

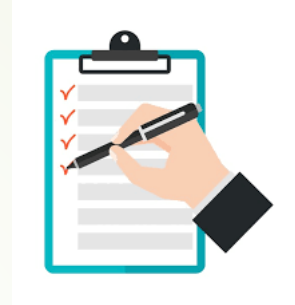
Females and STEM: Issues, Causes, and Supports

Lynda R. Wiest, PhD
University of Nevada, Reno
wiest@unr.edu

March 9, 2024

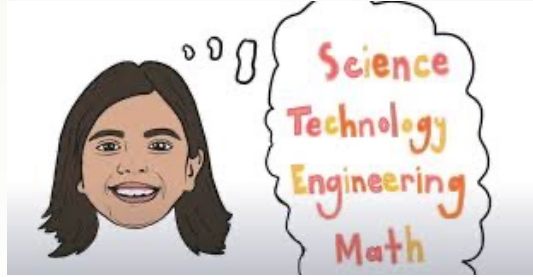


Agenda



- Rationale for gender parity in STEM
- Gender differences in STEM achievement and participation
- Influences on gender differences in STEM
- Ways for parents to support children in STEM
- Future directions for considering gender in STEM: Student identities
- Nevada Math & Technology Camp
- Questions/Comments

STEM = science, technology, engineering, and mathematics




Rationale for Gender Parity in STEM

- **Important resource for societal advance** (e.g., a nation's development)
- **Women's personal well-being** (US women earn about 80% of that of men for full-time work, live about 5 years longer than men, and are disproportionately represented among the impoverished, which can lead to serious life-quality and financial-security concerns)




Gender Differences in STEM Achievement & Participation

- Weaker dispositions (e.g., attitudes, confidence)
 - Lower performance on major standardized national/international tests
 - Less participation in optional STEM (additional courses, camps, clubs, etc.)
 - Underrepresentation in most STEM fields (in relation to degrees in all majors)
- 

Percent of Degrees in the U.S. Conferred to Females

	Associate's Degree	Bachelor's Degree	Master's Degree	Doctoral Degree
All Majors	62.8%	58.3%	61.9%	56.0%
Mathematics & Statistics	32.3%	42.0%	41.4%	27.9%
Computer & Information Sciences & Support Services	22.3%	21.9%	33.8%	25.3%
Agriculture & Natural Resources	63.0%	58.5%	60.1%	71.7%
Biological & Biomedical Sciences	72.7%	65.8%	62.5%	53.1%
Physical Sciences & Science Technologies	47.7%	44.6%	40.0%	35.3%
Engineering	19.0%	24.2%	27.7%	26.2%

Any observations?



Mean Annual Wages by Major Occupation	
Management	\$131,200
Legal	\$124,540
Computer and Mathematical	\$108,130
Healthcare Practitioners and Technical	\$96,770
Architecture and Engineering	\$94,670
Business and Financial Operations	\$86,080
Life, Physical, and Social Science	\$79,360
Arts, Design, Entertainment, Sports, and Media	\$76,500
Educational Instruction and Library	\$63,240
Construction and Extraction	\$58,400
Community and Social Service	\$55,760
Installation, Maintenance, and Repair	\$55,680
Protective Service	\$54,010
Sales and Related	\$50,370
Office and Administrative Support	\$45,550
Production	\$45,370
Transportation and Material Moving	\$43,930
Farming, Fishing, and Forestry	\$37,870
Personal Care and Service	\$36,210
Building and Grounds Cleaning and Maintenance	\$35,900
Healthcare Support	\$35,560
Food Preparation and Serving Related	\$32,130

Group Discussion

What do you think causes gender differences in STEM?



Influences on Gender Differences in STEM

- Family
- Teachers
- Peers
- The media
- Society at large

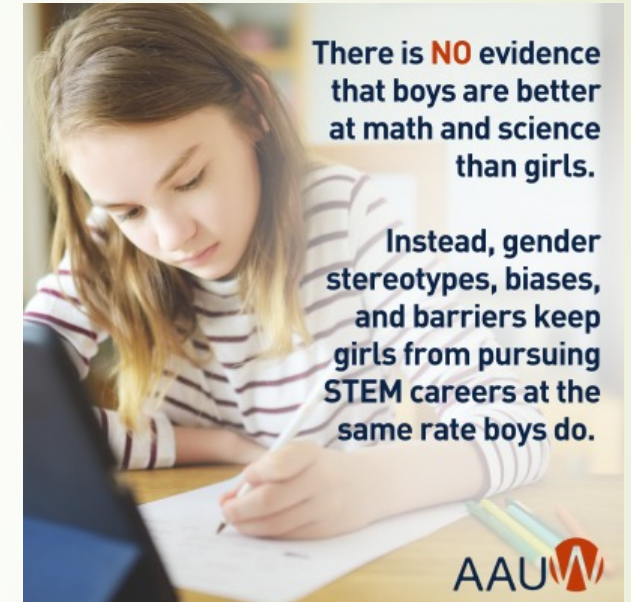


Example factors: differential experience (e.g., in spatial skills and use of equipment/tools); societal expectations (rule-driven behaviors, subject and career stereotypes)

A Key Point

Gender differences in STEM are sociocultural, not biological!

Evidence: differential performance across cultures, and by type of knowledge/skills assessed and test format and testing conditions; interventions can influence performance)



Group Discussion


1. Why do many females who do well in high school math and science coursework opt not to pursue STEM degrees?
2. Why do many who earn STEM degrees choose not to enter or to continue in STEM fields?

Note: Men are also underrepresented in some STEM-related fields, such as certain health professional occupations (e.g., nursing), but they are less likely to be the higher paying/higher status fields.





Ways for Parents to Support Children in STEM

- Hold high expectations for STEM efforts and learning.
 - Provide STEM opportunities (technological tools; camps/after school programs; etc.). Have children use computers and other technologies at home. Both parents have a strong impact.
 - Avoid saying you don't like or need math. Emphasize its importance and usefulness.
 - Emphasize the fact that math is learned through effort, perseverance, and appropriate experiences rather than being a natural ability.
 - Monitor what's going on at school (homework, grades, what child does in math or computer class; communicate with teachers...).
 - Play STEM games at home and online.
 - Connect math to real life.
 - Give support but have children think for themselves.
 - Explore possible career paths and preparation needed to get there.
 - Provide role models.
- 

Example Website with Women Role Models in STEM

Biographies of Women Mathematicians



[HOME](#) | [ALPHABETICAL INDEX](#) | [CHRONOLOGICAL INDEX](#) | [RESOURCES](#) | [CREDITS](#) | [SEARCH](#)



Judith Sally

March 9

Born this day:

Died this day:

- [Agnes Baxter](#)

Welcome to the web site for biographies of women in mathematics. These pages are part of a project at [Agnes Scott College](#) in Atlanta, Georgia, to illustrate the numerous achievements of women in the field of mathematics. Here you can find biographical essays or comments on the women mathematicians profiled on this site, as well as additional resources about women in mathematics. Each time this page is reloaded, a randomly selected photo is displayed to the left (if Javascript is enabled). Click on the image to go to the profile of that woman.

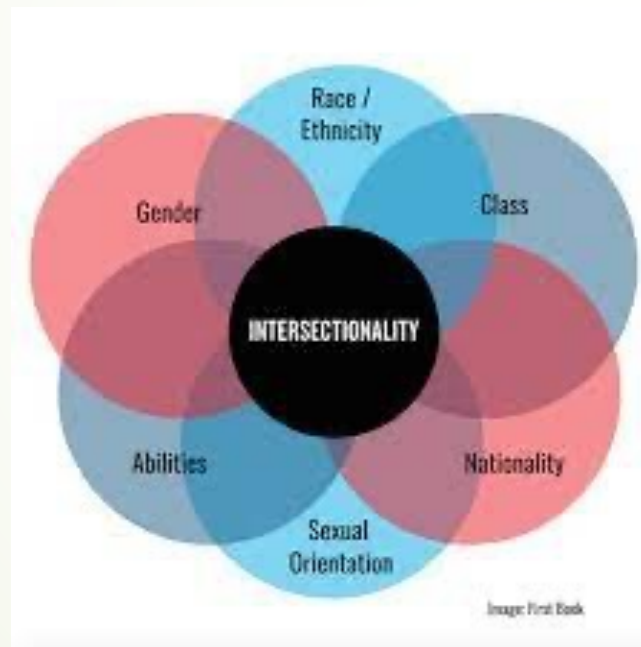
- [Names in Alphabetical Order](#)
- [Names in Chronological Order](#)
- [Interactive Timeline](#)
- [Names by Location of Birth](#) (including a Google Map view)
- [Other Resources about Women Mathematicians](#)
- [The First Ph.D's in Mathematics by Women before 1930](#)
- [Prizes, Awards and Honors for Women Mathematicians](#)
- [Birth and Death Anniversaries](#)
- [Photo Credits](#)
- [Search the site](#)

Did you know? (See the [Archive](#) for past announcements)

- Claire Voisin, Institut de Mathématiques de Jussieu, France, will receive the 2024 Crafoord Prize in Mathematics "for outstanding contributions to complex and algebraic geometry, including Hodge theory, algebraic cycles, and hyperkähler geometry." Voisin is the first woman to receive the Crafoord Prize in Mathematics. For more information, see the [news article](#) from the American Mathematical Society, or watch the [video](#) from the Royal Swedish Academy of Sciences that describes Voisin's work that led to the Crafoord Prize.
- Congratulations to Jenna Carpenter, Professor of Engineering and Founding Dean at Campbell University, who will take office as the Mathematical Association of America's new president-elect on July 1, 2024. For more information, see the [Press Release](#) from Campbell University.
- Congratulations to the USA Team for earning second place in the 12th European Girls' Mathematical Olympiad (EGMO), with each student also earning a gold medal for their individual performances. The EGMO is an

Future Directions for Considering Gender in STEM: Student Identities

- Intersecting identities
- Gender fluidity



**GENDER
IS A
SPECTRUM**

Nevada Math & Technology Camp (formerly Northern Nevada Girls Math & Technology Camp)





Thank you!

Lynda Wiest
wiest@unr.edu