interventions to address the causes across the areas of recruitment, interviewing, hiring, promotion and performance review. There are a range of interventions that will assist:

1. training, while not a complete solution, has an important role to play including helping people identify their unconscious biases and understand how they impact their organisational decision-making;
2. implementing reflective practices such as, for example, recruitment panels discussing their own biases before interviewing candidates, having to hand a description of biases that impact recruitment, their causes and their mitigation, and discussing ways for the panel to mitigate their biases can also play an important role<sup>19</sup>; and
3. the key change to organisational practices needed is accountability in decision-making. It is critical that proper monitoring becomes part of people management processes to ensure possible patterns of bias are identified, investigated and addressed.

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<sup>19</sup> Toner, Mark (2016). Gender Issues in Business. Available at [http://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwjY0cCdodvNAhXCKJQKHxKgA\\_YQFgghMAE&url=http%3A%2F%2Fwww.gendermatters.com.au%2FLiteratureRetrieval.aspx%3FID%3D207586&usg=AFQjCNFIRQLpjLbA0jmlk3i\\_G3gVfVCJEq&sig2=VUs53NziXIKSUNgZzLrdnA](http://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0ahUKEwjY0cCdodvNAhXCKJQKHxKgA_YQFgghMAE&url=http%3A%2F%2Fwww.gendermatters.com.au%2FLiteratureRetrieval.aspx%3FID%3D207586&usg=AFQjCNFIRQLpjLbA0jmlk3i_G3gVfVCJEq&sig2=VUs53NziXIKSUNgZzLrdnA).

### What are the remedies?

Despite demand for STEM skills and the difficulties that employers face in recruiting and retaining key STEM staff, Professionals Australia research confirms that strategies to attract, retain and promote women professionals may be hampered by cultural barriers, inflexible working practices, systemic bias in advancement strategies and inequities in remuneration. While women have made considerable inroads into STEM fields over the past three decades, workplace practices have been slow to catch up.

Many of the problems raised by respondents to the survey are core workplace, cultural and industrial issues which must be addressed to ensure that all employees are able to reach their professional potential. Flexibility in hours and carer and parental leave provisions are conditions that in practice are particularly important for female professionals, with women continuing to undertake the majority of carer responsibilities within their families. As long as flexibility and work/life balance provisions operate to entrench systemic bias, and while workplace culture continues to affect employees' ability to access these core working conditions, the types of cultural problems highlighted by respondents to this survey will continue to undermine the attraction and retention of women in STEM professions.

This submission outlines how highly-educated professional women continue to earn less than their male counterparts mid-career, and continue to be frustrated by a functional lack of access to core conditions that may be instrumental in promoting female retention and advancement. In highlighting these issues and workplace practices, Professionals Australia aims to contribute to the national discussion around addressing the issues that contribute to horizontal and vertical gender segregation.

We hope this report encourages policy-makers and employers to look at ways to tackle gender segregation by looking at the need to address entrenched structural bias in work practices, access to flexible work arrangements, cultural impediments to women's access to advancement and the gender pay gap in STEM at the workplace level. We urge decision-makers to consider policies that will support the recruitment and retention of women in male-dominated technical professions, improve the workforce participation rate of women in STEM fields and encourage employers to bring about the changes needed to become contemporary family-friendly and equitable workplaces that maximise the diversity advantage.

Addressing the complexities of gender segregation in the STEM professions is not only a matter of justice and equity. Tackling the issues will be fundamental to providing for the optimal attraction, development and retention of women in the STEM workforce, and to fully realising Australia's productivity potential and innovative capability into the future.

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### Attachments

We have attached to this submission:

- The Slower Track: Women in the STEM Professions Survey Report, Professionals Australia, 2015; and
- Unconscious bias in the STEM Professions, Professionals Australia, 2015.