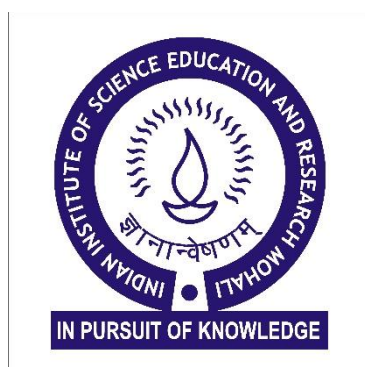


A Feminist Critique of Socialization in India's Scientific Community

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MS15168

**A dissertation submitted for the partial fulfilment of BS-MS
dual degree in Science**



Indian Institute of Science Education and Research Mohali

June 2020

Certificate of Examination

This is to certify that the dissertation titled “A Feminist Critique of Socialization in India’s Scientific Community” submitted by Ms. Sreelekshmi S A (Reg. No. MS15168) for the partial fulfilment of BS-MS dual degree programme of the Institute, has been examined by the thesis committee duly appointed by the institute. The committee finds the work done by candidate satisfactory and recommends that the report be accepted.

Dr. Anu Sabhlok

Dr. Adrene Freeda D’cruz

Dr. Ritajyoti Bandyopadhyay

(Supervisor)

Dated: June 15, 2020

Declaration

The work presented in this dissertation has been carried out by me under the guidance of Dr. Ritajyoti Bandyopadhyay at the Indian Institute of Science Education and Research Mohali.

This work has not been submitted in part or in full for a degree, a diploma, or a fellowship to any other university or institute. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due acknowledgement of collaborative research and discussions. This thesis is a bonafide record of original work done by me and all sources listed within have been detailed in the bibliography.

Sreelekshmi S A

MS15168

Dated: June 15, 2020

In my capacity as the supervisor of the candidate's project work, I certify that the above statements by the candidate are true to the best of my knowledge.

Dr. Ritajyoti Bandyopadhyay

(Supervisor)

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Sreelekshmi S A

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IISER Mohali

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Abstract

This thesis undertakes a questionnaire-based research survey on the gendered nature of socialization in India's scientific community. This thesis is an attempt to show the gendered nature of socialization of the scientific community of India. As a part of this feminist-sociological study, a survey was undertaken including IISER Mohali, IISER Pune, IISc Bangalore, IIT Kanpur etc., which has led to some concrete results.

Introduction

A day won't pass in my life without noticing any gender-related discrimination or crime in society. If one pays attention to the social life around, anybody can feel the same. Discrimination against women and other gender minorities have rooted in the very heart of the Indian culture in every aspect. "Na stree svaatantryam arhati" is a quote from Manusmriti, a law text followed by Hindus, this can be interpreted/translated in two ways. One is that "a woman does not deserve independence" and the other is that women are goddess and divine, so it is the duty of the man to protect and take good care of women.[1] Both of these interpretations do not help women to come forward in the mainstream. All people irrespective of their gender deserve independence and should be self-reliant. Social norms and values existing in Indian society strongly pullbacks women and other gender minorities from growing out of their shell than any other countries. Women are extremely underrepresented in every socio-economic sphere here. Gender inequalities existing in society leads to the spiking rate of violence against women and other genders.

Violence against women and other gender minorities is prevalent in India. According to National Family Health Survey in India 30% women between the age of 15-59 have experienced sexual, physical or emotional violence,[2] and the cases against other gender minorities would be included, this number will rise again. But it is more shocking to know that 99.1% of cases of sexual assaults are not reported.[3] India is one of the most dangerous countries for women.[4] In the case of women from scheduled castes or scheduled tribes, these scenarios get worsen. Their marginalization further narrows down their chances to get justice. The other gender minorities had to struggle throughout their life for justice in India. Lack of gender education in India make their life miserable from their childhood. Gender stereotyping, social norms and values safeguard and support the patriarchal structure of society and often leads to the violence against women and other gender minorities. Capital punishment and castration are not the solutions to this problem, we need strong law implementation and more importantly, need for gender sensitisation in every social institution.

India holds 112th rank in the Global Gender Gap Index by World Economic Forum 2019-2020, which measures the gender gap in economic participation, and opportunity, educational accomplishment, health and survival, and political empowerment.[5] This data

indicates that wealth is not reaching a major population of women and other gender minorities in the country and further exposes the worsened status and underrepresentation of women in the political arena. The struggle of an Indian woman, from a rural area, is pictured in the short film of Matchbox pictures, “The Ideal Bride”. A significant population of women in India are leading a life, depicted like that or even worse.

Gender priorities matter a lot when it comes to education or career in India. As a science student in an elite institution, I wondered how this gender disparities existing in society works in the institutional structures of science institutions. These institutions often projected as the ideal factories of knowledge production. If the scientific society is affected by these disparities, then somehow the knowledge produced from these systems is also compromised to some extent. So it is very essential to be sensitive about the discriminations existing in this field, and since the primary objective of this dissertation is to reveal how gender disparity operate and affect in the premier science research institutions in India.

Chapter 1

1.1 Literature Review: Women in Science

There are three distinct sub-fields of inquiry in the field of gender and social study of science as a socio-political artefact:

Women's History of Science

Clifford D Conner explained the historical role that women played in the making of modern science, women remained in the background of many crucial discoveries and only a few got in the limelight.[6] He says that twentieth-century anthropology treated women as almost nonexistent. He says that the primary knowledge about plant characteristics, that were crucial for human survival must have been collected by women, since women were the major foragers, as per the Hunter-Gatherer model. Conner points out that the accomplishments of Pedanius Dioscorides and Carl Linnaeus, pioneers in botany, were built on the knowledge of the experiments conducted by the indigenous population which most of whom are women. He strongly believed that women played an indispensable role in the origin of botanical sciences. He said that the discovery of ceramic art and weaving, in the Neolithic period were by women. He described the gender-based division of labour existed at that period as the main reason, since women tended to do the cooking, storing of food and other domestic jobs. These all point to the fact that there are so many unacknowledged contributions from many women and other backward communities to society.

Conner also criticizes the sexist metaphors in Bacon's philosophy of science.[7] He says that from the very definition of modern science by Francis Bacon, depicts the social position of women during the sixteenth and seventeenth century. Bacon projected Nature as a female and in his opinion knowledge must be produced by torturing and raping and thus by enslaving mother nature. The attitude that submission of women to male dominance

was an essential character of the society, which was supported by the extremely patriarchal group of scholars of that time. Conner says that education and professional degrees were completely the dominions of men in the sixteenth and seventeenth centuries. For further suppressing the opportunities of women, the native women healers, midwives were hunted in the name of witchcraft to professionalize and monopolize the healing or medical field as a part of the Renaissance movement. Medical self-help movements in the 1960s challenged orthodox science and led to women's liberation and science information movements.[8] A great number of women educated themselves about the female physiology and mastered and promoted the self- examination techniques. This has led to a major transformation in the medical practice afterwards. Conner unravels the politics of archiving and remembering the contributions of women and other racial minorities to modern science and the consequences of that discrimination are persisting in the society and every institution of it.

Philosophical Study

Sandra Harding believed that the gender of the investigator is significant in knowledge production.[9] A diverse group of researchers are needed to the democratic structure of knowledge creation. A feminist perspective is needed to eradicate the sexist and androcentric biases present in science. Harding suggests that by being sensitive about gender in the process of creation of knowledge might motivate an improved knowledge production. Standpoint theory insists that the investigator must be conscious about the standpoints of marginalized to understand the world from their angle.[10] Standpoint theorists consider all knowledge as perspectival, and they believed that some perspectives holds objectivity than others and thus becoming more standardized knowledge. [11] Harding says that knowledge production with a dynamic attempt for involving the research from the perspectives of the underprivileged will lead to the emergence of a stronger objective knowledge. She argues that so far achieved knowledge is only for the elite few, so a reinvention and replacement of sciences is needed. [12]

Gender Equity in Science Education and Research Institutions in India

Science is believed to be a field of meritorious people, women hardly find themselves in this group due to the fact that gender plays a vital role in shaping the career of a scientist. Jayasree Subramanian conducted an empirical study to understand how gender operates in the structures of science institutions in India[13]. She surveyed in the science institutions

in Chennai, Bangalore and Hyderabad in which female and male scientists had responded. She found out that majority of female scientists had a steady academic record up to the postgraduate level, after that the career graphs do not compare well with their male colleagues. After post-graduation, women are expected to start a marriage life in India, societal and family pressure on females were usually there from that period. Men usually marry women who are less qualified than them, so a woman who is a PhD scholar is more likely to marry someone who has already gained a PhD. So automatically career of the male counterpart get prioritised over the female and the major family responsibilities come on the shoulders on the woman. The prevalent patriarchal system favours the career of men at the expense of women's and evaluating parameters of academic achievements would be the same. The stereotype notions like ‘women do not have a good conceptual grasp’, “and “women are not serious about science” operate in science institutions are the reflections of the notions merit and authority that exist in the larger society. These gendered notions affect the academic competence of women scientists at least subtly in the everyday interaction between colleagues as well as in the policymaking level in the institutions. Mentors and advisers are not sensitive about the issue and not encourage women to embrace the arduous domains of research. The premier science institutions in India are perceived and projected as the shrines of excellence and functions in the idea that the capability to do science is inherent in a person and the talented are uplifted irrespective of their gender and socio-economic background. The operating systems of the institutions fail to see that the scientists are themselves social beings who must have been already biased. In a third world country like India accessibility to quality higher education is available only through a series of filtration in which a girl or other gender child rarely finds a way through it. Women are not getting the sort nourishment and encouragement that man receives in his career. If women lack the merit that men had, they naturally do not achieve a place in these institutions of excellence. If they possess the merit, and it needs to be explained that how their academic achievements do not match with their male counterparts.

The gender prejudices encased in the communication and cooperation in laboratories are often seen as personal actions instead of seeing them as the reflections of the social interactions of the larger society. The struggles of women and other marginalized gender communities are depicted in the short film "Halfway" by Collab lab,[14] even though it's a western background film, the scenario can be relatable to the Indian situation. Another important fact which Jayasree pointed out in her work is that the majority of women scientists were from socio-economically and culturally privileged families and thus having

strong support and encouragement to their career from them. So women or other gender minorities from an underprivileged family background rarely has this advantage and so for them to stand up in the main arena is almost impossible. She explains how gender works in various levels of operation in research institutions by citing some notions and practices of these institutions of excellence. Girl students are considered more bookish and diligent and boy students are considered to do better in understanding the concepts and questioning more about it. A female student who is a topper in IIT was admonished by her professor to not apply in the finest universities in abroad, because of being a woman, she would not be selected or even if somehow she got selected she would not be able to perform well. Taking on a female PhD student is considered as a vain process because she may not continue to pursue science. When a married male scientist devotes more to his career, he is seen as dedicated and when a female scientist does the same, she is considered to be uncaring and selfish. Women's potential to generate good work has been always suspected in India. Gender operates invisibly through all people including us. The patriarchal ideology and its structures which are predominant in society have a great effect on women, academic scientists, through family and the workspace.[14] Indian social structure gives great importance to women's family role and women who can balance both career and family are considered successful. Therefore, the majority of female researchers had to make a compromise in a career rather than the family.

Our study falls more directly in this sub-field though it occasionally takes insights from all the other sub-fields. Often, gendered exclusion in these pieces of literature means the exclusion of women in science. Identifying a slippage between gender and women, we propose to diversify our respondents and open the inquiry to the understanding of gender as a spectrum of relationality. This step enables us to not just unravel the androcentric biases in scientific practices, but also to call into question the heteronormative assumptions that structure scientific labour. Thus, we wish to understand the role that gender plays in producing and establishing a politically inert stage on which science acts. Not much research is done in this sub-field in the Indian context. Our research builds up its case around this very small knowledge-pool and thereby contributes to the global literature on the subject. We are specifically sensitive about the cultural context of science education and research in India and hence we study marginalization in the intersectionality of gender and caste.

1.2 Women's representation in Science

The below table shows the percentage of women faculties in major science departments in the prestigious science institutions in India.

Institutions	Biological Sciences	Chemistry	Mathematics	Physics
IISER Mohali	26.08	4.76	21.05	13.04
IISER Pune	22.58	15.15	26.92	12.9
IISER Kolkata	35.71	5.88	5.88	3.57
IISER Bhopal	11.11	11.11	10	8.33
IISER Berhampur	20	12.5	14.28	0
IISER Tirupati	40	20	28.57	40
IIT Madras	18.75	10.81	19.04	10.34
IIT Delhi	31.25	3.03	27.58	13.33
IIT Bombay	18.51	10.25	19.56	15.21
IIT Kharagpur	0	8.82	25	5.4
IIT Kanpur	10	5.12	20	7.31
IISC Bangalore	22.78	5.08	10.34	7.89
TIFR Mumbai	45.45	11.11	3.84	6.34

Data source: Websites of respective institutions

The highest participation of women is in the field of biological sciences having average participation of 23.24% and then comes Mathematics with average women participation of 17.85%. The least proportion of women are in the Chemistry field which is only 9.5% and

Physics departments had 11.05% of women participation. IISER Tirupati has the best women representation in all institutes. IISER Mohali, IISER Pune, IIT Delhi, and IIT Bombay have a competitively better representation, but still, it is only about 15%. It is interesting to realize that institutes located in former British presidency areas have shown a better value in women representation. Women are more attracted to the research in Biology and Mathematics than Physics and Chemistry. Biology and Mathematics are almost the opposite kinds of disciplines; Biology is more of inductive method and Mathematics is more inclined towards deductive methodology. Usually, women are considered to be weak in deductive reasoning and better in inductive reasoning; and the statistics showed that they are capable of handling both pretty well. Chemistry is the least favourite subject of women in science and graduates in chemistry are preferring industrial job over research and pursue their career away from research.[15] The main reason behind this is that there are not enough female role models in this field for the coming generation of women scientists.

Group photo of the faculties of the chemistry department (Figure 1.) in 1948 and faculties of the chemistry department of IISER Mohali in 2019 was shown with only one female faculty in both. From these two pictures, it is obvious that there is not much change in the scene after more than half a century.



Figure 1. Chemistry Department of Banaras Hindu University, 1948
Courtesy: Dr. Neeraja Sahasrabudhe



Figure 2. Chemistry Department of IISER Mohali, 2019

1.3 Transgender Scientists in India

There are almost 5 million transgender people in India, according to the transgender right group Rista.[16] Only a handful of people are in the science field of that population. A. Mani is a transwoman mathematician who is one among them in India. She stated in her blog that she had faced much discrimination after the transition in the academic world in India.[17] Every person in the transgender community has faced numerous challenges from their childhood. Most transgender people had suffered gender dysphoria during their adolescent age. Only a very few among this community are fortunate enough to get family and peer support. Depression and anxiety are common during the period of transition. Rejection by family and society often lead to the suicides of many[18] All these struggles severely affect their education.

Mani also had gone through depression, anxiety and suicidal tendencies and all these affected her academic career. These can be overcome with lesser sufferings if there had been any counselling facilities in school and college levels. She had to work solely, without any collaboration or co-authorization, due to the exclusion and marginalization, during and after the transition. She had dealt with misogynist male colleagues during that period.

She had provided some suggestions to improve the life of transgenders in academia and in common.

- Sexuality and gender studies should be included in the education curriculum to make people aware and sensitive about gender issues.
- Support group must be formed in every institution for them.
- More people from the diverse group should come forward.
- Educating the people and make the society aware of these issues for the change.

Chapter 2

2.1 Survey methodology

The questionnaire of the survey was circulated in IISER Mohali, IISER Pune, IISc Bangalore and IIT Kanpur etc. I collected the initial responses by asking my friends about their opinions about gender discrimination existing in the science arena. Most of them agreed on the existence of such a problem. But some are in the opinion that those who are passionate and excellent in science will always come forward in the field. The survey was conducted in a different set of people. The respondents of the survey are PhDs, postdocs, faculties, and other staff scientists. I tried to include as many questions as possible in the questionnaire to get information about every aspect of the gender discrimination practices in science. The main agenda of this survey is to understand the gendered nature of socialization in the Indian scientific community. But everyone won't be open about their opinion about this subject. So I tried to frame the same questions in different ways. The survey contains 47 questions and 14 sub-questions in which 33 of them are descriptive type questions, to make sure that a complete and clear opinion of each respondent was collected. Gender, discipline, academic position (PhD, postdoc, faculty or other staff scientists), and marital status have been asked before posing questions to analyse the data in every aspect. The survey questionnaire that I have used is given below.

2.2 Survey Questionnaire

Institution *

Short answer text
.....

Discipline *

Life sciences / Medical science

Chemical sciences

Physics

Mathematics

Technical studies

Other...

Level

*

- PhD
- Postdoc
- Scientific staff
- Faculty
- Other...

Gender

*

- Female
- Male
- Transgender
- Other

Age

*

Short answer text

Category (optional)

- General
- OBC
- SC/ST

Caste (optional)

Short answer text

Marital status *

Married

Unmarried/single

Widowed/widower

Section 2 of 4

Discipline ✕ ⋮

Description (optional)

In your opinion, what are the reasons behind the smaller number of women in science and technology fields? *

Long answer text

Do you think certain disciplines are more suitable for women? Please specify, if any, and why? *

Long answer text

"Science and technology institution systems work in a completely gender independent manner." *

Do you agree?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

"Women and men face the same level of difficulties for getting into higher positions in science or technology institutions." Do you agree? *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Does there exist any performance difference between male and female science students? *

Long answer text

When you take in PhD students in your group/lab, do you think that hiring a female student might be risky? *

Long answer text

Do you ask questions about getting married or life goals, when you hire a PhD student? *

- No
- Yes, but only to females
- Yes, but only to males
- Yes, ask both

Are there any stereotypical notions persisting in your particular discipline? Please explain, if there are any. *

Long answer text

"Women have to work several times harder than men to establish themselves." Do you agree? *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Does your institution have equal views about transgender scientists? Have you heard of any stories of discrimination outside the hetero-normative context? *

Note: Gender is not just a man-woman relation (heteronormative). It is a spectrum. Kindly answer keeping this view in mind.

Long answer text

Do you agree that, there exists any gender discrimination in terms of tasks assignment in the lab? If yes, how does it operate? *

Long answer text

Did you find any gender discrimination in spousal hiring? If so, in which way does it generally go? *

Long answer text

"Women's opinions tend to get marginalized in departmental meetings and policy making." Do you agree? *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Do you feel that your experience as a scientist is also affected by your caste and religious background in addition to your gender identity? *

Long answer text

Are you aware of the laws and institutional mechanisms for the prevention of sexual harassment in workspace? *

Sexual harassment is a form of violence against women and a human rights violation. It is a violation of fundamental rights as laid down in the Indian Constitution. Such behavior transgresses common dignity and gender equality and denies equal opportunity.

- Yes
- No
- Maybe

Are you aware of the existence of the committee against sexual harassment in your institution? *
If yes, then do you think that this body is active in handling reported cases of sexual harassment?

Sexual harassment is about any unwelcome sexually determined behaviour (whether directly or by implication) such as physical contact and advances, demand or request for sexual favours, sexually coloured remarks, showing pornography, or any other unwelcome physical verbal or non-verbal conduct of a sexual nature.

1. No
2. Yes, but don't know about activity.
3. Yes, but not properly active.
4. Yes, the committee is completely active and capable of handling such cases.

Was your choice of supervisor governed by the gender of the person? If yes, how did it help you in your career? *

Long answer text

Do you think that your mentors and supervisors interfere in your personal decisions (courtship/marriage)? OR Have you experienced such incidents in your career? *

Long answer text

Have you ever spoken about your work and being dismissed without consideration? *

Long answer text

Section 3 of 4

Colleagues

Description (optional)

"Male colleagues accept or value female colleagues' opinion without any discrimination. There doesn't exist any gender role issues." Do you agree? *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

"Colleagues support each other irrespective of gender." Do you agree? *

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

"Male colleagues do not show any kind of gender discrimination." Do you agree? If yes, what kind? *

Long answer text
.....

Have you ever experienced the inability to speak about your work in a gathering of your peers? *

Long answer text
.....

For female scientists: Questions a-e

Description (optional)

a. Are you excluded from social/informal networks of your colleagues because you are a woman?

- Yes
- No
- Maybe

b. Do "social norms" affect these informal communications. How?

Long answer text
.....

c. Does this exclusion or keeping a social distance from the informal groups affect your work/career?

Long answer text

d. Do platforms such as Indian women in mathematics,.....etc raise questions of gender discrimination in Science institutions?

Long answer text

e. Do you find it easier to talk about your work when you are with women than when you are with men?

Long answer text

For male scientists: Questions f-k

Description (optional)

f. Have you ever consciously made a sexist remark* in the PRESENCE of your female colleagues/students (especially in exclusive-male gatherings, as a matter of cracking a joke)?

Short answer text

g. Have you ever consciously made a sexist remark* in ABSENCE of your female colleagues/students?

Short answer text

h. If yes, do you justify them or do you reconsider your opinion in retrospect?

Long answer text
.....

i. Have you heard any male colleagues making sexist remarks* in absence or presence of women? Did you object or did you ignore?

Long answer text
.....

h. If yes, do you justify them or do you reconsider your opinion in retrospect?

Long answer text
.....

i. Have you heard any male colleagues making sexist remarks* in absence or presence of women? Did you object or did you ignore?

Long answer text
.....

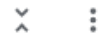
j. Have you ever supported your female colleague / colleagues in dealing with gender discrimination?

Long answer text
.....

k. How does passing a sexual remark hurt the workspace atmosphere?

Long answer text
.....

Family



Description (optional)

If married, Educational qualification of spouse: *

1. Under graduate or below
2. Post graduate
3. PhD
4. Postdoc

Profession of spouse:

Short answer text

Does marriage affect your career life? How?

Long answer text

Do you prefer to complete your academic assignments in your workspace, or do you carry it back home?

Yes

No

If your partner belongs to the same profession, does he/she do the same?

- Yes
- No

Is there any difference in the ways in which both of you approach your academic load?

Long answer text
.....

Who does the domestic/household work (other than the paid help) at home? (cleaning, child bearing, cooking and other tasks)

- Woman
- Man
- Both do equally
- Most by woman
- Most by man

Questions for female scientist: Questions l and m

Description (optional)

l. If your male partner shares equal household work, does he also take the equal mental load, or ^{*} does he need to be told?

(by mental load, remembering everyday details of what needs to be done to run the household and takes an independent initiative to solve everyday issues)

Short answer text

.....

m. How does mental load affect your academic pursuit?

Long answer text

"In-laws support female spouse's career without any patriarchal mindset. They value career of female and male equally." Do you agree?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Do family responsibilities affect anyway in travelling for international or national conferences?

Short answer text

.....

How many international travels have you avoided due to this reason?

Short answer text

Because of being a woman, do you restrict yourself from travelling for work related matters?

Long answer text

“Husband’s approval is necessary for a woman to pursue her career.” Do you agree?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

“Wife’s approval is necessary for a man to pursue his career.” Do you agree?

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Do you have to compromise in your career due to family responsibilities? If yes, what compromises do you make?

Long answer text

Do you agree that paternal leave should be given for at least 3 months?

Short answer text

Have you left a better employment and embraced a lesser job in order to be with your partner? Has your partner ever made a similar move?

Long answer text

For female scientists: Questions n-p

Description (optional)

n. Have you had a break in career due to motherhood? For how long?

Short answer text

o. Is there a creche facility in your institution for child care?

Yes

No

p. Do you think that conference/workshop organizers should keep this in mind to facilitate your participation?

Short answer text
.....

Do you think having a community kitchen facility in your institution will facilitate your academic work?

- Yes
- No
- May be

Does your department support you in scheduling meetings/classes by being sensitive about your household responsibilities?

Short answer text
.....

Do you depend on your extended family (parents and in-laws) for childcare? Or, do you have a 24X7 care-giver at home? Or, both?

Short answer text
.....

Does on-campus housing help? Or, does it induce multiple house visits during office hours and therefore, affects your professional work?

Long answer text
.....

Does your partner make efforts like bringing kids back from school, dropping them off at school, feeding them, etc.?

Short answer text
.....

Are you a single woman? If so, have experienced sexist behaviour from your male or female colleagues?

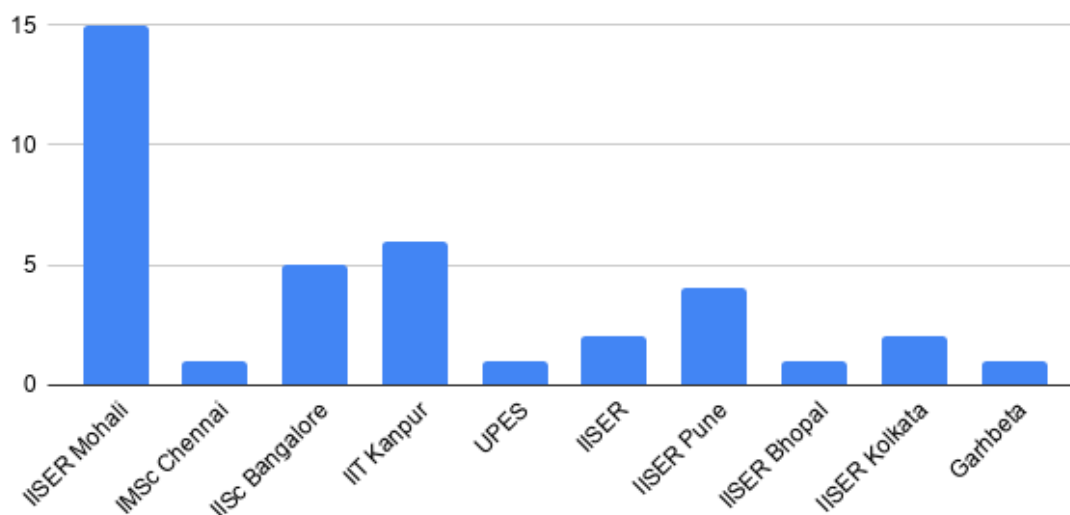
Long answer text
.....

Does being single affect your career positively or negatively?

Long answer text
.....

2.3 Observations

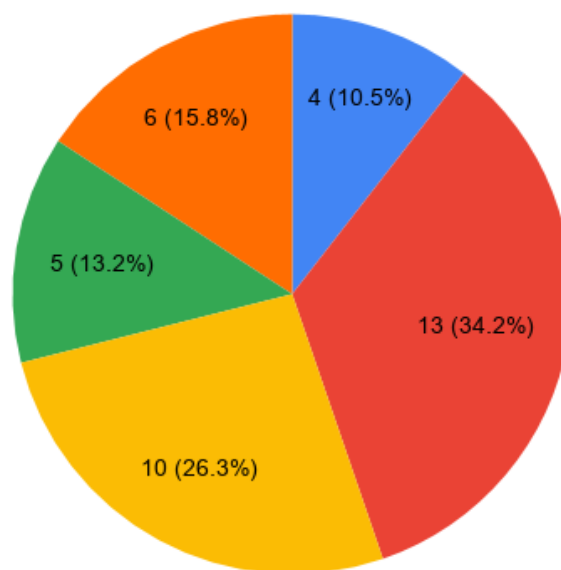
Institutions



The number of responses from each institution.

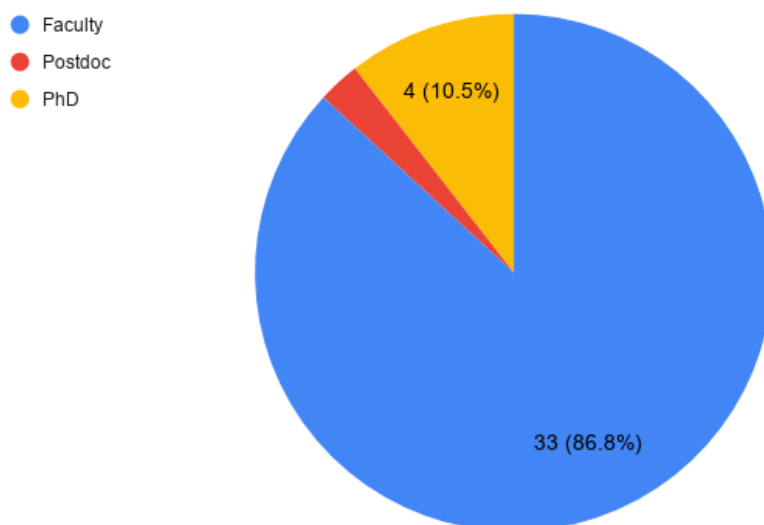
Discipline

- Physics
- Life sciences / Medical science
- Mathematics
- Engineering and other technical studies
- Chemical sciences



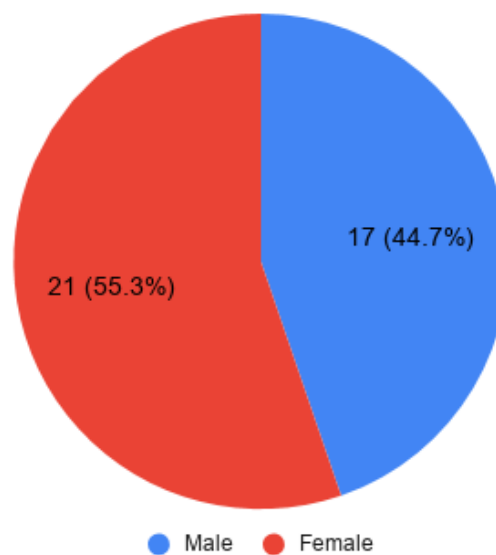
The number of responses from each discipline.

Level



The number of responses from each academic positions.

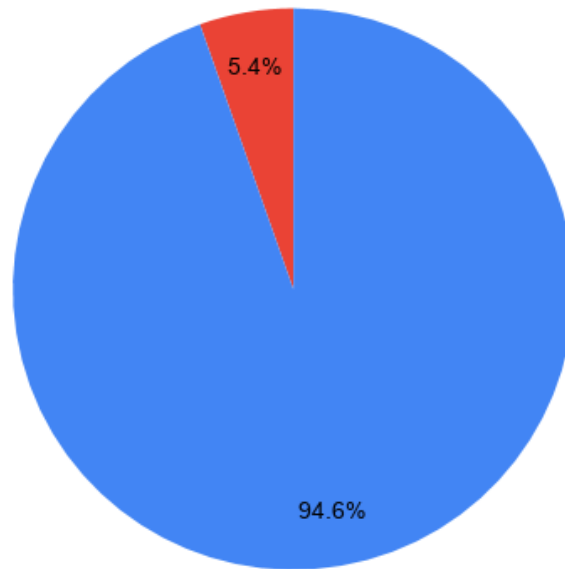
Gender



Number of responses from each gender.

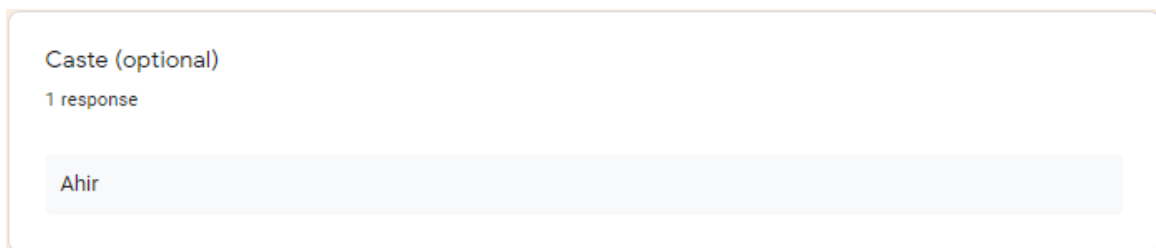
Category

- General
- OBC

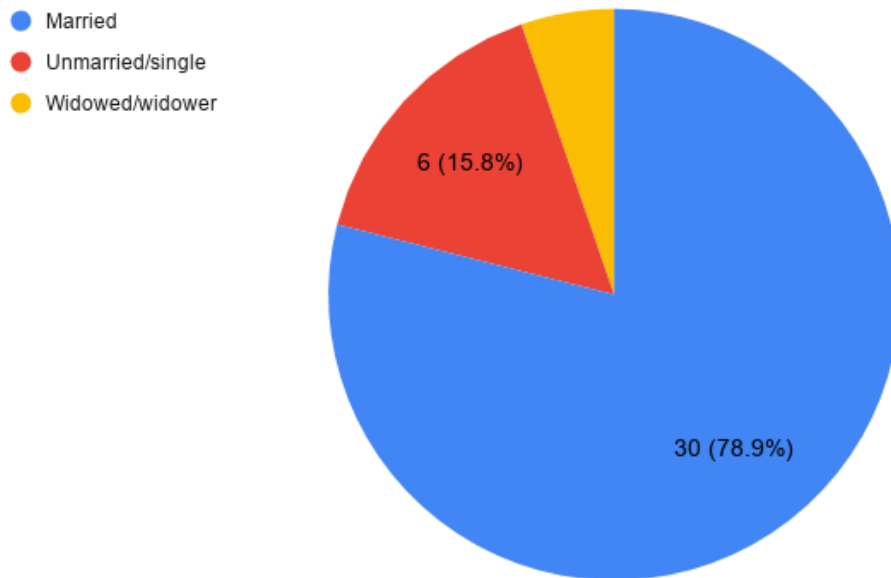


The number of responses from each category

Caste



Marital status



All the pieces of information given above serve as background data to analyse the following set of questions.

1. In your opinion, what are the reasons behind the smaller number of women in science and technology fields?

38 responses

1. Society often discourages a girl to go for studying science. This is being incepted in our head since long.
2. Parents often prefer to invest less for their daughter's study.

social compulsions and lack of support

Manifold reasons. Partly, academic taboo is a reason. My own niece for example preferred humanities, as she thought it will be "easy" and less technical than science.

Family responsibilities

There are many reasons. If I had to choose the top three reasons, I would say (1) lack of the required support at the institution, in society, and in personal life for women to be able to perform well at work while being able to balance their other roles, such as care giver and/or parent; hence, given the stress of balancing work, meeting professional expectations, trying to achieve tenure and promotions, together with performing other roles like parenting in their personal life where they on average invest more than do men, many women drop out and some may not even apply in the first place; (2) myriad, mostly unconscious and unstated biases at every stage, including hiring, tenure and professional expectations, and (3) lack of encouragement from a very young age onwards to pursue careers in science and technology together with fewer female role models in comparison with males

I cannot answer for other fields. In mathematics, this was originally (60 years ago) the case since fewer women were permitted by society to take "science stream" in school. Later, during the time when I was in school, the science stream was divided into "Engineering Stream" and "Medecine Stream". While both of these groups learnt mathematics and (until the time I finished school) gave the same mathematics Board exam, the teaching emphasis was different. Moreover, the men students in Engineering Stream had started going for "JEE coaching" around that time (1970's) which gave them additional training in Mathematics. In spite of this, you will find that a larger number of women were taking up graduate studies in Mathematics in the 1980's. In fact, it often happened that among the very good students in Mathematics at school level, the men entered Engineering schools while the women entered the good city colleges for BSc honours in Mathematics. However, over a period of time, the quality of city colleges dropped and so there were very few good undergraduate Mathematics programmes in India during 1990's. In the late 1990's undergraduate Mathematics programmes of high calibre were started at ISI and CMI. However, as these were residential programmes, there was again a lower participation of women students. (The number of students in these programmes was typically 20 or so; which is also a very small number for a country like ours.) Following the suggestions of Profs Bhide and Gvond Swarup, the science community pushed for the creation of good undergraduate science programmes towards the turn of the century. Ultimately, this led to the creation of IISERs which is good, but it ignored the way in which city colleges were going downhill. Combined with some of the central Universities like Hyderabad and state/central like Panjab University, this has led to some access to good undergraduate programmes in Mathematics across the country. In my estimation, about 10-15% of the students in these programmes consists of women which is not what it should be, but

is not small given the lack of access to basic education to many girl children in large parts of the country.

Poverty and gender inequalities in rural areas, high fees of science studies in private schools, early age marriage of girls compared to boys.

1. Social, less number of girls pursue career in this field. 2. Family, even after higher studies they often leave due to family reasons.

the way society is structured

Less motivation and support from society (family, etc) for women after their graduation to continue in STEM.

Lack of family support for higher study to women

Not sure

Societal challenges and not enough support structures.

1. Structural biases (e.g. lesser mobility demanded by parents/family) against women (not necessarily inside S&T) lead to fewer women with aptitude to pursue the sciences, or them quitting early in career (e.g. because we don't accommodate children and their needs in the institutions).
2. Structural biases (e.g. lack of peers who treat them equally) against women (inside S&T) ensure that they are not easily accommodated with S&T positions.

Early marriage, No reservation in the selection, Patriarchal hegemony

Traditionally women have not been encouraged from an early age. Also, there isn't enough advertisement of the work of Indian women scientists who can act as role models.

These areas require more time and energy to be devoted, hence women might not be able to

The perspective of our society is that women after a basic education take care of the household and men go out for work. This alienated women from pursuing something more challenging like having a career in science. From early childhood in schools girls should be educated about equal opportunities and orient them as career concentric. As they grow up let them choose if they want to make that career in science or not. In my opinion gender by itself doesn't have any bias towards science, it is the so called social norms

that puts pressure on individuals to follow a certain education/career path depending on what job is more feasible. And for sure less opportunities and challenges associated in pursuing science will be a demotivating factor for women whose households do not want them to go out of home to take care of families, or just want them to do a fixed routine 9-5 job

Family pressures and social pressures

The reflection of women in science is that of net working woman in society in general.

Social structure and patriarchal mentality.

I guess the ratio is improving these days.

Societal pressure to focus on family and the assumption that STEM jobs can be very demanding.

Lack of encouragement and guidance by family members and teachers.

Societal/cultural upbringing

Lack of support at an early age; consistent support and encouragement during later stages of their career; insensitivity of male leaders to ensure gender parity and diversity

lack of support to pursue a career while being married and starting a family

I don't think there are less women in science and tech filed. There are more women nowadays than last decade.

It is a general societal problem; unless the role of women in society changes, this will remain the same.

They need to be encouraged to study Science and Technology in their graduation and beyond

Patriarchy, Fear of safety, Conservative practices, Family pressure(Marriage) and Orthodoxy

Fields are demanding and women have a lot of extra commitments in family

Work life balance, the lack of human connection in science

Their family members, like parents don't think that the girls can go for higher education and do well in that. Girls with masters degree are pushed to go for clerical jobs or marriage instead of research oriented fields, where long time is required for success and marriage can't wait that long is the thinking of their parents.

There are several reasons for small number of women in academia. Specifically in science and technology fields, there exists a strong bias even at the school level. More specifically, girls are discouraged to take up subjects like mathematics and physics. Their shortcomings are constantly linked to their gender.

Lack of empathy and help from family/society, requirement to do what they feel they should and requirement to please others.

The education of children is largely supported from the families income. So the choice of domain a student makes is often influenced by the decision of the family members who sponsors his/her education. Since science and technology have predominantly been male dominated, many families simply follow the herd and discourage the girl child to explore domains where women examples are not predominant.

Patriarchal society

2. Do you think certain disciplines are more suitable for women?

Please specify, if any, and why?

38 responses

No

Not really

no

Arts, Social sciences and Biological Sciences.

No.

No.

In some ways, Mathematics and Mathematical Sciences along with other Theoretical Sciences *could* be considered "more suitable" for women from a social perspective. Given social pressures, it may be harder for women to spend long hours in laboratories as is often required for graduate students and post-doctoral researchers in the experimental sciences.

All are fine with women.

All disciplines are suitable for women.

I don't think so. Any subject is suitable for everyone.

No. Women are a good fit for all disciplines.

Theoretical disciplines offer the advantage of them sustaining even against the structural biases. However fewer women there suggests that other kinds of biases play against women in such situations.
So no: I can't think of any reason why certain disciplines may be more suitable to women and have no evidence to conclude otherwise.

Biology and the arts have been considered more appropriate because it is a belief that other disciplines need more physically intensive efforts (Like experimental physics or chemistry) or high level analytical skills (theoretical physics and chemistry).

May Be. Life science as per statistics.

I think all jobs can be handled by women with equal efficiency as that of a man. Maybe when required higher muscle power the job could be reserved for men.

Those disciplines that demand less traveling as well as physical work are suitable for women

In an ideal world, all the disciplines are equally suitable for men and women.

Not at all.

No. I believe all disciplines have their own challenges and if willing, women can beat any odds.

Women should be equally empowered as men. In any discipline women can excel.

I think women are capable of anything they wish to do.

no i don't think so

I don't think so.

Given the opportunity and space, anyone can perform well in any discipline.

I think all disciplines are suitable for women. It is individual's aptitude.

Yes. The subjects with a focus on human connection are preferable for women

All the disciplines are suitable for both men and women if he/she is interested in that and ready to spend time and face challenges in that discipline.

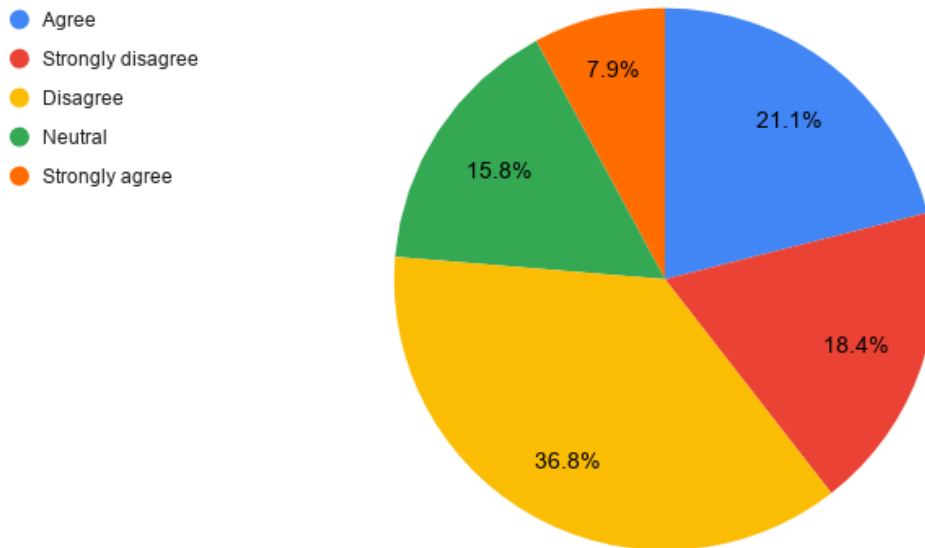
No, I don't think so.

No, I don't think certain disciplines are more suitable for women. Women should make up at least 50% of all students/postdocs and faculty in all disciplines.

It all depends on an individual's inclination and training at the basic level.

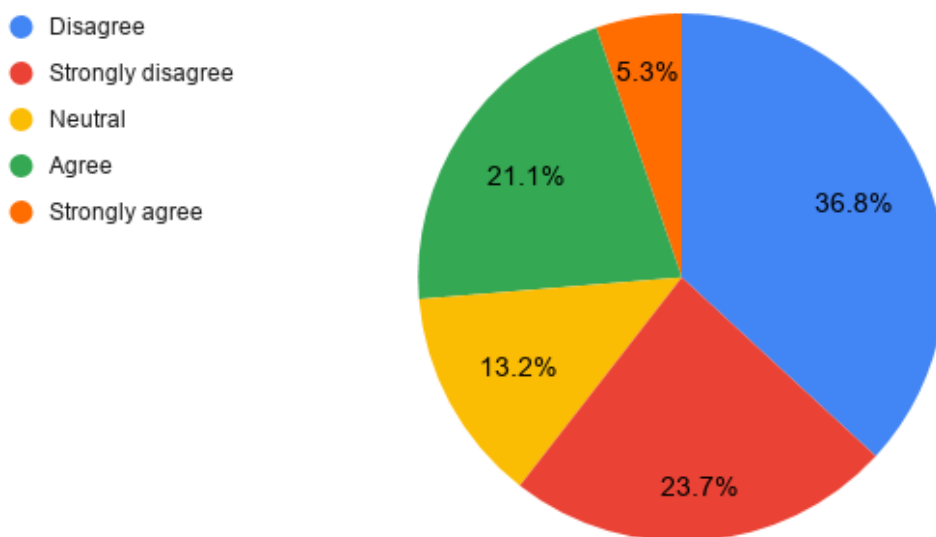
3. “Science and technology institution systems work in a completely gender independent manner.” Do you agree?

38 responses



4. “Women and men face the same level of difficulties for getting into higher positions in science or technology institutions.” Do you agree?

38 responses



5. Does there exist any performance difference between male and female science students?

38 responses

No

No.

no

I have not found any such.

yes

At IISER Mohali, I think female students do better than male students! Female students are much more sincere and regular than males. But motivated male students are perhaps more aggressive than their female counterparts.

In my experience with Masters and PhD students, there are no performance differences. Capabilities and abilities are similar for female and male students. However, female science students, on average, are less confident than male science students.

In my experience there is no difference for students who have equal opportunities.

Not at all.

I have teaching experience at two places: in my earlier institute classes I took was entirely male dominated with few women, men did better; in my present institute classes I have taken so far are female dominated and women did better.

So in my judgement this difference does not exist.

Yes but that is more of bringing up and environment how they have studied and that difference can be between male and male as well

There is a difference in the way male and female student organize and perform their respective tasks, but the productivity doesn't seem to weigh more on either side. Nonetheless, when a female student is pressed into social pressures of wedlock and having a child her mental focus shifts and this comes in as a big blow in her performance. Male students have the pressure of securing a stable career which pushes them to work even harder. Thus social pressure on male and female students affects their performance antagonistically.

Not really

Female students are more focused and tend to do better

Not at all. In fact, I find many of the female students are more dedicated and focused on their science.

I am not aware of any such statistical data.

I don't think so

No.

Yes.

The gender of the student does not influence his/her performance.

6. When you take in PhD students in your group/lab, do you think that hiring a female student might be risky?

38 responses

No

No.

no

No. Rather I prefer to hire female as I know many male scholars in my discipline who think that it is better not to opt for doing Ph. D. under supervision of a lady faculty.

yes

No. I have guided several female students, including a PhD student.

Not at all.

No. Currently I have 5 female and 1 male PhD students

NO

Unfortunately, I do. I feel more cautious about the project and makes me do a lot of back-up plans. The factors that affect a female student negatively is much higher than that often goes for male student. I have to add additional parameters into my thought process such as what will be the working time, whether she will manage to spend late night or early morning schedules if required, what if the student succumb to social pressure as mentioned before and decides to quit. But never have I doubted the intellectual capacity of a student just because she is a female.

Not at all

Absolutely not.

I am still a postdoc. If a professional atmosphere is maintained in a lab, and with your students/postdocs, gender will not matter.

Not at all (my first five PhD students are all female students)

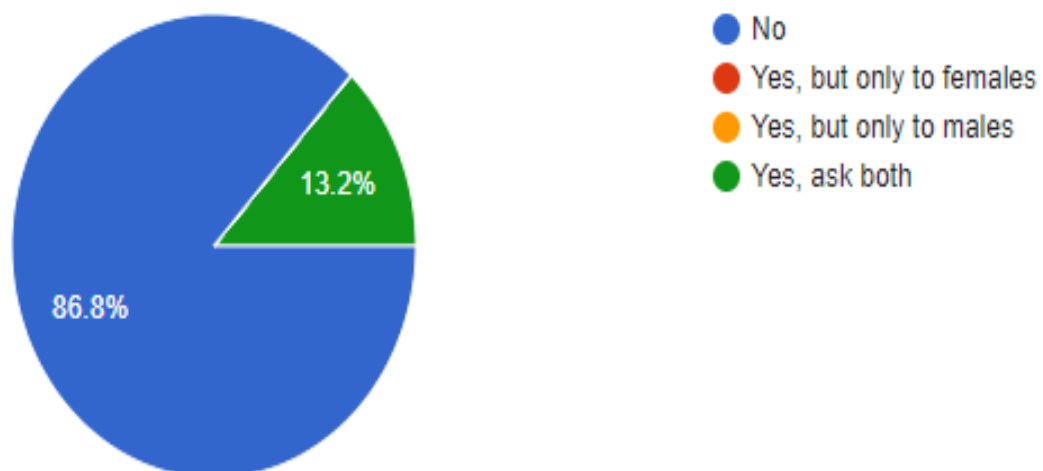
no rather it is opposite. I have found female students to be more trustworthy.

Sometime yes. If a lab has only male students then it may be uncomfortable for the first gile to get accustomed to the lab. That's why one should try to keep equal population from the beginning.

No. My lab has always had more female students then male students.

7. Do you ask questions about getting married or life goals, when you hire a PhD student?

38 responses



8. Are there any stereotypical notions persisting in your particular discipline? Please explain, if there are any.

38 responses

No

I don't know

1. Mathematics is not a girl' s cup of tea.
2. (A life experience of a lady faculty of math in a renowned govt. College of west bengal) if a female studies math for long time her mind becomes so complicated that if one marries her, his life will be ruined soon.

It depends on skill sets and should not be confused with gender equality.

There is no stereotype as per as I can say.

None relating to my specific discipline - they are the general problems faced by women that I have listed above.

Both men and women need to realise that to do mathematics, it is important to travel and meet people from other countries and cultures. I have seen both men and women students whose careers have suffered out of the wrong notion that social or political reasons should be allowed to limit them to certain geographical regions.

Yes

Not that I am aware of

May be in some engineering field, like civil or petrochemical etc.

Yes. Many PIs worry about women getting married and pregnant. It should not be the case

In my discipline, there is certainly ageism (that older you go, lesser capable you are): this inadvertently plays against women.
There must also be sexism because statistics reflects that. But I am somewhat pressed to find examples for stereotypes (though have plenty for structural biases: like lack of toilets, creches, support doing periods, and so on and so forth).

Yes, one of it is where ever there are more female students, there is less work and more talks

Not to my knowledge.

More women are thought to prefer the stream of Life science

We have more female students in the department than males. Its hard for me to see any stereotype, given only a year's experience here. However, I have noticed the performance level goes down as a the student get distracted due to social pressures.

None.

Nothing specific to my discipline.

Not aware.

Yes: "experimental scientists must be hard-working and men by default"

Many, that girls only think of getting married etc etc

yeah females are not thought to be good in mathematical areas

None

no

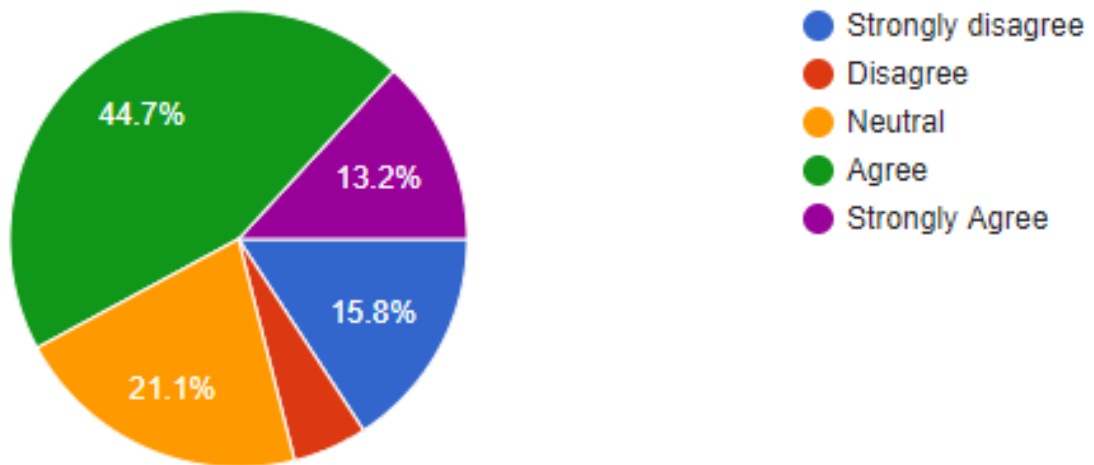
Not that I'm aware of.

Yes, women are assumed to have low aptitude for mathematics.

I am not aware.

9. “Women have to work several times harder than men to establish themselves.” Do you agree?

38 responses



10. Does your institution have equal views about transgender scientists? Have you heard of any stories of discrimination outside the hetero-normative context?

38 responses

No

Yes

In the science community, when someone receives a prestigious award, the person's sexual orientation often enters the discourse. If the awardee is a woman or someone in a same sex relationship, she often draws flak from others in her community. It is said that she has bagged the award in lieu of sexual favours.

no idea

Well....I don't know. But I do feel there are hidden discriminations in my institute, but that is somewhat different and not that simple.

No stories of discrimination

No I have not heard of stories of discrimination outside the hetero-normative context in my institution.

No idea of any rules. Have not seen an explicit case of discrimination in any Institute I have worked in.

Don't know

I have not heard of any stories where there ahas been any discrimination.

Not faced any such case till now

Yes it does

I would suppose that the institute has equal (or nearing equal) views, but I am relatively new here and do not know of any examples that suggest either ways.

I havent heard but there is not any equal view about transgender scientists

No data to go by.

Cannot comment. No precedence.

I would love to see a very inclusive society that is unbiased and only see what the person contributes to the scientific community and based on which judgement are made. I would like to believe our campus is pertinent to that vision. However, I m yet to testify that with new gender neutral or transgender individuals joining the institute.

I am incapable to answer this question.

Yes; No

Not aware of any case of such discrimination.

No. Yes, I have witnessed colleagues possessing discriminatory views.

They state that they do, but I am not sure if there has been any example where this has been demonstrated.

there is no discussion on it. i am not aware

No idea

I am not sure my institute is adequately sensitised

yes

I have not come across

I am not aware of the institutional views, however, I have heard stories of discrimination in hiring of transgender candidates.

I do not know

Not aware.

11. Do you agree that there exists any gender discrimination in terms of tasks assignment in the lab? If yes, how does it operate?

38 responses

No

no

Not in my lab. Both gender of students have to do all tasks.

yes. lifting heavy things primarily done by men.

I do not know.

Not aware.

Have never worked in a lab. In research seminars, (Mathematics equivalent of lab!), I have not seen any discrimination.

Largely no

Yes, in many subtle and not so subtle ways

Yes. In certain labs, where the work culture is more rigorous (day and night) they prefer only male candidates as they can work at any time.

yes, most of the male faculties have this notion that male students should be give more physical work than female

Not applicable for theoreticians.

Not in my lab. Don't know about other labs though.

Yes. Some tasks need physical strength and there sometimes a girl faces challenge. Just for example, lifting of a 50kg container (bu two of them) filled with LN2 or pulling a gas cylinder etc needs physical strength, which some of Indian girls don't have by nature. Some of them can manage but some can't.

yes. It depends on skill sets and should not be equated with gender equality.

I do not consider gender as a parameter while assigning tasks unless it requires heavy duty physical endurance. Example, I do not ask the female students to lift the 20 L liquid nitrogen tank when we need to

refill the bigger tank.

No, I do not agree.

Not really

I do not work in lab

Not applicable. I have never worked in a lab.

There is no discrimination, other than physically tough ones, that might be many of women and some men can not perform.

NOne

I have not come across any such cases, but probably does exist.

Certain activities may be more suitable for me. eg. changing cylinders, lifting heavy instruments etc

No at least in my laboratory

Yes. In my college administration does not prefer to give a lady faculty the following assignments 1. Assignment with lots of technical/ hardware knowledge 2. Assignments that involves complicated calculations 3. Finance related assignments.

In my lab, we strive hard to be fair in task assignment.

12. Did you feel any gender discrimination in terms of grades/credits being awarded to you during your career? If yes, in which manner was it biased?

38 responses

No

No.

no

No, I did not feel that way.

I don't know actually.

No.

yes.

Not really

I have not experienced any discrimination.

NO

I do not think so. Mostly men get it because there are mostly men working in the field, a possible reason for which I have already given. Once the number of men and women scientists are equal, we should look back at this point.

No, I have not faced any gender discrimination.

No

13. Did you find any gender discrimination in spousal hiring? If so, in which way does it generally go?

38 responses

No

1. I have experienced spousal hiring when I and my husband got selected for the posts of assistant system engineer in TCS
2. Interviewers did not show any interest in taking my interview seriously when I applied for the post of assistant professor in math in a University since my husband works in the same dept. as an assistant professor.

no idea

Usually I have seen colleagues to oppose spouse hiring in general. But that's not based on gender.

In the past, I am aware of specific cases where the Institute was *not* allowed to hire the spouse. Today, if at all, my experience is that Institutes encourage solutions to the "two-body" problem.

1. Who ever applies first, gets it. The other one, even if is good, sometime does not get job in the same place and that forces many of the women (mostly) to quite.

yes

It was obvious in certain institutes where I had interviewed at, however, it did not happen at IISER, Pune.

Yes, I felt that the female spouses of some colleagues in some institutes were hired because the male colleagues were very competitive and wouldn't have come here in absence of the other. I have not known the same situation for female colleagues (but have known situations where both colleagues were likely equally competitive).

no

No data to go by.

Cannot comment

Not that I know of

Yes, it goes without saying that hiring spouses is not at all considered favorably in most institutes in India despite the educational qualifications and other credentials being satisfactorily met by the spouse. This of course is not gender discrimination per se but is in some sense related!

Souces tend to be on losing side

I have not seen any gender discrimination. But I have heard some cases where the bias was in favor of the male spouse.

I do not have experience in this.

Not Applicable

Not aware.

Yes, with a reluctance to consider spousal hiring saying it will lead to a fall in standards.

yes, absolutely, the unsaid rule is don't hire in the same institute

Not sure

slightly

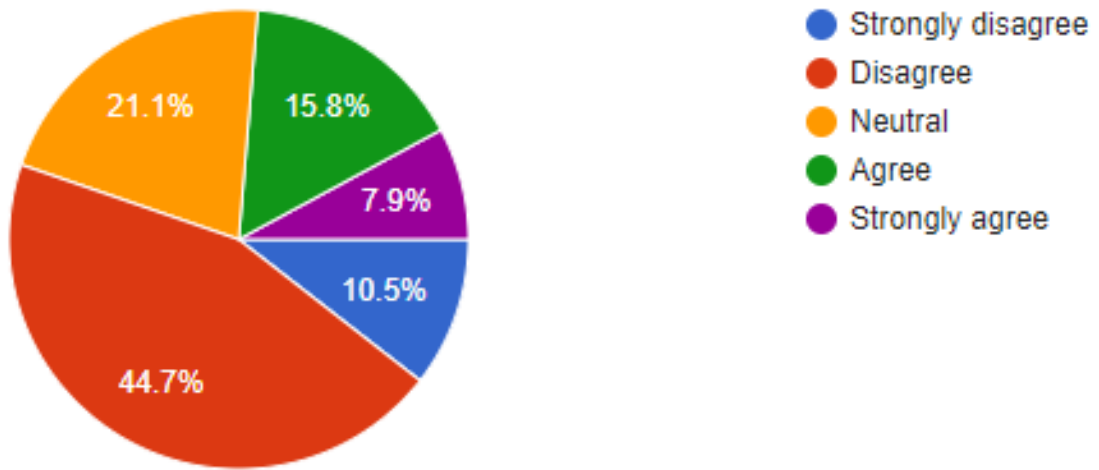
Colleagues have voiced strong opinions against hiring married couples. This almost always goes against women in terms of relocation etc. even if they are the preferred candidate. Although these suggestions were vetoed in this particular meeting, I have come to realize that similar views are held by several people in academia.

Once one of partners gets a job, the application of the other is not judged as per his/her credentials.

Yes.stronger candidate

14. “Women’s opinions tend to get marginalized in departmental meetings and policymaking.” Do you agree?

38 responses



15. Do you feel that your experience as a scientist is also affected by your caste and religious background in addition to your gender identity?

38 responses

- No
- No.
- no
- yes
- Yes
- As I carry a brahmin title I have not experienced such. But there are many of reserved categories whose talent get judged by their surnames.
- to some extend
- Well....what do you mean by caste here. If it is caste based on birth, then no. But your background institutions, the group you have worked on, might also call a caste system in academia, and that certainly matters!

Yes, in the sense that I realise that coming from a privileged background has eased my career in science

Almost all the mathematicians that I have met have been from the upper castes and from the dominant religions (and, in the West, the dominant races). I have not seen any specific discrimination. However, this is probably reflective of the lack of equality of opportunity. It is also possible for social patterns of behaviour within communities to emerge which indirectly are discriminatory. For example, if it is common to discuss after a seminar in a bar over drinks, that may discriminate against those who cannot, for religious or social reasons, go to such a place.

It can be influenced by gender identity at times, but definitely not by caste or religious background.

Yes, I strongly do.

Cannot comment

Very minimal, almost negligible. The idea of caste/religion creeps in only when we apply for a certain fellowship/awards etc where there is a relaxation on age or qualification for certain category of individuals even when at this stage of the career we all have similar facilities and opportunities.

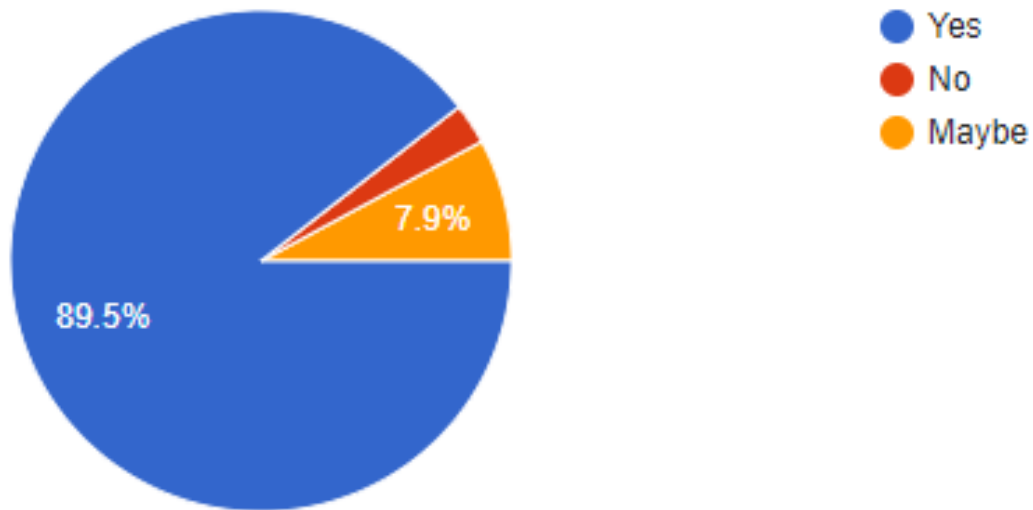
Yes.

Not applicable-I do not believe in Caste

No. But I am not a good subject to address this view.

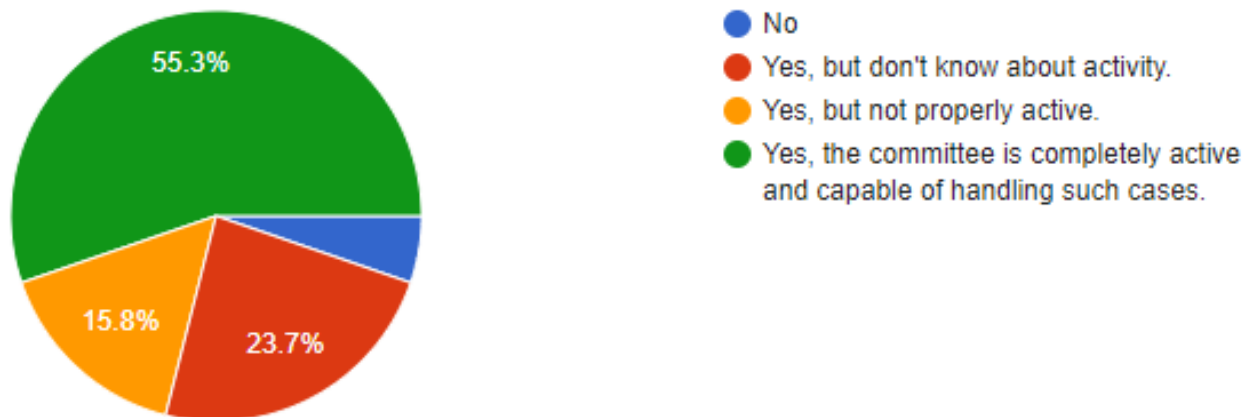
16. Are you aware of the laws and institutional mechanisms for the prevention of sexual harassment in the workspace?

38 responses



17. Are you aware of the existence of the committee against sexual harassment in your institution? If yes, then do you think that this body is active in handling reported cases of sexual harassment?

38 responses



18. Was your choice of supervisor governed by the gender of the person? If yes, how did it help you in your career?

38 responses

No

No.

no

It depends purely on skill sets and comfort levels.

No.

No, it wasn't.

Not at all.

NA

no it wasnt

No influence of gender

Yes. It was not very helpful that she was a female.

For this question, 36 respondents answered that there was no gender bias in their choice of supervisor.

19. Do you think that your mentors and supervisors interfere in your personal decisions (courtship/marriage)? OR Have you experienced such incidents in your career?

38 responses

No

no

No.

No. But I know many male/ female scholars in lab based subjects who have faced this.

No. In fact, my supervisor was pretty supportive to my decision. But I have seen such incidents where supervisors were not so supportive.

To some mild extent. My supervisor (and that of my spouse) were concerned that we should not get "distracted" from research once we got married (we were still graduate students at that time). In particular, they were concerned that our choice of post-doctoral work should not be dictated by the spouses choices.

NO

No, I am not aware of such incidents.

yes they do, they would pass some personal comments and if they get to know you are getting married they will start giving you all types of lectures and all that

NA

Yes

None

Yes, from a senior colleague.

Yes.

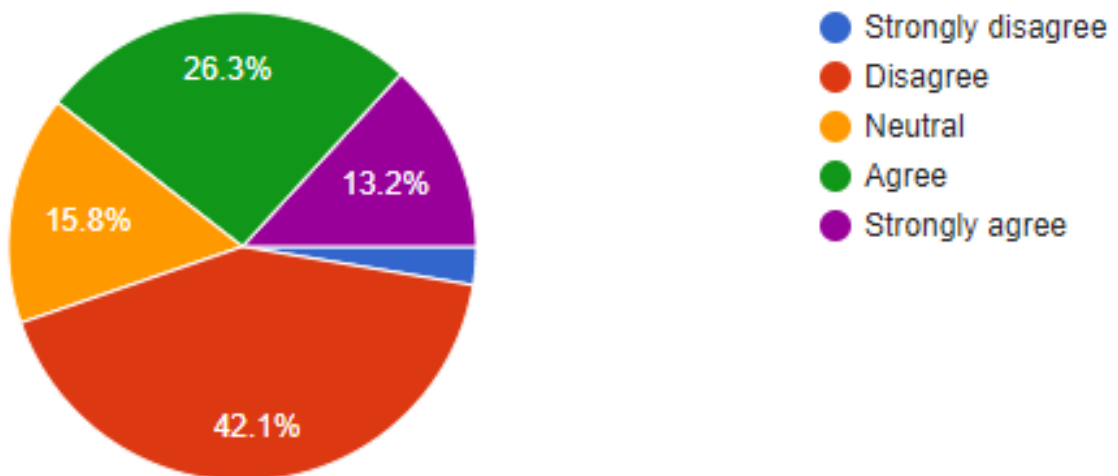
20. Have you ever spoken about your work and being dismissed without consideration?

38 responses

- No
- No.
- Yes
- yes
- no
- NO
- I couldn't understand the question. Spoken where and dismissed by whom?
- It has not happened to me.
- Only once

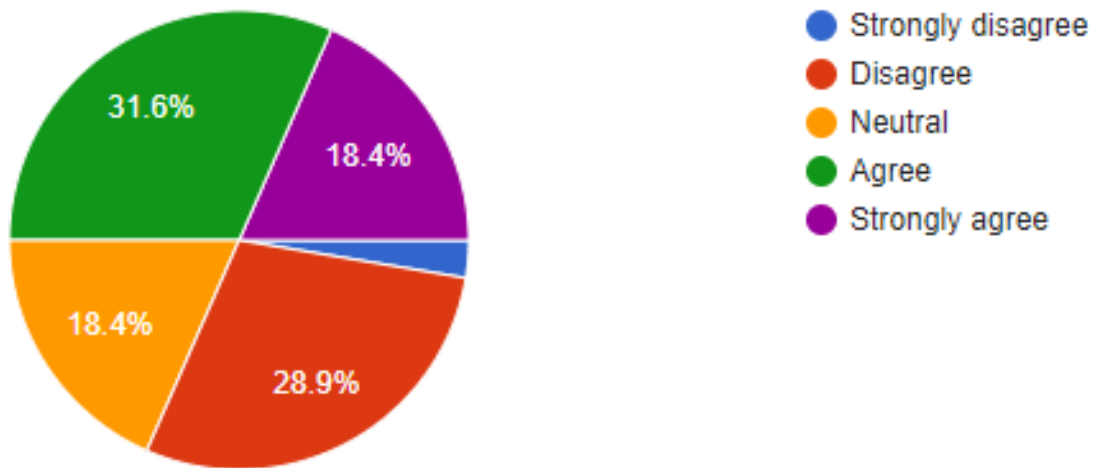
21. “Male colleagues accept or value female colleagues’ opinion without any discrimination. There doesn’t exist any gender role issues.” Do you agree?

38 responses



22. “Colleagues support each other irrespective of gender.” Do you agree?

38 responses



23. “Male colleagues do not show any kind of gender discrimination.” Do you agree? If yes, what kind?

38 responses

No

no

Yes

yes

Agree.

No. They often show. In my college a very sincere, experienced unmarried aged lady faculty shows strictness regarding the rules and carry out all the duties assigned to her without disobeying a single rule. In return many male faculties (specially in math dept.) say openly that "she has no child and this is why she is so strict".

Largely agree.

The main kind stems from male colleagues not fully realising or appreciating female responsibilities outside work (e.g., the impact on work resulting from pregnancy, caring for young children, or older parents) and as a result not adjusting professional expectations from female colleagues. This results in extra stress on females to perform, longer times to tenure and promotion, which can make females feel less valued. Females also disproportionately perform more committee-related and service-related work which can take more time away from doing science for females than males.

In my opinion, no gender-specific (or caste/religion etc. specific) discussion has a place in a professional setting. I have noticed a very small number of very conservative, mostly older colleagues who do make gender-specific observations. Most colleagues do not make such remarks and ignore them when made by others. However, since these remarks are usually not "called-out" they may have a negative influence.

yes.

No.

Agree

No. There is discrimination: for example in terms of "peer groups" (reading groups, trekking groups) being organized in my place of education (more so in UG, but perhaps also in PhD), it was more likely for women to be excluded than men.

I myself was insensitive enough to deny a lab-partnership (in my UG days) to a female colleague because I found it "awkward".

Not always

Not any to my knowledge

Yes, the insecurity levels of male colleagues with their female colleagues is quite high.

I am not aware of any kind of gender discrimination.

Yes, most of them, fortunately!

They do not see women as being equally capable

they do.

I believe a lot depends on the female colleague's attitude

In Some cases yes. Generally power dynamics and decision making

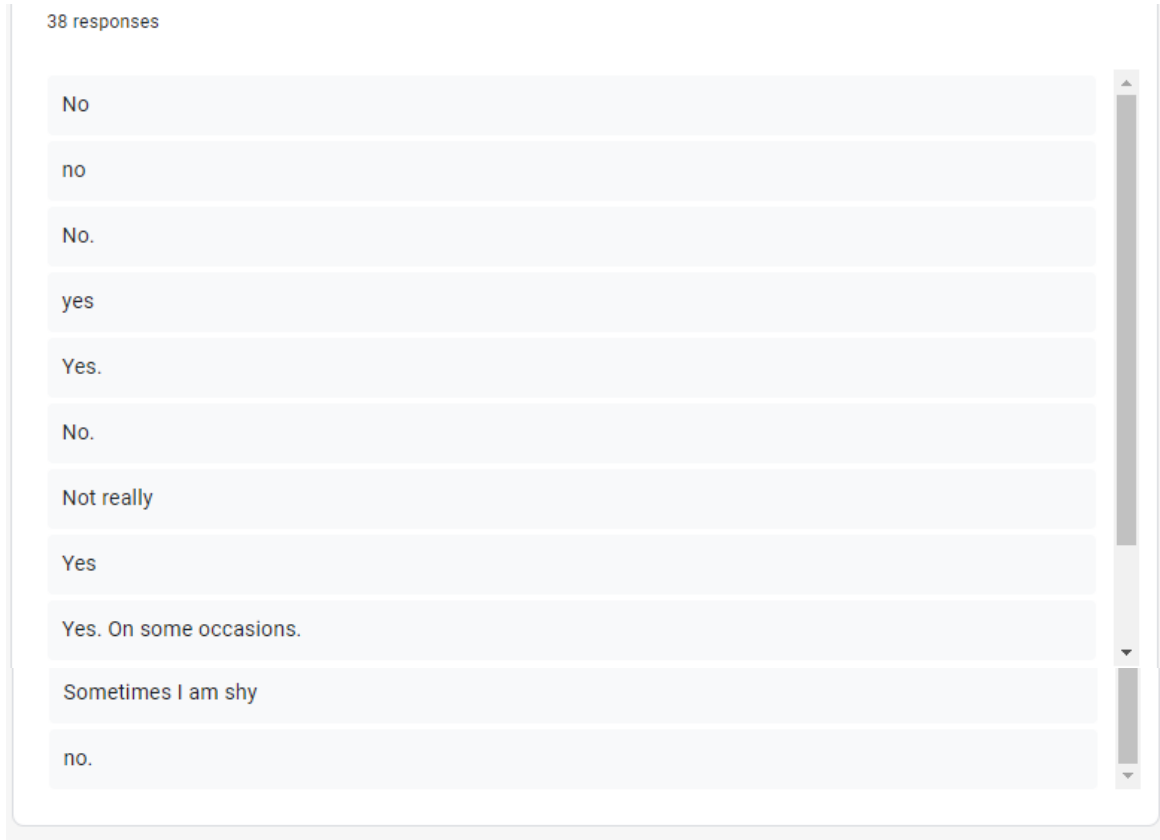
I haven't experienced it personally.

I disagree.

agree largely

Yes. Male colleagues are often blind towards child care issues which are of major concerns for us.

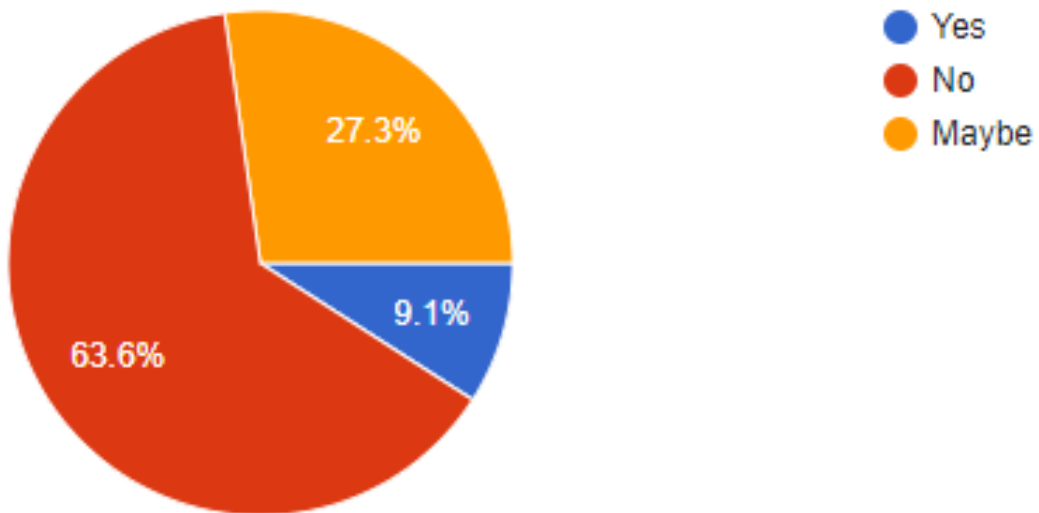
24. Have you ever experienced the inability to speak about your work in a gathering of your peers?



Questions 25-29 are for female scientists

25. Are you excluded from social/informal networks of your colleagues because you are a woman?

22 responses



26. Do “social norms” affect these informal communications. How?

18 responses

no
No
I am not sure.
Not aware
I have not experienced any such social norms.
I don't think so
Cannot say
May be
Indian social norms are highly discriminatory against women

yes

Sometimes. Women have restrictions on timing and the choice of place for informal communication.

We have little informal Communication.

Yes. This is particularly visible during conference and workshops, where a lot of discussion happens in informal spaces, which are difficult to navigate for women, because of social norms (that often gets passed off as social awkwardness of men in academia).

I do not know

no.

27. Does this exclusion or keeping a social distance from the informal groups affect your work/career?

19 responses

No

no

No.

May be

Not aware

Yes

I have not experienced any.

Could potentially affect

it does. not me in particular

somewhat.

Yes, a little.

Maybe

28. Do platforms such as Indian women in mathematics,.....etc raise questions of gender discrimination in Science institutions?

18 responses

Yes

yes

I am not aware about this.

I do not think so.

It does.

Not yet, but future I will

I guess so (don't know)

May be

No

I am not aware of their activities.

I do not know

Not aware.

no

29. Do you find it easier to talk about your work when you are with women than when you are with men?

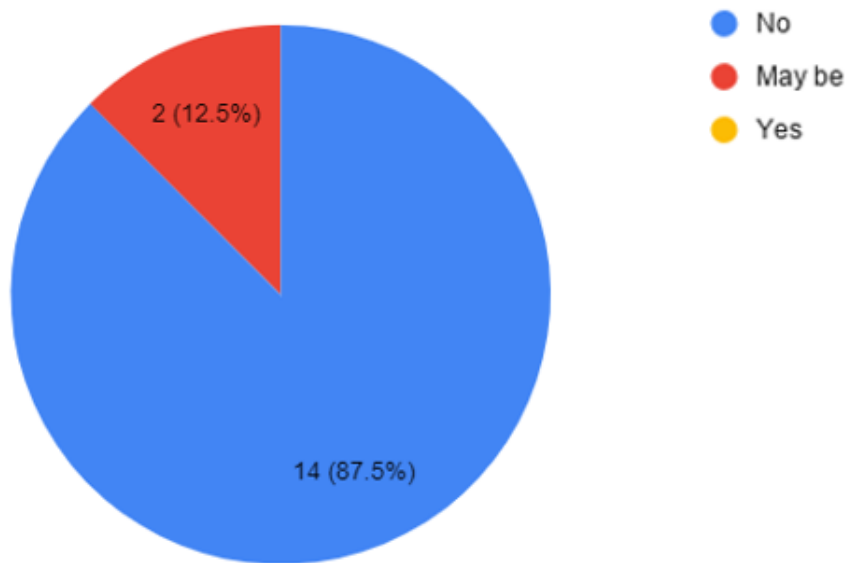
20 responses

No
Not really
Yes
I prefer both.
No, I am comfortable in both settings
I feel at ease with both of them.
No, I can talk in front of both men and women.
I find it the same.
not really
I can talk with both.
No, equal in both cases
I have never felt like that.
no

Questions 30-35 are for male scientists

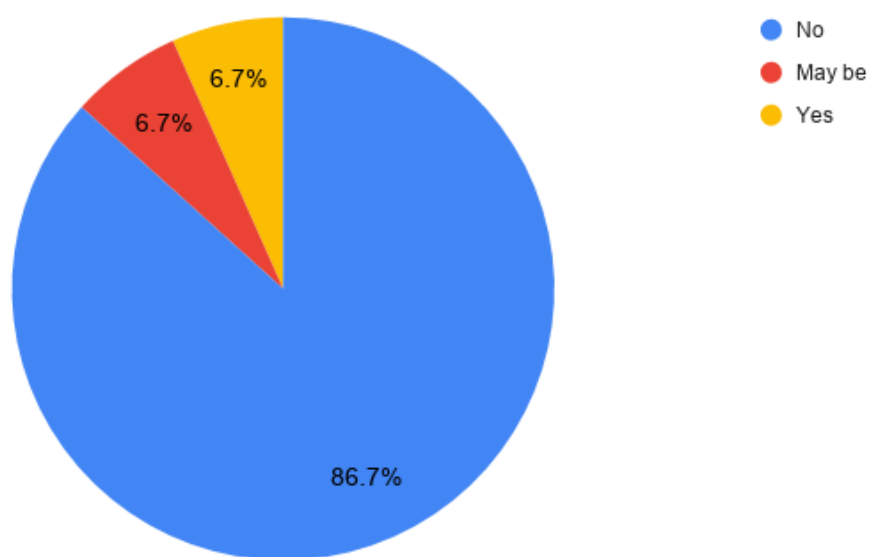
30. Have you ever consciously made a sexist remark* in the PRESENCE of your female colleagues/students (especially in exclusive-male gatherings, as a matter of cracking a joke)?

16 responses



31. Have you ever consciously made a sexist remark* in ABSENCE of your female colleagues/students?

16 responses



32. If yes, do you justify them or do you reconsider your opinion in retrospect?

8 responses

NA

N/A

not applicable

There *are* jokes which are sexist (racist, casteist, communal). Telling them does undoubtedly propagate negative culture, so are to be avoided. At the same time, telling them in a context where they could give offence to one of the auditors is worse as it puts pressure on that person to "be one of the gang".

i cant justify and sexist remark

Reconsider

33. Have you heard any male colleagues making sexist remarks* in absence or presence of women? Did you object or did you ignore?

16 responses

no

No.

In more recent times, I have objected.

yes, some times

Yes

Not in my presence.

i dont agree

Maybe. Didn't object.

rarely

Yes, and I ignored

Yes. Sometimes objected, sometimes ignored.

No.

yes, ignored

Yes. Depends on the power dynamics i share with the particular person. I do object and mention about the sexist remarks but in some cases I cannot.

I objected.

No

34. Have you ever supported your female colleague/colleagues in dealing with gender discrimination?

16 responses

yes

no

Yes

I haven't seen such episodes so far.

Yes.

No

Yes, I have supported female colleagues in dealing with what they believe is gender discrimination (cases are from different institute than where I am physically located, and my support is individual and telephonic).

Not had a chance to.

Never faced a situation

The female colleagues I know are fully capable of dealing with such discrimination. I fully supported them in such situations.

Never got such an opportunity.

Yes.

35. How does passing a sexual remark hurt the workspace atmosphere?

15 responses

it should not be tolerated

That's unprofessional.

Other than the obvious offence, it is unprofessional. The most important aspect of the social environment in academia is collegiality. Making unprofessional remarks leads to a breakdown of this. Every contribution in an academic environment should be to further rational discourse. One may employ humour or drama to make a point, but that should be something that underlines the primary content.

it vitiates, discrimnates

Very badly

It vitiates the atmosphere pushing the gender identities central, rather than the scientific conversation. By making a few people more vulnerable, it brings in an unequal power relationship which is unhealthy and counterproductive.

intensely

It takes away the warmth of mutual respect and cordiality among colleagues

It very adversely affects

It inappropriate and unprofessional.

It disturbs the professional environment a lot, and should be avoided at all cost.

it hurts

It creates boundaries between individuals, which resist the formation of a collective.

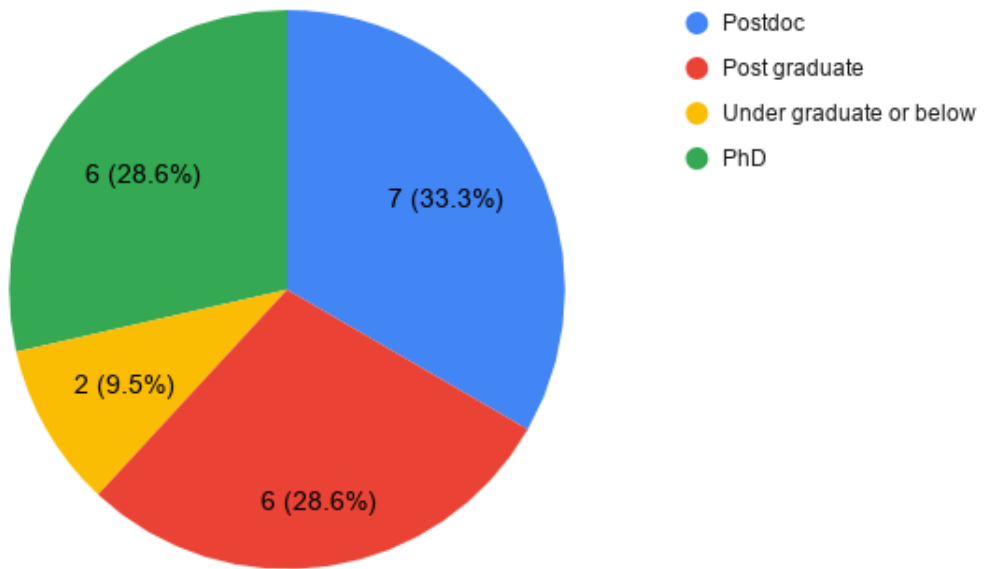
It makes people uncomfortable.

Drastically.

If married, Educational qualification of spouse:

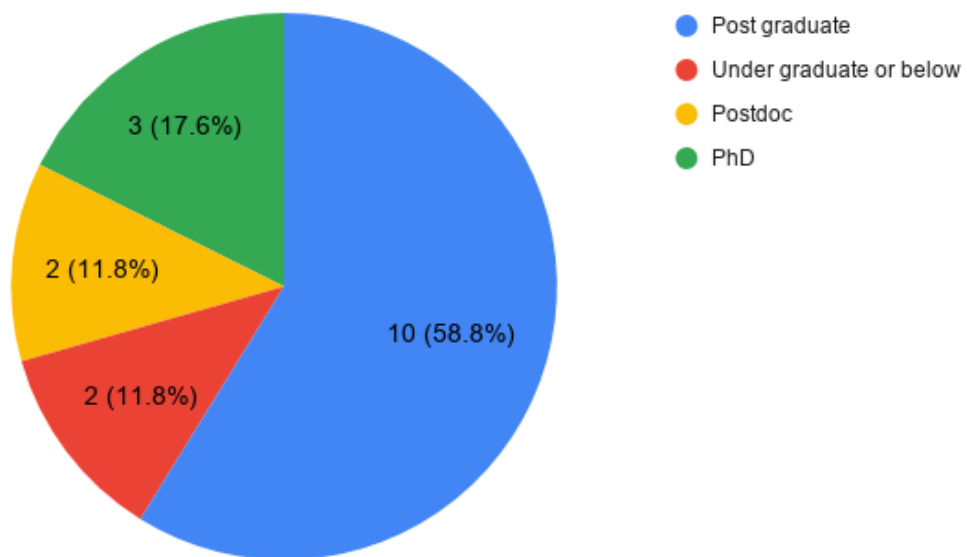
Female scientists:

21 responses



Male scientists:

17 responses



Profession of spouse:

Female scientists:

16 responses

Business
Management
Faculty
Doing Post doc
Post Doc-Mathematics
Faculty member at IISER Bhopal
Professor
Faculty
Associate Prof
Associate Professor
Faculty
Software engineer
Engineer
Assistant prof. in Mathematics
Scientist

Male scientists:

15 responses

School Teacher
Software Engineer
Student
Professor
Academic
She was a school teacher.
Currently not employed
Assistant Professor
would be great if she is also an academician
Assistant Professor in College
NA
housewife, taught poor children free
Administration
I am not married and the above question doesn't have an option for unmarried
Teacher

36.Does marriage affect your career life? How?

30 responses

No

After marriage I did my Ph. D. I did not get any support from my parents regarding my higher studies. I have been able to complete my Ph. D. only because of my husband, my mother and father-in-law. Just after my marriage while my parents are forcing me to get pregnant, my mother-in-law requested me not to conceive until I submit my thesis. I am really grateful to her.

yes

Yes. It enhances my productivity.

In a positive way since my spouse takes an equal part in child rearing and house work

An understanding person with whom to discuss all important decisions! Occasionally have discussions about science and mathematics too. (Though there is not much overlap in subject areas of our choice.)

It did. I had to change job three times to finally be with my family.

yes, it provides support

It absolutely does not.

Nope

Yes, it does. The bad news is I preferred to work odd hours, which is now difficult. The good news is I have support in many tasks which were otherwise to be managed alone.

-

Yes. Maes life more disciplined and hence one becomes more efficient in all aspects of life including career.

Not much

NA

Yes, in a very positive way. My spouse has been my strength in my career.

No.

It cannot be determined.

no

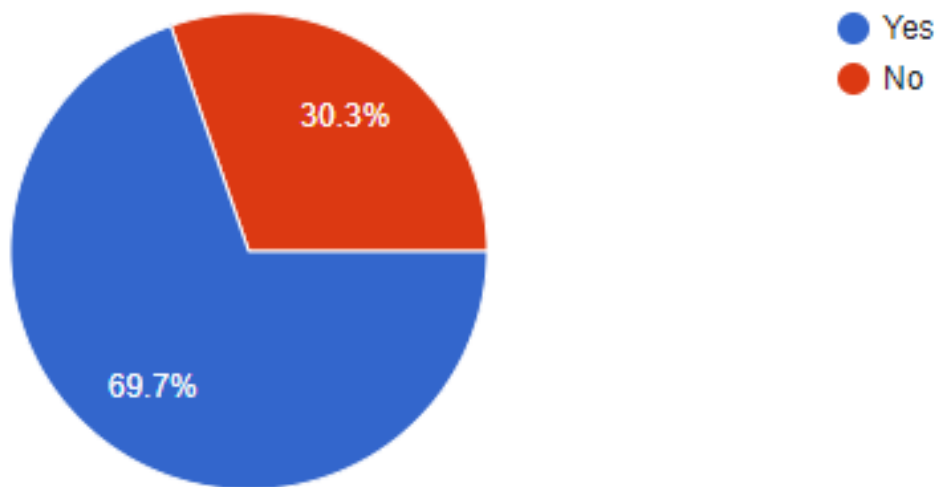
Very positively

Not significantly.

No it does not

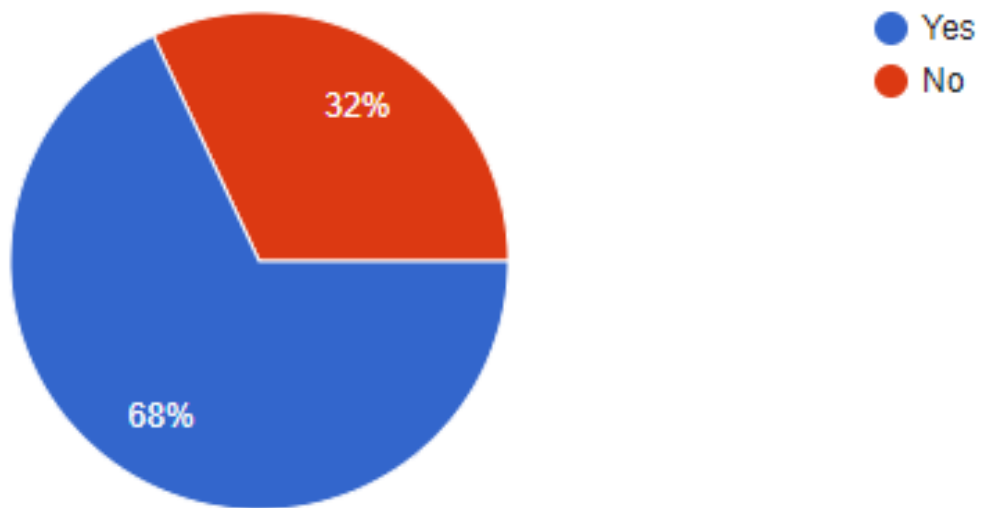
37. Do you prefer to complete your academic assignments in your workspace, or do you carry it back home?

33 responses



38. If your partner belongs to the same profession, does he/she do the same?

25 responses



39. Is there any difference in the ways in which both of you approach your academic load?

22 responses

- NA
- No
- Yes
- no
- My husband helps me a lot in my academic/ professional works. I bring all my load home while he tries to execute his works either in his work place or after I and my child get asleep.
- Not aware
- Many differences. My spouse is much more organised and systematic.
- yes.
- No.

nope

yes

Not really

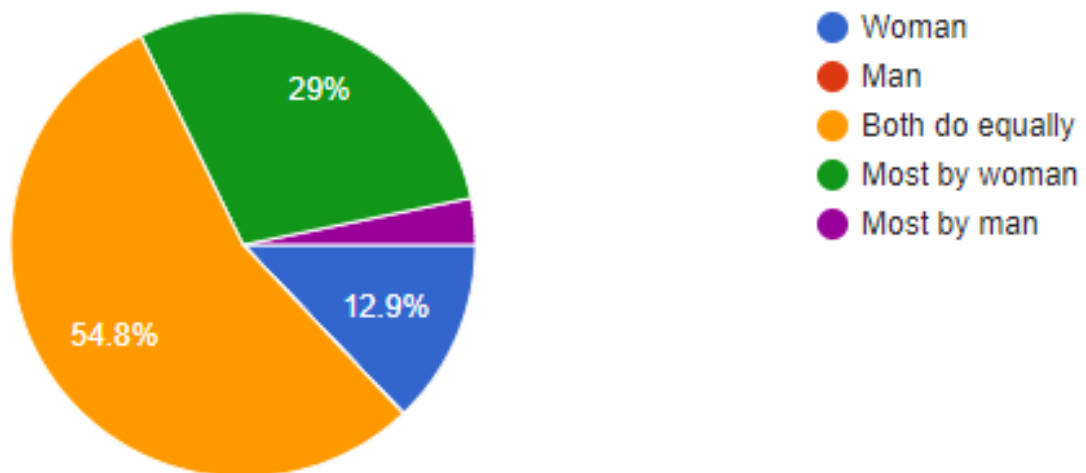
May be.

yes as we are two different people. our personalities govern our work style

He is not in academia

40. Who does the domestic/household work (other than the paid help) at home? (cleaning, child bearing, cooking and other tasks)

31 responses



Questions 40 and 41 are for female scientists

40. If your male partner shares equal household work, does he also take the equal mental load, or does he need to be told?

21 responses

Yes
Yes
I don't say anything, so yes he takes equal mental load.
He takes
Takes more mental load, I don't worry about housework much
Needs to be told
take the equal mental load
Yes
Yes, he takes. He doesn't have to be told.
Not married
No
He needs to be told/reminded.
Equal mental load
He does not take equal household load.
Equal load
Does not take it equally
he usually has to be told.
Same mental load
Yes
He does most of the household work and I take most of the mental load.
I probably do more of the housework organisation and carry a larger part of the mental load

41. How does mental load affect your academic pursuit?

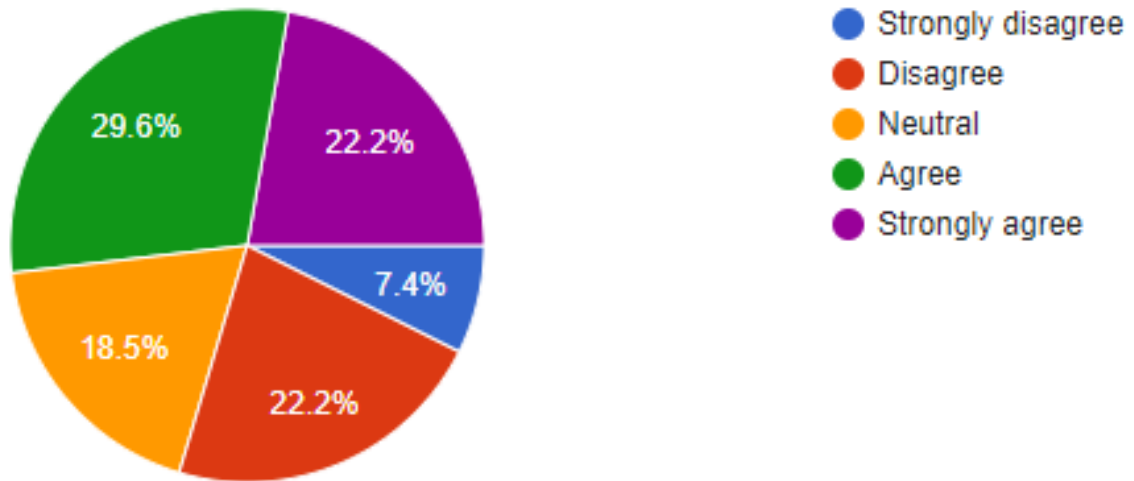
19 responses

- Not such.
- it affects a lot
- Not much
- It takes up time and thinking space
- It is important to be "in the zone" to do mathematical research. Thus, whether one is a man or a woman, it is important to forget all other responsibilities during this period.
- may be 10%
- It does hamper doing smooth research
- nope
- Don't know

- It distracts from work focus
- It at times affects...
- Not at all
- NA
- does not
- It does but I manage
- Challenging
- It makes life a lot more stressful by adding "management" to the several skills one needs to develop for a successful academic career.
- Nver faced this problem

42. “In-laws support female spouse’s career without any patriarchal mindset. They value career of female and male equally.” Do you agree?

27 responses



43. Do family responsibilities affect anyway in travelling for international or national conferences?

Female scientists:

15 responses

yes absoutely if you have a child.
No
No
No
Not yet
Not really
No
No
It does
No
Not really
No

No
Both me and my husband face equal trouble regarding this because our son does not want to leave us. But my in-laws help us a lot in this matter.
No, because my spouse is an equal partner in child rearing

Male scientists:

10 responses

No. I feel lucky to have a partner willing to sacrifice so that I can attend career related meetings and conferences.
It does. We want to travel together which is complicated, and mostly not possible.
Yes. A lot.
No.
Yes
Depends.
Yes
No
No
Yes

44. How many international travels have you avoided due to this reason?

Female scientists:

11 responses

None
None
no one yet
None

None
Many
Avoided till our child was 2 years old. Travelled after that.
None
Few
Nil
None.

Male scientists:

9 responses

Very rarely.
I am newly married, so none.
None. But had to make proper arrangements for my wife during my travel, which is a lot of work.
None.
Many
One.
NA
None
more than one in a year

45. Because of being a woman, do you restrict yourself from travelling for work-related matters?

Question for female scientists

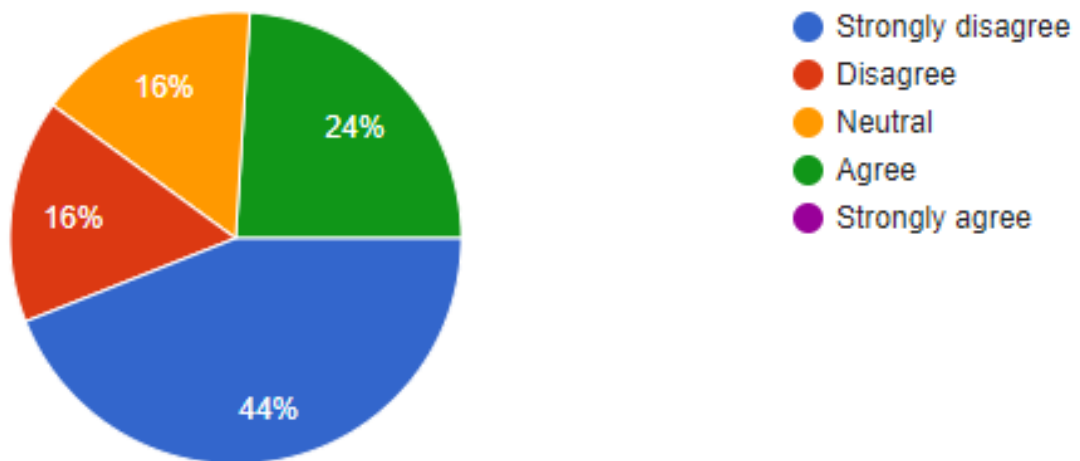
17 responses

it is because I am a mother
No
No
No
sometime yes
Yes

NO
No
No
No
yes
No.
Not really
Yes, my kid needs me.
No
Yes.
No

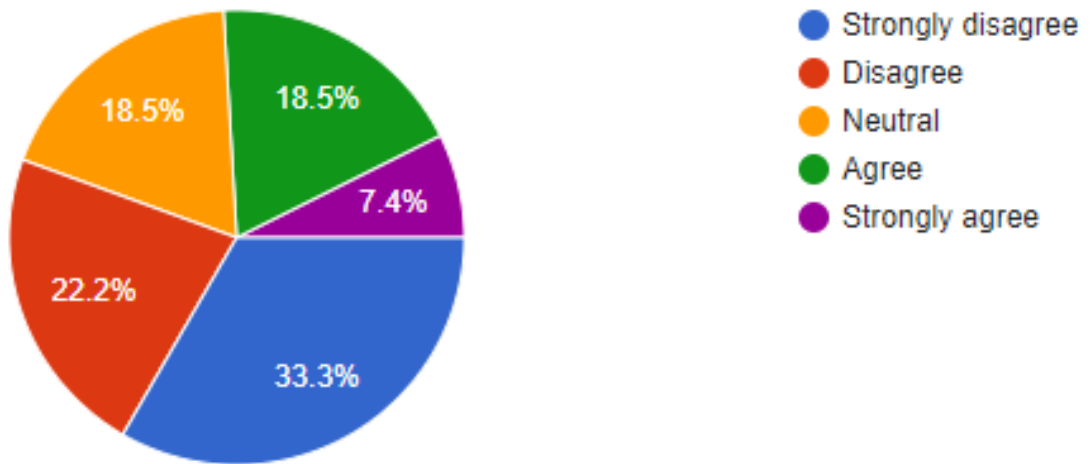
46. “Husband’s approval is necessary for a woman to pursue her career.” Do you agree?

25 responses



47. “Wife’s approval is necessary for a man to pursue his career.” Do you agree?

27 responses



48. Do you have to compromise in your career due to family responsibilities? If yes, what compromises do you make?

26 responses

No

No.

no

I dont apply for jobs in Universities situated far from my house because I dont want to leave my son. I am not confident about carrying my son everywhere I go. But my husband is ready to take all the responsibilities and pushes me hard to apply. But I feel very homesick.

Well....it depends on what you call compromise.

I can't stay late at work too often or attend weekend meetings very often. The number of grants I can take up is limited because of constraints on time for thinking and implementing.

Must mutually agree to decisions about career. If you are very individualistic then this may feel like a compromise.

No, I did not have to.

not yet

No, I hadn't had to compromise.

-

Not much

I made a compromise of not going abroad for a postdoc since my father was not well and I was the only daughter to support him.

no because I have an amazing support system.

I have to give priority to education of children

Yes, try not to visit abroad for long terms (few months)

49. Do you agree that paternal leave should be given for at least 3 months?

26 responses

Yes.
Absolutely
Yes.
Agree.
In most professions, yes. In academia, especially, in theoretical sciences, the demands of the profession are flexible enough.
I agree
Yes
Yes
Strongly agree.
Yes
Yes
Yes
Yes
Yes
Yes
Yes
Yes
No
Yes
Yes
Yes
Strongly agree as both parents are required for rearing the child during the early stages.
Yes
Yes
Yes
More than 3 months in deed.
Yes - in fact, it should be on par with maternity leave - this would give much support to women too

50. Have you left a better employment and embraced a lesser job in order to be with your partner? Has your partner ever made a similar move?

26 responses

No

Yes

No.

No. But my partner made such a move. In fact he is ready to quit his job and go with me and my son if I get a better chance far away from home.

My partner has done that. I tried to embrace a lesser job, but the job didn't want me!

No to both

Not really. We have jointly made decisions which felt to others as compromises but were beneficial in the long run.

I did not have to do that. But if it was required, both of us would have done that.

yes

not yet

No. But my partner made this move.

-

Yes, I have. He has not made any such move yet.

Till now we didn't have to take such a call.

No, Yes

my partenr did

no

No, as I had a better job and she followed me and found a similar job at the same city.

No, no

Questions 51 – 53 for female scientists

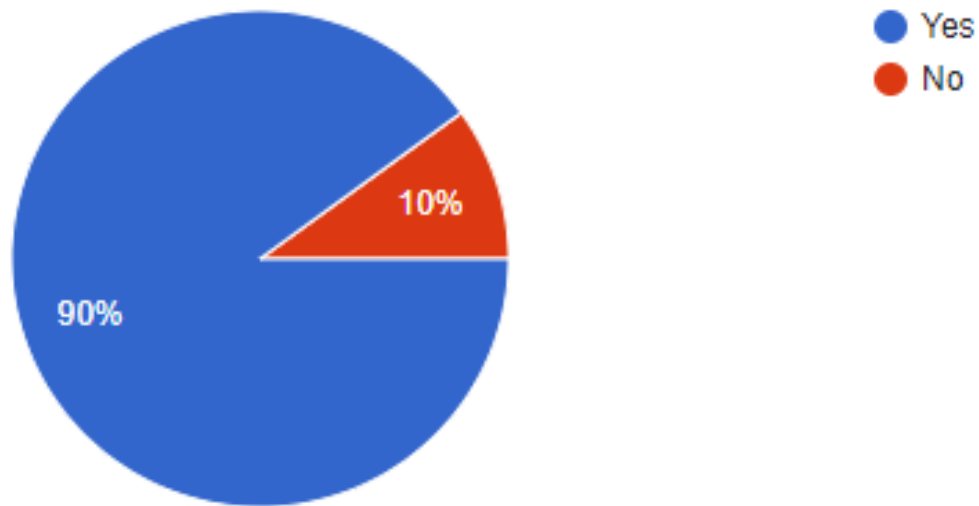
51. Have you had a break in career due to motherhood? For how long?

19 responses

yes for maybe few months
No
No
No
Almost 4 years
Not yet
Nope
No
No
No
No
No
No
Yes, 6 months
No
Yes 1.5 years
4 months
No
I have taken maternity leave for each of my two children. However I strongly feel that apart from the 6 month break, pregnancy and infant care means that productivity drops for at least a year and a half in total for each child.

52. Is there a creche facility in your institution for child care?

20 responses



53. Do you think that conference/workshop organizers should keep this in mind to facilitate your participation?

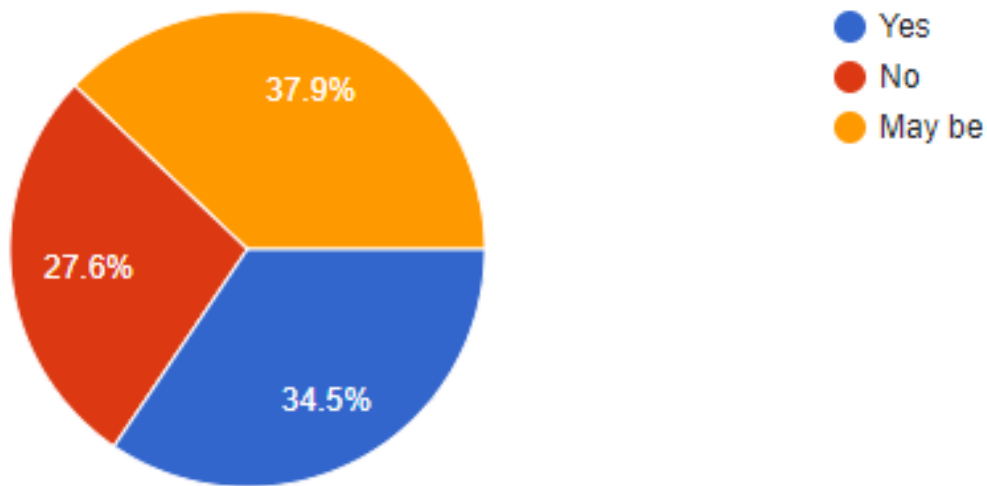
18 responses

yes
yes
indifferent
Yes
Yes.
Yes
yes
Yes
Yes
I do not fall in this situation now.
Yes
yes
Absolutely yes.
Yes
Yes
Yes
Yes

Yes

54. Do you think having a community kitchen facility in your institution will facilitate your academic work?

29 responses



55. Does your department support you in scheduling meetings/classes by being sensitive about your household responsibilities?

27 responses

Can't say.
not really
Yes.

Yes.
yes
Yes.
I do not know
yes
Yes
Not always
Depends on the HoD/Dean.
No
No
Yes
yes
No
yeah
No
yes
Yes
yes.
Most times yes.
No
No
yes
Yes.
Yes

56. Do you depend on your extended family (parents and in-laws) for childcare? Or, do you have a 24X7 care-giver at home? Or, both?

26 responses

None
yes, care giver
No child.
No child yet.
Na
No.
Both
n/a

No
Yes. 24x7 care giver is very expensive in Mohali. Don't have that privilege.
No
Neither
I depend on extended family
Both
NA
no kid yet
Not applicable
yes, my inlaws are supportive
Not applicable
My parents supported me, else I had to quite .
None
Care giver at home
My in laws take care of my kid
Parents
Both.
When children were young (0-3 years), my parents helped immensely. We don't have a 24x7 care giver. My husband and I, each has to single parent when the other parent travels on work

57. Does on-campus housing help? Or, does it induce multiple house visits during office hours and therefore, affects your professional work?

26 responses

- Yes
- yes
- I am not sure.
- Yes it helps at least me.
- not applicable
- I am not on campus
- Yes. Campus housing helps when one is friends with colleagues, They will often understand problems and help out.
- yes, it helps.
- yes it helps
- On-campus helps tremendously
- no
- Not applicable
- Helps
- I don't have on campus housing. I think it would help.
-
- Helps.
- Yes.
- Yes, it does help
- On-campus is better. Lot of time is saved because of less daily commute. Much safe environment for family. But one needs to stick to office hours professionally.
- Yes, No
- yes it is tremendous help for new mothers
- It helps
- Yes it helps.
- na

58. Does your partner make efforts like bringing kids back from school, dropping them off at school, feeding them, etc.?

25 responses

Yes.
not in this stage but he will
No child.
No child yet.
Na
Yes.
Yes
n/a
If needed, yes.
Not applicable
NA
Yes
Yes
NA
no kid yet
Not applicable
No
Not applicable
yes.
Yes
Yes
Yes
Yes
Yes
He takes all the responsibilities while I study or eat or take rest.
Yes

59. Are you a single woman? If so, have experienced sexist behaviour from your male or female colleagues?

18 responses

No
no
No, I am not single.
No.
-
NA
Yes. I have not experienced sexist behaviour by others.
Not applicable
doesn't apply
yes

60. Does being single affect your career positively or negatively?

18 responses

Not applicable

no

Not applicable.

-

Not applicable to me.

Its a tough question to answer. Being a single male I am not sure how it would better or worsen my career if I get married. I go by the philosophy everything in life comes with positive and negative effect on something. It is how exactly you strategies to strike a balance between this that would eventually decide the outcome to judge whether it is positive or negative

Hasn't affected.

Depends on the person.

NA

doesn't apply

not applicable

I am married

Childcare is own sole responsibility so it influences the working hours etc.

positively

2.4 Analysis and Inferences

Majority of the respondents of this survey belong to the general category(94.6%) and only 5.4% respondents from OBC category. A total of 38 respondents were there including 21 females and 17 males.

The question "In your opinion, the reasons behind a smaller number of women in science and technology fields" was meant to understand, the common reason in their perception about gender discrimination existing in the science arena. Most respondents, irrespective

of their gender, pointed out that the lack of support from the family and the society as the main reason. Some other popular reasons were the patriarchal structure of society, early marriage and family responsibilities coming after it. Most of them accepted this statement. The next question is that is there any disciplines which are most suitable for women. A large number of people answered that no discipline is more suitable for women. However, a significant percentage of people think that certain disciplines more suitable for women, and they suggested life sciences, arts, Mathematics and other theoretical sciences and social sciences as examples. One commented that "those disciplines that demand less travelling, as well as physical work, are most suitable for women". This is very interesting that those who commented that social structure as the reason behind lack of women in science, stating that disciplines that need more physical intensive efforts are not suitable for women.

Science and technology institutions should not reflect the discriminations existing in society in order to attract more people from every section of society. More than half of the respondents(55.2%) disagreed to the statement that science institutions work in a gender independent manner and 36.8% in that strongly disagreed it. 29% of respondents agreed that there exist no gender biases in science and technology institutions. But 15.8% of respondents were neutral to this statement. This could be an indication that the institutional system needs a change to attract all genders from society.

More women representation in the administration is needed to avoid the inequity in policymaking and implementation. The response to the statement "women and men face the same level of difficulties for getting into higher positions in science and technology institutions" was to understand the current situation for women to achieve higher positions. A significant percentage (23.7%) of respondents strongly disagreed and a larger percentage (36.8%) disagreed to the statement. 26.4% of respondents agreed that there exist no gender biases in reaching higher positions in institutions. 13.3% responded neutrally to this statement. As long as the administration is in the hands of the predominant group, there exists the inequity in every phase of knowledge production.

The question "does there exist any performance difference between male and female students" was supposed to understand the perception of the respondents as scientists about the academic performance of male and female students. Majority of the respondents commented that there exists no difference between male and female students in academic

performance. But a few commented that there exists and "females are more focused", "females are less confident than male students" are among those few comments.

The question "is hiring a female PhD student in your lab/group risky?" was asked to understand whether they fear any dropout or performance capability of female students. A substantial number of respondents answered that they don't feel that is risky to hire a female PhD student. But one comment says "Unfortunately, I do. I feel more cautious about the project and makes me do a lot of back-up plans. The factors that affect a female student negatively is much higher than that often goes for a male student. I have to add additional parameters into my thought process such as what will be the working time, whether she will manage to spend late night or early morning schedules if required, what if the student succumb to social pressure as mentioned before and decides to quit. But never have I doubted the intellectual capacity of a student just because she is a female." The question "do you ask questions about getting married or life goals when you hire a PhD student?" was related to the previous question. This is to understand whether they are concerned about academics being affected by marital life. But 86.8% of respondents were not concerned about this and they did not ask students about their marriage and life goals before hiring them. However, 13.2% of respondents asked both male and female students about their marriage and life goals when they hire PhDs. A substantial number of faculties may be concerned about hiring female PhD students to their labs/groups due to persisting social stigma against women.

The question "are there any stereotypical notions persisting in your particular discipline" is to understand and list out the unwritten notions which affect the quality of academic workspace. There were many as expected. "Females are not good in Mathematics" and "girls only think of getting married" were the most repeated ones in that. This stereotype could affect the mentality of the students which might reflect in their academic performance. The response to the statement "women have to work several times harder than men to establish themselves" was to understand that whether women are forced to work more to prove that these stereotypical notions existing in their disciplines are not true. 57.9% of people are in the opinion that women do work several times harder than men to establish themselves in their particular discipline and 13.2% strongly agreed to the statement. 21.1% disagree with the statement and the same percentage (21.1%) were neutral about the statement.

The question "does your institution have equal use about transgender scientists and have you heard any stories of discrimination outside the heteronormative context" was posed to get a perspective about hiring other gender minorities. But most respondents didn't know about any and it seems that they haven't even thought about the representation of other gender minorities in science.

The questions "do you agree that there exists any gender discrimination in terms of task assignment in the lab" and "did you feel any gender discrimination in terms of credits/grades awarded to you do during your career" were to understand whether gender work as a factor affecting task assignments and assessment of academic performance in institutions. The majority says that the gender hasn't influenced in task assignments and a few commented that works that require physical efforts were not given to female students. One comment says "In my college administration does not prefer to give a lady faculty the following assignments; assignment with lots of technical/ hardware knowledge, assignments that involve complicated calculations and finance-related assignments." 35 respondents out of 38 clearly stated that they haven't experienced any kind of gender discriminations in terms of grades/credits being awarded to them during their career. The question "did you find any gender discrimination in spousal hiring" focused to understand spousal hiring policies of the institutions. Many comments were in the attitude that hiring was always based on merits, no gender influence was there.

The response to the statement "women's opinions tends to get marginalized in departmental meetings and policy" was again focusing on the gender biases in the administration level of the premier science institutions. 55.2% disagreed to the statement, although a notable percentage of respondents(23.7%) agreed and 21.1% responded neutrally to the statement. It seems that the departmental meetings everyone get equal opportunity to express themselves and they consider everyones opinion irrespective of their gender. However, this speculation may not reflect the actual scenario since the number of respondents is statistically not enough to conclude any points.

The question "do you feel that your experience as a scientist is also affected by your caste and religious background in addition to your gender identity" was posed as an attempt to assess caste and gender stigma together affect one's career negatively. This can reflect in many ways, one is that a conservative upper-caste family may not allow their girl child to go for higher studies because of the traditional orthodoxy mindset. Other is that in a dalit

family which is financially backward, they could aid the education of only one child in the family and usually the selected one would be a male. Here, the comments were not as expected, a large set of people said that caste doesn't affect their career and many don't believe in caste. But it is important to note that 94.6% of respondents are from general category and 5.4% from OBC category, there was no dalit representation in the survey respondents. Here, no solid data was available to uphold my assumptions.

"Are you aware of the laws and institutional mechanisms for the prevention of sexual harassment in workspace", "Are you aware of the existence of the committee against sexual harassment in your institution", and "do you think that this body is active in handling reported cases of sexual harassment" are some questions which are posed to figure out the awareness of respondents about the committee against sexual harassment and its activities. 89.5% were aware of the existence of laws and institutional mechanisms to prevent sexual harassment in the workspace. 94.8% of respondents do know the existence of a committee against sexual harassment in their institution. 55.3% were confident that the committee is completely active and capable of handling such cases. A non-negligible percentage(15.8%) were in the opinion that the committee was not properly activity in handling the reported cases of sexual harassment and a significant percentage (23.7%) was not aware of the activities of the committee. It is disappointing that the committee activities in some institutions not reaching each person in it. An active committee against sexual harassment is very essential in the stable working of any institution.

Every respondent except one commented that their choice of the supervisor was not governed by the gender of the person. One comment says "Yes. It was not very helpful that she was a female." The question "do you think that your mentors and supervisors interfere in your personal decisions (courtship/marriage)" was kind of repetition of a previous question, a similar set of comments were written. An overwhelmingly high percentage of comments were in the opinion that supervisors haven't interfered in the personal decisions (mainly about marriage) of the students.

"Have you ever spoken about your work and being dismissed without consideration" was a question to understand the cooperation and support between colleagues has any influence of gender. But it seems that it could have been better if I framed the question differently. Most of them answered "no" to the question and a few commented that they had been dismissed without consideration. Further the questions like, "do you agree 'male

colleagues accept or value female colleagues' opinion without any discrimination. There doesn't exist any gender role issues.” , “do you agree ‘colleagues support each other irrespective of gender.’ “, “ do you agree, ‘male colleagues do not show any kind of gender discrimination.’” , and “have you ever experienced the inability to speak about your work in a gathering of your peers?” were asked to understand the influence of gender in cooperation and collaboration between scientists.

44.5% of respondents disagreed to the statement "male colleague accept female colleagues opinion without any discrimination". But 50% agreed to the statement "colleagues support each other irrespective of gender". More than half of the comments say that male colleagues did show gender discrimination. At the same time, most respondents haven't experienced any inabilities to speak about work in the gathering of their peers. The responses to these questions indicate that there exists explicit gender discrimination in peer gatherings in the science community. Male colleagues discriminate the minority group, the reasons can be many, some comments say; “yes, the insecurity levels of male colleagues with their female colleagues is quite high.”, “They do not see women as being equally capable.” etc. So it possible that the people of science often group or collaborate with the same gender.

The next set of questions were exclusively for female scientists. A greater percentage(63.6%) of female respondents were not excluded from social or informal networks of their colleagues because of being a woman. 27.3,% were not sure whether they have been excluded or not. Only 2 out of 22 respondents confirmed that they have been excluded from the informal gathering because of being a woman. The responses to the question "do social norms affect these informal communications?" had shown the same pattern of the previous one. Only a few comments stated that social norms affected informal gatherings. One comment says," Indian social norms are highly discriminatory against women." The question "do you find it easier to talk about your work when you are with women than when you are with men" was also focusing the same problem, exclusion of the gender minorities, and it's consequences. However the pattern was similar to the previous responses, many found it same easiness when talking to men and women about their work and only a very few felt difficulty to talk to men. The responses from the questions that are exclusive for women are contradictory to my expectations. Most women scientists have not experienced any difficulties with the gender gap. Only a very few were affected. The sample size of survey respondents should be taken into consideration here. The sample size

did not represent the actual gender minority group in the science community. It is possible that they don't differentiate the gender gap in the science community and the larger society. The respondents themselves are social beings, the biasedness existing in the society can reflect in them as well.

The coming set of questions were targeting particularly male scientists, to understand their perspective as a dominant community within the science community. The questions like “have you ever consciously made a sexist remark in the PRESENCE/ABSENCE of your female colleagues/students”, “do you justify them or do you reconsider your opinion in retrospect”, “have you heard any male colleagues making sexist remarks in absence or presence of women”, “did you object or did you ignore”, “have you ever supported your female colleague/colleagues in dealing with gender discrimination”, and “how does passing a sexual remark hurt the workspace atmosphere” were asked to learn their mindset about the exclusion of gender minority from the science community. The percentage of responses stated that they have not made a sexist remark in the presence and absence of female students or colleagues were 87.5% and 86.7% respectively. Others stated that there might be a possibility of making such remarks. However, only one respondent affirmed that he had made sexist remarks in absence of female students or colleagues and he commented “There **are** jokes which are sexist (racist, casteist, communal). Telling them does undoubtedly propagate negative culture, so are to be avoided. At the same time, telling them in a context where they could give offence to one of the auditors is worse as it puts pressure on that person to ‘be one of the gang’.” A significant percentage of respondents have heard their male colleagues making sexist remarks and they mostly objected it and supported the female colleague or student in any case. Most of them responded negatively to the question “how does passing a sexual remark hurt workspace atmosphere” by writing comments like, “it should not be tolerated”, “that's unprofessional” etc. Again when considering the sample size, I suppose the responses cannot resonate the voice of the larger community.

The objective of the next section of the questionnaire was to find out how family responsibilities affecting the career of each gender. Common questions and specific questions were there for each gender. A majority of respondents were married. Most of the respondents replied positively to the question that “how does marriage affect your career life”, and are an opinion that marriage provided support to their career. 69.7% of

respondents take their academic assignments back to their home and the same percentage of people commented that their partner also did the same. The question “Is there any difference in the ways in which both of you approach your academic load” was intended to figure out whether there exists a gender-related difference in each of them approaching their academic load and framing the question differently would have been better. There was an almost equal number of respondents stating that there exists a difference and not exist any differences. Men and women equally did household works was the most selected option(54.8%) for the question “who does the domestic/household work (other than the paid help) at home” and a 29% of respondents said that most of the household works were done by women in their houses and 12.9% percentage said women do their household works completely. The question “if your male partner shares equal household work, does he also take the equal mental load, or does he need to be told” was to understand whether the male partner takes the responsibilities of household matters as equal as a female partner and half of the respondents commented that their male partner had taken the equal mental load and the others commented that he had to be reminded about the household responsibilities. For most female scientists, family responsibilities affect their academic pursuit. One comment says " It makes life a lot more stressful by adding "management" to the several skills one needs to develop for a successful academic career." 51.8% of respondents are in the opinion that in-laws support female spouse's career without any patriarchal mindset. A substantial percentage disagreed that in-laws value male and female partners career equally.

The questions like “do family responsibilities affect anyway in travelling for international or national conferences”, how many international travels have you avoided due to this reason”, and ”because of being a woman, do you restrict yourself from travelling for work-related matters” were asked to understand how family responsibilities are affecting in travelling for work-related matters. Most women responded that family responsibilities didn't affect travelling for work-related matters. However, most women scientists restricted themselves from travelling after having kids. It seems that most of the responsibilities of the children are on the shoulders of women partners. Most of the respondents disagreed to the statements like "husband's approval is necessary for women to pursue her career" and "wife's approval is necessary for a man to pursue his career". 24% agreed that "husband's approval is necessary for a woman to pursue her career" and the same percentage of respondents agreed to the latter statement.

Further the questions like “do you have to compromise in your career due to family responsibilities”, “have you left better employment and embraced a lesser job to be with your partner” and “has your partner ever made a similar move” were asked to understand the balance between career and family life. Most respondents commented that they did not make a compromise in their career due to family responsibilities, irrespective of their gender. However, a significant percentage of respondents commented that the female partner had to embrace a lesser job in order to be with their partner. I expected this response since I have myself seen the trend in the science community on my campus. Usually, in Indian families, the male partner's career gets priority often than their female counterpart. It seems that the same pattern is reflecting in the science community in India.

Most of the respondents are in the opinion that paternal leave should be given for at least three months. Greater number of female respondents were in the opinion that they haven't had a break in career due to motherhood. However, it could be futile to infer anything from the data of such a small sample size representing a much larger community. But the opinions of people in science matters when it comes to this study. One comment says, “I have taken maternity leave for each of my two children. However, I strongly feel that apart from the 6-month break, pregnancy and infant care means that productivity drops for at least a year and a half in total for each child.”

The questions like “is there a creche facility in your institution for child care”, “do you think that conference/workshop organizers should keep this in mind to facilitate your participation”, “do you think, having a community kitchen facility in your institution will facilitate your academic work”, and “does your department support you in scheduling meetings/classes by being sensitive about your household responsibilities” were asked in order to figure out how the institutional practices help them to balance the career and family life. 90% of institutions had a creche facility on their campus. Majority of them responded that their respective authorities support them in scheduling meetings/classes by being sensitive about their household responsibilities. 90% are in the opinion that conference/workshop organizers should keep this in mind to facilitate their participation. 34.5% respondents supported and 27.6% opposed the idea of the community kitchen, and the rest were not sure about whether it will facilitate their academic work. Most respondents who were having kids had the support of family members or a paid caregiver for child care. Every respondent who had on-campus housing were in the opinion that it

helps many ways in their professional works. The question “does your partner make efforts like bringing kids back from school, dropping them off at school, feeding them, etc.” was kind of repetition of a previous one. Although most respondents who had kids responded that their partner makes an equal effort in matters associated with kids, a significant amount was in the opinion that their partner didn’t make an effort in this matter. There were very few single women attended the survey and only one comment says being single affect their career “positively”.

Conclusion

The survey suggested that gender discrimination does exist every level of operation in academic institutions, it leaves a great impact on the career of women scientists in academia. The majority responded that women had to face several difficulties and prove herself several times in order to be successful in her discipline. Discrimination on grounds of gender does exist in the scientific community and it affects the communication and cooperation between colleagues. However, most were in the opinion that family responsibilities don't have much effect on women's career. But I believe that it might be affecting women more in very subtle ways and they need not always recognise. Even though the sample size of the survey was very less, it provided some hint of reality, based on my knowledge of similar works.

Even though our society has changed a lot in accepting and valuing women. Still, Indian society is in the clutches of patriarchy and thus it crumbles the objectivity of practices in science institutions in India. Even now, people believe that some disciplines of research in academia are less suitable for women. Everyone including us blames the society for being discriminative against the marginalized, actually, it operates through each of us, in diffused manners which are almost invisible. Science institutions explicitly reflect and reproduce the biases existing in society. Lack of support of family and the patriarchal practices in the society and institutions are the main reasons for the exclusion of women and sex or gender minorities within the scientific community.

Any institutions of knowledge promote the meritorious and deserving and further nourish them to become more meritorious. The others who are already stuck in the system are left to further downfall and it plays in a vicious circle. Using the same yardstick to measure the merit of both is injustice. We have to be sensitive about the issues of the marginalized group in every phase of operation in the society and the institutions of knowledge. Men, the dominant group are not considerate about the issues of marginalized, in fact, they are the one who gets favoured in the cost of others.

A pool of perspectives of every group especially the marginalized and underprivileged is essential in the strong objectivity of knowledge produced in these institutions. So a diverse population of scholars are needed to attain this aim. But women and other sex or gender minorities are highly underrepresented. So nurturing these communities is very indispensable to make the creation of knowledge more democratic and acceptable. In order to make knowledge more democratic a serious reconstitution of practices of institutions is necessary.

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Appendix A

Interview of Prof Arvind

Prof. Arvind,

Professor

Physical Science, IISER Mohali

Q1. In your opinion, what are the reasons behind the smaller number of women in science and technology?

Women have not been around in all arenas. So science and technology are not different from other things. There is nothing special about science and technology. There are not enough women in most things. Because society has been secured in a long period. In some professions, women have come forward. In other, they have not. But compared to earlier time there are lot more women particularly as PhD students and at various level. It will take some time before one would see its effect.

Q2. Do you think certain disciplines are more suitable for women?

That is women to decide. I have not such specific feelings. Each individual decides what field are more suitable for them or less suitable for them.

Q3. “Science and technology institutions systems work in a gender independent manner.” Do you agree?

I don't know. The biases which exist in society are reflected in all institutions and all its organs. Sometimes they are direct and sometimes they are indirect. Sometimes they are over and sometimes they are forward. So to say that we have a society which is gender divided which is discrimination.

Q4. Does there exist a performance difference between male and female science students?

I haven't come across anything in my career.

Q5. When you take in PhD students in your group, do you think that hiring a female student might be risky?

No, I haven't thought about it. My first PhD student was a girl. I have many girl students. I never thought about gender while considering for PhD.

Q6. Are there any stereotypical notions persisting in your particular discipline?

There may be. Stereotyping happens when any group is small or its minority or so on. To some extent, it must be happening, if someone pays close attention. For example., sometimes I have heard people say Physics is not for women. Such kind of stereotyping statements I have heard. People do make statements, "This is not for X and this is not for Y".

Q7. "Women have to work several times harder than men to establish themselves." Do you agree?

In science at least, I don't think so. They might have to do other things. Within a discipline, if they are performing at the same level(That is not happening). Women have other responsibilities that I agree with. But if you say that if a woman is performing at the same level and she doesn't get the credit for that, I think, in science, I don't see that.

Q8. You said they have other responsibilities, can you explain?

In society, they may have more family responsibilities. They may have other responsibilities for children. That might be leading them to work more. Because they have to take care of certain other things.

Q9. Do you agree that there exists any gender discrimination in terms of task assignments in the lab?

I don't do experimental work. So, I don't have direct experience of it. But there might be some things that may not even be negative. In the sense that, in some lab, if you have to pour liquid nitrogen or something has to be carried, it may be that the PI would ask the male student to do that. Unless a female student volunteers to do that, PI may think that the job is a little hard and that kind of things. Beyond that, I don't see there is a division in terms of working on a problem.

Q10. Did you feel any gender discrimination in terms of grades/credits being awarded to the students or you during your career?

I haven't come across.

Q11. Did you find any gender discrimination in spousal hiring? If so, in which way does it generally go?

That's a question of policy. Some institutions have a policy not to hire spouses. IISER Mohali is open to hiring spouses. It had so many couples. IISER Mohali has no such discriminations.

Q12. How does it work?

It is never a spouse hiring, it is independent hiring. No negative bias is used to discriminate. There is no discrimination. For example, In situations like one person has got a job in one institution and the other person cannot apply. We don't apply that. Some institutions certainly would not hire couples. IISER Mohali is open to hiring couples. It has never hired a couple also. It is independent.

Q13. "Women's opinions tend to get marginalized in departmental meetings and policymaking." Do you agree?

No, not in IISER Mohali. I have not seen that happen. Although women are very few. But I think that they are quite vocal. They contribute to everything.

Q14. Do you feel that your experience as a scientist is also affected by your caste and religious background in addition to your gender identity?

The scientific community is a community within society. Again, society is caste-ridden, hierarchy-ridden, region-ridden and has all those biases along with gender. It will reflect.

Q15. "Male colleagues accept or value female colleagues' opinion without any discrimination. There doesn't exist any gender role issues." Do you agree?

Not all male colleagues. But a large number of male colleagues accept. There are male colleagues who kind of discriminate. May not be direct. It comes from a certain cultural background. May not be taking women's opinion the same way, that might be a behaviour which is reflected in their background and so on. There may be some who may be believing in male superiority. There also might be women who believe in female superiority. Individuals are individuals. But yet again it comes back to the same question. Since women

are few, so therefore many of the times this would lead to discrimination. Like male colleagues don't take their opinion or whatever they say. It can happen.

Q16. "Colleagues support each other irrespective of gender." Do you agree?

I think so.

Q17. Have you heard any male colleagues making sexist remarks?

I have heard.

Q18. Have you ever supported your female colleague/colleagues in dealing with gender discrimination?

Whenever needed, I have supported.

Q19. How does marriage affect your career life?

Any marriage/family needs to do certain responsibilities. That goes, either way, the family also gives support, but the family also takes away time. It depends, some people do not set up a family because they only want to focus on work. Sometimes it works, sometimes it doesn't. First, you have to separate the two things then only you can look at. They are different aspects of life. They influence each other. They interact with each other.

Q20. Do you prefer to complete academic assignments in workspace or home?

I do carry back. In academics, there is no separation of workplace and home and all that It's all mixed up.

Q21. Is there any difference between you both approach your academic load?

I think in any problem, first of all, different individuals approached differently. I think different genders also approach them differently. That is a generic thing. I think approaches are different.

Q22. Do family responsibilities affect anyway in travelling for the international or national conference?

Of course, all responsibilities interact with each other I have avoided travels and she has also. Both have avoided.

Q23. Do you have to compromise in your career for the family?

I don't see separate entities for family and career. Compromising one for another. I believe in holistic life. Things influence each other, to make certain decisions, say you don't attend the conference because your parent is ill. Is it compromising? It is an interaction between different aspects of life.

Q24. Do you agree that paternal leaves should be given for at least three months?

I don't know. I am ambivalent. They may take leave. I don't think so. 15 days Maybe we can make it 30 days. Maternity leave is already 6 months. I think that is adequate. There is child care leave for two years. That can be combined with maternity leave. A good amount of leave is available.

Q25. Does on-campus housing help? Or, does it induce multiple house visits during office hours and therefore, affects your professional work?

It affects positively. A lot of works get done. You can bring work home. You can go back and forth to the office from home. That helps a lot. Particularly, for women, it's more important. If they have a small child they can go back and forth several times a day it's not possible otherwise.

Q26. Do you think there is a difference between the knowledge produced by women and men?

That's an interesting question, there's a lot of literature on it. In my opinion, if you go from a purely scientific view there should not be. Then the knowledge is produced by human beings. Their dispositions will come in the kind of knowledge or the way the

knowledge will be produced or the nature of knowledge. This can happen on two levels. One level is deciding what problems should be worked on. How the scientific community should organize. And then at the moment, women are not the majority they are smaller in number so things get decided by groups which are predominantly male groups. In some sense, larger organisational level maybe we have not seen what would be called a different or a feminine way of looking at science. On the other hand, many of these decisions women are involved. But are they involved or are they influencing it in a certain way that one should be able to see it in a feminine science or masculine science and all? I think science is broader and deeper than that. One should not consider it as an Indian science or western science and all that. Similarly, such differences should kind of disappear. One way to look at it, there are two kinds of science feminine science and masculine science. Other is that science is one, there could be influences. A woman may want to choose a certain kind of problems and explore them in a certain way. So perspectives could be different. In the end, the whole scientific community interacts together. All this perspective get together. Many more kind of individual perspectives than feminine and masculine.

Q27. What are the challenges that you faced as a husband and a scientist at the beginning of your career? Especially in recruitment in IISER?

I had a small child. So some responsibilities were there which I had to fulfil.

Q28. “Family and career balance is very essential in a scientist’s life.” Who makes more effort for maintaining this balance: sir or madam?

That is equal.

Q29. Have you ever felt that your wife was treated unfairly in any academic matters?

I don't know. I have not known.

Q30. You have a long period of experience, can you explain the change in the participation of women in science over this period?

There is a lot of change. I remember that 45 years ago people would directly say that “I don't want a woman PhD student”, “I don't want a 5th-year project student who is women. Because anyway she will get married and she is not gonna pursue science.”, “She is not going to work seriously.” Such statements were commonly made. “I don't want a women

PhD student. She will get married after 3 years and what will happen, maybe she will have a child and I don't want to make a crash year.” Such treatments were very rampant. Now many of these things will be in peoples mind. But nobody says so. People are much more willing to take women PhD students. I see a huge change in these situations. There was a very active direct thing, without any qualm somebody would say that I don't want a woman PhD student.

Q31. As a male scientist, how can you make your colleagues path easier?

I think if there are special difficulties in integrating women into science. We should make way for that to disappear. If we need to change the balance we will have to. We need to actively hire more women in science. We are not compromising quality, but what is that you should actively look for bridging this balance and making this balance better.

Q32. Did you face any challenges or problems when you collaborated with ma'am?

I don't

Q33. Did you ever deliberately keep your career separately?

We have a collaboration. That collaboration is part of our activity or work. She has her independent work I have mine. That independent work is a natural part of our work. Our work has several parts. On one part we collaborate. That's it.

Q34. What all things we can do to improve participation of more girls in science?

I think we should nurture them by providing them with long term career support. Not just women all underrepresented groups should be nurtured from a younger age with top security identifying its tail and end. Supporting them financially as well as socially as well as professionally whether they are scheduled caste or scheduled tribe or any other group. If you want the broader participation you have to go out and nurture those communities. It won't happen automatically. Women are also similar.

