



# STATUS OF WOMEN IN MATHEMATICS

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## Abstract

For a long time, woman have been under appreciated and harshly judged in the field of mathematics based their gender. Although there have been many improvements in their status in this field in recent years, but women still lay behind in entering at research level of mathematics where they can develop their skill. The main aim of present paper is to focus on various factors responsible for their under representation in the field of mathematics.

**Keywords:** Women in mathematics, mathematics and gender issue.

## Introduction

Mathematics is still male dominated area of knowledge into which women's entry is indirectly prevented. It is a general assertion that males outperform females in the field of mathematics despite of the fact proved scientifically that biologically women have greater strength and intelligence as compared to men. Societal recognition to the intelligence of women is based upon the religious and cultural role expecting from the women, which is generally not in the favour of women's active contribution to any field. As a result of this women's participation in the field mathematics at various levels is not found to be encouraging. it does not mean that women do not learn or practise mathematics in their day to day life; No doubts elementary mathematics is part of their regular curriculum. But this situation of learning elementary mathematics cannot be taken as granted to say that women have equal opportunities. The major concern here is lesser entry of women to the advance level mathematics wherein they could develop their skill and intelligence. Data for Project Talent was collected around 1960 and assessed the mathematics achievement of high school students in the United States. The data indicated that sex related differences in achievement did not show up until about twelfth grade when it was found that boys tended to do better than girls in mathematics'.

## Historical evidences:

Women in the various countries are expected to fit a certain stereotype and subjected to domination by religious dogmas and code of ethics, which are always prevent them from knowledge. As a result of this woman participation in mathematics at various levels is not encouraging. From centuries women have struggled to gain complete acceptance in the mathematics field. In England girls were not permitted to take up their matriculation examination of university of London before year 1869. Cambridge University started admission of girls in degree classes in year 1921. One can find hardly a few women at top level positions in the field of mathematics. This paper puts light on the few famous female mathematicians struggle for existence in the mathematics field.

Hypatia is recognized as the first woman to have a significant impact in the field of mathematics, and some have referred to her as the "mother of mathematics". She was born in the fourth century in Alexandria, Egypt. Her father was Theon, a great mathematician and a philosopher of that time. He encouraged her for research. She was raised with the idea that she could do anything she wanted, which was very rare for women, especially during that time. She

studied all areas of thought and flourished these ideas most in mathematics, science and philosophy, she exceeded her father's knowledge, so she was sent to Athens to study. In those days Athens was the center of the mathematics in the world. She was most well known for her work she became the recognized head of the Neo-Platonist school of philosophy at Alexandria. Hypatia lived in Egypt during the rise of Christianity In A.D. 412, Cyril, a man who opposed Neo-Platonist, became the patriarch of Alexandria. He thought Hypatia would impede the rise of Christianity, so he spread rumors that if she were to be killed, it would make way for other religions to come together. In A.D. 415, Hypatia was attacked on her way home by a mob of people. She was stripped and killed with pieces of broken pottery, and then dragged through the streets.<sup>2</sup> Hypatia's life ended tragically.

Sophie Germain of France and Sofya Kovalskaya of Soviet Union had been prevented from getting public lecture on the basis of their sex; they get their education privately at their home. Sophie Germain was born in 1776 in Paris in a moderately wealthy family. Sophie Germain was an important person in the history of mathematics, not just an important woman. Her work in number theory has been the foundation for the works of countless mathematicians. She was the first to make a bold step into the theory of elasticity, and inspired others to venture into this relatively unexplored realm. Without her work, the mathematical world would have suffered. She was financially supported by them throughout her life, as she did not marry and was unable to secure a professional academic position due to her sex. Sophie Germain work under pseudonym M. Leblanc despite of her contribution to field of mathematics. From the time she was thirteen years old, Sophie Germain wanted to be a mathematician Germain's family was by no means supportive of her education as at that time it was common knowledge that girls who were too studious turned wild, and, as evidenced by the popular play *Les Femmes Savantes* by Moliere, could not truly become intellectuals anyway.<sup>3</sup> Even with this goal in mind, one cannot completely ignore her gender. The fact that she was a woman did greatly affect her life, as she was denied access to resources that could have allowed her mathematical abilities to develop even farther. Her parents tried to discourage her from her studies, she was never given a tutor, and she could not attend an institute of higher learning. Even after her abilities were recognized by the academic world, her gender kept her in the position of an outsider, a lone genius who could not significantly interact with the people who should be her peers. She also studied Gauss' *Disquisitiones Arithmeticae*, published in 1802, and wrote her first letter to him November 21, 1804. She once again assumes the name M. LeBlanc, fearing that Gauss would not take her letter seriously if he knew she were a woman.

Cristine Ladd-Franklin had fulfil the requirement of Ph.D degree many year before she awarded degree till year because Hopkin University did not recognise the women candidates before year 1921.

Mary Ellen Rudin was born in Texas in 1924 to a middle-class family. Mary Ellen Rudin is an exceptional woman. Not only was she a great mathematician and researcher, but she found time to have a family and was able to find a perfect balance of the two. she first became interested in mathematics, when she enrolled in University of Texas. When she came to the university, R.L. Moore took her under his wing, and he helped her build her independence in mathematics.<sup>4</sup>

When she was asked in an interview in 1986 how she felt about her mathematical education, she replied, I really resented it, I admit. I felt cheated because, although I had a Dotorate of Philosophy, I had never really been to graduate school. I had not learned any of the things that people ordinarily learn when they go to graduate school. I didn't know any algebra, literally none. I didn't know any topology. I did not know any analysis—I didn't even know what an analytic function was. I had my confidence built, and my confidence was plenty strong. She explained that this was because of the way R.L. Moore taught her. She was discouraged from reading any mathematical papers or works by other mathematicians, and she was simply taught to create her own ideas and theories. She only knew what Moore taught her, and never branched out from that.

All of these women have made exceptional contributions to the mathematics field, but their experiences have not been without discrimination.

### **Factors Affecting the Status of Women in Mathematics**

For a long time, women have faced many hardships and discrimination based on their gender. Women were always expected to be exceptional both at mathematics and in their womanhood and failure to do so strength the belief that women and mathematics were incompatible, if they were themselves too to studies, they were harshly judged as a woman but on the other side, if they embraced the more stereotypical roles of a woman, they were not taken seriously as a mathematician. It was very hard to be accepted as both a woman and a mathematician without facing criticism. This was not only the situation in past even in present scenario, a very few woman like to study mathematics beyond high school. Why this is the situation? Some factors that seem to contribute to this are females' lesser confidence in learning mathematics, a belief that

mathematics is not useful, and males' belief that mathematics is a male domain<sup>5</sup>. Also the stereotypes of women in mathematics ladies who are being unattractive, unmarried. Traditionally, mathematics is identified with the realm of the mind, and women are associated with "bodies, children, hearth, and home"<sup>6</sup>. Society's perception of women and mathematics is undergoing a change. Positive fact shown by researchers that at all levels there has been increased awareness of under representation of women in mathematics. Country as well as individual women calling it issue of paramount concern. It means Women still lay behind in entering at advance level of mathematics. But once they enter into the discipline of mathematics they never lagging behind their counterpart, as may be evidenced from research paper publish by them and research guidance given by them. Latest research on girls and boys shows the gradual decrease in sex difference in mathematics achievements. Women's underrepresentation today results from a complex set of interrelated factors, some of which society could meaningfully address if the focus was placed squarely on them. One key to such success is moving beyond historical issues and confronting current ones.<sup>7</sup> Women's current underrepresentation in math-intensive fields is not caused by discrimination in these domains, but rather to sex differences in resources, abilities, and choices whether free or constrained.

## Conclusion

Socio-culture and social-psychological factors contribute significantly to gender disparities at various levels. Hence teacher and parents need to become active change agent in fostering positive attitude in order to enhance their interest and achievement in mathematics. The rate of entry of women in the field mathematics can be geared up by restructuring the curriculum of mathematics at higher level and make it more job oriented according to present needs.

## References

1. Elizabeth, Fennema (1980), "Sex-Related Differences in Mathematics Achievement: Where and Why", Women and the Mathematical Mystique. Ed. Lynn H. Fox, Linda Brody, and Dianne Tobin. Baltimore: The Johns Hopkins University Press, 1980, pp. 209-221.
2. Laura, Koch C (1998), "Hypatia" Notable Women in Mathematics: A Biographical Dictionary". ed. Charlene Morrow and Ten Perl. Westport, CT: Greenwood, pp.94-97.
3. Hill, Amy Marie (1995), "Sophie Germain: A Mathematical Biography" A thesis Presented to the Department of Mathematic and the Honors College of the University of Oregon.
4. Rudin, Mary Ellen (1990), More Mathematical People Contemporary Conversations Boston: Harcourt Brace Jovanovich pp. 283-303.
5. Huff, Kendra, Women in Mathematics: An Historical Account of Women's Experiences and Achievement CMC Senior These Claremont McKenna College.
6. Claudia Henrion (1997), 'What's a Nice Girl Like You Doing a Place Like This?' Women in Mathematics: The Addition of Difference. Bloomington: Indiana, UP, PP. 66-83.