Find Your STEM high school conference 2019

Amelia Irvin, junior, Ragsdale High School

WHY SO FEW??

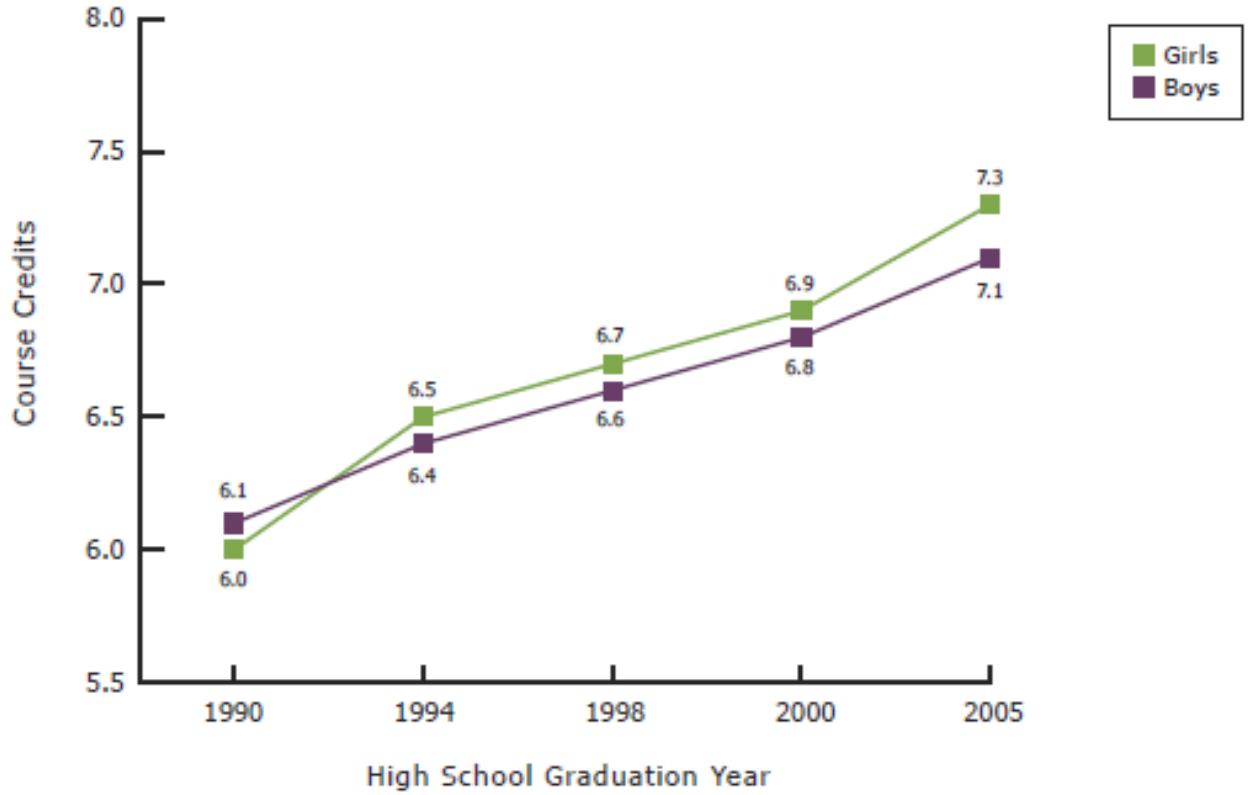
What are the challenges and opportunities for girls in science, technology, engineering, and math education and careers?

FACT

Girls’ performance and participation in math and science subjects in high school has improved over time and, in some cases, has surpassed that of boys.

In high school, both boys and girls are earning more credits in math and science over time, and girls earn more credits than boys do.

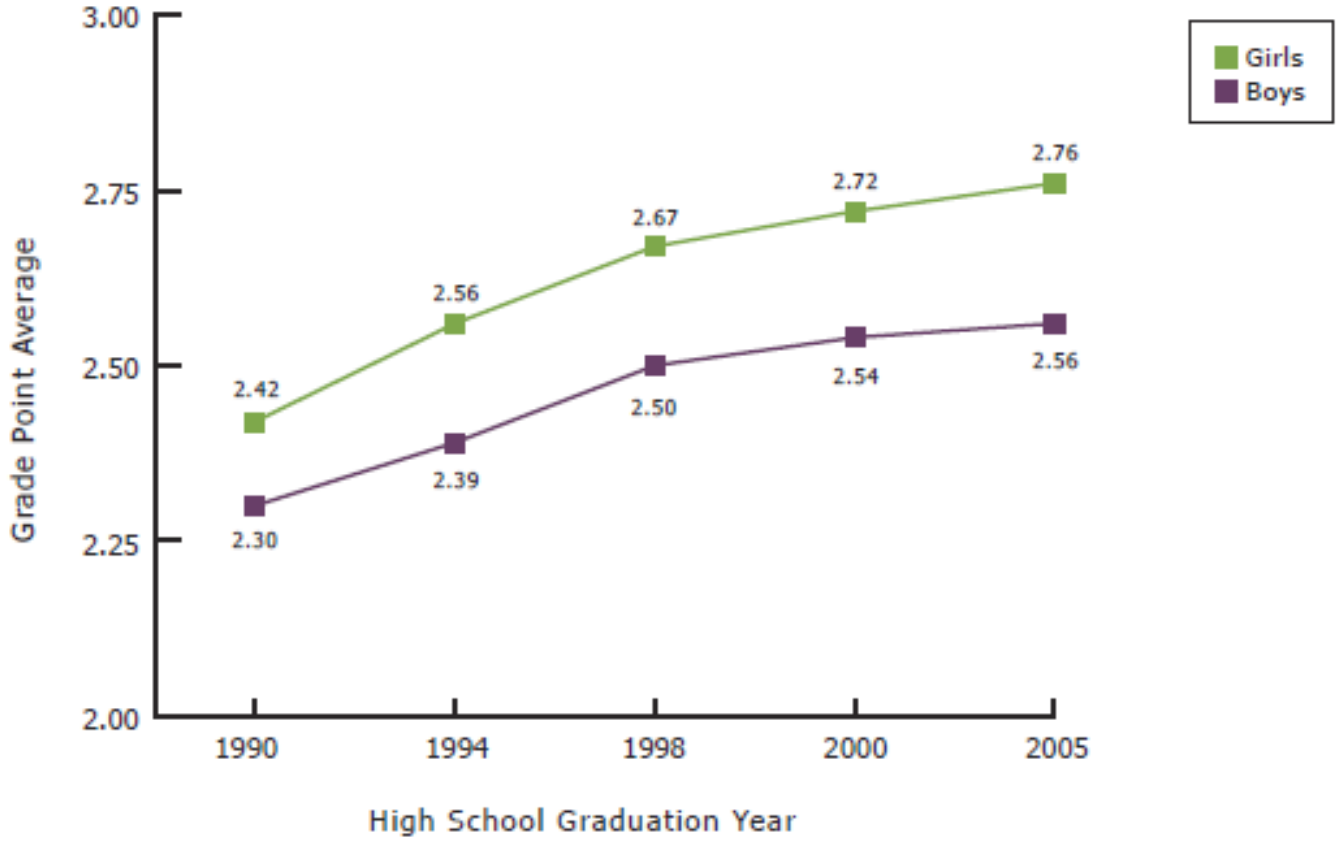
High School Credits Earned in Math and Science, by Gender, 1990–2005



Source: U.S. Department of Education, National Center for Education Statistics, 2007, *The Nation's Report Card: America's high school graduates. Results from the 2005 NAEP High School Transcript Study*, by C. Shettle et al. (NCES 2007-467) (Washington, DC: Government Printing Office).

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

Grade Point Average in High School Mathematics and Science (Combined), by Gender, 1990–2005

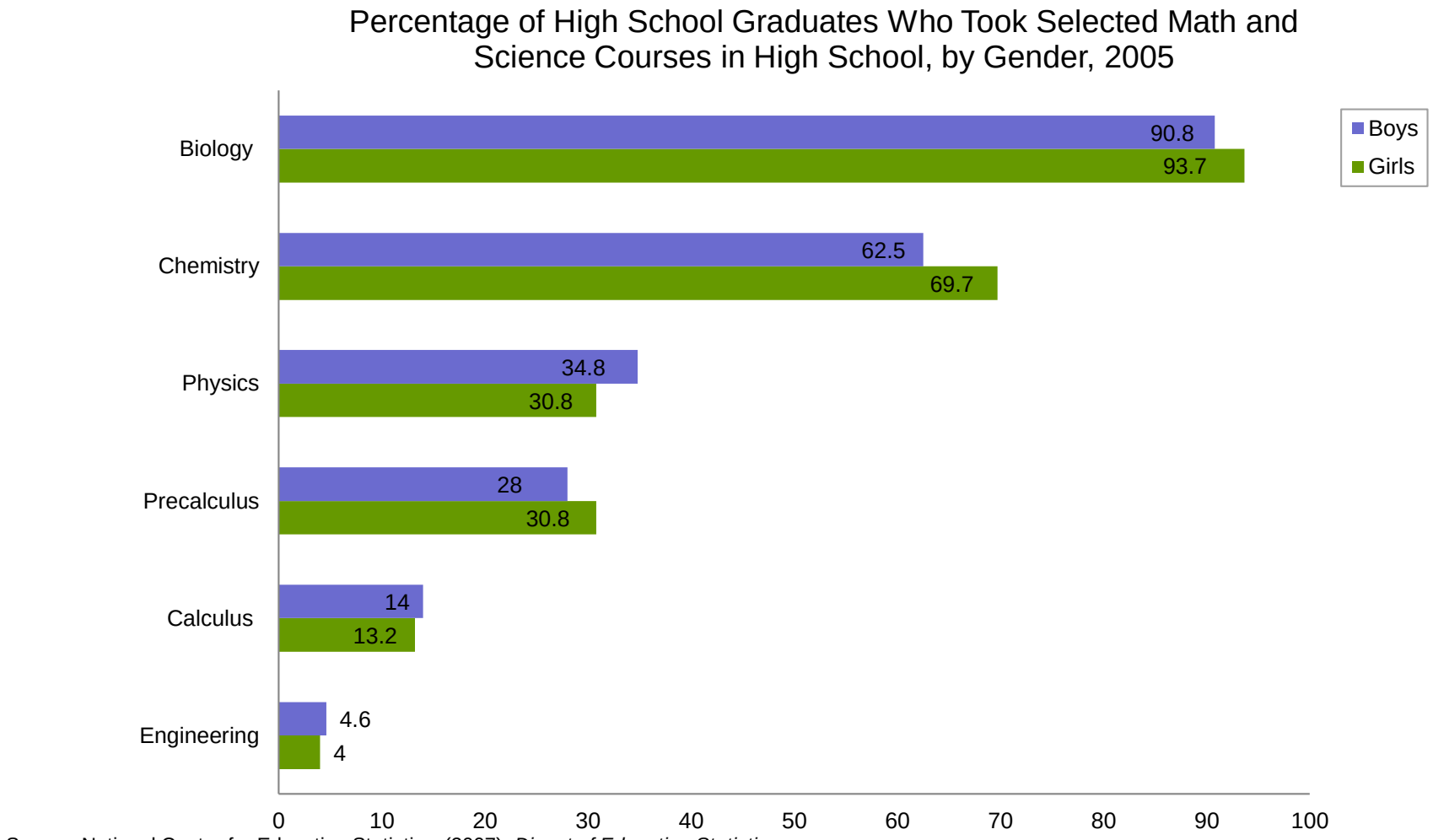


Source: U.S. Department of Education, National Center for Education Statistics, 2007, *The Nation's Report Card: America's high school graduates: Results from the 2005 NAEP High School Transcript Study*, by C. Shettle et al. (NCES 2007-467) (Washington, DC: Government Printing Office).

FACT

Girls’ participation and performance on high-stakes tests in math and science in high school are also improving over time, although boys perform better on average.

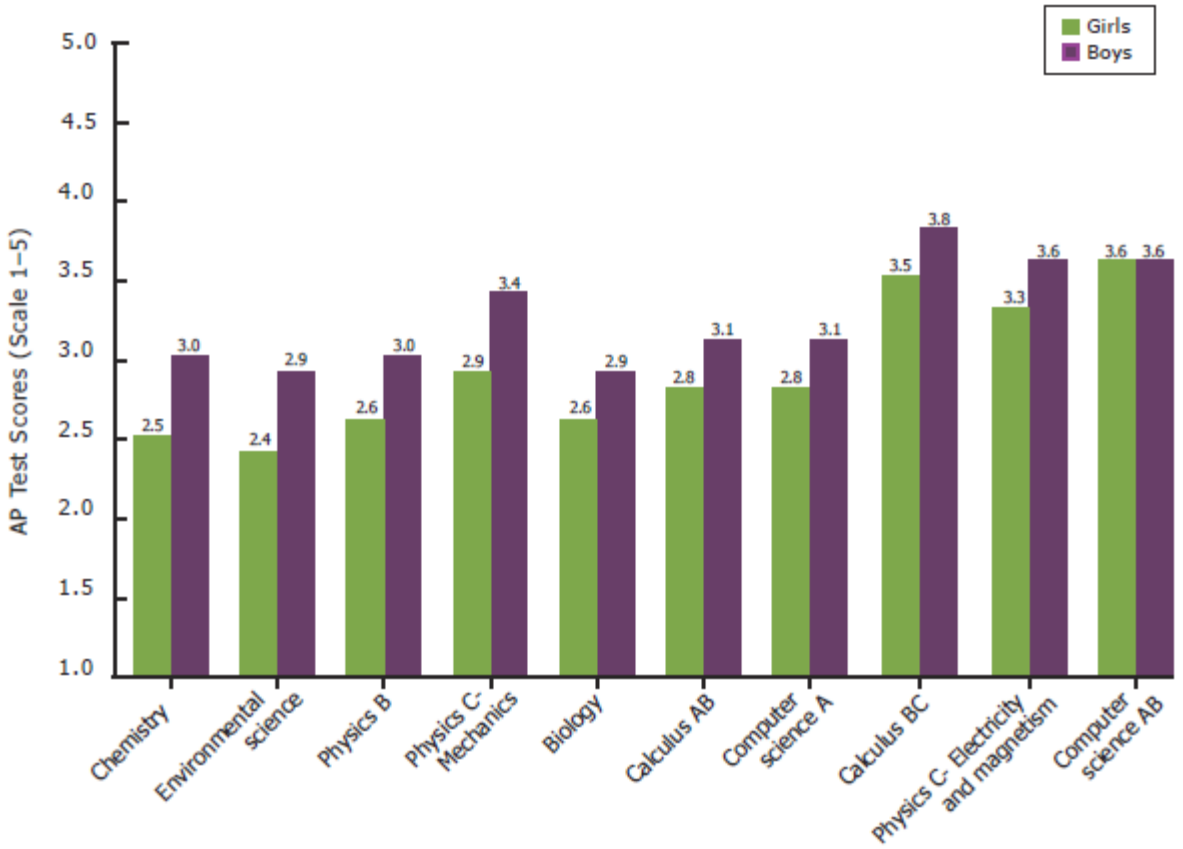
High school girls are more likely to take biology, chemistry, and pre-calculus than boys are, but girls are less likely to take physics.



Source: National Center for Education Statistics. (2007). *Digest of Education Statistics.*

On average, boys perform better than girls do on Advanced Placement (AP) tests in math and science.

Average Scores on Advanced Placement Tests in Mathematics and Science Subjects, by Gender, 2009



Source: Retrieved November 11, 2009, from the College Board website at www.collegeboard.com.

“Boys do not pursue mathematical activities at a higher rate than girls do because they are better at math. They do so, at least partially, because they *think* they are better.”

—Shelley Correll, professor

FACT

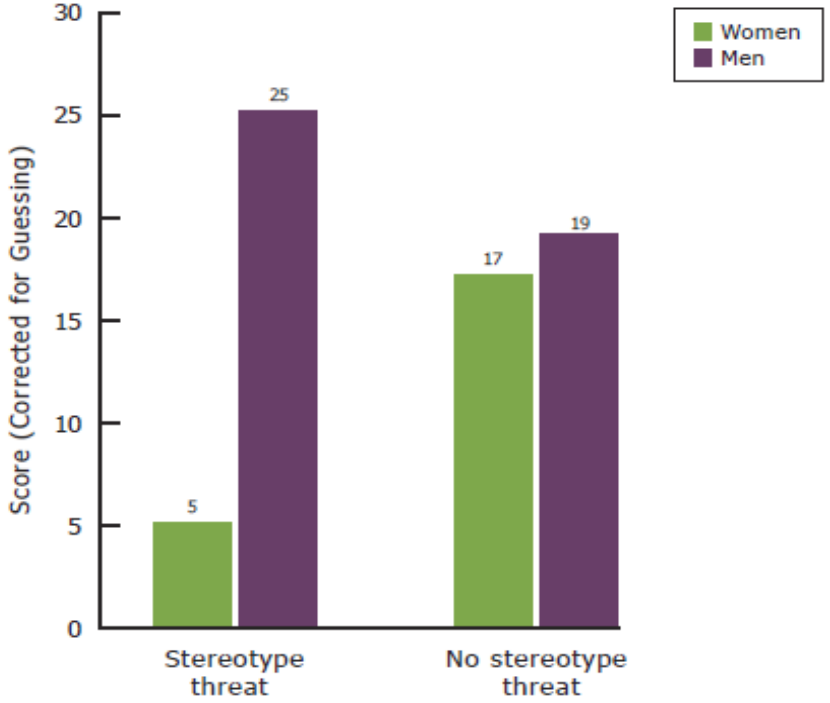
Girls’ achievements and interests in math and science are shaped by the environment around them.

FACT

Believing in the potential for intellectual growth, in and of itself, improves outcomes.

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



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

Source: 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.

In math and science, a growth mindset benefits girls.

Fixed Mindset	Growth Mindset
Intelligence is static.	**Intelligence can be developed.**
Leads to a desire to *look smart* and therefore a tendency to	Leads to a desire to *learn* and therefore a tendency to
• **avoid challenges**	• **embrace challenges**
• **give up easily due to obstacles**	• **persist despite obstacles**
• **see effort as fruitless**	• **see effort as path to mastery**
• **ignore useful feedback**	• **learn from criticism**
• **be threatened by others' success**	• **be inspired by others' success**

- Teach children that intellectual skills can be acquired.
- Praise children for effort.
- Highlight the struggle.
- Gifted and talented programs should send the message that they value growth and learning.

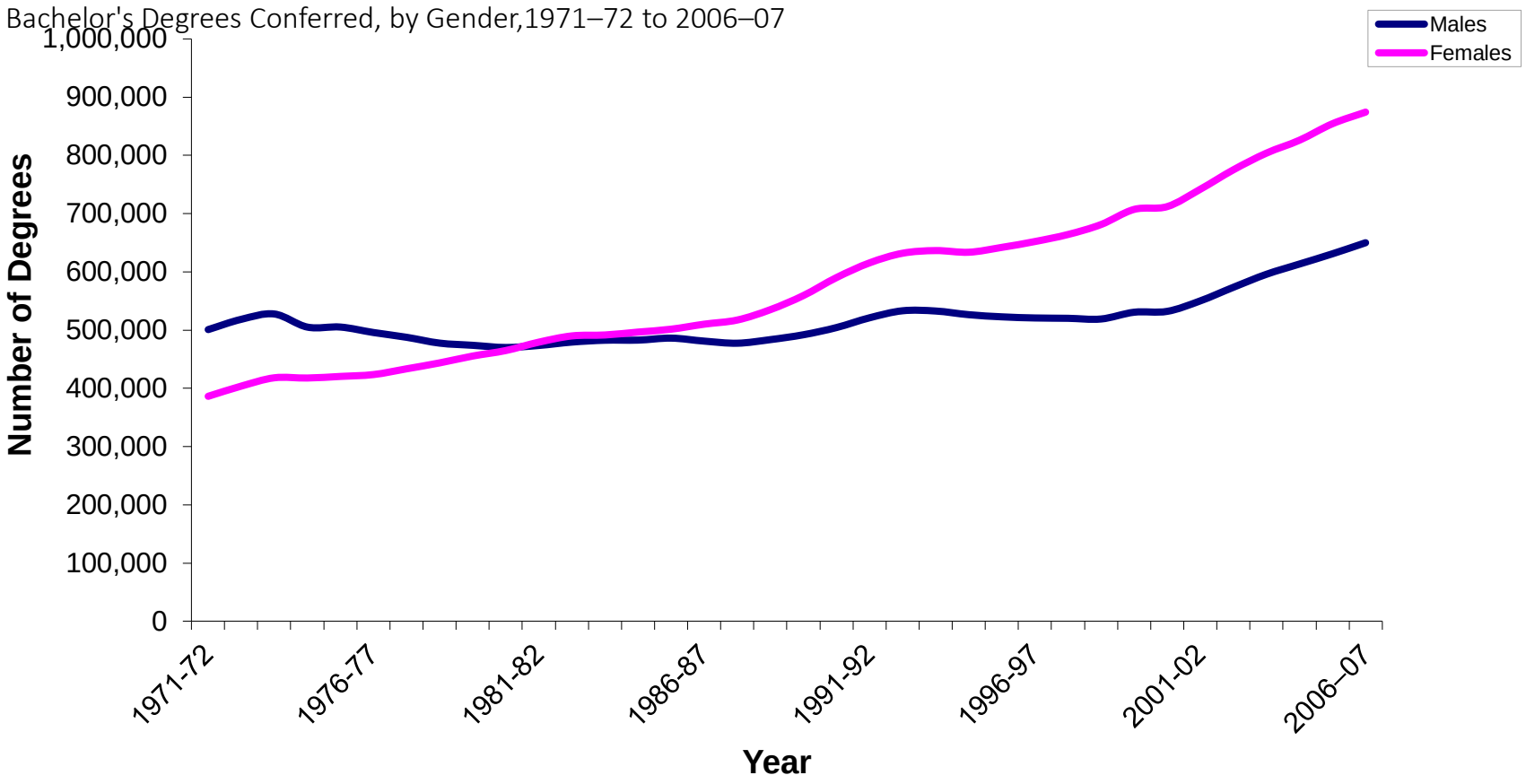
FACT

Negative stereotypes about girls' and women's abilities in math and science persist despite girls' and women's considerable gains in these areas in the last few decades.

FACT

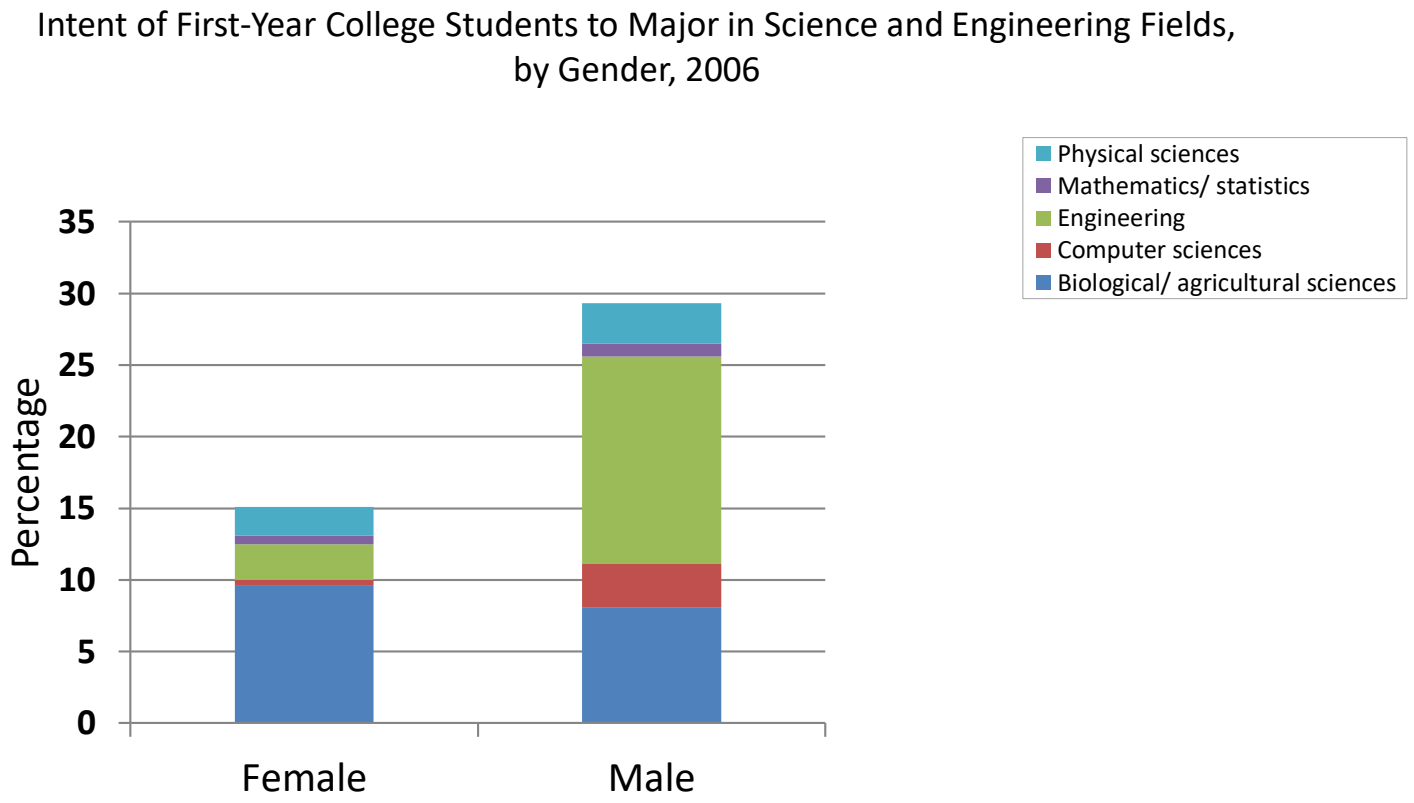
Despite the positive trends in high school, the transition from high school to college is a critical time for young women in STEM (science, technology, engineering, and mathematics).

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



Source: Snyder, T.D., Dillow, S.A., and Hoffman, C.M. (2009). *Digest of Education Statistics 2008 (NCES 2009-020).* National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Washington, DC.

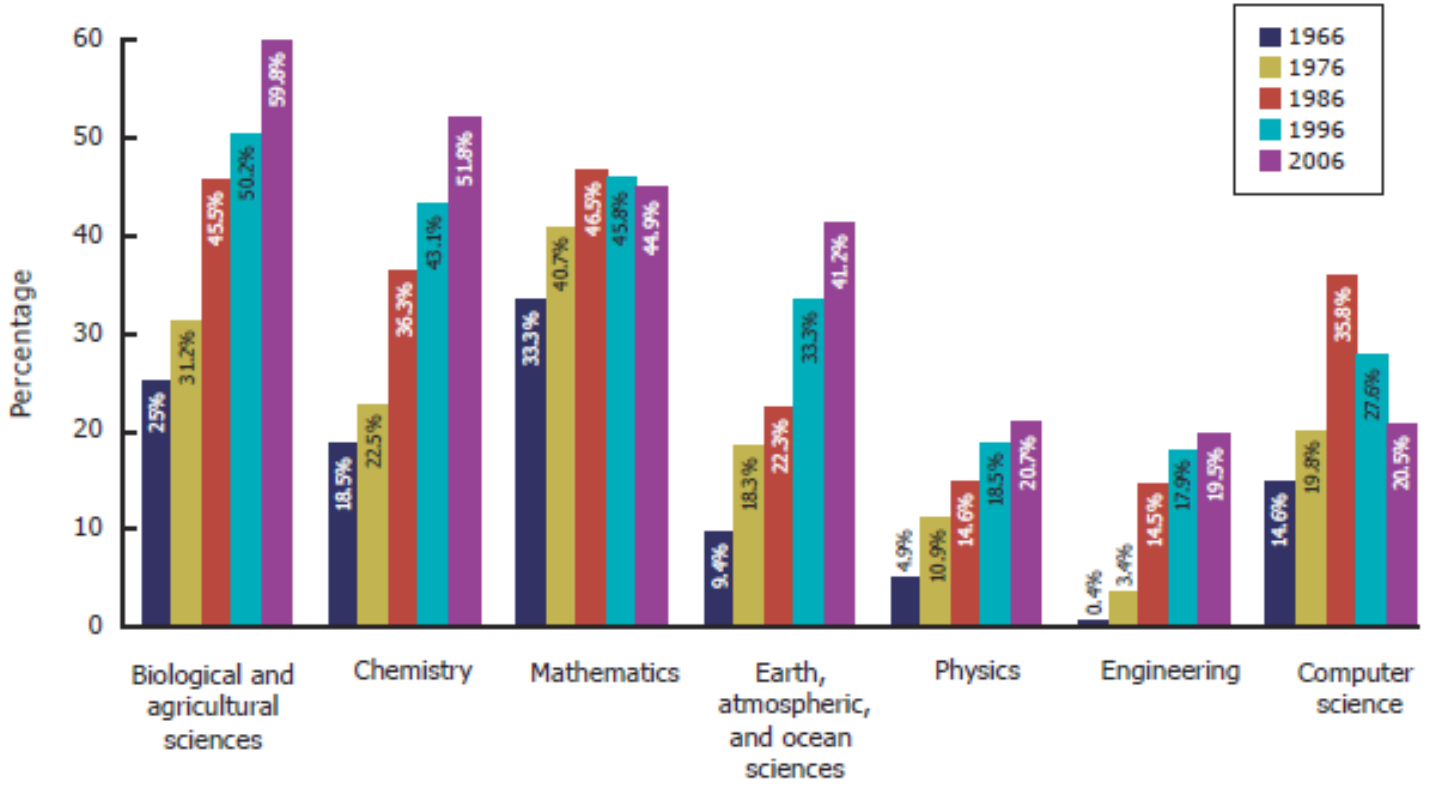
Women are less likely than men are to declare a STEM major in college.



Source: Commission on Professionals in Science and Technology. Data derived from Cooperative Institutional Research Program, Higher Education Research Institute, Graduate School of Education and Information Studies, University of California, Los Angeles, *The American Freshman: National Norms for Fall 1990 through Fall 2006*, www.gseis.ucla.edu/heri/heri.htm.

Women's representation among STEM bachelor's degree holders has improved over time but varies by field.

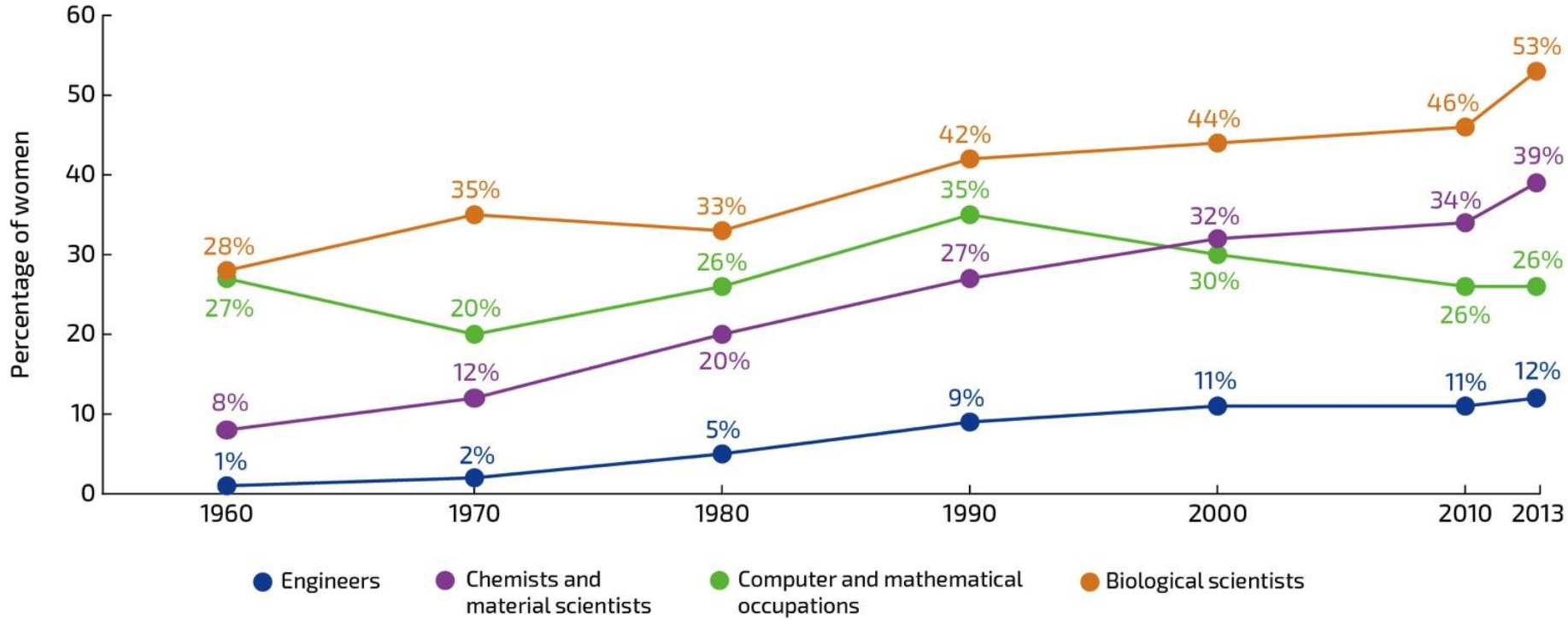
Bachelor's Degrees Earned by Women in Selected Fields, 1966–2006



Source: National Science Foundation, Division of Science Resources Statistics, 2008, *Science and engineering degrees: 1966–2006* (Detailed Statistical Tables) (NSF 08-321) (Arlington, VA), Table 11, Author's analysis of Tables 34, 35, 38, & 39.

Women’s representation in the STEM workforce is also uneven.

FIGURE 1. WOMEN IN SELECTED STEM OCCUPATIONS, 1960–2013



Amelia Irvin: AAUW Triad Tech Savvy,

How I Found My STEM

➔**I joined Girl Scouts and discovered robotics and programming in elementary school. . I have continued to be involved in FIRST robotics as a member of an all girls team, Girls on Fire.**

➔**I took a chance on trying something completely new, an aviation summer program and came to the conclusion that piloting a plane is definitely a girl thing. I am enrolled in the accelerated pilot program at Piedmont Flight Training pursuing my private pilot's license.**

➔**Currently, I am taking these classes:**

- ➔ **Gen Ed at Ragsdale High School.**
- ➔ **Early college at GTCC**
- ➔ **Programming and engineering at Weaver**

My career goal is to earn a job as a software engineer in the field of avionics.

I found groups where I enjoy volunteering through Girl Scouts, Aviation Clubs, IT for Girls, Tech Savvy, Heads up for Youth. NCCJ, & Robotics. I encourage other girls to find what they enjoy so they can gain the benefits of giving back.