
Why is it that very few women manage to reach higher positions in the sciences? Prabha Rani and Shashi Saxena talk to women researchers at Delhi University

Women Researchers In The Sciences



THE study of science has, for many years now, held a position of prestige in schools and colleges. The tone for this was set by national leaders who believed that the creation of a "scientific minded" society was crucial to the development of a modern, technically developed nation. A direct consequence was the importance given to science at school and college levels. Students were allotted their fields of study according to the marks obtained by them. The highest scoring students were given science.

Education today is so structured that the study of science usually takes up more time and energy than that of commerce or arts. This is largely due to the hours a student of science is required to spend in the laboratories.

As a consequence, expectations from students of science have been very high. It is presumed that the energy they spend is not simply to obtain a certificate from the university. They are expected to have a genuine interest in their subject, a desire to extend the frontiers of knowledge in their field.

A large chunk of the girls going in for college education do so because the marriage market today demands that brides have a graduate degree. It would seem that a larger proportion of women students of the arts are

being geared for marriage rather than a vocation. However, in the case of female students of science it is expected that more of them would go in for a career than would girls from arts or commerce.

Despite this higher expectation from female students, the minimal presence of women at prestigious institutions of science is noticeable. This is true of university faculties of science as well.

For instance, in the Delhi University department of botany there is only one woman teacher against 23 men teachers. In the department of chemistry there are three women and 51 men. In physics there is not a single woman lecturer but there are 51 male teachers.

It is significant that the ratio of men students to women students is not as disproportionate as is the ratio of faculty members. The ratio of men to women PhD students in the three departments of botany, chemistry and physics is 39 : 28, 91 : 53 and 202 : 58 respectively. Interestingly, the department of physics which has the widest disparity in male to female students, is also the department with no female member on the faculty.

This report is an attempt to understand why few women manage to reach higher positions in the field of science. We have tried to locate

the social constraints under which women operate and also the factors that are supportive of women.

We interviewed 18 students of Delhi University; 15 of them were women and three were men. We also interviewed one woman lecturer, the only one in the Delhi University department of botany.

Family Support

All the women we spoke to have enjoyed the total and sustained support of their families. The parents of all of them are literate and many of them are graduates. Their desire to educate their daughters goes beyond the desire to fulfil the requirements for the girl to make a good marriage. They are willing to give more, in terms of money and moral support, to help their daughters find some space for themselves in the outside world, beyond their home.

Poornima's father told her: "Study as much as you want, otherwise you will blame me for not educating you." Swati Biswas says her mother wanted all her children to stand on their own feet.

Shirley Thomas' parents continued to support her financially throughout her education. She moved out of Kerala after graduation. She did her postgraduation from Agra and

All photographs accompanying this article are by Maya Chowdhry.

moved to Delhi for research. She has only recently begun receiving financial assistance from an institution.

Malti Narayanan says she would not have joined research if she had not obtained financial assistance, although her parents would have supported her.

Once out of the home and having lived on their own for a couple of years, women take decisions independently and manage to obtain the consent of their parents as well. These are often unconventional decisions. Uttara Datta has completed her PhD dissertation, but she does not intend going back to her parents in Bhubaneswar. She is planning to stay in Delhi to look for a job. This arrangement is accepted by her parents.

The parents of these women are in a way exceptional. They have to face criticism from their immediate kith and kin who constitute their society. As Sanyukta says: "My parents are supportive but we have to face society. For instance when I have to travel alone my relatives do not like it. They blame my parents for sending us for higher education. But my parents think it is better for girls to be self-sufficient."

Choosing Science

All the students appear to have developed an interest in science fairly early in their lives. Good marks in science subjects and the encouragement given by teachers were contributory factors in the development of this initial inclination.

Shirley Thomas, for instance, scored well in chemistry in her predegree course so she chose to do BSc chemistry honours. As Mridula Mittal says: "I think a lot depends on the teachers at that stage. Also, you choose the subject in which you have scored well."

Though interest developed at school may lead women up to



Sanyukta, Ph D scholar in chemistry

graduation, a different set of considerations determines their entry into research. Many of them are led into research by default.

Roma Bhargava's father wanted her to become a medical doctor. That appears to have been one of the reasons for her having taken up science. Some of them appeared for entrance exams for medicine and entered research only when they

failed to get admission into medical college.

Some also deliberately chose to continue research after having initially come into it by default. Bhawani Majumdar, for instance, joined BSc Honours in physics when she failed to get admission into medical college but she decided to stick to physics, and did not appear again for the entrance exam to medical college the

following year.

Some deliberately opted for research. Malti, for instance, went in for research without much self doubt. Her deep involvement with chemistry decided her course of action. Now, she is determined to do research and teach.

Men's reasons for opting for science are not very different from women's. Ashok Kumar says: "I joined science because at that time there was a strange craze for these subjects. Science was something that challenged and fascinated me. So I joined science." While Promod Kumar felt there was more to learn in science, Suresh was just interested in it. Suresh had come to Delhi to appear for the UPSC exam but when he did not qualify, he continued with his research which he had joined in the meantime. He did not appear for the UPSC exam again.

Unwritten Laws

Although male and female students show similar inclinations towards science and their motivations for taking up the subject are similar, women students do work under certain real constraints.

Research students normally spend about eight to 12 hours in the laboratories. Women who are resident on the campus can spend on an average three hours more than a day scholar can. The primary reason is that girls are required to be back home by the time decided upon by their respective families. It could even be an unwritten law that they should be back home "before dark." Some day scholars work from about 9 a.m. to 5 p.m. or 6 p.m. But resident students are not absolutely free either. Sanyukta says: "Men can work overnight. We cannot come to the lab when no one is around, that is, before 7 in the morning and after 7 in the evening. I cannot just come. I have to maintain certain hours, even though the lab is open. No one comes at that time. We have got our key but we



Sanyukta at work

cannot come. The guard does not allow us in after 7 p.m. He has strict instructions that the girls are not allowed to work after 7. Boys can work till 9."

Malti Narayanan is aware of this constraint and has registered her protest with the head of the chemistry department. She says: "Till last year there was no restriction but now, the present head has put the restriction that after 7 girl students should not work. He feels it is very unsafe."

The head of the department has restricted the timings of male students as well, but they can work until 8 p.m. Some girls feel that this rule is not adhered to by men. The stated reason for the imposition of the rule is that chemistry labs are prone to accidents and since few people are around in the campus at this time, it is safer to leave the lab early.

Malti says: "I don't like this kind of restriction. In fact I have talked to the head personally also. If I want to work at my own risk, I should be allowed. But you can get special permission. If your guide is around, you can work later." Sanyukta, who says she is allowed to work till 10 pm. if there are other girls with her, feels scared to do so. She would like to

work as and when she wants and for long hours but the walk back to the hostel is a problem for her. "I feel scared", she says "I would prefer someone to come with me if someone is available. But I don't feel like asking anyone."

Interestingly, a series of real and imagined limitations determine the women's choice of an area of specialisation in research. Although most of the labs do not have restricted timings for women, many women, on their own, restrict themselves to 7 or 8 p.m. Women do not choose fields of study that might necessitate experiments which need vigilance for 20 or more hours.

Lata Gupta says: "There are some experiments which go on for 24 hours. I feel I cannot go for that. So I have to really limit myself to certain regions where such things don't come." Swati Biswas feels: "Some experiments are carried out for which you have to stay the whole night. I don't think it is allowed by the department. There will be objections from the family also."

Lata Gupta gives the example of work with liquid helium. "If you ask for liquid helium at 5 p.m. they will give it to you at 8. Then you cannot do the experiment. The next morning,

the same thing will happen. We cannot think of working with liquid helium while boys can. My male lab mates work at any time they like. They can even start an experiment at 9 p.m.”

Marriage And Career

Many of the women view marriage as important, even crucial, to their lives, affecting, if not determining the course of their career. It is here that male students differ from female students in their ideas and expectations from life and relationships.

Both men and women students are aware of the responsibilities marriage entails and the time they would be expected to give to the new relationship. But the crucial difference in their perception is that while men know what they would demand of their wives, in terms of time, emotional support and sustenance, the women were mentally struggling to create space for themselves within the very limited scope offered to them by marriage. They were more aware of what would be demanded of them by the husband and his family than of what they could demand from the relationship.

The fact that there is a so called “right” age for marriage, which is generally accepted by society, adversely affects the calculations of many women. For instance, Sanyukta, who is working for her Ph D wants to go abroad for further studies, but would like to do so only after getting married because, she says, after returning from abroad there should be somewhere to go. “If you stay unmarried too long you cannot get a match.” Her brother who is studying abroad is unmarried.

However, Sanyukta does conceive of relationships with men which do not involve marriage. She says: “I find that I will be much more happy with friends than to have a husband because husbands have more authority.” She feels that will not be

While men students know what they would demand of their wives, women are more aware of what will be demanded of them than of what they can expect from the relationship

possible within the present social set up.

Uttara Datta, who has decided to stay in Delhi to look for a job, feels that it would be best for her to marry before she finds a job. She explains : “ I will know where to work, where to look for a job. If my husband settles for a certain place then I would look

if their family demanded it. Roma Bhargava, who has made a significant contribution to the establishment of a new section in the department of botany, is willing to leave it all if her future in-laws demand this. Although she has not given much thought to this aspect of her life, she feels that she cannot expect her in-laws to



In the chemistry department

around that place. If I look around for a job before marriage I may get it anywhere and then will probably have to leave the job later.”

Teaching is seen by many as an available option that can neatly balance the requirements of a career and a family. Neerja Grover feels teaching is the best profession for women since it allows time for the family. She has completed her Ph D and is also married and has a baby. She is not keen on a job. But she feels she might help her husband in his chemicals factory.

Women who have spent years working in a particular field of research are prepared to give it all up

accept her returning home at 9 or later in the night as she does now. She says: “ Let me achieve something”, as if anticipating that with marriage all achievement will come to a stop. She can contemplate leaving her academic career altogether if the situation so demands. She says : “If your husband says ‘Do this’ and you do something else, that kind of thing is not permissible in Indian society.’ Shirley Thomas would think of giving up her career if children demanded her attention.

Malti Narayanan, on the other hand, is committed to her subject and would not accept any demands on her time that required sacrificing her

research. She wants to teach because she feels that offers time for research. She says: "Marriage should not affect your research. Only when I get a job and I am settled, only when I feel I am standing on my own feet, will I think of marriage." She adds: "Even if I get married, I will make sure that it does not affect my career. That is my priority." She knows what she wants from a husband. She says he should give as much importance to her career as he does to his own. Sunita Mohanti feels similarly: "If I marry, I will have it clear that I don't want to leave my career."

In contrast, Ashok Khurana wants to marry a woman who will not have to spend 12 hours in a research lab, but has a more sedate job with a 9 to 5 schedule. She should, he says, understand his erratic timings. In return, he will help her in the kitchen which he sees as her domain. "I have found", he explains, "that if both are research scholars she won't be able to do other duties very efficiently, like maintaining the house."

At no point do men students see marriage as something that will even remotely affect their career. However, Promod Kumar, when questioned, said

he was willing to marry a woman who worked as many hours as he did in the lab. Suresh Kumar would prefer an earning wife but if he is earning enough he would not insist that she earn.

Marriage is not the only curtailing factor in the career prospects of women researchers. Many day to day problems which are solved as a matter of course by men become major hurdles for women, determining their future.

For instance, there is a prevailing concept of what is a suitable work atmosphere for women. The pharmaceuticals industry is a major job provider to chemistry students. Many industrial houses have their own research divisions in which they employ scientists. These are usually situated on the male dominated factory sites. The all male atmosphere is a major problem for women researchers, if they manage to get employed there.

Another handicap is that women who have to live on their own in places where they get a job find it difficult to obtain a place to stay. Major cities like Madras, Delhi, and Bombay have women's hostels but

these are often absent in smaller towns. So acceptance of a job is also determined by the availability of other facilities of this kind. Even becoming a member of one of the faculties in the university becomes a stupendous task. Very few women manage to withstand the social pressures working against their aspirations, if they have developed any.

Dr Usha Rao, the first and only faculty member of the University botany department had to resist pressures from her otherwise supportive family, to marry when she was in the midst of her research. She finally got married later to someone of her choice. Her family wanted her to drop research and take up teaching. But she wanted to devote herself exclusively to research. Now she has students under her and also a lab of her own.

Although women have to work against tremendous odds to achieve something and create space for themselves in what are seen as male domains it is possible for some to make their way despite the constraints of society. The few can do it are usually those whose families are willing to give them some measure of support.