

Analyzing the Challenges and Possible Strategies for Female Researchers in China Based on the Number of Researchers and Social Phenomena

Hu Chiyue, Xu Jiayu, Xu Yushen, Qi Yanshuo, Su Lechen

Abstract

Background: The growing number of female researchers in China is contributing significantly to scientific innovation, yet gender disparities persist in research opportunities, career advancement, and work-life balance.

Analysis: Social and cultural factors, such as disproportionate domestic responsibilities, and systemic gender biases in science and technology development hinder women's progress.

Discussion: Efforts to address these challenges include reforms in peer review, access to professional networks, and improved maternity leave policies. These strategies aim to create a more inclusive and supportive environment for women in academia.

Background

With improved education and social status, the number of female researchers in China is growing, becoming a key force in scientific and technological innovation. The data from China Association for Science and Technology Innovation Strategy Research Institute indicates that the total number of female scientific researchers in China continues to grow, and the reserve is increasing rapidly(Figure 1&2).[1].

However, women researchers still face challenges: on the one hand, the number of women working in the science, technology, engineering, and mathematics (STEM) is much lower than that of men, which does not ensure gender equality in peer review and research opportunities; On the other hand, there is still a sufficient gap between the number of works created by women and men in science, which has a clear impact on women's career advancement[2].

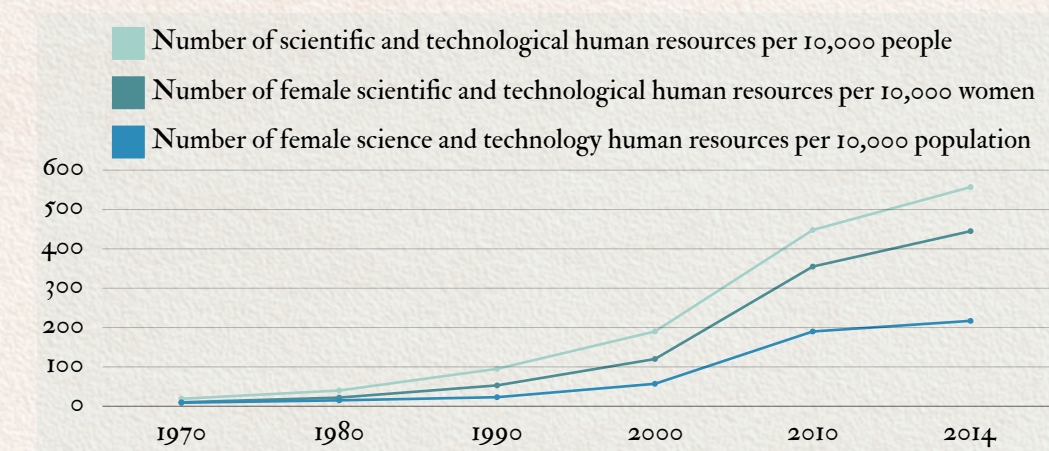


Fig 1. Trends in the development of science resources and women's science human resources per 10,000 population from 1970 to 2014

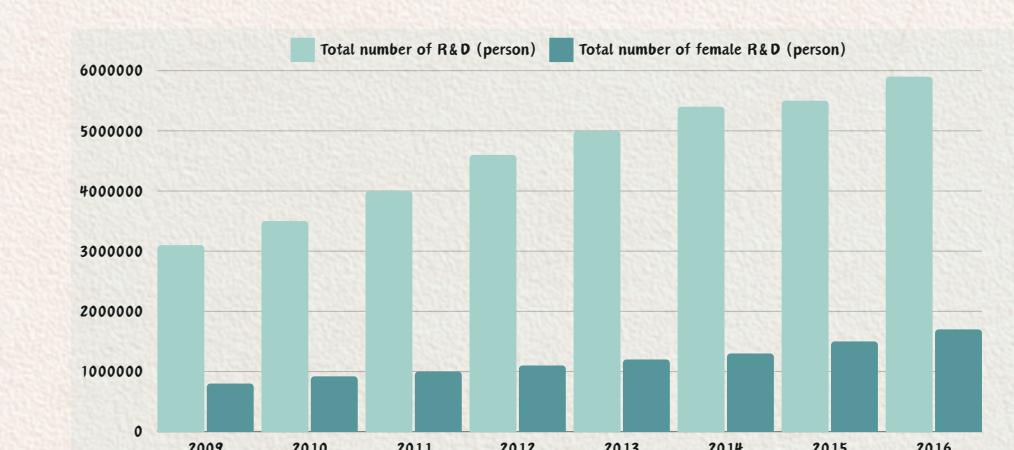


Fig 2. Changes of total R&D personnel and women in China from 2009 to 2016

Cause analysis

1.Social and Cultural Factors

Despite China's transition to a modern society advocating for gender equality, the physiological characteristics of women result in Chinese female researchers shouldering a disproportionate share of responsibilities in childbearing, childcare, eldercare, and other domestic duties[3]. This imbalance creates a significant tension between their responsibilities and career development.

2.Science and Technology Development System

Factors within the scientific system itself, including gender disparities and blindness in the scientific research management system and major science and technology decision-making processes, are also significant. For instance, a 2015 survey revealed that 87% of female college graduates experienced gender discrimination during their job search process[4].

3.Disparities in Goal Among Women in STEM

In recent years, the proportion of women among postgraduate students has been increasing rapidly. However, the growth rate at the doctoral level is notably slower than at the master's level(Figure 3). Studies have shown that after entering scientific and technological positions, women's pursuit of higher degrees in the industry tends to decline with age, and the gap with men gradually widens[5].

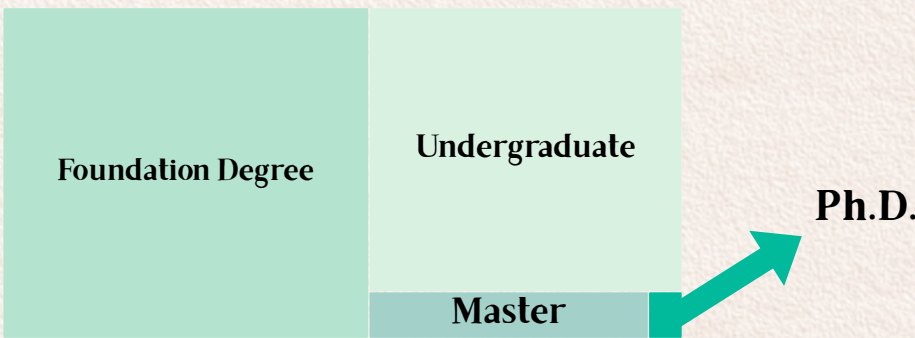


Fig 3. Proportion of women in higher education in China in 2016.

Discussion

- **Efforts** to promote gender equality in academic publishing and peer review aim to eliminate gender biases and ensure fair evaluation.
- **Reforms** in academic publishing and peer review aim to eliminate gender biases and ensure fair evaluation.
- **Equal** access to professional networks, funding, and resources is prioritized to support women's career advancement.
- **Improved** maternity leave policies help women return to work smoothly after career breaks.
- **Academic** conferences are also working towards gender balance among invited speakers, fostering inclusivity and diversity.

Together, these measures form a comprehensive strategy to create a more equitable and supportive environment for women in the workplace.



[1]China Association for Science and Technology Innovation Strategy Research Institute,Research Report on the Development of Chinese Human Resources 2014,December 24,2021.

[2]Ross MB, Glennon BM, Murciano-Goroff R, Berkes EG, Weinberg BA, Lane JI. Women are credited less in science than men. Nature. 2022 Aug;608(7921):135-145. doi: 10.1038/s41586-022-04966-w. Epub 2022 Jun 22. Erratum in: Nature. 2023 Sep;621(7979):E41. doi: 10.1038/s41586-023-06571-x. PMID: 35732238; PMCID: PMC9352587.

[3]Feiqiang C. Investigation and Analysis of the Current Status of Women's Power Participation in Hunan Province. Guihai Review, 2014, 30(6): 104-108.

[4]Ma Ying, Zhao Yandong, Gong Xu, et al.. Close the gender gap in Chinese science. Nature, 2018, doi: 10. 1038/d41586-018-04996-3

[5]Lanxiang Z, Lixuan L. The Impact of Women's Subjective Preferences on Gender Stratification in China's Science and Technology Sector. Studies in Science of Science, 2008, 26(6): 1157-1163.

[6]Peterson, Barbara Bennett. Notable Women Of China: Shang Dynasty To The Early Twentieth Century. New York: M.E. Sharp. 2000: 341-345.

[7]Lee, Lily Xiao Hong. Biographical Dictionary of Chinese Women(The Twentieth Century 1912-2000). New York: "An east gate book". 2003: 204. ISBN 0-7656-0798-0.

[8]Chiang, T. C. Madame Chien-Siung Wu: The First Lady of Physics Research. World Scientific. 2014. ISBN 978-981-4374-84-2

[9]Song L, University of Chicago, Columbia University. Beijing: Jinghua Publishing House. 2010 July: 114-118.

[10]Zheng W, Li E, Peng S, Wang X: Tu Youyou winning the Nobel Prize: Ethical research on the value and safety of traditional Chinese medicine. Bioethics. 2020; 34: 166-171. <https://doi.org/10.1111/bioe.12456>