K-12 Gender Bias: How Teachers can be Change Makers

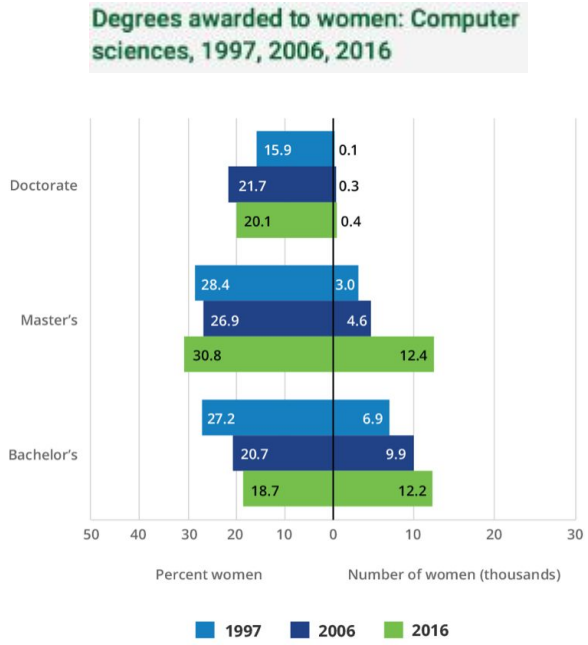
By: Layla Jaber, Sam Scheck, Heather Kuhn, Marian Singletary

Problem

- Decrease in the number of women in tech over the years
  - Following the trend shown to the right, there will be no women bachelor's degree graduates in computer science by 2032

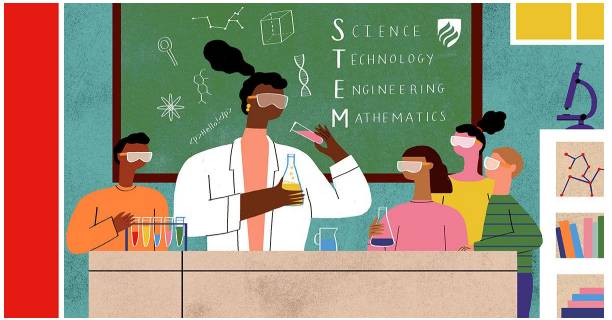
- Lack of diversity in the field can lead to:
  - Underrepresentation of women in the technology field
  - Men's perspectives favored in research, development, and usage of technology

- How can we combat this gender gap?
  - K-12 educators



Why Educators?

- Educators as change makers means:
  - Positively influencing students in their formative years
  - Providing basis for personal interactions for students to feel encouraged
  - Trainings providing concrete skills for educators
- Change in direct and actionable ways
  - **Cannot** control student-to-student interactions
  - **Cannot** control student-to-family interactions
  - **Cannot** control student-to-society interactions
  - **Can** control student-to-teacher interactions

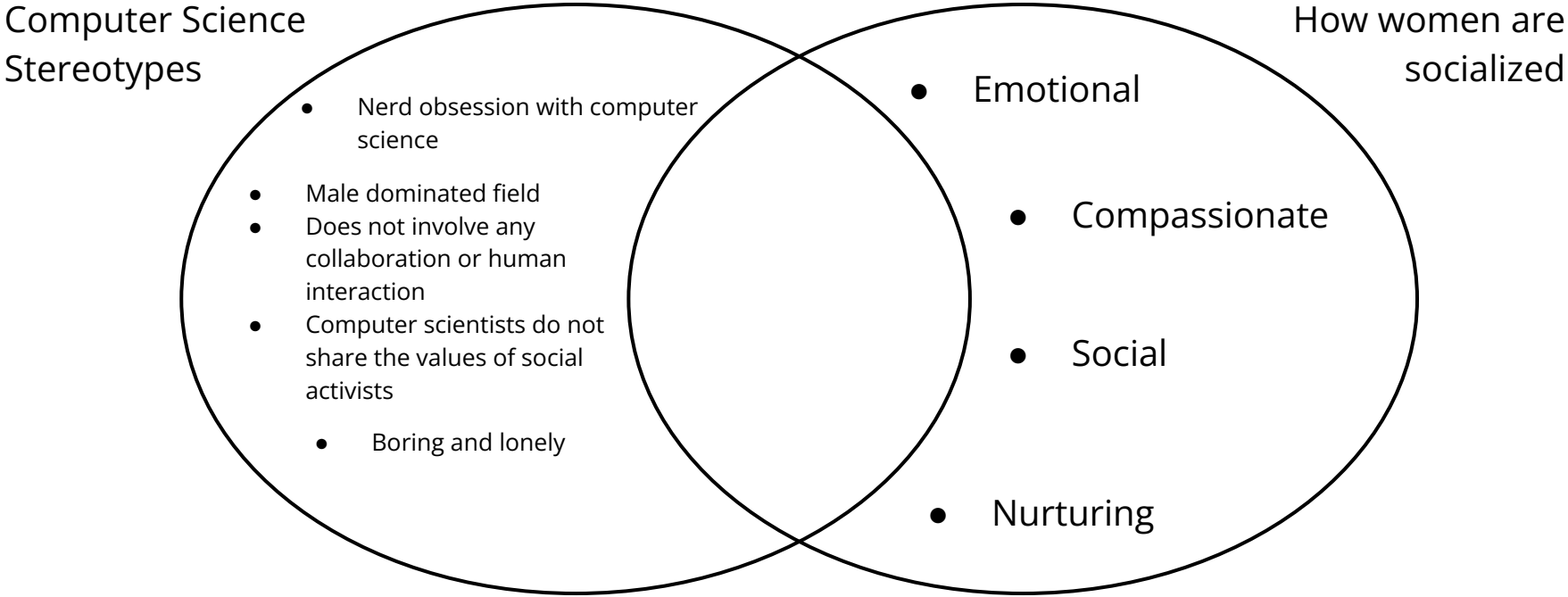


Why Early Development (K-12)?

- Early established beliefs
  - Gender biases presented by family, society, and classmates (Ex: tech and computer science associated with masculinity)
- Altered perceptions
  - Stereotype threat
    - According to Claude M. Steele: “a situational threat… that, in general form, can affect the members of any group about whom a negative stereotype exists… where bad stereotypes about these groups apply, members of these groups can be reduced to that stereotype.”
  - Can affect performance, confidence, willingness to pursue tech career or education

What is the gender gap attributed to?

Research by Sax, Vitores, and Gil-Juarez



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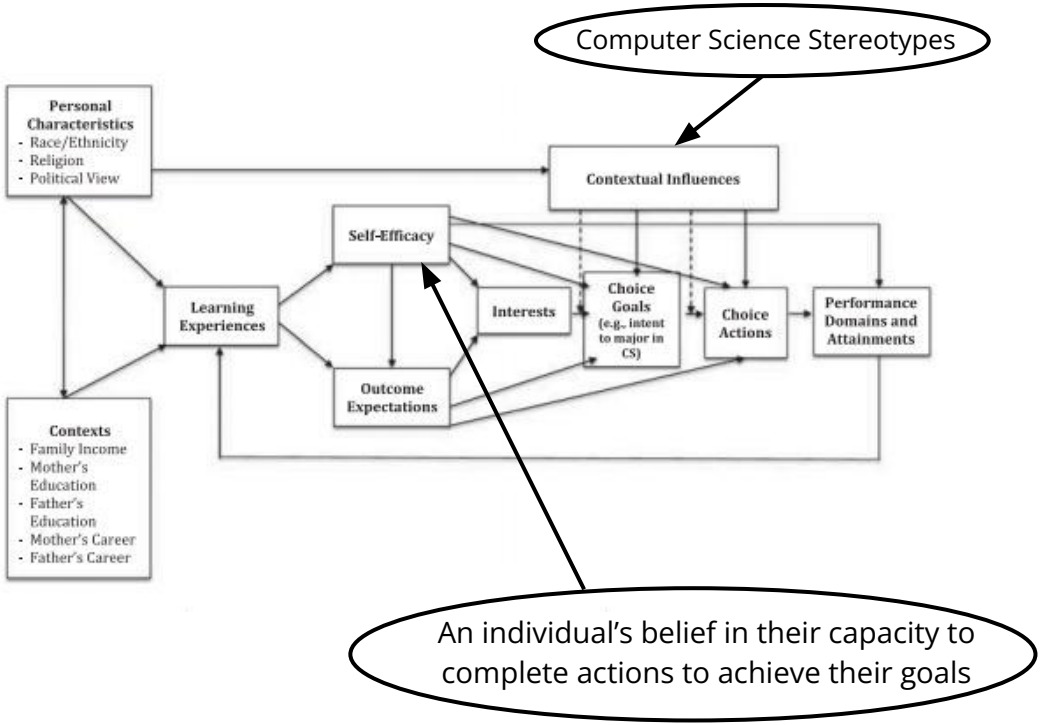


Media can influence women's confidence, whether through personal consumption of media or through family, teachers, and peers relaying their learned gender based biases.

Example:

Sax found that women's math self-concept (one's perception of their own abilities to success in mathematics) was much lower than men's

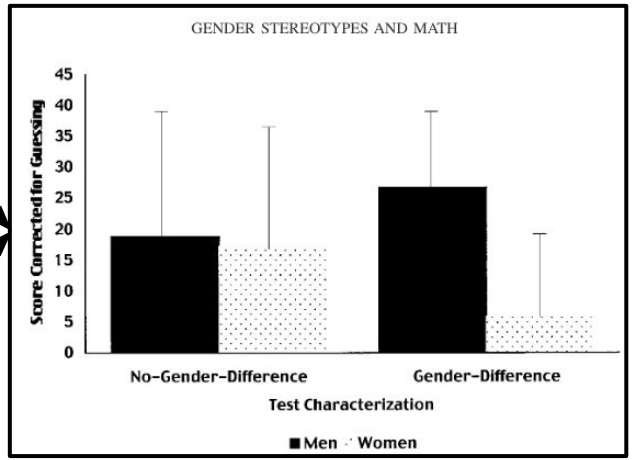
Stereotype Threat

Study by Claude Steele

Two groups of students who identify strongly with being good at math (made up of both men and women)

One group was told the test results would reveal gender differences

One group was told the test results have never revealed gender differences in the past



- Fear that stereotypes are true creates more anxiety and affects performance
- Demonstrates disruptive effect that stereotype threat has on members of a negatively stereotyped group
- Women experience more anxieties and difficulties succeeding when attempting to “break the mold”
- **Solutions**: Optimistic teacher-student relationships (challenge students and affirm their abilities, stress that there is no right way to go about learning), Support for women to fall back on when their confidence is wavering

Student Perceptions

Research by Roli Varma

Why do you think so few women are pursuing a degree in computer science or computer engineering?

"Well, it's a sexist thing to say but boys are rational and girls are emotional"

"Girls are not encouraged to do well in math in [school]"

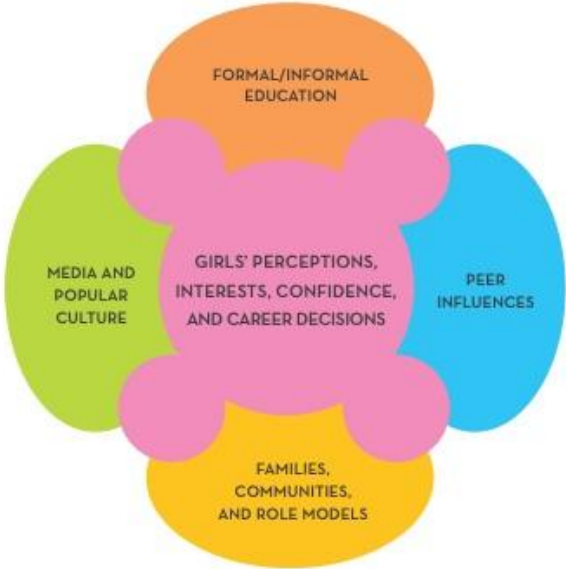
"Most women do not want to be bothered with technical stuff"

Gendered stereotypes inform the majority of the experiences that shape students' answers

The School Environment

Research by Catherine Ashcraft

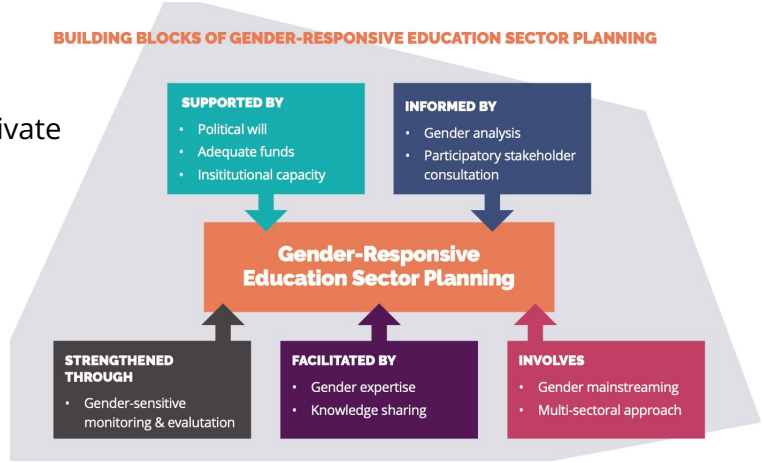
- Computing curriculum
  - Computer science lessons are taught abstractly and are detached from societal applications
    - Emphasizes society's disconnect between technology and addressing social issues
  - Focuses more on individual projects rather than collaboration
- Who can change these things?
  - Educators
  - Educational policymakers
  - School counselors
  - Researchers in gender, diversity, technology, and education



Intersectional Experiences of Girls in Tech Settings

Research by Global Partnership for Education

- Understanding the educational experiences of students from different socioeconomic groups and geographic locations is extremely important
    - Illuminates more specific learning needs and priorities
- School-related gender-based violence
    - Female dropout rates rise in conflict-affected settings
- Multisectoral approach to minimizing gender bias
    - Collaboration between different policy areas (public and private sectors)



Cultural Conceptions of Gender

Research by Pei-Ru Liao

- Gender impacts lived social relations
- Examples of gender in different contexts:
  - Australia: “[gender] can be conceptualized as a simple binary category in the girls-in-education movement”
  - Finland: “[gender equality] takes the idea of binary gender as a given, as a fact based on the male/female division”
  - Taiwan: “[gender includes a] holistic and non dualist conception of personhood and a non dichotomous view of femininity and masculinity”
- Gender is understood and performed much differently in different cultural contexts
- No clear cut method of tackling gender biases

Making Change

- Representation
  - More diverse staff in schools provide students with role models that look like themselves
- Resources, Intersectionality, and Inclusivity
  - Access to computing courses within the classroom
  - Access to technology for individual students
- Training for Educators
  - Address implicit biases that everyone holds
  - Equipping teachers to facilitate conversations around biases and address them openly with students
  - Stepping in when girls and minority students are being mistreated or are struggling with confidence
  - Allyship:
    - Understanding how similar environments are experienced in different ways by people of differing identities
    - Standing up for those who are talked over, denied opportunity, or need support in other ways

THANK YOU!

Resources

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