

**Women in the Scientific Research Workforce
ARC Linkage Project
Interim Report 2
July 2013**

In Australia little is known about the careers of women in science outside the academy. This research project funded by the ARC and industry partners, the Bio21 cluster, RACI and Science and Technology Australia, seeks to understand more about the careers of women and men in the scientific research workforce, to inform both workforce planning and policy making in this area. Research in the USA has investigated why so many qualified women in the sciences, engineering and technology fields purportedly 'quit' their careers and proposed some solutions.

In 2012 the project commissioned analysis from ACER of pertinent data from three large data sets: the 2011 census, the National Research Student Survey, and the DIISRTE higher education staff and student data collection for 2011.

An online survey of the target population was piloted by the project research team and then conducted from November 2012 to end of February 2013, distributed via the industry partners and participant referrals.

The current phase of empirical work involves focus groups across Australian locations in which respondents were clustered to obtain richer detail on issues flagged from the survey responses and large data analysis, prior to work on a toolkit.

Some interim findings include:

1. From large data-set analysis:

From Census analysis:

- In 2011 there were 22,315 individuals with postgraduate qualifications in chemistry and biology of which 10,622 were female (47.6%). The numbers qualified have grown 27 per cent since 2006.
- Of these:
 - Over 80% live in capital cities
 - 55.7% were born outside Australia (cf 34% of total population) – this percentage is higher in younger than in older age groups
- In 2011 the participation rate in the workforce of this group was 76.1% for women and 77.2% for men.
- 26.8% of women (10% of men) in the public sector work part-time; and 32.7% of women (18.4% of men) in the private sector.
- Women are substantially less likely to be in the highest income category, and men reach higher income categories at a younger age.

From Postgraduate Students 2010 destinations survey:

- The NRSS is a national survey of Higher Degree Research students undertaken by ACER in 2010. There were 11,710 responses received and 695 of these were females undertaking studies in the fields of biology (558) and chemical sciences (137). The vast majority were full-time students and one in five were international.
- 64% ideally wanted to go directly into an academic position, but numbers considering a research career outside the academy increased as they got closer to graduation.

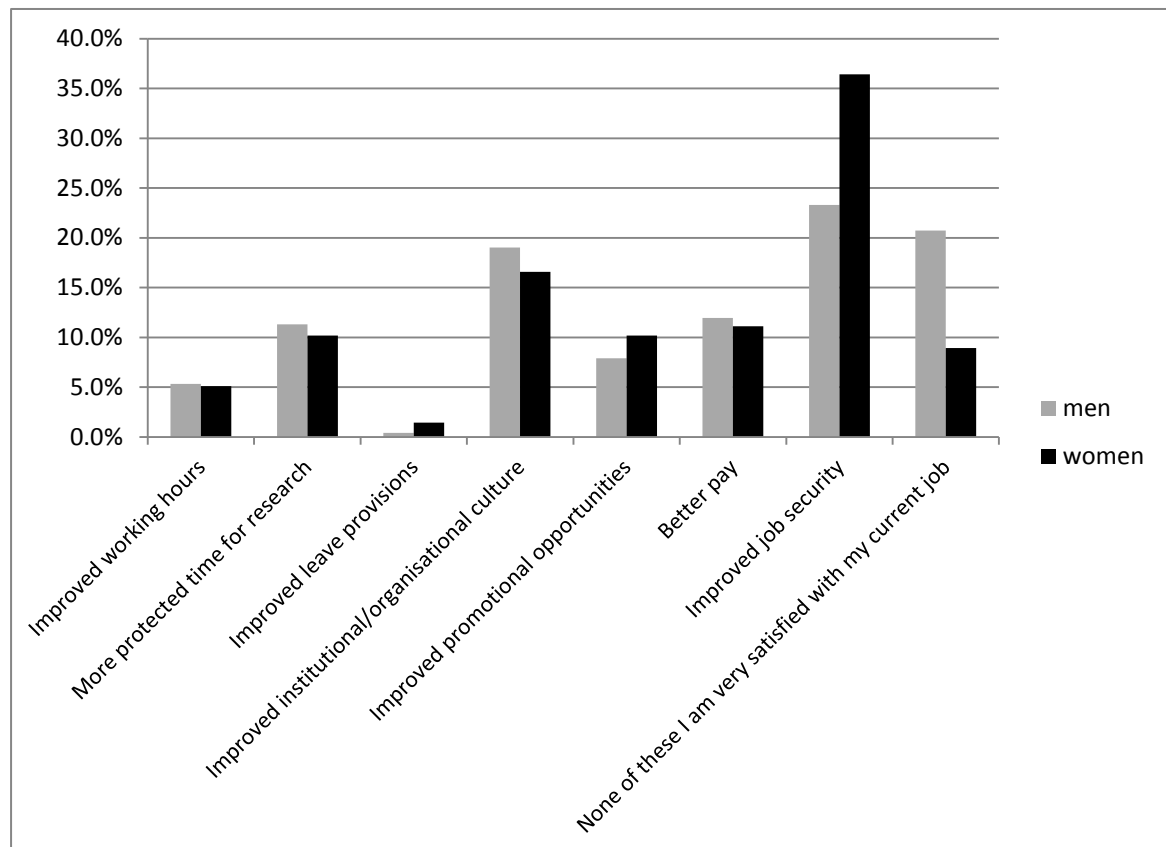
2. Survey overview

During the period mid November 2012 to 28 February 2013, the on-line survey was distributed via the industry partners to their members and related organisations. The survey was also distributed amongst staff at CSIRO. Survey recipients were asked to forward the survey onto colleagues qualified in the biological sciences and chemistry related industries, but no longer working in the field.

Survey highlights:

- The survey received 1298 usable responses, 48 per cent men, 52 per cent women.
- In line with the age profiles identified in the census data, the majority of women were under 40 and the majority of men were over 40 years of age.
- 63 per cent of respondents hold a PhD, a further eight per cent were studying for a PhD.
- Of all respondents 70 per cent reported that they were currently working in a research role and 30 per cent were not currently working in a research role.
- For those not working in a research role the reasons given were either ‘lack of positions in my field’, or ‘could not see a future in research in my field’. Men formed 53 per cent of the group not currently working in research.
- Key gender differences emerged – women were more likely to be working in biological sciences, be employed on fixed term contracts and be working in a research role in either a research institute or university. Men were more likely to be working in the chemical sciences, and be employed on continuing contracts, working in the university or private sector.
- Of those who have left the research workforce a little over a third say that their knowledge and skills are partially utilised, and a quarter agree that their knowledge and skills are fully utilised, in their current (non-research) position. The results by gender are very similar. This is in contrast with respondents who are currently working in a research role; this group report much higher levels of knowledge and skills utilisation in their current position.
- The survey asked what one factor would make a difference to job satisfaction:

If there was one factor you could change that would make a major difference to your levels of job satisfaction what would it be?



These gender differences will be explored in single sex and mixed focus groups to examine decision making at critical career junctures, career planning and expectations.

Survey participant quotes:

While on maternity leave my replacement was unsuccessful in obtaining any grants...now I am back but have no funding! I shouldn't have to spend my maternity leave applying for funding so that I can have a job when I get back - this is how inequality starts. I feel like my career has had a huge disruption and I don't see how I can get it back on track now unless I am willing to compromise on my family time. It's really all getting a bit too hard...no wonder women leave science.

I just hope this survey gets to some of those people that have already been squeezed out of their science career. I can give plenty of anecdotes of highly qualified, capable scientists that wish to be doing research but can't get jobs. I will try and forward this survey to a few friends including one working in the deli at Coles. She has a PhD in cell biology. I wish I did medicine. At least those researchers can fall back on their 6-figure day jobs. Pure scientists are pretty screwed in terms of fall-back career options. Try planning to have a family or taking a loan for a house in this environment!

The further up the ladder you move, the more demoralising a career in science seems to become, with continual fights for funding, pressure from employers to do research with 'public appeal' and an overload of administrative responsibility.

I am sick and tired of short-term contracts based entirely on limited industry/ARC funding, and the expectations that you will put in 'whatever hours it takes' to get things done.

3. Focus Groups

We have conducted four focus groups in Melbourne and one in Canberra, and two each in Sydney and Brisbane. To date there have been 33 participants, 16 women and 17 men; 18 of the participants are currently in a research role and 15 have left the scientific research workforce and were in a variety of roles including consulting, private industry, legal, and the public sector. With the consent of participants discussions have been recorded and transcribed. Issues flagged by participants include: their experiences of careers and workplaces outside universities and the adequacy or otherwise of their PhD as preparation; their experience of the gendered culture of the workplace; and their experiences and concerns relating to job security and job opportunity in the actual economic conditions for industry in Australia. A critical emergent theme is that of having little understanding of research career pathways and modes of employment at the commencement of post-graduate studies and belated realisation of the nature of the research workforce conditions of employment.

4. Next Steps

In addition to detailed regression analysis of the survey data the focus group transcripts will be the subject of close textual analysis. Key issues identified will then be the focus of a 'Diversity Advantage Toolkit' for developing and sustaining diversity, designed to be transferable across professional and industry boundaries.

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