NAPE

Increasing the Diversity of the STEM Workforce

Strategies for Counselors

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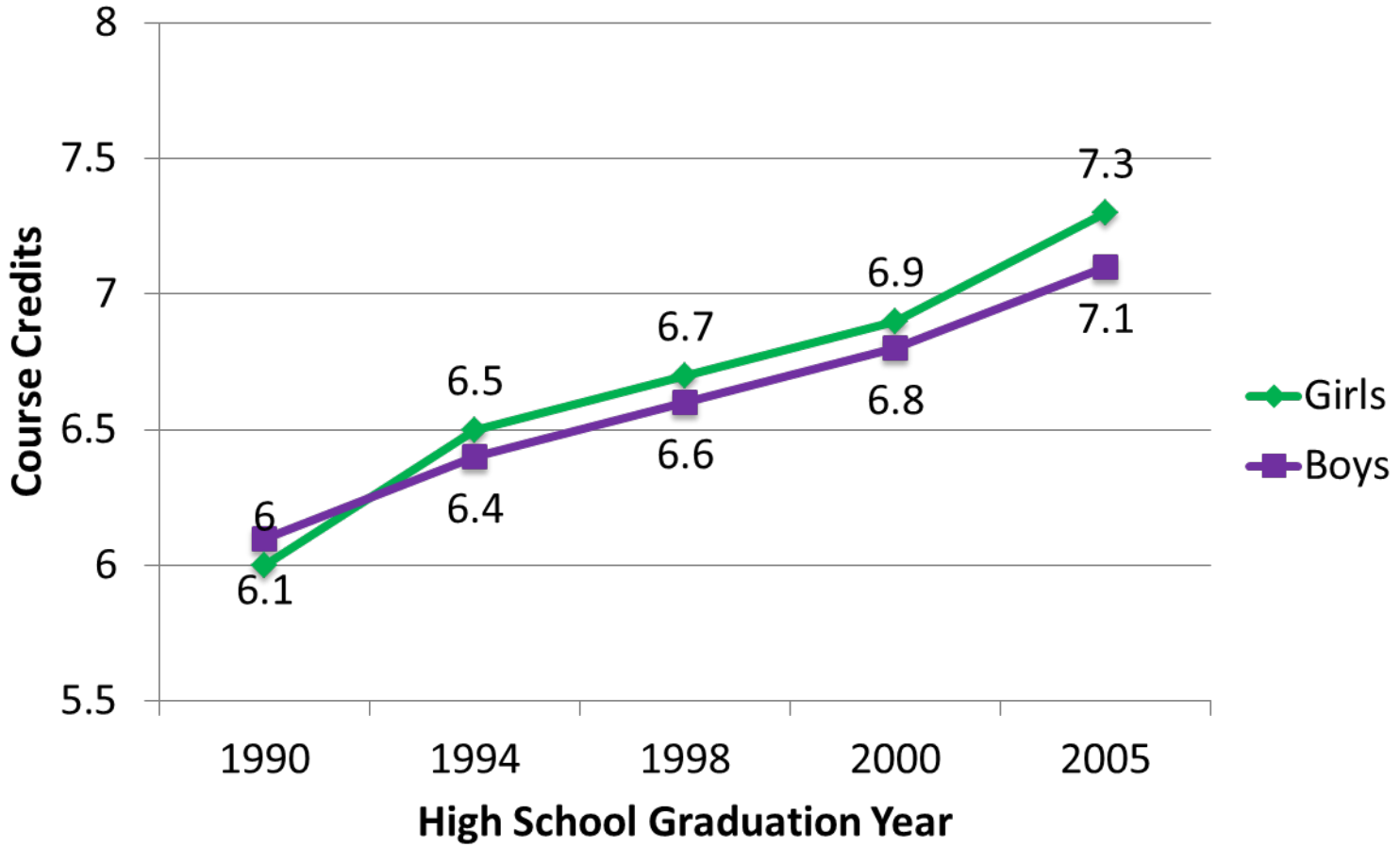
National Alliance for Partnerships in Equity

Status of Women and Girls in STEM

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.

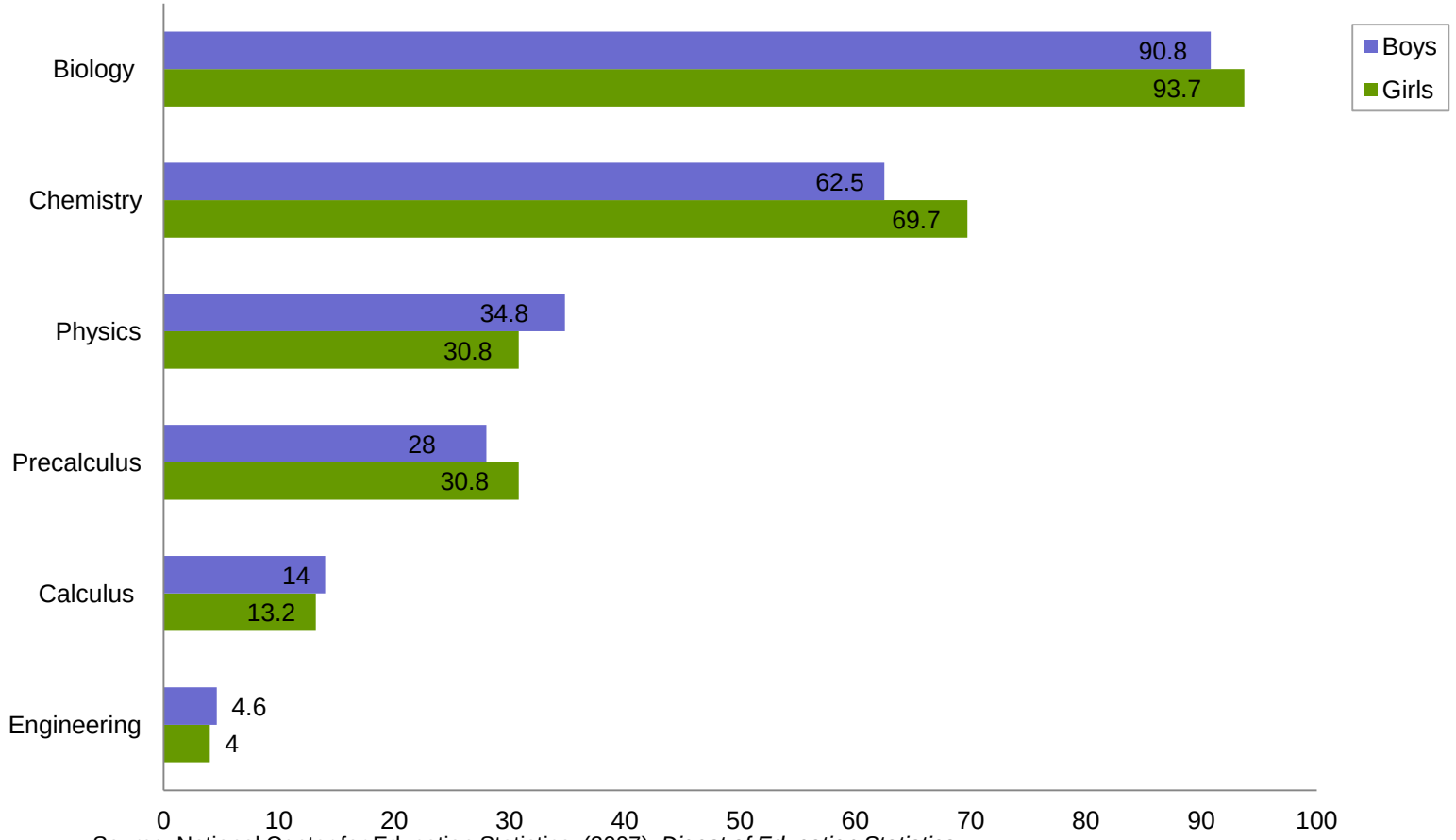
High School Credits Earned in Math and Science, by Gender, 1990–2005



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).

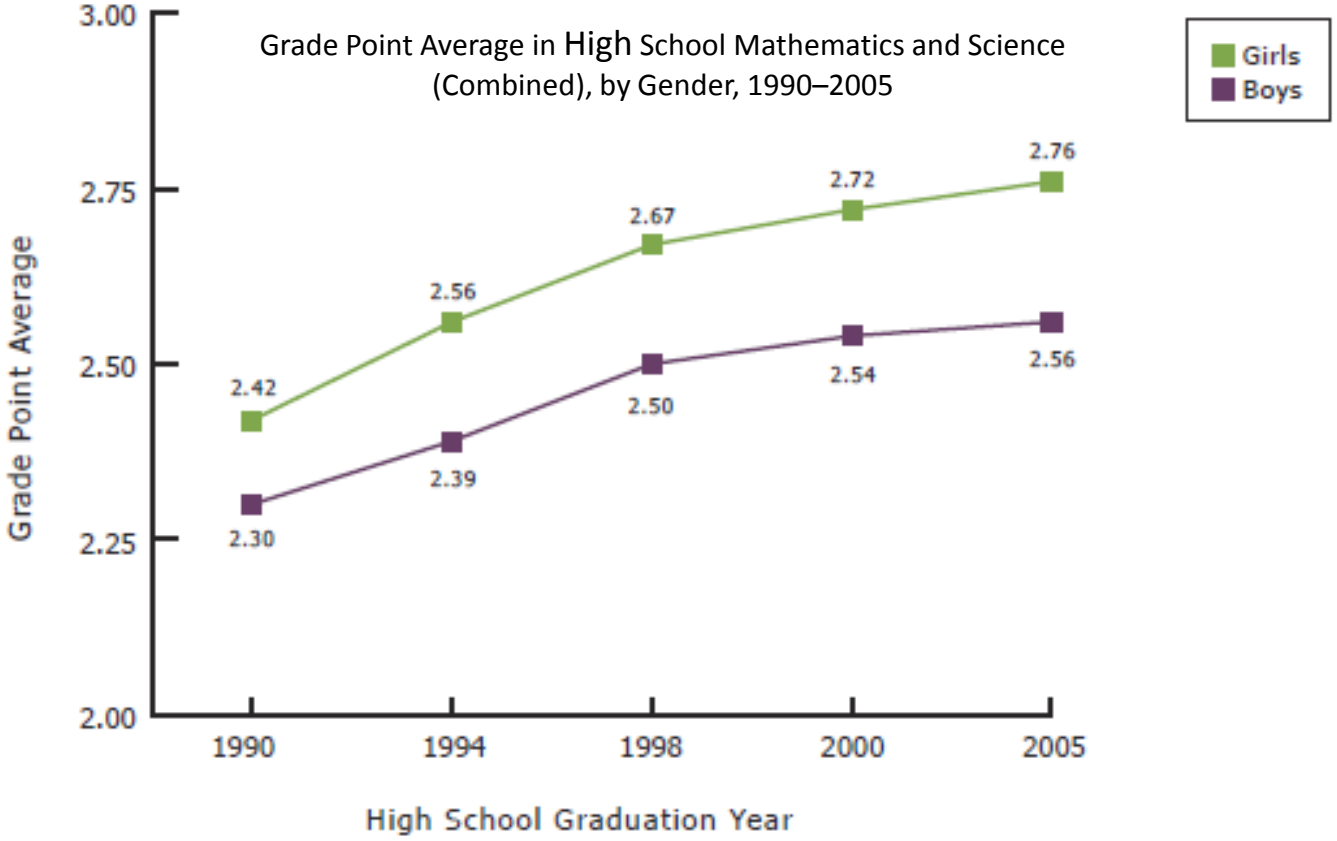
High school girls are more likely to take biology, chemistry, and pre-calculus than boys are, but girls are less likely to take physics.

Percentage of High School Graduates Who Took Selected Math and Science Courses in High School, by Gender, 2005



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

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



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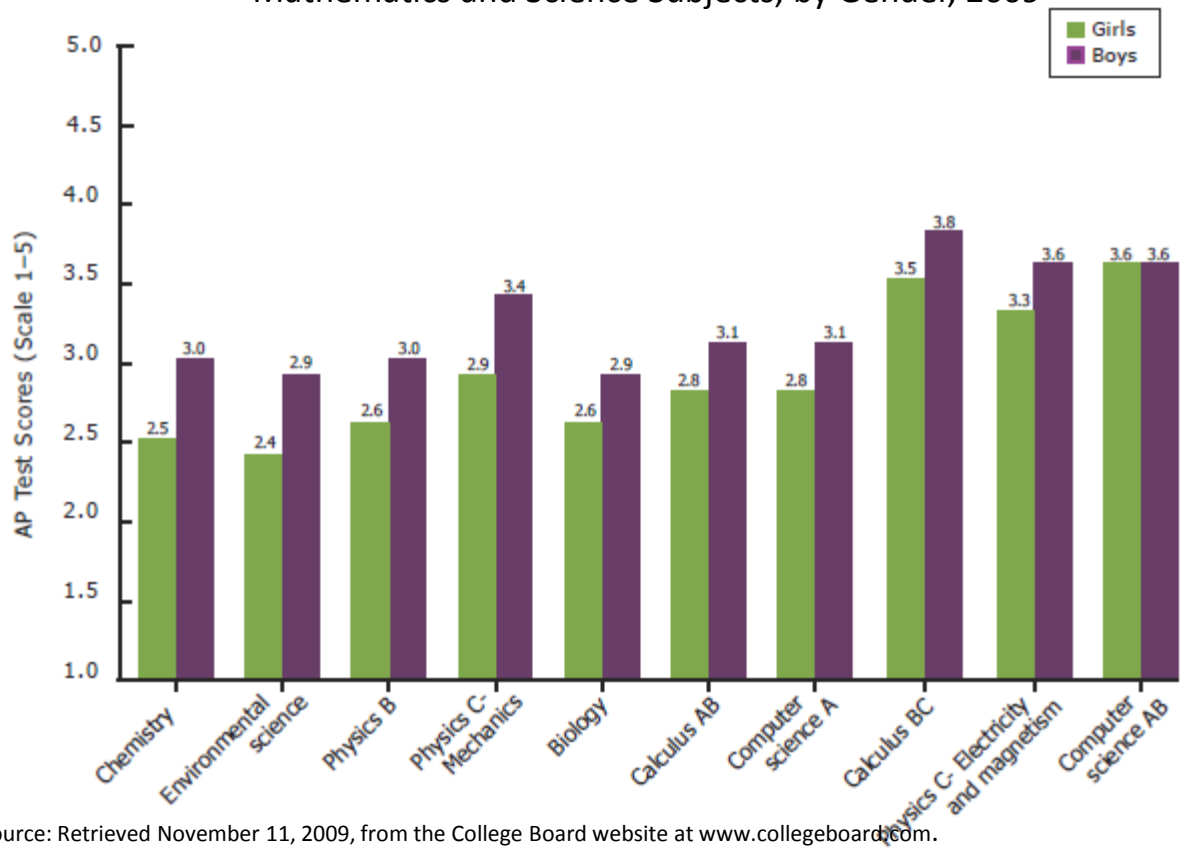
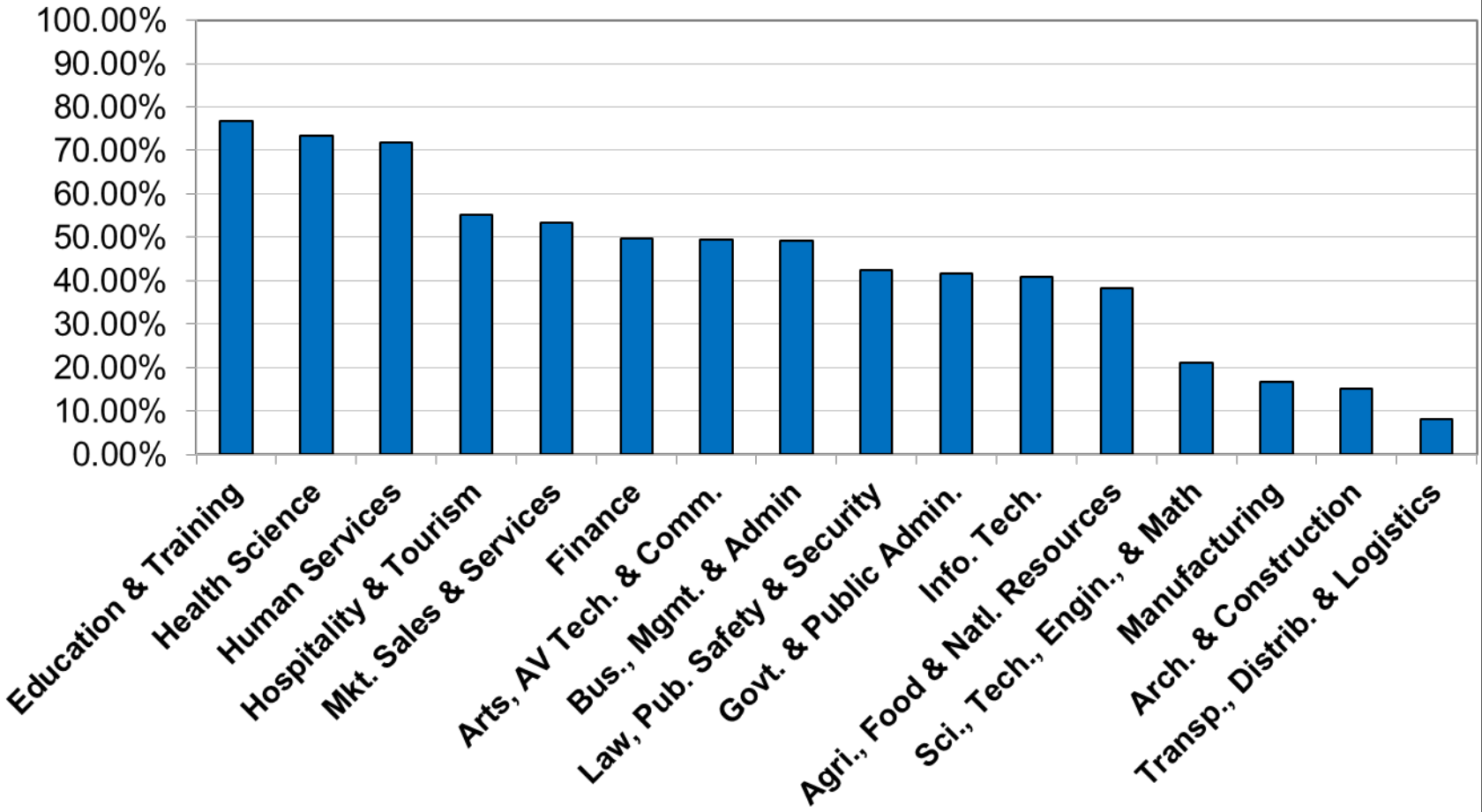
On average, boys perform better than girls do on Advanced Placement (AP) tests in math and science.

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.

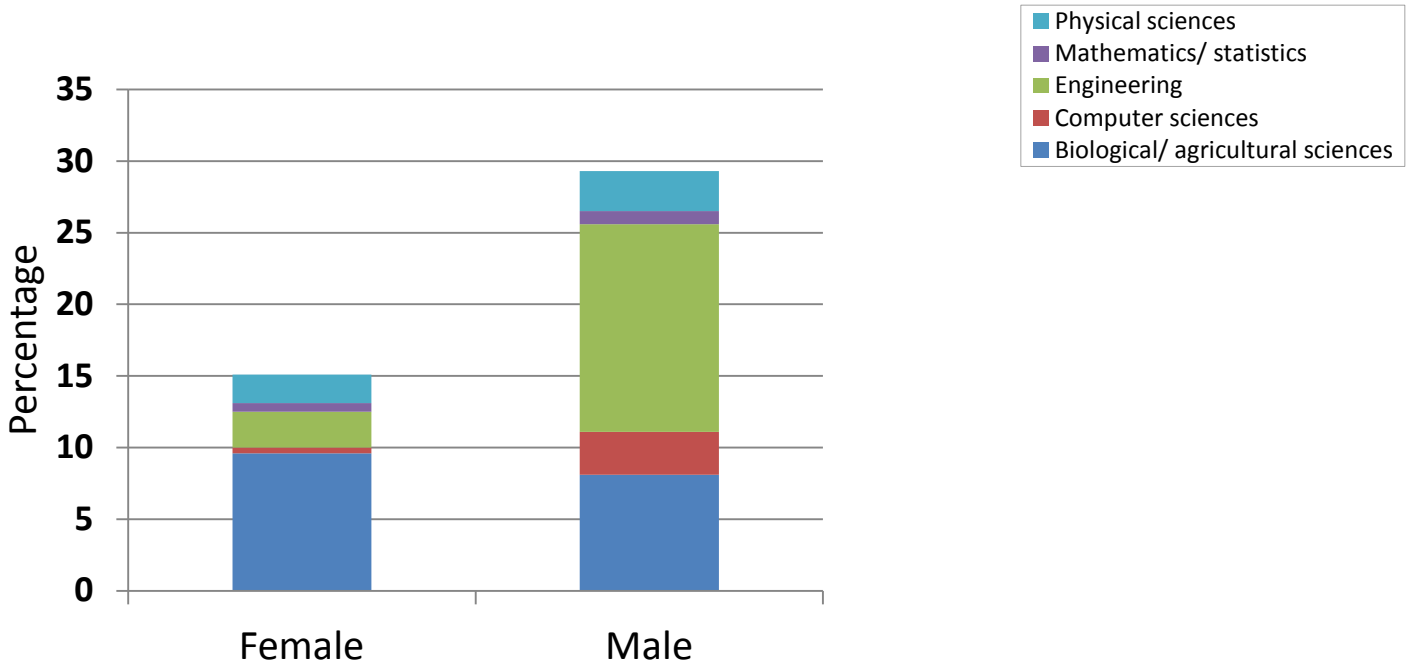
CTE Secondary Female Enrollment in U.S. by Career Cluster, 2009-2010



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).

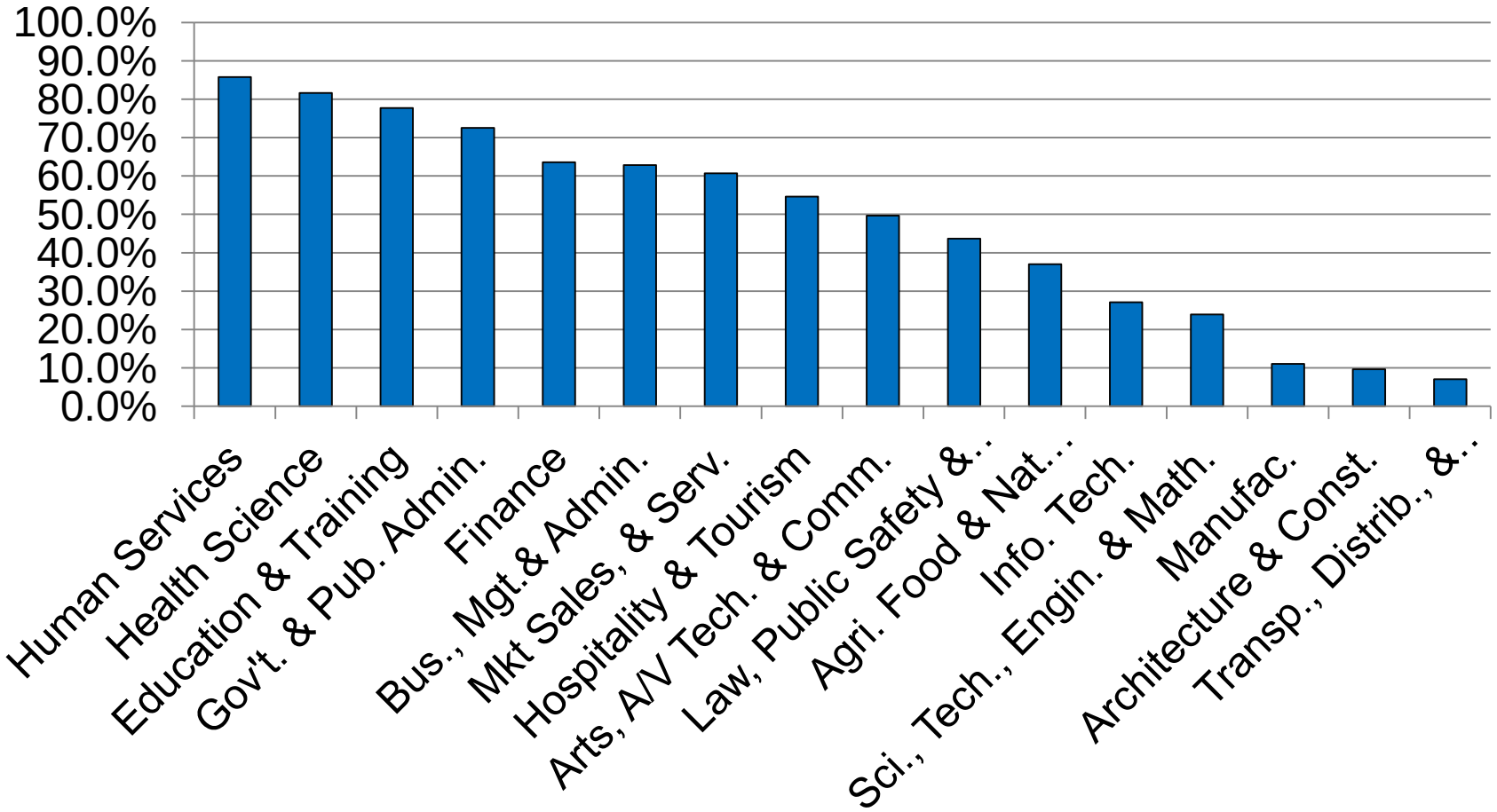
Women are less likely than men are to declare a STEM major in college.

Intent of First-Year College Students to Major in Science and Engineering Fields, by Gender, 2006

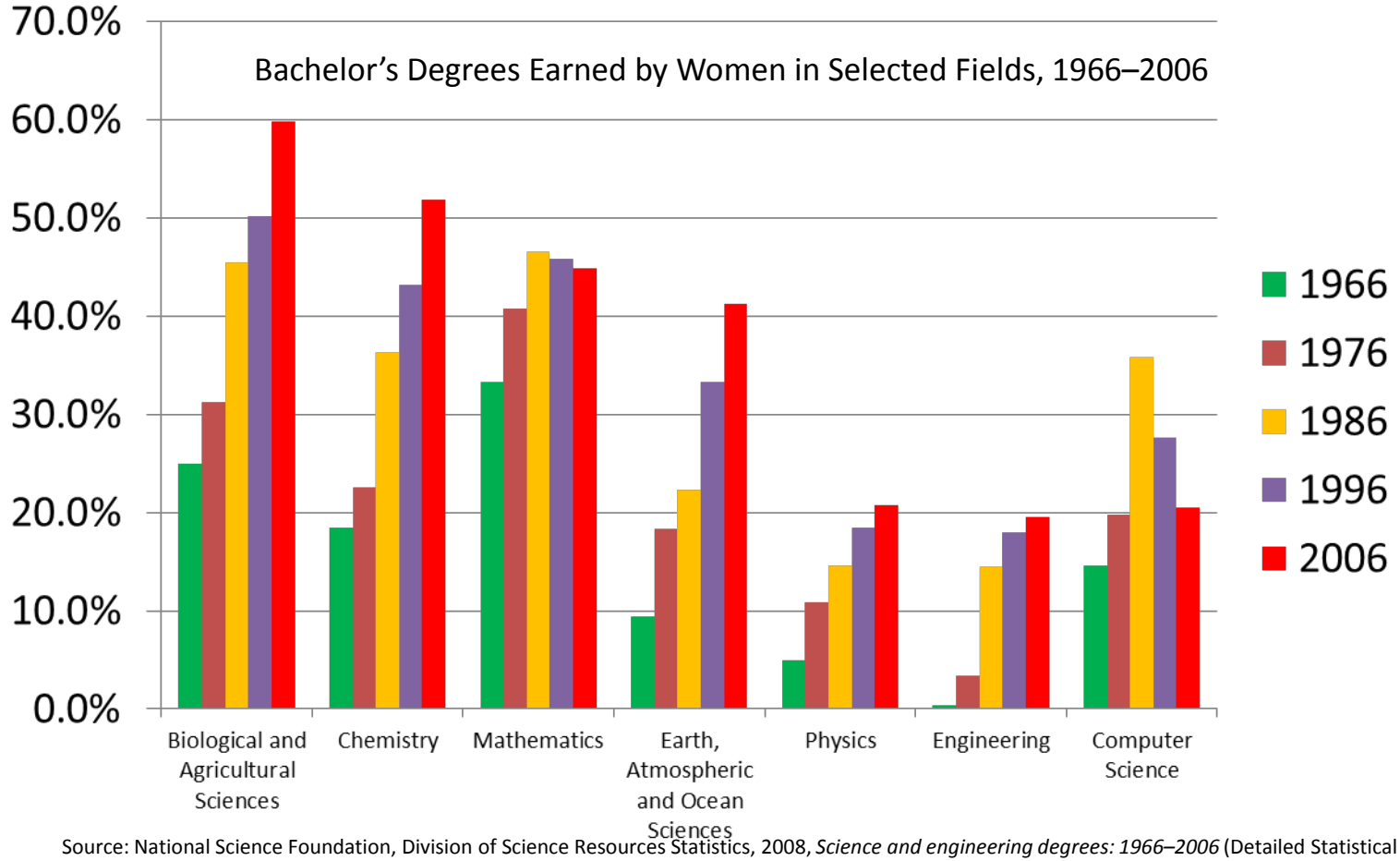


Source: Commission on Professionals in Science and Technology. Data derived from Cooperative Institutional Research Program, Higher Education Research Institute, Graduate School of Education and Information Studies, University of California, Los Angeles, *The American Freshman: National Norms for Fall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

CTE Post-Secondary Female Enrollment in U.S. by Career Cluster, 2009-2010



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

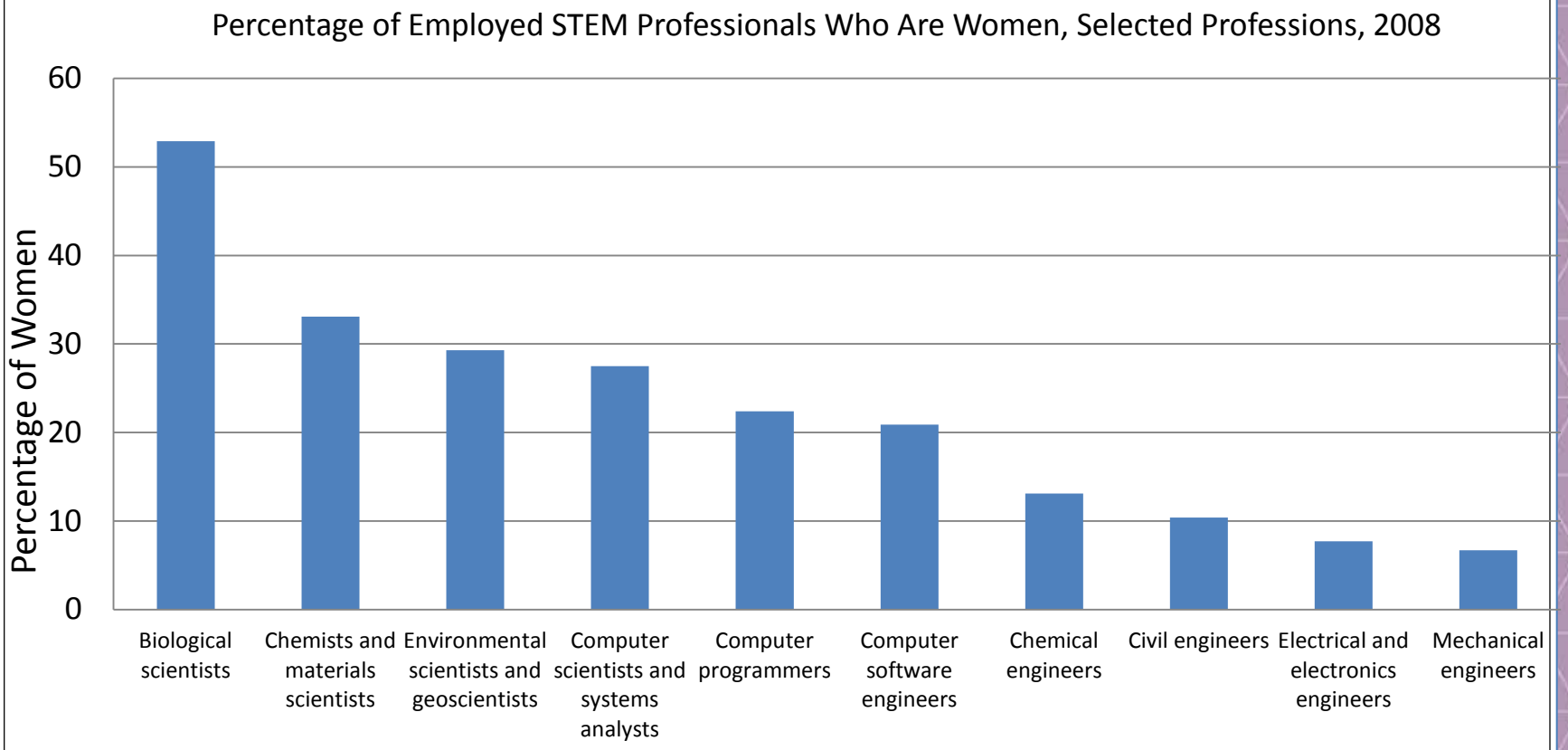


Source: National Science Foundation, Division of Science Resources Statistics, 2008, *Science and engineering degrees: 1966–2006* (Detailed Statistical Tables) (NSF 08-321) (Arlington, VA), Table 11, Author's analysis of Tables 34, 35, 38, & 39.

Startling Statements

- Conduct your own poll
- Survey three other people in the room
- Average their answers
- Be prepared to report out your polling results

Women are underrepresented in many science and engineering occupations.



Source: U.S. Department of Labor, Bureau of Labor Statistics, 2009, *Women in the labor force: A databook* (Report 1018) (Washington, DC), Table 11.

Why do we care?

- Global competitiveness
- Innovation
- Workforce development
- Economic self-sufficiency
- Career satisfaction

Barrier Busters

What can counselors do to support student's exploration of nontraditional careers?

Career Guidance Materials and Practices

- More than just brochures and posters
- Get beyond the images
- Beware of subtle messages
- Be careful about how you use interest inventories
- Design career exploration in all clusters without self-selection

Implicit Association Test

https://implicit.harvard.edu/implicit/

Career Guidance Materials and Practices

- Create opportunities to spark student interest
  - Pre-enrollment exploration programs
  - Tours that include hands-on activities
  - Nontraditional program exploration days (ex. Diva Tech Day)
  - Targeted recruitment activities
  - Send a personal invitation (ex. Focus on Your Future event)

Diva Tech Day

http://pages.minot.k12.nd.us/votech/File/resources/divatech12.htm

Early Exposure

- Most students pursuing a nontraditional career have had a friend or family member influence them
- Spark an interest that would otherwise not be evident
- Informal experiences supported by formal experiences
- The earlier the better

NAPE

As part of their Destination Imagination project, a team of junior girls from Bartlett Academy developed and conducted three Saturday workshops for 4-6th grade girls to explore engineering through hands on experiences.

Parental Support

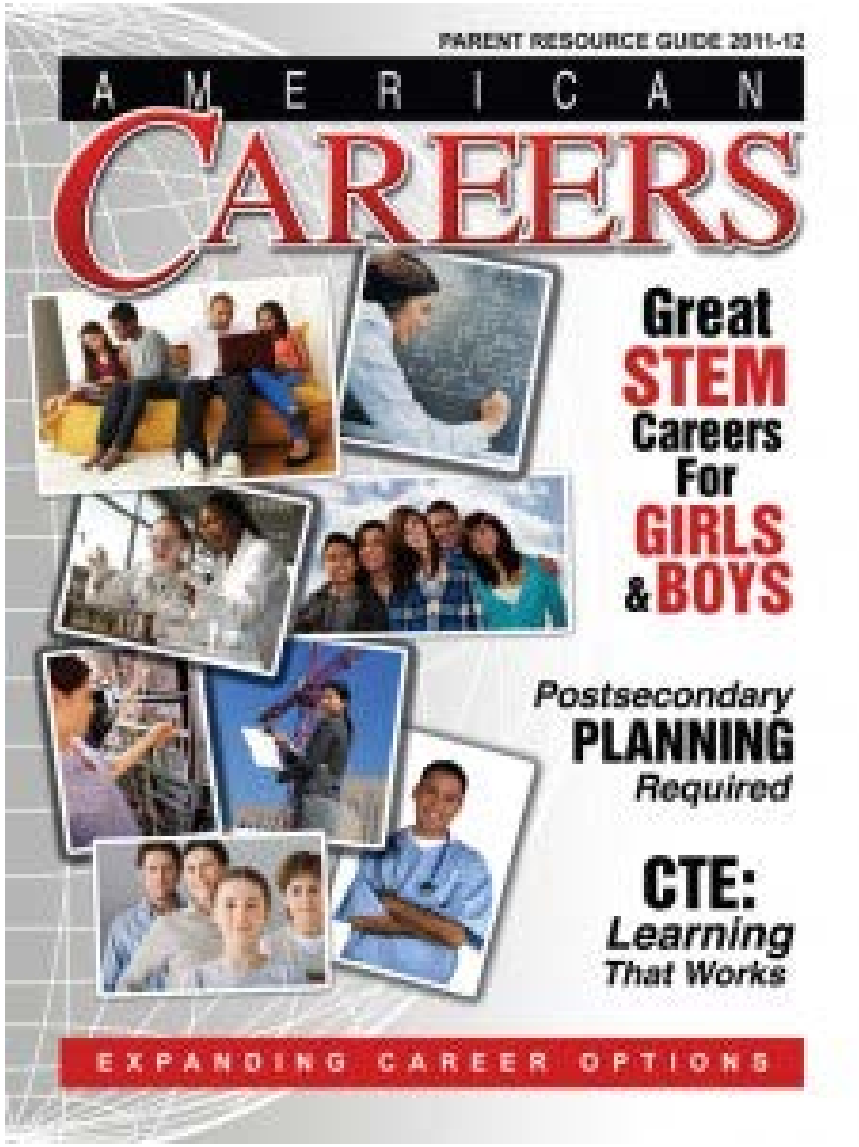
- Parents are the #1 influence of student college major and career choice
- Negative messages from people with emotional influence difficult to overcome
- Educate parents
  - Newsletter articles
  - Website information
  - Parent night program
  - Open House demonstrations
  - Student award programs

NAPE

American Careers Parent Magazine

Nontraditional Careers Edition

http://www.napequity.org/american-careers-magazine/



Nontraditional Role Models

- Strongest evidence in the research
- Need to see someone that looks like them in the career
- Family members are significant
- Teachers
- Mentors

Nontraditional Role Models

- Career speakers
- Job shadowing
- Field trips
- Mentoring
- Online career exploration
- Print images
- Video selection

Focus Your Future

- http://archive.napequity.org/page.php?183

I am an Engineer

Cisco Systems Inc.

Available at
www.stemequitypipeline.org

Self-efficacy

- Attribution Theory
  - Girls more likely to attribute success to external factors and failure to internal factors
- Stereotype Threat
  - Stereotype that girls are not as capable as boys in math affects their performance
- Confidence Precedes Interest for Girls
  - Girls need to build confidence before they are likely to indicate interest

Student Isolation

- Cohort of underrepresented students in a program are more likely to complete than a single individual
- Individuals more likely to
  - Have trouble integrating effectively in to social structure
  - Suffer decreased performance
  - Drop out
- Schedule students in cohorts when possible

Support Services

- Tutoring
- Child care
- Transportation
- Financial Aid
- Books, Equipment, Tools, Clothing
- Tuition
- Modification of Curriculum, Equipment
- Student/Teacher Aides
- More

Questions?

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www.napequity.org

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