A Fine Balance

Women in Science navigating Academia

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Women are underrepresented in academic science, especially at the higher levels of prestige and power

- Why? This question remains interesting even today, and not just in developing countries.
- A very recent editorial in Science: **Leveling the Playing Field** by Marcia McNutt, Editor-in-Chief. 26 July 2013
- There is need for a serious enquiry into the causes behind the low representation as well as low participation of women in many areas of academics, but particularly in the sciences.
These are real issues

• Women’s participation in science is low.

• Representation in scientific bodies, such as faculties or in Science academies, is low.

• Women in decision making positions are few.

• Persistence is low— the *leaky pipeline*
Across the world some questions that have kept cropping up:

- Should women be admitted to science courses? Given science/mathematics degrees? Appointed as professors?
- Do they “take away” jobs from men?
- These issues are relevant even today, and again, not just in India.
However

- Women perform at the highest levels when given the same opportunities and encouragement as men.
- Mathematical abilities are roughly gender independent but performances differ depending on circumstances.
**New Trends in Gender and Mathematics Performance: A Meta-Analysis,**
S M Lindberg, J S Hyde, J L Petersen, M C Linn,

- Meta-analysis of data from 242 studies published between 1990 and 2007, testing 1286350 people. No gender difference, and nearly equal male and female variances.

- In some nations/social groups, girls have reached parity with boys in mathematics performance. This information should be made widely known, to counteract stereotypes about female math inferiority held by gatekeepers such as parents and teachers, and by students themselves.
for Eilidh

I loved your age of wonder: your third and fourth and fifth years spent astonished, widening your eyes at each new trick of the world—and me standing there, solemnly explaining how it was done. The moon and stars, rainbows, photographs, gravity, the birds in the air, the difference between blood and water. In true life? you would say, looking up and I would nod, like some broken-hearted sage, knowing there would be no answers soon to all the big questions that were left, to cruelty and fear, to age and grief and death, and no words either. And you, like me, will sit and shake your head. In true life? Yes, my sweet, strong daughter, I’m afraid there is all this as well, and this is it: true life.
Stereotypes

• Seriously influence competency beliefs (parents/teachers) or (more importantly) self-efficacy
• Have deleterious effects on actual performance
• Can play a role in policy decisions as well as personal decision-making.
What does it take to be a woman scientist in India TODAY?

- Lilavati’s Daughters: The women scientists of India.
- Rather than look either to world history or to our own history for scientific heroines, it was necessary to tell the story as it is …
What did we learn?

• The actual representation of women is probably worse than imagined.

• Less than 10% of Academy fellowships in the sciences. Worse in engineering, better in medicine.

• Less than 5% of all Bhatnagar awardees

• Fewer than 5 Directors of major laboratories.

• Very uneven participation- region and community wise.
There are many common themes that run through the essays

- Parental (and in-law) support.
- Strong role models in schools and colleges, usually female.
- Help during early career, especially for raising children.
- Mentors, senior colleagues.
- Chance.
The Indian scenario today

- The enrolment of women students in schools and colleges is high; level of achievement high.
- However participation of women in research in science is low, presence in high positions in academics is low.
- The science attrition rate increases along the line from school to college to university to careers.
At the national level

• Both social and economic reasons suggest that the participation of women in science in India needs to increase considerably.

• There is important to facilitate ways in which the pursuit of science by women can be effective.

• Important policy decisions therefore need to be taken.
At the national level

• Measures are necessary not just to attract girls to science and engineering, but to keep them there. One must thus create the means to facilitate negotiation of a science career.

• Awareness that it is not impossible to maintain a career/family balance needs to spread to parents, the family and colleagues so that this is an acceptable option.
| Simple measures that are not difficult to implement |
Small things that can make a big difference

- Childcare: A good crèche on every campus.
- Housing: High priority to young couples.
- Proactive hiring policies for helping couples manage dual careers.
And more…

- Encourage and reward excellence shown by women.
- Improved work climate: Gender sensitivity and effective addressing of harassment issues.
- Gender Audits! Institutions should give information on fraction/distribution of women in faculty, students etc.
The *leaky pipeline* survey

- The Indian science community has for long contended with one discomfiting statistic: more than 50 per cent of women with Ph. D’s in science do not make it to research positions in science institutes.

- The reason, as conventional perception had it, was that women scientists were overwhelmed by family responsibilities, particularly after childbirth, and pressured to drop out of research.
The *leaky pipeline* survey

- A database of Ph. D. s (both women and men) who have left science after an advanced degree, namely those whose present profession is not based on their earlier training.

- The survey aims to analyse what helps those who have had successful science careers, and what hinders those who have opted out!
The *leaky pipeline* survey

- The database consists of 1,985 women with a Ph.D. in science, engineering or medicine in the 30 to 60 age group. The survey covered 568 women scientists and 161 men scientists in research.

- The women were divided into three categories: those engaged in research; those in undergraduate teaching, managerial or temporary research posts; and women scientists presently not working.
Surprising findings

- The proverbial “glass ceiling” that cuts short women's careers in science comes not from family, but largely from a systemic bias at the institutional level.

- The majority of unemployed women Ph. Ds’ said they “did not get jobs” (66.7 per cent). “Family reasons” was cited by only 3.3 per cent as the main reason for not working.
Surprising findings

• This lack of job opportunity underlines the need for transparency in the selection procedure at institutions, and also the importance of gender audits. As many as 85 per cent of all women said they successfully balanced work and family, many of them choosing to negotiate “winding career paths” in an attempt to stay on the research track after childbirth.
Surprising findings

• About 13 per cent of women in research had chosen to remain single, compared to just three per cent of their male counterparts.

• This study presents a different picture of the Indian woman scientist — as someone with formidable tenacity and ambition, who ensures she balances career and family, working longer hours than her male counterpart, and who is proactive about keeping herself updated.
For women scientists many aspects of career choice are predicated by

• spousal choices,
• the location of institutes of higher education,
• institutional rules, and
• the constraints imposed by highly specialized institutions.
Administrative reforms

• In today’s scenario, there are many “two-body” problems: Academics married to other academics, and many institutions often discourage linked appointments.

• A real commitment to gender sensibilities is needed, and not just a patriarchal attitude that “facilitates” women.
Institutional location matters

- It is much easier to find positions in different organizations in cities than it is in smaller/rural towns.

- Ancillary facilities are also easier to come by in larger cities and or larger institutions—medical care for oneself and dependents, schooling and other education.

- National priorities and policies need to look at this.
Finally, size does matter

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<td>• It can be difficult to offer two linked positions even when competences are comparable in small institutes.</td>
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<td>• Less desirable for the institution, since it mixes the personal and the professional.</td>
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<td>• An administrator’s nightmare!</td>
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Inclusivity benefits all

- Directly and indirectly, this improves the quality of science and its social relevance.
- Programs to enable re-entry in to a scientific career are all very well, but better if they were not necessary in the first place.
- Make the workplace “life-friendly” by having proactive policies that address some common issues faced by women academics.
Why is this important?

• The diversity of an institution correlates with its vitality, with the new ideas that can come forth, and with its essential character. Gender is one component of such diversity. Academic institutions that are committed to ensure and enable the participation of women at all levels of academics are the richer for it, so measures that can be taken to promote institutional gender balance are important and should be encouraged.

• A corollary, therefore, is that policies and attitudes that suppress or reduce such diversity need to change.
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