Participation of Women in Science: Problems and Solutions

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Outline

1. Some specific issues faced by women (and minorities)
2. How can we go forward
3. My story
1. Some specific issues faced by women (and minorities)

2. How can we go forward

3. My story
More women are earning science and engineering doctorates.
The problem is not simply the pipeline.

In several fields, the pipeline has reached gender parity

• For over 30 years, women have made up over 30% of the doctorates in social sciences and behavioral sciences and over 20% in the life sciences. Yet, at the top research institutions, only 15.4% of the full professors in the social and behavioral sciences and 14.8% in the life sciences are women.

• Women from minority racial and ethnic backgrounds are virtually absent from the nation’s leading science and engineering departments.
Scissors Diagram Showing the Gender Distribution within Career Stages in Biological Sciences at German Universities (2003)

This study debunked the following beliefs:

1. Women are worse than men in math
2. Once the pipeline problem is solved, unequal representation will disappear
3. Women are not as competitive as men and don’t want jobs in academe
4. Academe is a meritocracy
5. Women faculty are less productive than men faculty
6. Women are more interested in family than careers
7. Changing the rules means that standards of excellence will be lowered
Stereotypes:
Do they impact science careers?
Which groups do you think these word maps represent?
Letters of recommendation for faculty positions

words more common in letters for men

words more common in letters for women

Implicit Bias

Also known as Unconscious Bias, Implicit Bias is a theory that some behaviors are driven by learned stereotypes that operate automatically – and therefore unconsciously.
Competence, hireability, and mentoring by student gender condition (collapsed across faculty gender).
Stereotype Threat

Internalized negative stereotype

Anxiety

Poor performance
Stereotype Threat: female/math

Being the only female in a classroom affects female college student performance on Math but not Verbal SAT

Adapted from Inzlicht et al, Psychological Science, 2000.
Impostor syndrome

Describes people who can’t internalize their accomplishment, remaining convinced that they are frauds and do not deserve the success they have achieved.

Proof of success is dismissed as luck, timing, or as a result of deceiving others into thinking they are more intelligent and competent than they believe themselves to be.

Impostor syndrome is particularly common among high-achieving women, although some studies indicate that both genders may be affected in equal numbers.
What I’m not talking about: overt gender inequities

1. Discrepancies in start-up packages/ wages/advancement

2. Number of women speakers at conferences

3. Day care provision

4. etc
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Proactive steps

1. [http://thriving.berkeley.edu/home](http://thriving.berkeley.edu/home)

2. Stanford: Geneticists for Diversity in Science
Another solution: A peer mentoring group
Every Other Thursday
STORIES AND STRATEGIES FROM SUCCESSFUL WOMEN SCIENTISTS

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GROUP:
The power of **not going it alone**

An Antidote to Isolation and Competition

Practical Support

Confidentiality
What happens every other Thursday?

A meeting facilitated by one of the members.

A set framework for discussion.

Who wants to work? Ask for time.
Work

The issues
  Professional/personal
  Specific/Long-term or general

Feedback
  Honest
  Neutral
  Identify pigs
Pigs

negative self perceptions

“I’m lazy about writing papers and always put it off until there is a huge crunch.”

“I can never get the right message across when I’m critiquing a student’s work.”
Work

The issue
  Specific
  Long-term or general

Feedback
  Honest and neutral
  Identify pigs

Strategies

Make a contract
Contract

A precise formulation of objectives
Positive and Possible

Immediate: “I will set aside a full day each week to work at home on my manuscripts.”

Broad/Long range: “I will work to include time for [quiet thought] in my life.”
Other Recurring Themes

Managing Time and Establishing Equilibrium

Institutional Politics and Strategy

Writing and Giving Talks

Taking Care of Ourselves (Life is a Limited Resource)

Family ties and obligations

Respect personal instinct, goals, creativity

Mentoring– women and men
What happens every other Thursday?

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A set framework for discussion.

Who wants to work? Ask for time.

Work

Strokes and social time
Strokes
“little gifts to go home with”

A stroke for how you always get right to the heart of the issue.

A stroke for your work tonight--you are taking care of your health and taking care of the people in your lab.
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Goal: Biochemical Geneticist  
( High school)

Cornell University 
(Botany Major)

no career path for women scientists...

Ph.D.
Goal: Biochemical Geneticist

Cornell University
(Botany Major)

no career path for women scientists...

M.S., Biology
Brooklyn College
(Clara Blake)

B.S., Science Education

University of Oregon
Ph.D., Aaron Novick
Post Doc, Pete von Hippel

Diversion -
New goal: become teacher

Ph.D.
Aaron Novick / Early Institute of Molecular Biology, University of Oregon

Pete von Hippel
Carol and Steve
Miriam, the snake charmer
Goal: Biochemical Geneticist

University of Oregon
Ph.D., Aaron Novick
Post Doc, Pete von Hippel

University of Wisconsin
-Dick Burgess
-Howard Temin

Assistant Professor,
Department of Bacteriology
University of Wisconsin
Dick Burgess

Howard Temin
Goal: Biochemical Geneticist

University of Oregon
Ph.D., Aaron Novick
Post Doc, Pete von Hippel

University of Wisconsin
-Dick Burgess
-Howard Temin

Professor,
Department of Bacteriology
University of Wisconsin

Professor,
Departments of Microbiology/Immunology and Cell/Tissue Biology
UCSF
How unicellular organisms integrate their gene expression patterns to enable rapid response to changing environments
My Path

Graduate student:  How does lac repressor work \textit{in vivo}

Postdoc: How does lac repressor work \textit{in vitro}

Scientist:  the \textit{in vivo} role of sigma, the prokaryotic transcription Initiation factor

Wisconsin faculty :  RNA polymerase as an integrator of signals important stress responses

UCSF faculty:  Global approaches to gene function Regulation of translation
The win-win potential for motherhood and science

Women wishing to combine children with a research career should not be seen as taking a backstep but as bolstering both activities argues Marlene Belfort

Marlene Belfort, a member of the NAS is Professor of Molecular Genetics and Director of of the Division of Genetic Disorders at the Wadsworth Center, NYS Department of Health, Albany, New York