

Changing the culture: A first-hand example

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In 1998, I joined the Department of Chemistry at Case Western Reserve University (CWRU) in the USA as a new Assistant Professor. Professor Mary Barkley and I, both laser spectroscopists, were hired to build a new area of strength. That we were the first women hired as academic staff in the Chemistry Department was such a remarkable event that it made the headlines in the campus newspaper (Figure 1). Today, there are six women with primary academic appointments in CWRU's Department of Chemistry, and Barkley is the Department Chair. The fact that hiring a woman in chemistry is no longer headline material is due, in part, to a pioneering programme called ACES (Academic Careers in Engineering & Science).

ACES was started in 2003 with the ambitious goal of transforming the institutional culture of CWRU to achieve gender equity across the campus, particularly in the challenging STEM¹ faculties. Chemistry was one of 31 pilot departments selected for intense participation in ACES initiatives. One of the key factors identified as a barrier to the advancement of women in STEM fields was underlying gender bias, and many features of the ACES programme successfully targeted that critical issue. This article gives a first-hand perspective on what it was like to be a part of this intense effort to level the playing field for women in academia.

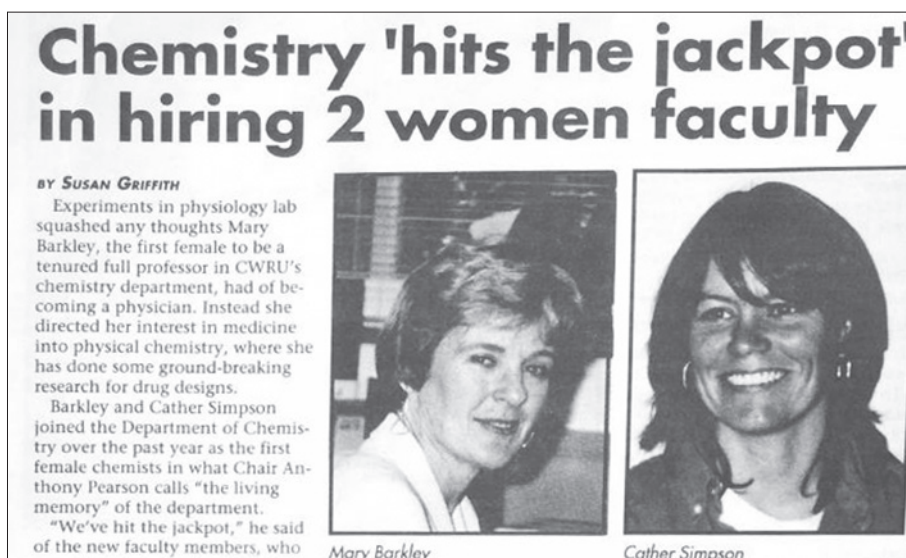
¹ STEM: Science, Technology, Engineering and Mathematics.

Figure 1. The noteworthy event of hiring women faculty in 1998.

Gender schemas and unconscious gender bias are now very well established, as is the fact that we all have them to some degree. These are the underlying assumptions about people that lead both men and women to be surprised when the cardiac surgeon is a woman and the nurse is a man. They impact our decision making and our assessments in ways that sometimes surprise us. I will not discuss gender bias in any detail here, but refer the interested reader to *Why So Slow*, a very knowledgeable and readable book on the subject by Virginia Valian.

The problem with bias

I was not surprised to find myself the first female Assistant Professor of Chemistry when I arrived at CWRU. I knew the history going in. However, I was surprised that being female in a science career was still noteworthy in 1998. And I was very unprepared for how much being a woman actually mattered.



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In 2000, Prof. Nancy Hopkins from MIT spoke at CWRU. The previous year, she had published a study that demonstrated previously unrecognised gender inequivalence at MIT², and that is now largely credited with revitalising efforts to level the playing field for women in academia. As I sat in the audience, I was powerfully struck by her observation that it had taken a lot of data for her to really believe that her career had been adversely affected by her gender. That was true for me as well, and I was only beginning to recognise it in my third year as an Assistant Professor.

Like many young women of my generation, I believed that the gender battles had already been won. In retrospect, the belief that there is a level playing field for men and women is foolish – my PhD and postdoctoral years were littered with events, small and large, that should have clued me in and prepared me for the challenges of being a woman in a STEM field. Being female in science affects everything from day-to-day conversations with colleagues to success in the activities and achievements of an academic science career. The idea that the science and engineering world does not treat men and women alike is difficult to acknowledge, however.

I had been there before. I was the only girl in the entire senior baseball league in my teens³ and I won a coveted starting position at second base in the infield. Despite the fact that there were frequent choruses of ‘get that b**** off the field’ from some of the parents, and that I was the only girl, my teammates and I actively maintained that there was no bias against girls in that league. We would have felt diminished, somehow, to admit there might be. The boys’ achievements would have been undermined by having favored status, and I would have had to face prospect of being the token girl.

Just this year, 2014, the Fields Medal was won by a woman for the first time since the award was established in 1936.⁴ Which inference feels more uncomfortable: that there may be gender bias in deciding the top mathematics awards? that this might be the first time that a woman really deserved to win one of the total of 55 Fields Medals awarded over the years? or that Maryam Mirzakhani had an advantage because the International Mathematical Union needed a woman to win?

These anecdotes point to one of the more significant challenges to levelling the playing field in any competitive arena: the participants can have a very strong vested interest in its already being level. We really do not want to believe there is bias, and we certainly do not want to believe that we ourselves exhibit it. It took people like Nancy Hopkins, Virginia Valian, Bernice Sandler, Debra Rolison and many others to help people realise that while overt, aggressive sexism is not a common problem any more, women in STEM fields suffer the consequences of gender bias. At CWRU, it was the ACES programme that helped us to recognise the gender bias and gave academic staff the tools to combat it.

² ‘A Study on the Status of Women Faculty in Science at MIT’ with introductory comments and a list of the members of the committees that performed the study and recommended changes, the first of which Nancy Hopkins chaired, can be found at: <http://web.mit.edu/fnl/women/women.html> (last accessed 4 Nov 2014).

³ Equivalent to the U15 league in the New Zealand baseball system.

⁴ The official website for the Fields Medal is: <http://www.mathunion.org/general/prizes/2014>. The Guardian published an article about Maryam Mirzakhani: www.theguardian.com/science/2014/aug/13/fields-medal-mathematics-prize-woman-maryam-mirzakhani (last accessed 4 Nov 2014).

Academic Careers in Engineering and Sciences (ACES) at CWRU

The National Science Foundation’s ADVANCE programme provided the majority of the funding for CWRU’s ACES project, in the form of a \$3.5M (USD), 5-year, Institutional Transformation award. NSF-ADVANCE has awarded over \$130M (USD) to tertiary education institutions in the US to ‘increase the representation and advancement of women in academic science and engineering careers, thereby contributing to the development of a more diverse science and engineering workforce.’⁵ This extraordinary programme started in 2001, and still going strong today⁶, has these goals:

- (1) to develop systemic approaches to increase the representation and advancement of women in academic STEM careers;
- (2) to develop innovative and sustainable ways to promote gender equity in the STEM academic workforce; and
- (3) to contribute to the development of a more diverse science and engineering workforce.⁷

NSF-ADVANCE particularly focuses on the career success of female academic staff; it does not provide support for the recruitment, retention or increased success of female students in undergraduate or postgraduate programmes.

In 2003, a team of top researchers from engineering, science and the business school, led by Lynn Singer, Deputy Provost and Professor of Environmental Health Sciences, Pediatrics and Psychiatry, was responsible for CWRU’s being the first private university ever to be awarded an NSF-ADVANCE grant, and the ACES programme began. The ACES initiative at CWRU articulated an ambitious goal to ‘promote a culture of equity, participation, openness and accountability at CWRU’ with targeted positive impact at all three levels of the university academic staff: the university leadership, the faculty/school, and campus-wide. The team sought to achieve a 20% increase over baseline in the number of women academic staff in science and engineering with four primary activities: targeted recruitment at multiple levels, increased advancement and retention, a positive change in the institutional climate, and training and development of the academic staff for men and women at all levels. Implementation was intense, and involved a combination of accountability at the dean level, executive coaching for university, school and department leadership and for female academics, training and guidance for searching, hiring and promotion of academic staff, workshops and focus groups for all academic staff, male and female, and other initiatives.

The ACES programme was successful in increasing the percentage of female tenure-track academics in the Faculties of Science and Engineering, though the increase in numbers was not dramatic. Singer reflects now that she had hoped to solve the problem of under-representation by women in the School of

⁵ Information about the NSF’s ADVANCE programme can be found at the website: <http://www.nsf.gov/crssprgm/advance/> and other links from there (last accessed 5 Nov 2014).

⁶ A new round of Institutional Transformation and Institutional Transformation Catalyst awards was just made in 2014, to 9 universities. Links to these can be found at: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383 (last accessed 5 Nov 2014).

⁷ These goals are formally articulated at: http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5383 (last accessed 5 Nov 2014).

Medicine, and ‘ten years later [it] is clearly not solved.’ Still, she wonders ‘what would have happened had we not done anything.’

Equity in departmental leadership, on the other hand – in the form of departmental chair roles and endowed chairs held by women – improved much more dramatically in both science and engineering. For Singer, the ‘significant advances in the percentage of women department chairs’ was one of the most impressive successes of ACES. Among the most positive outcomes for her was ‘inspiring women faculty to take on leadership roles and even seek them.’

New policies implemented university-wide include improved paid parental leave, partner (dual career) hiring policies, and domestic partner benefits. Several new permanent positions and programmes aimed at continued improvement in the climate for women and underrepresented groups, including a Vice President of Diversity, Inclusion and Equal Opportunity, were created from ACES. ‘A transformed climate and greater success in promotion and tenure for women faculty’ is a clear success of ACES, according to principal investigator Professor Diana Bilimoria, who has written about ACES in several papers, book chapters and a book *Gender Equity in Science and Engineering: Advancing Change in Higher Education*.⁸ Clearly, the ACES programme was a success, and in 2008, at the end of the grant, many of the new initiatives were institutionalised at CWRU in a programme called ACES+.⁹ Now the challenge at CWRU is to continue to fund the programme now that the NSF-ADVANCE grant period is over. In retrospect, Singer wishes she had raised endowment funds for the longer term.

ACES prevents the death by a thousand small cuts

By the time ACES started at CWRU, five years after I arrived, I had been forced to admit that the playing field was not level in science, and I was losing my sense of humour about it. A postdoctoral fellow balked at being asked to give a group meeting talk because he ‘shouldn’t have to be told what to do by a woman.’ A student in the first class I taught at CWRU had answered a final examination question with some seriously hardcore pornography. One senior colleague had adopted the rather patronising habit of rubbing me on the head in the hallways as a greeting. Mary Barkley was assigned as my mentor, because we are both women. I had been asked out on dates several times after my presentations at conferences, once by a very eminent researcher in my field after he had spent 20 minutes in discussion about my research; this spurred discussions with male peers about how undermining it could be – they expressed puzzlement about why I would prefer for people to come to my talks for the science.

When women quit academic jobs in STEM fields today, I call it death by a thousand small cuts. Open, overt sexism is no longer tolerated, in the main. What is left, then, are these ‘papercut’ instances of bias. Each individual event like the ones

described above is relatively short and sharp, but too minor to precipitate a life-changing response. I fired the postdoc, with cause, and the porn-student got into heaps of trouble. My colleague stopped patting me on the head when I asked him to. Barkley and I maintain a very positive relationship, though we both insisted at the time that a mentoring relationship should be based on something other than common sex organs. The eminent researcher did not hold a grudge after I declined his invitation – he became a useful advisor and promoted my career in numerous ways. However, by 2003, the accumulation of my ‘papercuts’ and those I witnessed frequently happening to others were making me frustrated.

Then ACES arrived. The ACES programme showed me how to identify and understand all of these sorts of experiences and how to combat the unconscious (and sometimes conscious) bias that often underlies them. ACES led me to a firm belief that a positive transformation of the institutional culture of STEM fields eventually could make the ‘papercut’ events every bit as rare as the overt sexism that characterised the previous generations’ experiences.

What worked well?

Rather than give an exhaustive description of ACES initiatives, activities and events, I will describe some of my favourite parts of the ACES programme more anecdotally. A complete description of ACES can be found online (reference 9), and programmes at other US institutions designed to achieve similar goals can be found through reference 5.

At CWRU, Chemistry was chosen as a pilot department for the ACES programme, and the experience was very intense. Workshops and focus groups were held for women, men and mixed-gender groups of academics, and we were all exposed to ideas about schemas and unconscious bias. Initially, this was quite challenging and disruptive, and the climate got worse in my department before it got better. It was the same resistance that my teenage baseball team exhibited towards admitting that there might be a disadvantage to being female. Several of my male colleagues grew quite defensive about attributing any part of their success to a gender advantage. Everyone, including me, was surprised and dismayed when we began to identify gender bias in our actions and thoughts that had previously been unconscious.

The key, though, is that we were talking. The benefits of these many, many discussions soon became apparent. Women from across the university met and shared stories – and solutions. The sense of validation for many of us was palpable – we were not imagining things, most men did not experience daily ‘papercuts’ like we did, and it is something that we, the university and the STEM community should work to fix.

The workshops, seminars and training also eventually led to a much wider recognition of the problem; we all began to ‘out’ these unconscious biases and behaviour, men and women alike. We all began to count interruptions, because we learned that men tend to interrupt women in professional settings more than the other way around. Similarly, we all noticed that people got more perturbed when women interrupted. At one point in a department meeting just before I left CWRU to move to the University of Auckland, I made a suggestion to the group that was largely ignored. A few minutes later, one of my colleagues brought the suggestion up as a good idea that we should discuss further, but he attributed it to the male colleague sitting next to

⁸ Bilimoria, Diana; Liang, Xiangfen 2011. *Gender Equity in Science and Engineering: Advancing Change in Higher Education*. Routledge Studies in Management, Organizations and Society. Routledge, Taylor & Francis Group.

⁹ The details of the ACES programme at CWRU, the team of people involved, the results, and the continued initiatives through ACES+ are available online at: <http://www.case.edu/admin/aces/> (last accessed 5 Nov 2014).

me. Most professional women in male-dominated fields have experienced this, and it can be exasperating. At that point, ACES was in its third year and just about everyone at the meeting recognised immediately what had happened, and called it out. This is a beautiful example of how knowledge of this sort of bias can defeat it.

I also became quite facile with modern research on gender discrimination, schemas and unconscious bias, and it has served me very well. For example, one year I received a raise that was far too low given my very high level of productivity that year. Because of ACES, I knew my pregnancy that year had probably had an unconscious negative impact on the assessment of my performance. I took some of the published research on this topic to the chair of my department, and he re-evaluated my record and I received a larger raise. My now extensive network and knowledge of the literature on gender bias has its roots in the ACES programme.

One place where unconscious gender bias can have a profound impact is in hiring. The ACES programme required that our hiring processes be facilitated by someone trained in recognising gender bias who would attend all of the meetings and interviews of candidates. This ‘meddling’ was not well received – many of my colleagues and I thought it unnecessary and intrusive. We were wrong.

I sat on a hiring committee that was discussing which of two candidates would be offered a final interview slot. One candidate had several research ideas that seemed to the committee to be scattered, though we thought she would probably be good in the first year chemistry curriculum. The second candidate seemed more focused, and had a clear back-up plan of alternative research projects if his first one did not get funded. He seemed to be an excellent candidate for our more advanced courses. At that point, the external ACES facilitator asked a few questions: each of the candidates had given us five related ideas for research – why was one ‘scattered’ and the other perceived as a good back-up plan? Where did the first candidate express an interest in or experience with undergraduate teaching? Didn’t the second candidate say he wanted to teach undergraduates? Which candidate had published more high-profile papers? We reviewed the files and our discussion, could not articulate a reason why one was ‘scattered’ and the other ‘careful planning’, and we had indeed accidentally attributed the second candidate’s interest in undergraduate teaching (a lower status activity than teaching advanced courses) to the female candidate. Our un-

conscious biases were thoroughly exposed, and we were then able to recognise, with some surprise, that the female candidate had also published more high-profile papers. We offered her the interview. I became very optimistic about what ACES could do to transform our institutional culture.

Many of the ACES initiatives involved activities that helped women staff members achieve. I had an executive coach from the CWRU Business School, who helped me learn to present my ideas forcefully and work to achieve positive change, to choose when to say ‘no’ and ‘yes’ to requests, and to maintain my composure in stressful and difficult situations. These and other workplace skills have served me well ever since, and I was pleased to see that ACES+ has retained executive coaching for new women academics. I was also required to have three formal mentors – one in my department, one at CWRU but not in my faculty, and one in my field outside CWRU. ACES required that I be proactive in these relationships, and these eventually became a very useful collection of resources, mentors and advocates. Perhaps more importantly, the experience taught me the value of these networks, how to form them and how to get the most benefit from (and for) them.

Other initiatives were more department-, faculty- and/or university-wide. The leadership training that all department chairs, deans and other members of the senior management team received was remarkably successful. Not only did the university leadership learn to recognise bias and combat it, they also were exposed to effective leadership strategies and tactics. Our department meetings were transformed from wandering discussions and arguments into much more highly structured conversations focused on decisions and outcomes and on achieving the agenda. The decision-making process was much more transparent, and our confidence in each other and in our leadership grew. The training did focus on gender bias, and how it affects the advancement of women, of course. I can still vividly remember discussing a colleague’s tenure case, after receiving tenure and promotion myself. The department chair reminded us that it is common for women’s achievements to be underrated, even by supportive colleagues, and that we should have one more look at our evaluation in that light to make sure that we had not done that. Five years earlier, before being department chair, this same person did not really believe in unconscious gender bias. Now, he was aware of it and reminded us to be on our guard for it. This is how cultures transform.