

Promoting the Career Success of Women Scientists in India:  
A Report on Two COACH-Sponsored Workshops  
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COACH conducted multi-day workshops in India in early September, 2014 sponsored by DST and IUSSTF. One was held in Delhi September 1 to 5, and the second was held in Bangalore September 8 to 11. Almost 70 women attended the Delhi workshop, and 30 attended the Bangalore meeting. All participants were housed in facilities on-site. The agenda for the meetings covered a wide range of topics, from writing proposals and academic papers to interactions within the workplace, paralleling content delivered in workshops in other countries including the United States.

This report summarizes data from two major sources. The first is internet-based surveys sent to participants shortly after the close of each workshop and again in the summer of 2015. The questionnaires were designed to measure the extent to which participants' networks with other women scientists had changed as a result of their participation and to obtain feedback from the participants on the workshop. The second source of data is individual interviews with 22 attendees. The first section below summarizes information from the surveys, looking at changes in their networks over the span of the meeting and then at their views of the workshop and suggestions for future ones. The second section describes the results of the interviews, examining challenges that the women face in developing their careers and balancing career and family life. A final section summarizes the analysis, notes difficulties in getting all of the desired data, and discusses possible future directions.

## **1.0 Survey Data**

For the survey sent immediately after the workshop information was obtained from 28 of the 67 Delhi participants and 12 of the 30 Bangalore participants, a return rate of about 41 percent. The follow-up survey had a total return rate of less than ten percent, a rate that is, unfortunately, not uncommon in contemporary survey research. Information from the first survey indicated that the workshop attendees were, on average, in early to mid-career. The earliest year of degree was 1987 and the most recent was 2012, with an average of 2004, 10 years before the workshop. The attendees' scientific specialties are summarized in Table 1. Chemistry was the most common area, followed by biotechnology and agriculture. Section 1.1 reports data on changing networks over the time of the workshop and section 1.2 examines respondents' views of the workshop.

### *1.1. Changing Scientific Networks*

The majority of the survey content involved questions regarding the extent to which participants were acquainted with the other participants, asking them to indicate if they 1) knew each attendee before coming to the workshop, 2) had met the person at the workshop, and/or 3) planned to stay in touch with the person in the future. Respondents could check multiple categories. Workshop organizers hoped that the attendees would increase the breadth and strength of their scientific networks during the workshop. Previous research has found that network ties are often crucial in promoting advancement opportunities. Research has also shown

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that women scientists can often feel isolated and that contacts with others in similar positions and with similar characteristics can be helpful.

Figures 1 and 2 illustrate changes in the social networks of Delhi participants over this time. The pre-workshop data indicate that most of the attendees knew no one else at the start of the workshop. There was only one group of four people who knew each other. However, by the end of the workshop, none of the attendees was an isolate and the network was relatively dense. A similar pattern of results appeared with the Bangalore participants.

Because the number of responses to the summer 2015 survey was so small, a similar analysis could not be completed. However, an open ended question in that survey asked attendees “what types of post-workshop interactions with the women scientists who went to the workshop have been most helpful to you?” Attendees at the Delhi workshop mentioned both contacting and being contacted by others for professional advice and information about scientific conferences and journals. A woman who had attended the Bangalore workshop reported more extensive relationships:

Some of them have become good friends. Some of them are in my facebook and whatsapp contact list. We discuss real life situations at work and how we are handling that. We seek suggestions. Sometimes we just laugh and plan to meet again. We have discussed how to begin some collaborative research.

This comment indicates that the goal of decreasing isolation and promoting supportive relationships has been advanced, at least for this respondent.

### *1.2.Attendees’ Views of the Workshop*

The last question of the survey sent immediately after the workshop asked respondents “to add any comments or suggestions you might have regarding how COACH can better help women scientists throughout the world.” The answers dealt with four major themes, summarized in Tables 2 to 5: 1) Evaluative comments regarding their experience at the workshop, 2) Suggestions for the workshop content and process, 3) Suggestions for future COACH International initiatives, and 4) Suggestions related to the status of women in science in India. The summer 2015 survey also asked general evaluative questions regarding the workshop.

Half of the participants volunteered comments regarding the quality of the workshop and all of these were very positive in nature (see Table 2). Responses in the one-year follow-up continued to be positive. When asked what they had learned that had been helpful to them, two people mentioned making effective presentations, mentoring, and networking. A third specifically noted skills learned in handling difficult situations and the art of negotiation. Interestingly, at least one of this, admittedly small, group of respondents mentioned each of the major elements of the workshop.

A little more than a third of the respondents to the immediate post-workshop survey had suggestions for future workshops (see Table 3). These included the possibility of more interactive content, having separate workshops for people at different career stages, devising ways to expand the workshops to other women and to men, and addressing issues that are unique to India. In addition, almost half of the respondents offered suggestions regarding future COACH International activities (see Table 4). Virtually all of these involved expansion of the work to

more locales, disciplines, participants, and fora. Finally, two participants had comments that seemed to be particularly oriented toward the situation in India regarding infrastructure needs and issues in disseminating what they had learned (see Table 5).

When asked how COACH might better help women scientists around the world, respondents to the summer 2015 survey reinforced the importance of content that was included in their 2014 workshop, such as enhancing networks, improving presentation skills, and communication and negotiation. Respondents also suggested that workshops involve smaller working groups and participants from similar fields, thus potentially increasing the potential for future collaboration. A desire for more interaction among participants and field trips to industries or organizations of common interest was also stated.

## **2.0 A Qualitative View of the Lives of Women Scientists in India**

During the fall 2014 workshop 22 interviews were conducted with women who volunteered to speak about their careers and ways in which they balanced work and family life. It was hoped that the interviews would yield information that would be helpful in planning future COACH workshops to help promote the advancement of women in science in India as well as in other countries. It must be stressed that all of the women interviewed were successful scientists – those who had managed to negotiate graduate school, the scientific workplace, and combining family and career responsibilities. Thus the responses described below might best be understood as a picture of how *successful* women scientists in India manage their lives.

Fourteen of the 22 interviews were conducted in Delhi and 8 in Bangalore. All but two were tape recorded, after consent was obtained from the interviewees, and the tapes were transcribed. Notes were taken after conversations of interviewees who did not want to be taped. The interviews were semi-structured in nature, conducted in a conversational manner, but adhering to a common set of points that should be addressed. All of the interviews were conducted by the author. An Indian social scientist sat in on some of the interviews and asked some questions but was not involved in analyzing the data reported in this paper. Because the interviews were conducted during the workshop sessions or during lunch or breaks they were generally less than 30 minutes in length. The explanation of the interviews given to the participants and the outline of questions that were asked are in the final pages of this document.

The paragraphs below provide an overview of the information obtained relating to five major areas: 1) the types of positions the women held, 2) the extent to which they believed gender inequities occur within the scientific world in India and factors related to inequities, 3) the ways in which they have balanced career and family obligations, 4) support and mentoring that they have experienced, and 5) plans for the future. A final section includes general reflections from the interviewees and the author.

Great care has been taken to disguise the identity of respondents. For instance, references to places where people live or work and details of family members, such as age or gender of a child, have been removed. Comments have also been grouped together to describe common themes. To provide further assurance that no individual can be identified, the report was sent to all attendees at the conference to elicit feedback and suggestions. Two attendees had minor suggestions and these have been incorporated.

### *2.1. Positions of the Women Scientists*

The women who were interviewed held a wide variety of positions. About half were in government research institutes, where they had both teaching and research responsibilities. A third were in universities, both private and government sponsored, where teaching receives more emphasis. The other women were in a variety of other types of science-related organizations. The most common job title reported was “scientist,” followed by professor, with the rank of assistant to full. The units in which they worked varied from having only two people to well over one hundred. The representation of women in their units also varied widely, from less than one-tenth to over three-fourths of the employees.

There was substantial variability in the age and experience of the interviewees. Some were newly minted PhDs who had been in their current positions only a short time, while others had been in their posts for more than two decades. They also represented a broad range of scientific areas, approximately equally divided among bio-technology related areas, agriculture, engineering, and a variety of other fields.

The most important aspect of the sample is that all the women were successful scientists. As one respondent put it,

- All these women here made a point to themselves in their life to continue. That is why we are here.

### *2.2. Gender Equity and Work*

The vast majority of the interviewees said that they had not personally experienced unequal treatment between men and women in the workplace. There were only three notable exceptions.

- One woman recounted an example of support given for travel and other resources to a male colleague rather than to her when there did not appear to be a clear reason to do so.
- A teacher in the private sector reported that, when requesting a raise or other support, she had been told either “indirectly or directly that I didn’t need money...because your husband is ...earning good money.” (In government organizations salaries are fixed, so this does not seem to be considered an issue.)
- A third was told by her supervisor when she began that “this lab is not meant for ladies.”

While minimizing their own experiences with gender inequity, a substantial proportion of the respondents commented on disparities and inequalities at the higher reaches of their organizations and, especially, the lack of women as department heads and other administrative posts. At least some also believed this pattern would affect their own careers. As they explained,

- We have never had any female area executive director or director.
- We have 120 faculty members, 90 of whom are females, but over the last 6 years, and even before that, we have always had a male as chair ...We should be having a woman as our chair.
- For me to move up the ladder will take more time compared to my male colleagues.

A number of interviewees specifically commented on more general, and subtle, patterns of unequal treatment:

- I never felt uncomfortable as a woman, but I can feel the effects. It's hard to specify. Probably no one is doing anything wrong to me directly, but I don't get things as easily....It takes more time for women to move up the ladder, men are noticed more, opportunities are easier for men.
- Sometimes you feel they are giving some little advantage to our male counterparts.
- Sometimes I feel we are treated differently.
- I have always observed it as a subconscious thing that is happening....Maybe it's not intentional....maybe it's a bias.

The interviewees cited two major reasons for the inequities: cultural patterns, especially those related to family responsibilities, and concerns for women's safety. They also noted how the impact of these factors is cumulative in nature. Each of these themes is explained in more detail in sections 2.2.1. and 2.2.2 below.

### *2.2.1. Family Responsibilities and Gender Inequities in the Workplace*

The lack of women in higher positions and the more subtle gender-related biases noted above were often attributed to cultural patterns within the society as a whole. A large proportion of the women commented on the way in which the responsibilities associated with family life contribute to women leaving the field, making choices that are detrimental to career advancement, and not having the time or energy to devote to work that men do. Below are some samples of the comments:

- Women have to consider their family.
- They get married and have to move with the family.
- They [men] have more opportunities compared to women. Women are always restricted. We cannot move around, you don't want to shift your entire family to a new place.
- It's expected that the girl will still do everything [at home, even though] she might be as tired as her husband....We are girls, we have to go and start cooking right now, while boys don't do that.

One woman explained how this had affected her own life.

- It was necessary for me to have a family life, so I opted for a transfer. The transfer I got was a waste of time, it took such a long time.

The family responsibilities can affect judgments made of women in the workplace:

- One of my colleagues is married with a baby and her husband lives somewhere else. She has to go back home by 5:00 or 5:30 because she has a baby. But because she can't work late or come on weekends, people think that maybe she's not that good. There's always that comparison. Housework is not taken into consideration. The man doesn't have to do so many things at home, but they don't think of that. Instead they think that she's not that productive.

The nature of family life and associated norms can also affect the rewards women receive in the workplace:

- It is that male psyche. They feel that we don't need money. We are a second income to the family. In India, the male has to provide for the family. If the woman is earning, it's extra income. They use the term pocket money sometimes.

### *2.2.2. Concerns for Safety and Gender Equity in the Workplace*

Concerns regarding safety of women were cited by several interviewees. Regulations related to safety often restrict women's ability to work at night unless accompanied by a man. Yet, as some interviewees noted, the way in which this issue is handled can affect relationships with others on the job, assessments of the woman worker, and issues such as job assignments.

- Women can't work at night, there are security issues. For my department I have to make sure you have a male counterpart to work at night. Otherwise it's not possible, even if you want to [work at night]. That independence is not there. If you work at night with the male counterpart there's a different opinion about you the next day."
- You have to give women work between 6 a.m. to 6 or 7 p.m....The male candidates say it's unfair to work in the night and the women during the day."

Clearly it is a dilemma, for the interviewees realize the necessity for safety measures, but also the extent to which the associated restrictions can affect careers and the possibility of advancement.

- They had to take care of our safety in the field.
- But maybe it's for my good....If there is an assignment that has to be done late in the night, my advisor was not giving to me maybe, he was giving it to the male students. Maybe it's a bias, but maybe it's for my good.

### *2.2.3. Cumulative Impacts*

Taken together, the restrictions that come from family responsibilities and work restrictions, often associated with safety concerns, were seen as influencing women's ability to network with others, including the opportunity to meet with colleagues outside the workplace.

- I'm certain that several of my women colleagues are not very good at networking. That is entirely because we don't have the evenings off like they [men] do. Indian men do not have anything to do with the kitchen. That's entirely the woman's domain, as is looking after children....I could not have sat in the evenings over drinks, network, and make contacts. So whatever contact I make is during those office hours, maybe during conferences, and this is a negative thing. But there is no other way I can do it. I've made my priorities. I have to give time to my family.
- They [men] will be given higher positions, to handle extra responsibilities other than teaching....But because males are providing more administrative support to the administration of the college, that male will be made head of the department (speaking particularly of the private sector).

Several interviewees noted the way in which the cumulative impact of these factors can help explain the lack of women in the higher echelons of the field. Because women are more likely to drop out of the work force or to be given fewer responsibilities, they are less likely to be considered for advancement and the potential pool of women candidates can be small:

- Because males are providing more administrative support to the administration of the college, that male will be made head of the department.
- The number of women with more experience is small.

### *2.3. Family Patterns and Experiences*

The interviewees reported a variety of family situations. Over one-fourth of the interviewees were single (six out of 22). Four were married but childless and the remaining women (twelve of the 22) were married and had children. Of the 11 women who addressed the issue, nine indicated that their marriages were not arranged, but were “love marriages.” Most often they had met their spouses through school or on the job, and several indicated that they were in the same field and/or the same work organization as their husbands. Several respondents noted that, before marriage, they had talked explicitly with their future husband and in-laws about the importance of continuing with their scientific schooling and career. Slightly more than half of those who were married lived in nuclear families, sometimes because they were far from their in-laws. The remaining women, including some who were in love marriages, were in joint families.

#### *2.3.1. Family Responsibilities*

Almost all of the married women reported very heavy family responsibilities. Even though almost all had household help, they still devoted many hours to household-related tasks such as cooking and shopping and caring for family members. Descriptions of a typical day illustrate the extent of the household duties, the devotion that the women have to their families’ well-being, as well as the strain that results from the multiple duties of home and work.

- There are 11 persons in my family. I start early in the morning, I wake up at 5, I cook for my family. I prepare lunch for 8 persons....Then I give them breakfast....I stay in my office the whole day, ...help my child with homework, prepare the evening meal, and then I have to prepare things for the morning, to cook food again and go to the office....I do shopping along with going to the office, for it is part of my routine.
- I start at 5 in the morning. My husband looks after the bed and domestic helpers that come. I take care of my child’s food and school preparations. I want to take care of that myself. That’s the way it is.
- I start at five o’clock in the morning. I prepare tea, coffee, then lunch for the three of us, pack my son [for school], and start to the college. At the college I work from 8:45 to 4:30....When I return my child and I sit and continue homework until 7:30 or so....When we go to sleep it’s around 10 or 10:30.
- A typical day is very tough. In the morning, you rise around 5 or 5:30, then you have to cook, and prepare the child to go to school....You have to do everything for the child. My husband helps, but most of the job is for you....Then you prepare yourself and go to work ....We have very little time for lunch for we’re always busy. When you go back home, your child will be waiting....It takes around till 11 or 12 at least to go to bed. I have a maid for cleaning the home, but cooking and all that I manage.

A woman who does not have a maid reported that her husband provided some help, but that the majority of the work still fell on her shoulders.

- We do share some work. With the jobs of cooking, washing, and ...cleaning the house, I am doing it.... He (my husband) will help me by getting groceries and vegetables. But, cooking, definitely, he won’t help me with.

The women in joint families almost always had childcare support at home:

- My mother in law helped. She was there when the children came back from school.

- My mother in law is good, she's helping, she looks after my child all the time.

But, even with such support from extended family, much of the work of childcare fell on the interviewees. Descriptions of tasks related to child care, such as preparing children for school, tutoring at night, and arranging lessons reflect the deep love and concern that the women have for their children, but also the extent of the duties and demands.

- I have to look after my child, get the child up early in the morning, breakfast, pack the lunch...I love it, that's why I'm doing it. If I'm not there, they're fine.
- We can't compromise my child's future...My child should also have many interests and opportunities. I take my child to music class and give snacks and everything. I have to be with my child, then come back, help with homework, start cooking dinner.

Those without family support at home reported a variety of means of child care when their children were young including, for some, a substantial involvement of the husband in conjunction with day care programs.

- Because I have no family support, we put the child in care at my husband's office...He could take care of the child on lunch or a break. When it was evening, after 5, I collected the child from him and I would look after him until he came back....We are able to care for our child and do our jobs.
- I used to leave my child in day care close to my place.

While some respondents lived on the campuses where they worked, a large proportion lived in densely populated urban areas. The demands on their time were heightened by very extensive commutes:

- [My commute is] 35 to 40 minutes.
- Work is around 18 km from my place. Considering the distances in the city, it's okay, it's commutable....I have no other option. If I have to manage my career as well as my home, I have to drive. I can't expect someone to take me every morning and every evening. You have to be independent, learn how to drive, and have your own car.
- [My commute is] two hours in the morning and two hours in the evening.

### 2.3.2. *Stresses and Strains*

Taken together, the heavy demands for household work, child care, commuting, and job responsibilities produce a great deal of strain and stress. The stress appeared with women in all types of family situations. It seemed to reflect not just the extensive time demands, but also the emotional toil of wanting to perform well in so many areas of their lives and to meet the needs of so many people about whom they cared deeply. The descriptions of difficult times involved a variety of points within the life course and a wide variety of situations:

- When you go home you have no time for the profession, when you're at work you have no thought for the family.
- I'm exhausted. Sometimes I'm irritated as well, why is it so difficult? ... I want to work, do my research, to give more time for preparing for teaching. At the same time I want to give time to my family....How do I adjust? I wish there would be more time than 24 hours in a day.



Strains can also result from the lack of family support. One interviewee described strains resulting from parents' objections to their choice of a love marriage and their subsequent refusal to provide support.

- [My child] went to a preschool, then to a regular school. We had a tough time, my mother was working and I was also working. There was no one to take care of the child during illness...My in-laws... said they weren't going to look after the baby. They said, "If you want to look after the baby you can resign your job and stay home."... I was in the early stages of my career. I didn't want to have a break. So I just continued. I only had one child.
- When the children were younger, it was horrible. It was not an arranged marriage, it was a love marriage. We didn't get support from my parents or my husband's parents.

It must be remembered that the interviewees were all established scientists and thus had managed to successfully navigate the various demands within their lives. Some described how they, or their friends, dealt with these stresses and difficult situations. One option was working with a spouse to counter negative family interactions and living situations:

- One of my friends is not very happy sometimes because her in-laws are not happy that she's working so much. But... her husband is with her and supports her.
- We were living with my in laws for the first 5 years of marriage, but they expected me to do certain things....Then we moved...That was done with the support of my husband and it is good.

Another option involved negotiations with family members about the work load to reach an arrangement that was tolerable:

- There was a little negotiation [about household chores. Having the help do] the domestic work, cleaning, and laundry was fine. But with regard to the cooking they said, "We don't like the food by the domestic help." At one point, it was really difficult, I would come home at nine in the night and thought, "You can't expect me to make chapattis at nine in the night. We really made an arrangement. Either we eat food made by the third party or we starve; we don't eat chapattis at all. We need to adjust. So they agreed and we now have a cook also.

At the same time, families were often cited as a key source of support, and the nature of support that the women receive is the focus of the next section.

#### *2.4 Support, Mentoring, and Networks*

As might be expected given the very successful careers that the interviewees have had, they all described support received from others including their families, teachers, and work supervisors and colleagues. There was a great deal of variability, however, in the extent to which they reported having mentors for their careers or in their ability to network professionally.

##### *2.4.1. Support from the Family of Origin*

A number of the interviewees talked of support they received from their parental families. Sometimes they described the way their parents served as role models, in part because they also had to balance a variety of issues within their lives.

- [My mother] was a professor. She had a tough time managing things.

- My mother is a teacher and worked all the time [I was] growing up.
- My father did a bachelor's and master's degree after marriage, while he was working. My mom did her PhD while we were home. This family background is a boost to me. You can see it's a good thing.

Parents, and extended family, were lauded for the support and encouragement they gave during schooling and once careers were launched as well as support for marriage choices that might be seen as untraditional by some in the society.

- My marriage was a love marriage, but our families supported it. We got great support from my parents and also his parents.
- It starts with my grandfather....He ensured that his kids and grandkids should get a good education and ... study hard....He was also the one who told all the nagging relatives, nobody's going to bring any marriage proposal until she finishes her master's degree....Let her finish her degree and then think about marriage. That was a huge thing... in my career development, for I could have been married off into a very wealthy family, but sit at home like a suitcase. Then, during my master's course I met my future husband. I just presented him as the person I love and want to marry, and it happened.
- My parents are so supportive. In India, you won't find many families supporting their daughters to stay far away [for work as mine do].
- My parents treated me well....They did not stop me from doing anything. Whenever I wanted to do something, I just told them and they supported me. I got great support from them....My brother was also very supportive and still is today.

Finally, the family of origin could be the source of practical assistance in times of need.

- My mom and mother in law are working, but they said if you need anything we are ready to come....My mom said, "we had issues in managing you when you were a small kid [because of work pressures] and we don't want you to have the same issues....We are here to support you.

#### *2.4.2. Support from Husbands and In-Laws*

A large proportion of the married women mentioned receiving support from their husbands. Such support came both from husbands who were in scientific careers and thus potentially more familiar with the work demands as well as from those who were in other areas of work. For example,

- My husband has been very supportive to me. Since he's in the research field he knows the problems with it.
- My husband is a businessman. He encourages me to carry on. Whatever issue comes to me, he's quite helpful. Even with being at this workshop for a week, my husband will manage the kid's studies and homework.
- I got married during my PhD. But I was lucky. My husband and I talked before marriage about how I wanted to complete the PhD. No complaints on that front, on the support from either my husband or his parents.

Like the woman quoted immediately above, several of the women explicitly noted the support they received from in-laws, especially the women who lived in joint families.

- We are a joint family, we are lucky. They are very supportive, both my in-laws and my husband. This gives me the added extra edge of confidence.
- My mother in law was a great help when my children were young....We shared the responsibilities. She was very supportive of my working and she still is.
- I get good support from my in-laws. That is the reason I'm able to manage my job.

Of course, the issues involving in-laws and spouse can be complex given the husband's obligations to his own family of origin. The complexities can be especially difficult when there are different views regarding a woman's devotion to her scientific career. As one respondent who lives in a joint family put it,

- My husband is nice, he is good. He loves me, but he's more oriented towards his family. He must first listen to his mother and father, and then I come afterwards. He is caring, but the other voices are there, so he has to support them.

#### *2.4.3. Support from Teachers and Supervisors*

In addition to support from families, several interviewees mentioned the important role of teachers in encouraging their careers. Some mentioned experiences before their college years, but most mentioned support from their doctoral and post-doctoral advisors as well as from their work supervisors.

- During my school, my biology teacher was the one who really made me interested. She taught with such passion that I got attracted to the subject....My principal also believed in me. He said, "You are very intelligent, you will go ahead in life."
- My master's advisor was wonderful.
- My PhD advisor has been really good. I see him as a good scientist and also as a good human being.
- I was in a girl's school and always had female teachers. They were very helpful.
- I had a great post-doc advisor....I'll always remember that. He helped me grow a lot.
- When our child was little my boss, who was chair was very sympathetic about the situation....I was blessed with people who were very positive and supportive.
- In my first job my boss seemed to be very confident in me. So he gave me many responsibilities that are usually not given to such junior people. He also gave me a lot of exposure. He would go out of his way to give me exceptional opportunities. That's how I realize he believes in me and that he's training me to be a good leader. That also played a good influence.
- I had good advisors. My thesis advisors were really good....

In contrast, some reported negative experiences with faculty

- Once I moved to college, there hasn't been much support. Guidance is very rare.
- My PhD advisor was not a good person. [The advisor] was very troublesome.

#### *2.4.4. Mentoring*

Some of the support was described as involving career mentoring, both from teachers and advisors as well as from supervisors at work:

- My PhD supervisor was my mentor....I'm still in contact with him.
- My post doc advisor was quite good. My PhD advisor was also good. I consider them both mentors.

- I had good mentors in my schooling. The mentor who I met at school is still monitoring my achievements....

Yet, somewhat more women said that there was no one that they regarded as a mentor and could turn to for career advice:

- Right now, I really don't think I have anyone I can call a mentor.
- I don't have a mentor, but there are people helping out.
- I haven't had a mentor whom I could talk to about my personal problems or professional problems.
- Mentoring is a big problem. I didn't have any mentor.
- I didn't get proper mentorship.
- As far as my career is concerned, I really did not get somebody as a true mentor.
- Nobody is there to listen to me.... In fact I'm a mentor to many of my colleagues.

#### *2.4.5. Networking*

While questions about support for travel and networking activities were not consistently asked of all interviewees, the responses that were given indicated a fair amount of variability. Some reported being quite active in seeking out other scientists and trying to network:

- I am always searching for conferences or training programs.... I am on email chatting with friends. They tell me about forums for conferences and I will go and apply.
- I keep searching on the Internet to find people with similar interests. I just try to mail that person, and talk to him or her.

At the same time several respondents noted that they find networking with others to be challenging.

- I find networking difficult.... I don't mind networking for others, on the other hand. But for myself it is a problem...Also, I'm good at negotiating for my students, but not for myself.
- There are a couple of my colleagues who do that [network well]. It's just hard. I find it very difficult.

#### *2.5. Future Career Plans*

As a whole, the interviewees seemed highly optimistic and forward looking. Several expressed strong desires to pursue leadership positions in the future. Some explained how they were poised to help their country through scientific leadership. Interestingly, while there did not appear to be large differences in the responses of interviewees in Delhi and Bangalore in other areas examined, only one of the comments about pursuing future leadership posts was expressed by a participant from Delhi. All of the other such comments were made by the Bangalore participants.

- Of course I want to get some important position where I can do more and return more to society. It's important.
- Yes. I want to take up more leadership positions.... I'm very much interested in taking on more responsibilities.
- I'm not where I want to be. I want to excel. I'm focused on what I have, not what I don't have, and work with it so I can be a known scientist in India and affect the people with my work. I feel that Indian scientists can do a lot for their people. The general public could benefit a lot from simple scientific interventions. I want to make a difference, to

see that my research actually translates to the public where they use it for some good, to make a difference in their lives. I'm passionate about my research and I want to do that.

- I'm definitely thinking about higher positions. They [my superiors] tell me, "You are working very hard, we see that, you are going to get there."... This gives lots of motivation. I'm motivated to work harder. So I'm always aiming at that.... Within a short span of time, I expect the next promotion, and I will run into it.
- I have an ambition to do go for a higher post.... I'm ready to take on administrative work.
- Ambitious things can be done.
- I plan to move into a position of leadership. That's the reason I wanted to come to this program.... I have high ambitions.

Two respondents, both from the Delhi workshop, specifically commented on the difficulties women face in moving into leadership positions, primarily because of heavy family related responsibilities, both in caring for family members and restrictions in moving:

- What I have realized is that generally women are reluctant here to take the responsibility because they are more careful about their kids and their families.... All of them have families and... they have to take care of their kids.
- It's always, you have to move with your husband. That is a common thing. It's very accepted to not think about the girl's career. In my own case, I'm leaving this open.

## *2.6. Reflections*

The previous sections describe a wide range of difficulties that women scientists in India face in developing successful careers. Because the women who were interviewed for this report are highly successful, they have managed to withstand these difficulties, often because of strong support from others. As several of them noted, many women are not able to follow their footsteps, finding the barriers too difficult to overcome. At the same time, the interviewees commented on a number of areas that provide optimism regarding changing this situation and promoting greater gender equity.

Several respondents noted that the extent to which gender inequality is problematic is not uniform throughout the country, explaining that the issues are more serious in rural areas as well as in certain regions. Others suggested that issues varied from one discipline to another. Interviewees from emerging scientific areas and with larger proportions of women seemed to believe that their colleagues and superiors were more receptive to women and their inputs. They also were less likely to report having personally experienced inequities or to have observed them in general. In addition, there were indications that inequities were more marked in the private sector than in the public sector. These differences were attributed to strict government regulations regarding pay, job assignments, and advancement.

Several interviewees expressed optimism regarding change and the potential for greater equity in the future. One source of this optimism was the growing representation of women in the field. As more women enter and persist in their careers the pool of senior women will increase and the interviewees believed that the potential for greater inclusion will increase. The other source of the optimism involves changing attitudes and behaviors of younger cohorts of women scientists, who are more likely to challenge inequalities at home and at work. As one more senior woman put it regarding home life,

- the young girls are all working, they have the guts to say, “I’m earning as much as you do or more than you do, so you might as well help me in the kitchen, with the children, otherwise it’s going to be very difficult.” They make life difficult for their husbands.
- We were the first generation who came out to work. When I was at school only 50% of the mothers of my friends and classmates were working. The other half were only at home. In my case, all my 10 friends are working. We were the first generation to come out and work. We faced all these difficulties.

A younger woman scientist’s account of her conversation with a superior in response to a particularly difficult encounter with a colleague illustrates the “guts” of the younger generation mentioned above:

- I told him, I don’t want that gender bias at work.

In addition, several of the women, including those who felt they did not have a mentor, described how they are now mentoring others. Their mentees were usually their doctoral students and, sometimes, junior colleagues.

- I’m a mentor for both my male and female students, they do well.
- I’m currently mentoring three young ladies. They always ask me for advice.
- Sometimes I serve as a mentor to my friends.
- I am mentoring others.

Such mentoring of young scientists would seem to be a clear way to help women pursue their scientific careers.

The discussion of family patterns and experiences also supports the potential impact of generational change. Younger women appeared much more likely to be unmarried or, if married, to not have arranged marriages or to be in a joint family. Such arrangements could be expected to support greater gender equity in other areas, for data from extensive cross-cultural studies show that greater gender equality is found in societies that have nuclear families. At the same time, it must be stressed that the various alternative family patterns can be very problematic. In short, there does not appear to be any perfect solution to the multiple demands women face within the culture, within the family, or within their careers.

Some described the issues that can face women who are unmarried. While unmarried women do not face the family demands described in earlier sections, they can face discrimination in the workplace and clear issues of personal safety.

- I always feel disadvantaged relative to married people. Married people can say, “My husband is there, my family is there.” What do I say? I don’t have anything to say. This is a disadvantage for me.
- If you’re unmarried and have no male to support you, people may think, “she’s easy.” That’s always there. I had male colleagues come banging at my door in the night....That is a problem...It’s always, you have to have a male person guarding you...If you’re too cheerful or friendly it’s taken in a wrong sense. You can be too arrogant, too stubborn, and too friendly, especially when you’re unmarried and living alone.

Similarly, while a nuclear family arrangement can promote independence and, perhaps, diminish interpersonal conflicts between family members, it can result in greater strains related to the

provision of childcare and domestic support. One respondent described these issues and reflected on the choices that families are making:

- I think the Indian scenario is changing. Earlier, everyone wanted to have nuclear families and more people were moving out from the small towns to the cities. As the work pressure increases and we have more working couples, we realize again the importance of joint families....Many females quit their jobs because they didn't have support at home. They didn't have in-laws with them or somebody at home to take care of the kids. They tried but they see it's very difficult for them to manage both without any support.

Finally, although not a focus of the study, it should be mentioned that women scientists in India, like their male counterparts, can face a variety of budgetary and infrastructure conditions that seriously affected their ability to travel or even network with others in an electronic manner and thus advance their careers. These barriers seemed especially severe for those in more rural areas. As one respondent put it:

- It is hard to meet other scientists because we are far from the major cities....We had started meeting electronically, because we don't have funds for travel, but the connectivity is not that good.

### **3.0 Summary**

This report covered a wide variety of topics using data gathered from the COACH visit to India in 2014. Information related to the surveys of participants indicated that they enjoyed the workshops and felt that they were beneficial to them personally and to the potential for progressing in their careers. At the same time participants provided several useful suggestions for improving the workshop and avenues for COACH International to pursue. Data regarding changes in networks indicated that participants had many more connections with others at the end of the workshop than at the beginning and, for at least some of these participants, the relationships have continued. The interviews provided fascinating insights into the complexities the women scientists face and the ways in which developing successful careers involves difficult gender-related issues within the workplace, their families, and the larger culture issues.

Limitations to our results resulting from difficulties in obtaining data should be noted. We had hoped to administer two surveys at the time of the workshop, paralleling the process used in other settings. One involves networks among participants and the other taps a range of issues regarding workplace and career concerns. Both surveys have been successfully used by us in many other countries. Having data from India would provide important information for comparisons to these groups as well as important insight into issues in India. We were, unfortunately, not allowed to distribute the surveys during the workshops. Thus, we opted to send the networking survey to participants via e-mail after the workshop ended, but opted not to burden attendees with the additional survey. While the interviews touched on many of the workplace and career related issues covered in the survey, having the quantitative survey data would have provided more systematic information from a larger group. In addition, we have not been able to obtain a report that summarized issues faced by women scientists and was distributed at an early planning meeting for the workshops and catalyzed our activities. Finally, a Bangalore-based social scientist conducted interviews with a few workshop participants using the COACH interview protocol. To date, despite repeated requests, we have, regrettably, not received copies of the research summary or the interviews.

Despite these limitations, it appears clear that the participants were very pleased with the outcome of the workshop and that the potential for productive interactions was substantially greater after their attendance. The interviews indicate that the challenges faced by the women scientists are not small. Yet, the women voice courage, optimism and exhibit extraordinary strength that should be very helpful to them and their society in the future. The interactions of COACH staff with the women have been enjoyable and inspiring.

Table 1

<i>Area of Scientific Specialty of Attendees at Delhi and Bangalore Workshops (%)</i>	
Chemistry/pharmacy	23.8
Physics, including space	9.5
Biology	9.5
Medicine	7.1
Math	2.4
Agriculture (plant and animal)	11.9
Biotechnology	16.7
Computer, data base, engineering	9.5
Miscellaneous/Other	9.5

N = 42

Table 2

*Open Ended Responses Related to Evaluations of the Workshops*

- The workshop was very nice and refreshing to all women scientists.
- My experience with COACH faculty was really great. They were listening to our problems related to career and balance between career and life and they provided us suitable answers to face these problems efficiently. I am really thankful to COACH faculty for their valuable suggestions and co-operation.
- Keep on motivating the women about their potentialities.
- Awesome.. Continue doing these workshops and training programmes. Lots and lots of positive vibrance, enriching experience. I will surely do my best from my side towards similar activities.
- Thank you very much for the Excellent and Commendable Workshop at the outset!
- Dr. Pushpa I am grateful to you that in those short moments you had guided me to solve my personal problem that is related to my carrier advancement and motivated me to get over t gradually and move ahead . The sky is the limit for all of us! Thanks & Regards
- Good initiative, ALL THE BEST!!
- You are doing great. Thank you so much.
- COACH is an excellent platform to bring women in science together. The course is thoughtfully structured and well executed. Lot of work for Geri and Laura which is truly appreciated and a big responsibility for Pushpa (Indian perspective).



- Thanks for the workshop you conducted at INSA, New Delhi. It was very informative and I was delighted to see the efforts COACH members are putting in for the career advancement of women scientists.
- COACH is a very good platform for women scientists. You have ignited the spark...
- It was a great learning. COACH is doing in a wonderful way to uplift the Women in Science. Prof. Laura, Geri, Pushpa, Jean, they all are so impressive to convey their message. I have developed new networking group, I would surely be a good mentor now. I am going to start grant proposal writing after this workshop. Thanks a lot COACH. I will miss you always.
- It was indeed a fruitful Workshop. It helped in the overall development in all good sense. It was a great pleasure to hear the sessions by Prof. Gerry, Pushpa Ma'am and all other COACH members, which helped in an overall Capacity building process. Being a fresh graduate and aiming for Doctorate degree, to pursue further in research this training program helped me address my weaknesses and also ways to overcome the same. I am thankful for entire COACH team for such an enlightening workshop. Hoping to be in touch in future as well.
- It was a wonderful experience of sharing and learning from COACH faculty and the equally unknown women scientists from such diverse fields. I thank the entire team in preparing the training material and imparting the same in such an interesting manner. I enjoyed all interactions.
- The sessions were quite useful as a budding scientist to face challenges and to be aware of gender discriminations in my profession.
- It was a very wonderful and useful training program at NIAS, Bangalore. The initiative taken by COACH is appreciable. The lectures and discussions of topics like mentoring, leadership issues and art of negotiation can help us to improve on our weaknesses.
- First of all, I have improved my confidence levels by sharing our experiences and sessions are very interactive and interesting.
- COACH does a great job. But yet to meet of the privileged and under-privileged women of many Nations and regions. All the very best for the endeavor.
- First of all I thank COACH for their effort. This program has helped me a lot.
- I really enjoyed, especially the mentor and mentee training session. Made me realize, when I was observing how rarely I am a good listener.

Table 3

Open Ended Responses Regarding Suggestions for Workshop Content and/or Process

- There should more interactive learning to assess the liabilities and strength and how to go ahead.
- I wish that men should also be participants of these workshops so that they will also be sensitised to the issues that concern their women colleagues.
- Please try to include cultural programme and surprise activities for the participants.
- More game playing and tasks/exercises designated completely towards honing up their leadership skills , mentoring skills , the art of negotiation , writing a project proposal etc. in a continuous step-wise manner focusing on one or more skills at a time.

- Some real case studies of writing a project proposal may also be discussed in the class in some of the Science disciplines. A link, if possible, may be also provided for each Science Discipline for one of us to browse through to enable us to spear ahead with more confidence.
- The programme run by the COACH on 1st September to 5th September is for the scientist of first stage. Therefore such type of programme may be organised at university level to have access to young scientist.
- You may plan some games around the themes of negotiation and leadership. Thank you so much.
- The group can involve the participants from each training in disseminating the learning and furthering the noble cause of science among women. Further, they can be asked to share their exchanges in field in doing so and suggest more and more options. They can even include some activities to enforce the concepts.
- The sessions however could be more finetuned to address the societal differences that exist in India.
- I would like to give one suggestion that please conduct these workshops separately for women scientists at different levels (i) at entry level (ii) mid career (10- 15 years) (iii) senior level
- By teaching the innovative thoughts, to cultivate the leadership qualities.
- It would be nice if COACH can design some awareness programs for men in senior positions at our work place and sensitize them about the issues that women scientists face during their career.
- The participants of the meeting were at different stages of their career. Sometime, they felt it is not beneficial, which triggers a negative feedback to the other participants.
- Most practical sessions for women to communicate well, firm and articulate, will help in boosting their confidence.
- You may plan some games around the themes of negotiation and leadership.

Table 4

*Open Ended Responses Regarding Suggestions for Future COACH International Initiatives*

- Try to involve local women scientists and provide guidance to them so can they can also serve their area in collaboration with COACH.
- There should be networking and collaborative projects for women scientists and the technologies be refined as per Indian context.
- I have one suggestion for COACH regarding women scientist workshop/training or any other program related to women technologists that COACH should invite all over world women scientists to attend training /workshop in University of Oregon. So that the women can interact with each other and get some good idea in research field of science.
- By conducting more trainings in different countries, regions to sensitize the women force in all the science, engineering and humanities subjects to make them realize of their power and incentives to be generated and equally divided among all the age groups to move on with effectiveness by selecting and professional leaders in field to carry out this

type of training in our own states by providing funding's so as to reach the message in broader prospective.

- Above all it should be a continuous programme to be done in phases requiring involvement of many persons to take this campaign ahead in various countries for the few initial years till the in-house and selected work-force become a coach themselves to spear ahead the campaign in their respective countries.
- Each country also needs suggestions from US side on the removing the bottlenecks which exists in our system and processes that is being voiced by the participants in these workshops as what can they done to improve upon the system, processes etc. by means of sharing from the US counterparts how those thing are being done at US .
- I hope many more disciplines besides chemistry will participate in future workshops.
- By disseminating the networking skills and other leadership qualities to all mid-carrier woman scientists in the world.
- By organizing workshop/Seminar frequently and giving information about the various oppertunities for career advancement of women scientists.
- Conduct such workshops in various locations. For example in Hyderabad, so that all my women colleagues can participate.
- According to me more efforts to involve women scientists in collaborative research work will take this motive further.
- I would be glad if COACH organizes workshops to follow up the participants of the current workshop, and traces their growth over a period of time.
- Can conduct much more training programs like this in future
- But yet to meet of the privileged and under-privileged women of many Nations and regions. All the very best for the endeavor.
- By providing an platform for interaction with scientists from around the world in the same field of study
- Taking initiative to organize more workshop of this type for young women planning to take up science as carrier
- Award of small duration fellowship on the basis of performance and achievements
- It would also be helpful to have some follow-up programs, in collaboration with the scientific bodies of each country, to track the progress and effect of these workshops. A COACH kiosk or meeting could be arranged at major International Symposiums/conference venues, so that we also get to interact with women scientists at an international level especially in our research areas.
- The women scientist could be motivated by not just organising workshops but by listening to their problems with patience and trying to help giving a personal touch whenever contacted. The promises made should be sometimes fulfilled too.

Table 5

*Open Ended Responses Related to Improving the Status of Women Scientists in India*

- Sometimes, the ground reality is different, struggling to get the infrastructure facilities and equipment to work. Skill requirement in the frontier areas of science and the

advancements in subjects are required by the women scientists for career development and publications.

- Now we have to take it from here and spread the message.

Figure 1: Networks of Delhi Participants Pre-Workshop

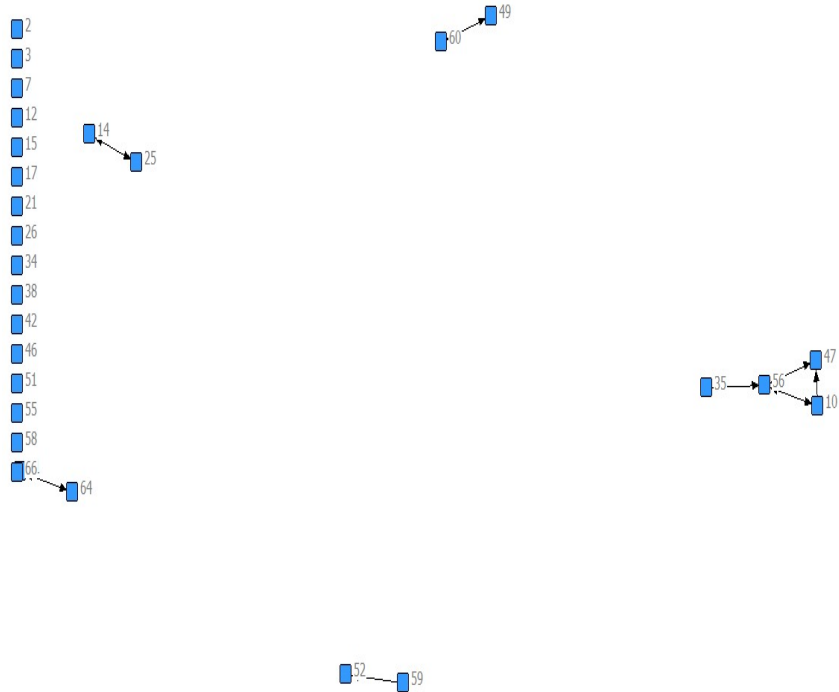
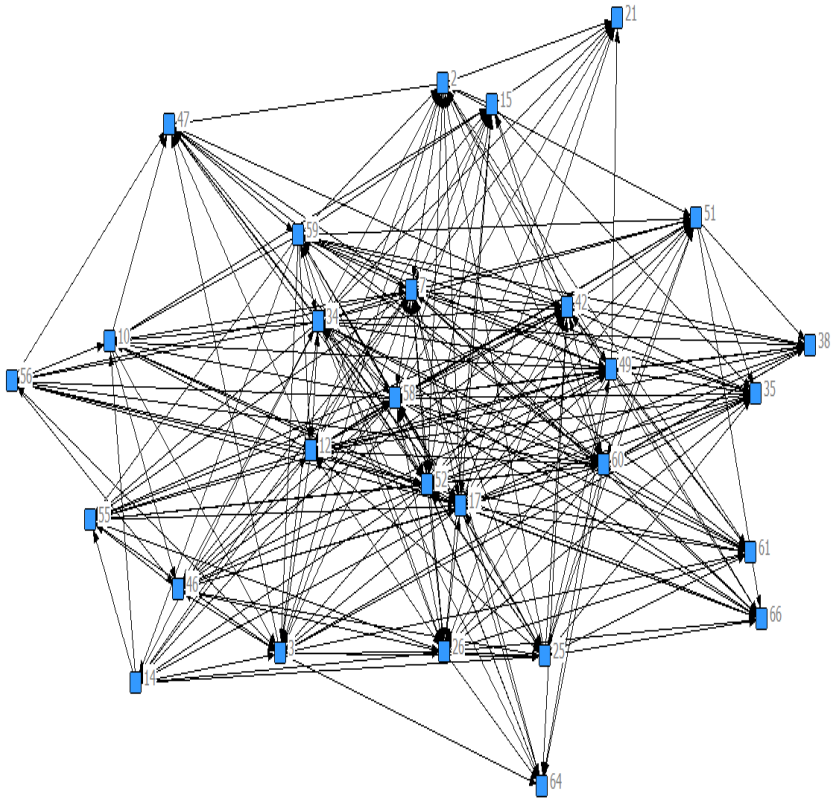


Figure 2: Networks of Delhi Participants, Post-Workshop



Note: The ties are based on respondents' indicating that they planned to stay in contact with another person. Ties may be nonreciprocal or reciprocal, as indicated by the arrows at the end of each line.

Appendix A  
Explanation of Interview Given to Participants

COACH Interviews with Women Scientists,  
Delhi and Bangalore, September 2014

Thank you for agreeing to participate in an interview regarding your experiences as a woman scientist. The information you provide will help COACH learn more about the careers of women scientists around the world and how we can help them be successful. To date we have talked with women from Latin America, North Africa, and the United States; and it is important for us to also learn about the experiences of women in India.

The interview will take about a half hour. Questions will cover issues such as the nature of your workplace, your experiences as a woman scientist, how you balance work and family life, and how mentoring has affected your career. You can, of course, skip any questions you prefer not to answer. When we write about the results we will never reveal your name. Any information that could identify you, such as where you work or your specialty area will be disguised. We will not single out individuals or locations. All recordings will be downloaded to a secure website using Audio Hijack and deleted after transcription.

If you have any questions regarding the research, contact Geraldine Richmond, COACH Chair at [Richmond@uoregon.edu](mailto:Richmond@uoregon.edu), Priscilla Lewis, COACH Coordinator at [cilla@uoregon.edu](mailto:cilla@uoregon.edu), or Jean Stockard, COACH Research Team Leader at [jeans@uoregon.edu](mailto:jeans@uoregon.edu). If you have any questions regarding your rights as a research subject, please contact the Office for Protection of Human Subjects at the University of Oregon, (541) 346-2510. Thank you again for your help.

Appendix B  
COACH International In-Depth Interview Protocol

Introduction:

- Your participation is voluntary, if you choose not to participate it won't impact your relationship with COACH in any way
- The interview is confidential, no names of individuals or universities will ever be used in reporting the results
- You can skip any question you prefer not to answer
- If it is alright with you, I'd like to audio record the conversation so I can make sure I don't miss any of the conversation. Is that alright?
- Do you have any questions?
  
- To start, could you tell me about where you work?
  - Do you work in a university or in another type of setting?
  - How long have you worked there?
  - How many scientists are in your department/division?
  - How many are women?
  - Are the Dean or Department head women?
  - How important is publishing research to promotion in your department/division?
  
- I'm interested to know if you think that there are ways that male and female scientists are treated differently in your department?
  - PROBES:
    - Do you feel that there are differences for men and women in getting research published or funded?
      - Has that impacted you?
  
    - Do you feel that there are differences for men and women in salary or research resources, like laboratory space and equipment?
      - Has that impacted you?
  
    - Do you feel that there are differences for men and women in teaching assignments?
      - Has that impacted you?
  
    - Do you feel that there are differences for men and women in the amount of service?
      - Has that impacted you?
  
    - What about in getting promoted, are there gender differences?
      - Has that impacted you?
  
    - Are you treated differently by your male and female colleagues? In what way?



- Are your friends at work mostly men or women?
  
- Are there other gender differences that have impacted you in the workplace?
  - Harrassment from men?
  
- Do you think your career would be any different if you were a man?
  
- Tell me balancing work and life. Do you have a husband? Children?
  - What do you do to help balance work and life?
  - Do you think it is more difficult for women to balance work and life?
  
- I'm interested in your thoughts about the importance of getting to know other scientists in your country and internationally.
  - Are there ways that more senior scientists have helped you in your career?
    - How did you get to know those scientists?
    - Were men or women more likely to help you?
  
  - How much of an effort have you made to get to know more senior scientists?
    - In your country?
    - In other countries?
    - What have you done?
  
  - Are there gender issues in getting to know more senior scientists?
  
- Do you want to have a position of leadership in your institution some day?
  - Are there obstacles that you think you would face to get a position of leadership?

Anything else you would like to tell me about gender and being a scientist from your experience?