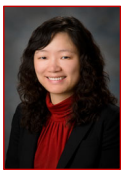
Women in Bioinformatics, Computational Biology, and Health Informatics (ACMBCB2023)

Time: 12:20pm-1:20pm, US-CDT Location: Ballroom A/B

Challenge, Solution, and Action

Distinguished Panelists:

- **Ahyoung Choi, PhD, Assoc. Researcher,** MOGAM Institute for Biomedical Research, South Korea
- **Nora Franceschini, MD MPH, Prof.,** Global Health, Univ. of North Carolina at Chapel Hill.
- **Sheida Nabavi, PhD, Assoc. Prof.,** Institute of Systems Genomics, University of Connecticut
- **Teresa Przytycka, PhD,** NCBI, National Library of Medicine, NIH
- **Wenqi Shi, Rising Star Awardee,** School of ECE, Georgia Institute of Technology
- **Wenyi Wang, PhD, Prof.,** UT MD Anderson Cancer Center, Rice University, Texas A&M

Co-Chairs

May D Wang, PhD, Prof., BME/ECE/CSE, Georgia Institute of Technology and Emory Univ.

Wenyi Wang, PhD Prof. UT MD Anderson, Rice U and Texas A&M

2023-09-06 ACMBCB2023 - Women in BCB

Distinguished WiB Panelists

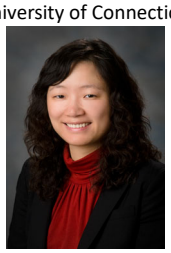
Ahyoung Choi, PhD
MOGAM Institute for Biomedical Research, South Korea

Nora Franceschini, MD MPH
Gillings School of Global Health, University of North Carolina at Chapel Hill.

Sheida Nabavi, PhD
Institute of Systems Genomics, University of Connecticut

Teresa Przytycka, PhD,
National Center for Biotechnology Information, National Library of Medicine, NIH

Wenqi Shi, Rising Star Awardee
School of ECE, Georgia Institute of Technology



Wenyi Wang, PhD
The Univ. of Texas MD Anderson Cancer Center Rice University Statistics, Texas A&M Statistics

2023-09-06 ACMBCB2023 - Women in BCB 2

Ahyoung Choi, PhD

- **Title:** Associate Researcher of AI and Bioinformatics
- **Affiliation:** MOGAM Institute for Biomedical Research
- **Contact:** ahyoung.choi@mogam.re.kr
- **Weblink:** www.mogam.re.kr

- **Research Interests:** Bioinformatics, Cancer Genomics, Machine Learning, Deep Learning, and Drug target identification
  - Next sequencing data analysis;
  - CRISPR screening data analysis;
  - ChIP-seq data analysis;
  - Network analysis;
  - Construct bioinformatics database;

2023-09-06 ACMBCB2023 - Women in BCB 3

Nora Franceschini, MD MPH

- **Title:** Professor of Epidemiology, Chair of the Ancillary Committee of the Women's Health Initiative, Fellow of the American Heart Association
- **Affiliation:** Department of Epidemiology, Gillings School of Global Health, University of North Carolina at Chapel Hill.
- **Contact:** noraf@unc.edu
- **Weblink:** https://sph.unc.edu/adv_profile/nora-franceschini-md/

- **Research Interests:** Cardiometabolic and kidney diseases, human genomics of diverse populations, and Preventive Health
  - Genome-wide studies of complex traits: genotypes and sequencing data;
  - Multi-omics research: integration of data with environmental factors;
  - Epigenetic research: DNA methylation biomarkers of exposures;
  - Admixture mapping and fine-mapping studies;
  - Meta-analysis and meta-regression;

2023-09-06 ACMBCB2023 - Women in BCB 4

Prof. Sheida Nabavi, PhD

- **Title:** Associate Professor of Computer Science and Engineering
- **Affiliation:** Departments of Computer Science and Engineering, Institute of Systems Genomics, University of Connecticut
- **Contact:** sheida.nabavi@uconn.edu
- **Weblink:** https://sheida-nabavi.uconn.edu

- **Research Interests:** Computational Genomics, Bioinformatics, Biomedical/Biological Image Informatics, Machine Learning, Deep Learning, and Signal/Image Processing

  - Single cell sequencing data analysis;
  - Copy number and structural variation detection;
  - Multimodal muti-omics data integration;
  - Pathological image analysis;
  - Mammogram image analysis;
  - Multiplex microscopy image analysis;

2023-09-06 ACMBCB2023 - Women in BCB 5

Teresa Przytycka, PhD

- **Title:** Senior Investigator
- **Affiliation:** National Center for Biotechnology Information, National Library of Medicine, NIH
- **Contact:** przytyck@nih.gov
- **Weblink:** **https://www.ncbi.nlm.nih.gov/CBBresearch/Przytycka/index.cgi#research**

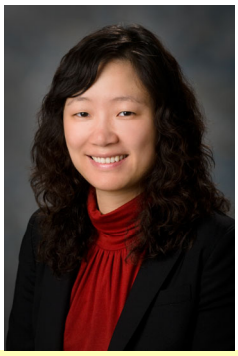
- **Research Interests:** computational modeling and analysis of biological processes, with emphases on hypothesis and theory-driven questions that are enabled by large-scale data analysis using algorithmic approaches.

  - Mutational Signatures in Cancer;
  - Cancer evolution;
  - Network Biology;
  - Gene Regulation;
  - Aptamers

Wenqi Shi, Rising Star Awardee of GT-ECE

- **Title:** Ph.D. Candidate
- **Affiliation:** Bio-MIBLab, Departments of Electrical and Computer Engineering, Georgia Institute of Technology
- **Contact:** wqshi@gatech.edu

- **Research Interests:** Biomedical Big Data and AI, and Intelligent Reality for Personalized, Predictive, Pervasive, and Preventive Health (pHealth)
  - AI-enabled Clinical and Health Decision Support System;
  - Electrical Healthcare Records and Large Language Models;
  - Explainable and Responsible AI in translational Bioinformatics;
  - Personalized Medicine and Shared Decision-Making.



Prof. Wenyi Wang, PhD

Title: Professor of Bioinformatics and Computational Biology, Biostatistics

Affiliation: Departments of Bioinformatics and Computational Biology, Biostatistics, The University of Texas MD Anderson Cancer Center, Rice University Statistics, Texas A&M Statistics

Contact: wwang7@mdanderson.org

Weblink: **https://odin.mdacc.tmc.edu/~wwang7/index.html**

- **Research Interests:** The development and application of computational methods to study the evolution of the human genome as well as the cancer genome, and to further develop risk prediction models to accelerate the translation of biological findings to clinical practice.
  - Deconvolution and single-cell modeling for intra- and inter- tumor heterogeneity
  - Semi-parametric survival modeling for cancer risk prediction.

WiB in Action

WiBCB Topics (5)

1) Do you observe **any bias in men vs women** working **in BCB**? If yes, what are they? How to address that issue?

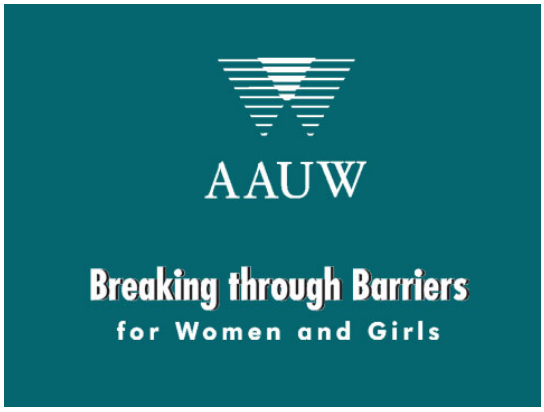
2) What are **immediate/small or big steps** we may take to push up the glass ceiling for women in academia and in industry?

3) How to deal with common situations when women are likely to say **no** to travel-related businesses due to family reasons? **How do you balance work and family?**

4) To work in BCB, what are the **top three factors** you consider are important for a productive career despite individual experiences and personal traits?

5) Do you have a mentor in your career? Do you want to serve as a mentor?

Set Up The Stage: Referenced Reports



- ***Why So Few? Women in Science, Technology, Engineering, and Mathematics***
- *1881: American Association of American Women*

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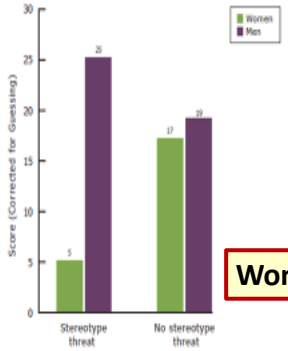
Negative stereotypes about girls' and women's abilities in math and science adversely affect their performance in these fields.

Performance on a Challenging Math Test, by Stereotype Threat Condition and Gender

Negative



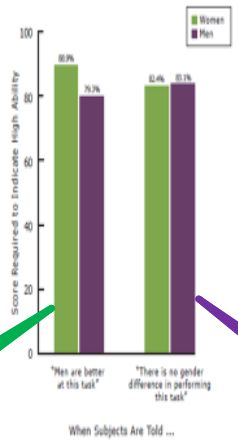
- Expose girls to successful female role models in math and science.
- Teach students about stereotype threat.

Women in STEM Perceptions

Women hold themselves to a higher standard compared with men in "masculine" fields.

Students' Standards for Their Own Performance, by Gender

Positive



- Set clear performance standards.
- Help girls recognize their career-relevant skills.

Women **Men**

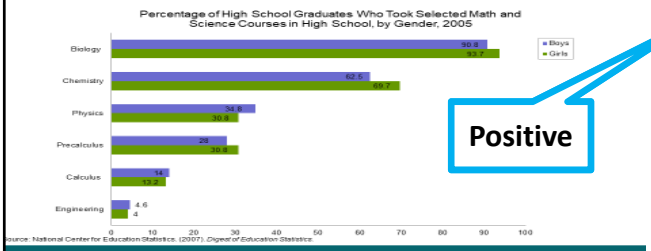
ce: Spencer, S. J., Steele, C. M., & Quinn, D. M., 1999, "Stereotype threat and women's math performance," *Journal of Experimental Social Psychology*, 35(1), p. 13.

Note: Respondents were asked, "How high would you have to score to be convinced that you have high ability at this task?"
Source: Correll, S.J., 2004, "Constraints into preferences: Gender, status, and emerging career aspirations," American Sociological Review, 69, p. 106, Table 2.

2023-09-06 AAUW Breaking through Barriers for Women and Girls ACMBCB2023 - Women in BCB AAUW Breaking through Barriers for Women and Girls 12

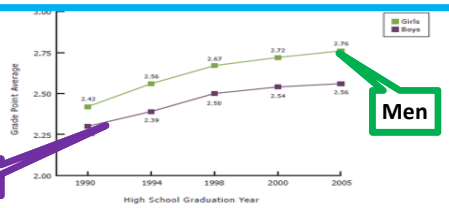
Progresses for Women in STEM

High school girls are more likely to take biology, chemistry, and pre-calculus than boys are, but girls are less likely to take physics.



Positive

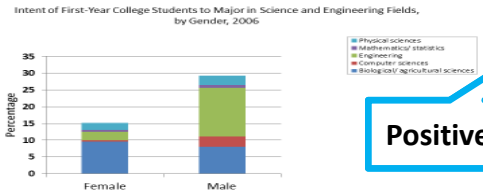
Female high school graduates now also earn higher GPAs, on average, in math and science, than their male peers do.



Men

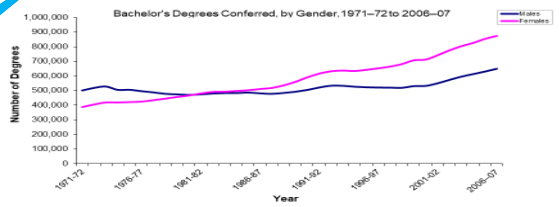
Women

Women are less likely than men are to declare a STEM major in college.



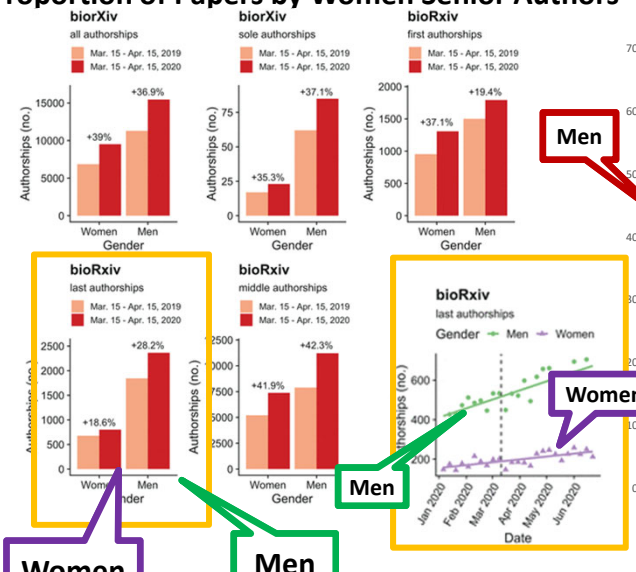
Positive

Women have earned the majority of bachelor's degrees since 1982.



Reality of Women in Peer-Reviewed Publications and NIH R01 Awards

Proportion of Papers by Women Senior Authors



Women

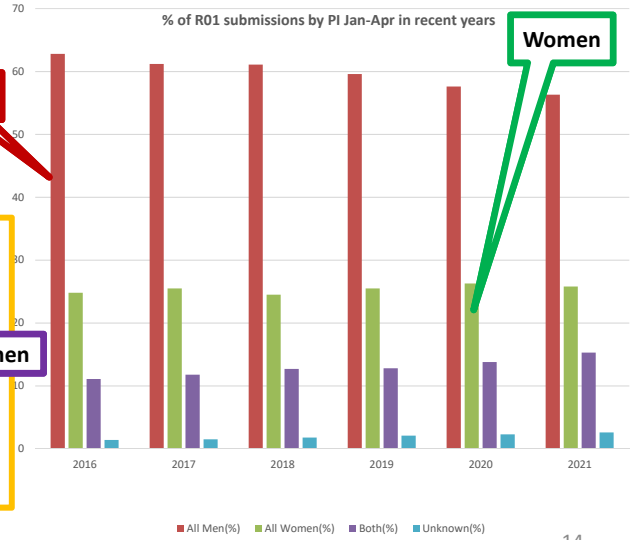
Men

Men

Women

https://journals.sagepub.com/doi/full/10.1177/23780231211006972

NIH R01 Awardees in NIH Blog (June 2021)



Men

Women

https://nexus.od.nih.gov/all/2021/06/01/an-updated-look-at-applications-submitted-during-the-pandemic/

Part 2: What's preventing women from becoming more influential leaders?

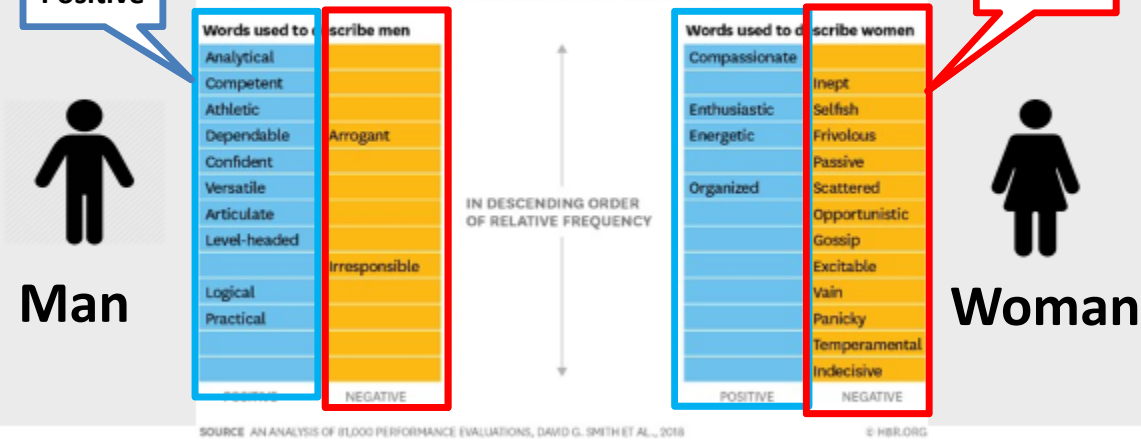
Glass Ceiling for Women in Leadership

2. Gender bias

Positive

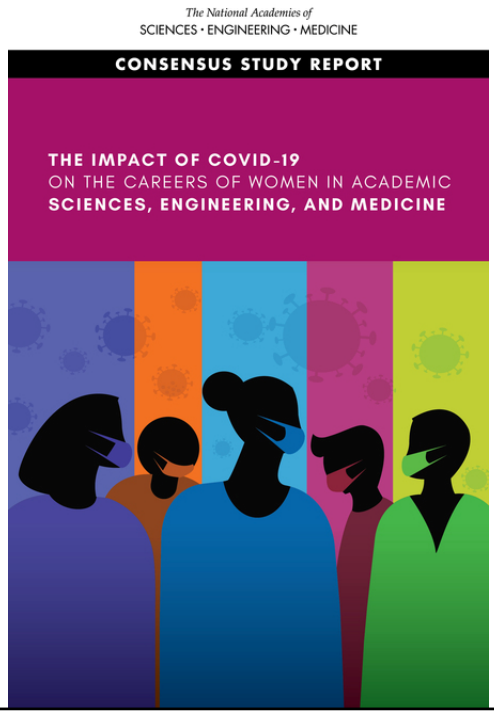
Negative

Managers Use More Positive Words to Describe Men in Performance Reviews and More Negative Ones to Describe Women



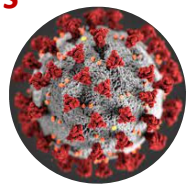
Man **Woman**

SOURCE AN ANALYSIS OF 81,000 PERFORMANCE EVALUATIONS, DAVID G. SMITH ET AL., 2018 © HBR.ORG



Referenced Reports

- NASEM (National Academy of Science, National Academy of Engineering,
- National Academy of Medicine) ➔ Report Post COVID-19 Pandemic Outbreak
- Following 2019 Report of "*Promising Practices for **Addressing the Underrepresentation of Women in Science, Engineering, and Medicine: Opening Doors***"



Life Impact on Women

Published: 18 May 2017

Work–life balance: Break or burn out

Kendall Powell

Nature **545**, 375–377 (2017) | Cite this article

83k Accesses | **14** Citations | **610** Altmetric | Metrics

Taking time off from work is crucial for avoiding stress and depression, and their potential consequences.

Prof. May Dongmei Wang, PhD

- **Title:** Professor, Petit Institute Faculty Fellow, Wallace H Coulter Distinguished Faculty Fellow, Director of Biomedical Big Data Initiative, Kavli Fellow, Georgia Distinguished Cancer Scholar, FAIMBE, FIAMBE, FIEEE
- **Affiliation:** Departments of Biomedical Eng, Electrical and Computer Eng, Computational Science and Eng., Winship Cancer Institute, Parker H. Petit Institute of Bioeng and Biosciences, Ins. Of People and Technology, Georgia Institute of Tech. & Emory U.
- **Contact:** maywang@gatech.edu
- **Weblink:** https://bme.gatech.edu/bme/faculty/May-Dongmei-Wang

- **Research Interests:** Biomedical Big Data and AI, and Intelligent Reality for Personalized, Predictive, Pervasive, and Preventive Health (pHealth)
  - Clinical and Health Decision Support System Using AI;
  - Extended Reality (VR/AR/XR) for Healthcare;
  - Translational Bioinformatics;
  - Pathological Imaging Informatics;
  - Critical Care and Chronic Health informatics ;
  - Bio-Nanoinformatics;
  - Telemedicine