

CALL FOR CONTRIBUTIONS TO A COLLECTION OF LIFE STORIES

Dropped Futures: Stories of Women in Science and Academia

In 2000 and 2003, Carol Shields and Marjorie Anderson published two highly popular and touching anthologies of women's writing. *Dropped Threads* and *Dropped Threads 2* were collections of non-fiction stories left behind. Stories not told yet requiring a voice so as not to be forgotten. Lessons learned by women to be told to women capturing threads of common experience, understanding, strength, courage and common ground. The stories covered a diversity of experiences and provided a focal point to gather strength by collectively integrating individual stories that were powerful in their own right but even more so when read in the context of the others. All stories were provided by individual authors of their own accord. In some cases, names and places were altered to protect the identity of the authors fearful of retaliation. All stories are true.

The challenges faced by women in science and academia are not new. The trends are consistent and well documented by quantitative data collection and analysis: few women in the natural sciences and engineering faculties, women of lower rank and lesser salaries than their male counterparts, longer time frames to achieve tenure and promotion, fewer women selected for prestigious Chair positions and awards, etc. These are the hard statistics. Emerging from the literature more recently however, are trends relating to the softer statistics: lesser and poorer quality research space, exclusion from networks, and "chilly" climates.

This negative situation has real consequences on the productivity and contribution women can make to the science world. Despite the statistics, their consistency and prevalence, the issues remain and the number of women and female students affected continues to increase. In fact, many women would argue that the situation has actually worsened. In the world of academia where free speech and independent ideas are the cornerstone of the institution, discrimination against women is real. As a scientist this concerns me. As a mentor this concerns me. As a mother this concerns me.

The goal of this anthology of stories is to better identify the issues, the consequences and the potential solutions from the eyes and hearts of women on the academic front lines. Our suffering must be expressed in the hopes of reducing the occurrence for others. Reoccurrence occurs for two reasons; a lack of awareness and a lack of accountability. Perhaps that landmark effort of *Dropped Threads* to capture women's untold stories can also be applied to women in science and academia to raise awareness and to counter the increasing pressures to be silent. When the numbers have done all they can do, perhaps personal accounts that outline consequences and successes will put a human face on the implications of the present system of injustice. Perhaps the statistics are simply not capturing the stories and the real suffering. Suffering matters. It matters to the individual, their families and their contribution to the local

and global arenas of their expertise. It also matters in terms of institutional reputation and the health and safety costs associated with individuals constrained from contributing to their full potential. Finally, if all humanism is removed from the equation, heaven forbid, suffering still matters because it costs money to the institution, the health care system, the legal system, and to the funders of the institution and the research.

The aim of this collection of stories is not to target women against men or women against women. We need to learn from our history. If it was not for the many men who have spoken up and defended me in the midst of my storm I would not be where I am today. Stories can be submitted from women about themselves, women about women; they may also come from men for women.

This is about barriers to women in science and academia. Some of these barriers may also have been experienced. The intent of this collection of stories is to identify common threads. My hope is that the stories will be of interest to those entering the sciences and engineering, to those looking for support and affirmation, and to those in a position of authority with the responsibility to provide a safe and productive working environment.

I hope this anthology will provide women a place to know they are not alone. Perhaps it will serve as an “orientation” for new women entering academia. Perhaps young women need to know the statistics are true and they require appropriate training on how to handle and navigate this world they WILL have to work in and know very little of. Perhaps these stories will bring greater understanding and awareness. Perhaps it will fall on deaf ears. I do know we need to find a better way to understand the stories and the consequences to find real change.

For me, this collection is about survival in the middle of a terrible storm I never expected to be in nor ever asked to be a part of.

The Statistics

Challenges to women in science and engineering have been well documented in North America and internationally dating as far back as ancient Greece (Frize 2009). In early times, women anonymously practiced and published science through male family members or colleagues. Although the ability to practice science and engineering as a woman has dramatically improved, our history is relatively recent; women’s colleges in Cambridge, UK have been entitled to receive university degrees only since 1948 (Frize 2009).

Women have increased their place in academic institutions yet membership in the natural sciences, physical sciences, computer sciences and engineering remain far below an equal abundance with male membership. Female presence is highest at lower academic levels (Assistant Professor) and decreases as rank increases. This fact was most recently quantified by

NSERC (2010) stating that women make up only 12.2% of all Full Professors in the natural science and engineering disciplines versus 27.8% at the Assistant Professor level. Despite an overwhelming number of female undergraduate students in the natural sciences for example, the number progressing through to graduate school and especially to PhD, Post Doctoral and Faculty positions decreases with each increment in training and professional status. NSERC (2010) suggests that retirement of older male faculty members will open the door to more female hiring and slowly increase the representation of females in most natural science and engineering fields. This statement however remains speculative assuming the barrier is access to an “open” position. Certainly, many positions were and are available in Canada through the Canada Research Chairs (CRC) Program (see below) and the hiring of women was and remains far below an equitable distribution both in terms of the number of women hired for available positions and the number of women placed in the higher ranking CRC positions. Based on additional observations of authors (this book), it appears that unless strict equity numbers for targeted disciplines and colleges are put in place and enforced, preferences revert to hiring men. Steinpreis et al., (1999) have documented that if equally qualified male and female candidates apply for an academic position, both men and women are significantly more likely to vote to hire a male applicant versus a female applicant with the same academic record.

In addition to quantifying the numbers of women moving through the academic ranks and the relative disparity with men, there is also significant disparity in wages and the time to attain tenure (Nature 2010, NSERC 2010). Tenure of course, is a permanent, indeterminate faculty position; essentially job security. Why would it take a woman longer to achieve tenure?

There are several possibilities some which have been adequately studied and some which have not. Perhaps woman simply take longer to meet the standards because they are less productive. The findings of Umbach (2006) do not support this hypothesis reporting that the salary gap between women and men in academe persists, even after controlling for variables such as academic rank and number of publications. Findings reported in this book also provide evidence that women of significant productivity, and in some cases higher productivity than their male counterparts, meet tenure standards yet their application process is delayed by procedural inconsistencies. This finding is supported by Moore & Sagaria (1993) who attribute women's status to academic departments' policies and practices that restrict women's success. These authors also suggest that female faculty may take longer to acquire tenure because they are assigned heavier teaching loads or may have more difficulty being appointed to influential committees than their male counterparts. Resources for doing research may be distributed inequitably, or the research done by women may be valued less than that done by men. Inequitable access to “soft support” is discussed below. One final hypothesis is that women do not achieve tenure at the same rates as men because of family responsibilities and raising children which take them from their academic duties and result in lesser productivity over a comparable period of time.

One of the greatest injustices in science and academia is the prevalence of opinion that women cannot be world class teachers and researchers and have a balanced family life including

children (Finkelstein, 1984, Chamberlain, 1988). It has been quantified that women who do achieve tenure are less likely to have children than are men who achieve tenure, across all disciplines. Among women and men who have children early in their academic careers, men are far more successful at earning tenure than are women (Mason and Goulden 2002). Further, not only is the opinion of incompatibility between science and family commonly tabled but its reality is in some cases endorsed. As recent as 2010, female graduate students have been asked to provide their birth control prescriptions to their male supervisors as evidence that they are practicing safe sex and not “jeopardizing” their graduate studies, and the productivity levels of their supervisors, by having children (Dubé, this book).

Excessive work load and an unbalanced lifestyle is one of the most common complaints in employee surveys from academic institutions and is a factor in increasing employee absenteeism and dissatisfaction. The costs to the employer for stress leaves, medical leaves and resignations due to work load are extreme. If tenure is based on maintaining a standard that requires excessive hours of work for a professional-type position (>55 hrs/week), I would suggest that not only is this a failure of human resource departments but also holds relevance to labour laws. The standard was created based on a patriarchal model where men who chose to have families were successful due to the presence of a wife or partner who chose to remain at home and tended to the family responsibilities including children. Not only is this patriarchal model archaic, it is not representative of balance in any form. Despite the limitations of the standards (and they are a limitation if they are restricting the potential of the work force), I predict that an extraordinary number of women exceed the standards and have children yet still achieve tenure at a lesser rate than men.

Regardless of the reasons why women move through the system slower, drop out with increasing rank, and take longer to achieve tenure despite having equal qualifications, if effective and enforceable guidelines for hiring existed in the targeted disciplines, disparities would be lessened. Human Resource departments within academia must do more than lip service to equity numbers and should be held accountable to external agencies that ensure the real stories are not buried in a broader pool of non-targeted statistics. Although quota-based systems are often a source of tokenism, the reality is that without protective quotas in targeted areas for qualified female candidates, they will not be hired. Women are underrepresented in department leadership positions that potentially compound procedural actions. Among Association of American Universities research institutions, approximately nine out of ten department chairs in engineering, mathematics, and physical sciences are men. (Niemeier, D.A., and Gonzalez, C. 2004). Men dominate senior administrative positions at most academic institutions in the fields of natural science and engineering not to mention lead administrative posts in central administration. Thus, quotas are required until the balance of power is resolved. Further, the fact that women are employed at a lesser rank to begin with suggests that hiring criteria based on a curriculum vitae of qualifications and productivity either do not exist, are not followed, or are not enforced. Women also need to better understand their own worth and value and understand that they deserve to negotiate hard and relentlessly to the standard they

deserve. Regardless of the cause, this statistic on wage and rank disparity for women has existed for over 20 years, institutions have failed to rectify the problem, and that statistic is simply unacceptable.

In Europe, the situation is similar to Canada with the proportion of women in science and engineering in higher ranks decreasing and men are on average three times more likely than women to be in Full Professor positions. Women are considerably more likely than men to be in technician jobs (versus “researcher” jobs), despite being similarly qualified and are paid less than their male counterparts. A European Commission on the subject recognizes, *“Promotion of women does not mean treating them in the same way as men. Men’s characteristics, situations and needs are often taken as the norm, and – to have the same opportunities – women are expected to behave like them. Ensuring gender equality means giving equal consideration to the life patterns, needs and interests of both women and men. Gender mainstreaming thus includes also changing the working culture.”*

In a 2006 report by the National Academies of Science, a panel identified the continued questioning of women’s abilities and commitment to an academic career, and a system that claims to reward based on merit but instead rewards traits such as assertiveness that are socially less acceptable for women to possess. This same report encourages trustees, university presidents and provosts to be leaders in changing the culture at their institutions to recruit, retain, and promote women and for deans and department chairs take steps to minimize recruitment, hiring, promotion and granting tenure biases.

What is also unacceptable is the inequitable access of qualified women to prestigious positions. The Canada Research Chairs (CRC) Program, the federal program to stop the Canadian “brain drain”, continues to show statistics limiting female leadership opportunities (NSERC 2010). Tier I Chairs are senior, world class researchers with higher funding, resources, and unlimited duration. Tier II Chairs are researchers 10 years or less out of their PhD, are junior chairs and have the potential to be world class researchers. These positions while allocated to Universities based on their level of certain funding levels require an extensive application process by a candidate that then undergoes a thorough and detailed peer review process to ensure the nominated candidate meets the standards of excellence established by the CRC Program. Funding for the salary of the program originates from the federal CRC Program and the “hosting” institution is required to provide a supportive research environment for the applicant. Tier II CRCs receive ½ of the funding of Tier I CRCs and hold their position for up to 10 years only.

Statistics show that in 2006, women held only 16% of the Tier 1 Chairs and only 27% of the Tier II Chairs. In 2007, out of a total of 780 science and engineering CRCs only 11.5% (90) were female. In 2008, 115 out of 817 (14%) of CRCs were female and only 27 (7.5%) of these were Tier I. The facts: fewer female CRCs overall and even less in the Tier I category with the greatest resources and a commitment into perpetuity. This trend continues to today (NSERC 2010). Although the CRC positions are allocated to the academic institutions on the basis of Tri-council funding levels, it has not been the practice of the CRC Program to track institutional

performance from an equity perspective or to ensure university compliance with commitments made to the CRC. Again, quotas would serve to balance the situation until the real cases of the disparity can be identified and resolved.

A second case in point is the recent Canada Excellence Research Chairs (CERC) competition recently held in 2010. CERCs are “super-chairs” in research recruited from around the world and provided close to 30 million dollars in government and institutional research funding to build a research empire in an area of scientific, social and economic importance to Canada. Sadly and astonishingly, not one of the nineteen CERCs was awarded to female researchers. In fact, of the thirty-six short-listed candidates, none was female. The defence to this has suggested that women simply have not had enough time to reach the same potential as men to meet the “bar of excellence” for consideration. That appears to be a highly circular argument as the reason women have not had the time to acquire similar stature (if it is indeed true), is because of gender biases in the first place. Creating an environment of “super chairs” exclusive to men presents a picture of a presumed obvious; women just do not make the bar. Considering the statistics for the CRC Program existed at the time of the CERC process, it is rather surprising that lessons were not learned.

While the hard numbers speak a story, the numbers that quantify the “soft resources” also show a similar story. Success in teaching and especially research is not solely dependent upon good ideas, excellent research funding, or prolific writing skills. Access to space, administrative support and opportunities are also real “deal breakers” as research programs increase in size, the number of students trained, the extent of large scale collaborative research projects, and with increased research dollars accumulated. Nature (2010) provides several reasons for the on-going disparity between men and women in science including *“accumulating inequities in resources and respect”*, *“women scientists starting their careers in poorly equipped labs with fewer graduate students and less prestigious committees”*, and *“women scientists are less likely to win high-status prizes”*.

Furthermore, *“subtle sexism”* has been reported and has been shown to be *“corrosive to women’s careers”* and *“impair job performance, damage self-esteem and prompt a literal or a figurative withdrawal from the workplace.”* In some cases, “chilly climates” for women develop due to a lack of awareness of the common incivilities that reflect subtle sexism. At scientific meetings it has been observed that women scientists do not get the microphone to speak and, when they do, are interrupted sooner than their male colleagues (Nature 2010).

Sandler and Hall (1986) claimed, based on anecdotal evidence, that the climate for women at many institutions is “chilly.” Although several campuses have conducted studies recently to examine the “chilly climate” for female faculty (e.g., Harassment Task Force of the Ontario Council of Regents, 1992; Johnsurd & Atwater, 1988), they have not used systematically selected samples nor instruments with established, desirable psychometric properties. Research on the quality of the work environment for female faculty has been hindered by the lack of an adequate instrument for measuring the degree of support or hostility of the work setting.

In Conclusion

I wish to use my experience to try and make a difference and, to be honest, to feel I am putting a positive effort into a solution when I know there is a problem, a serious problem, to be fixed. I want your short story on your experience, challenges, consequences and solutions relating to women in science and academia. The stories need not be long (3-6 pages) but told from a perspective that moves readers to read and gives them the desire to understand. Please be as candid and honest as needed. If confidentiality and anonymity is needed, then please advise and your identify will be protected. The intent is to collectively edit the stories and publish a book. I want to know your story so we can together tell the stories to make a difference. I believe it is only together that our voices will influence.

Please submit your stories by the end of August 2011 by email to:

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If you have questions, please contact me at (306) 292-7451.

Kindest Regards



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