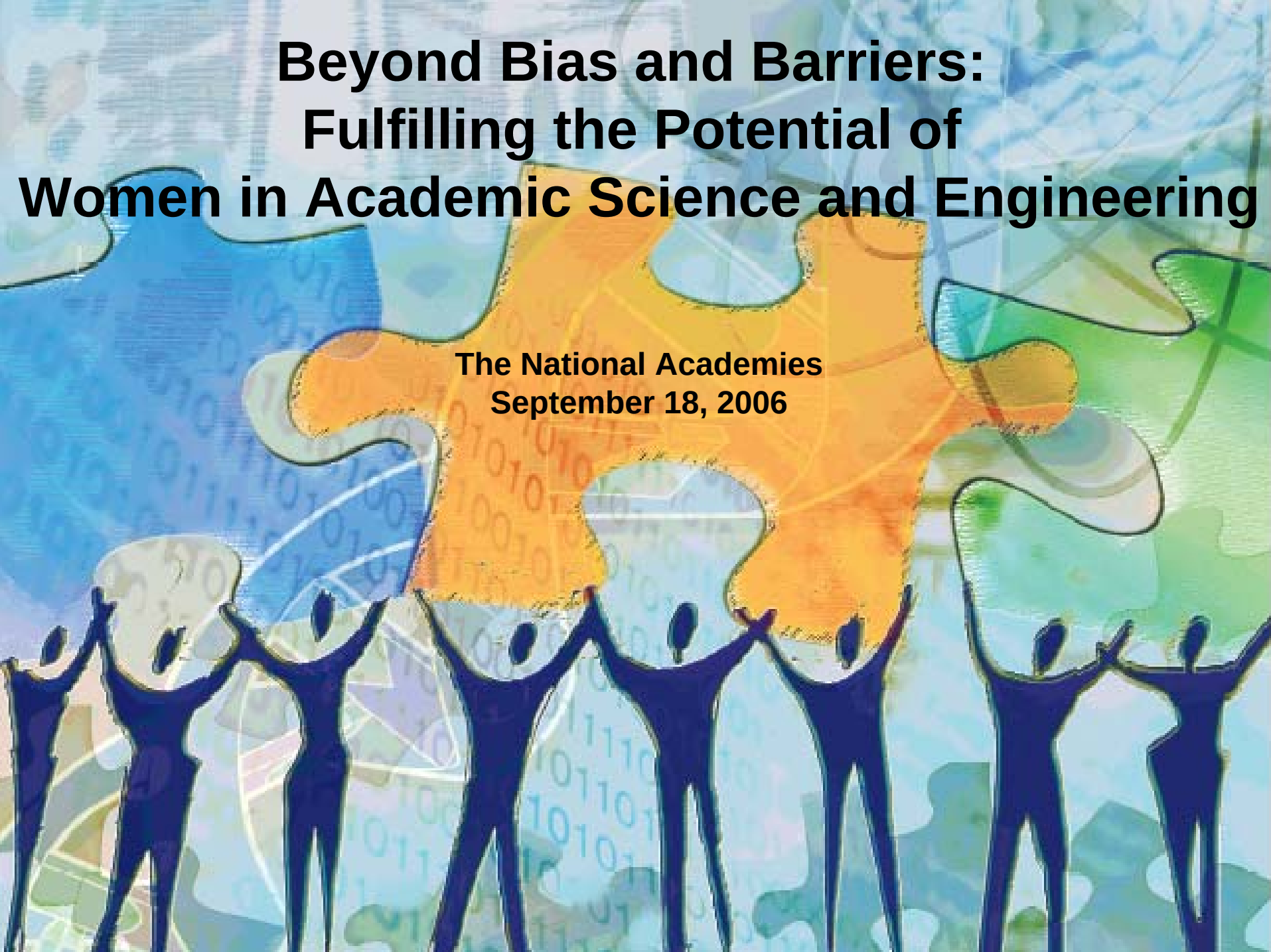
WISELI

Women in Science & Engineering Leadership Institute
University of Wisconsin-Madison

What is WISELI?

- 2002-2006, funded by National Science Foundation ADVANCE grant
- Co-PIs Molly Carnes, Jo Handelsman, and Jennifer Sheridan
- Research center to centralize all ADVANCE-related activities:
  - Research and program evaluation
  - New programs
  - Data collection and analysis
  - Dissemination

Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering



The National Academies
September 18, 2006

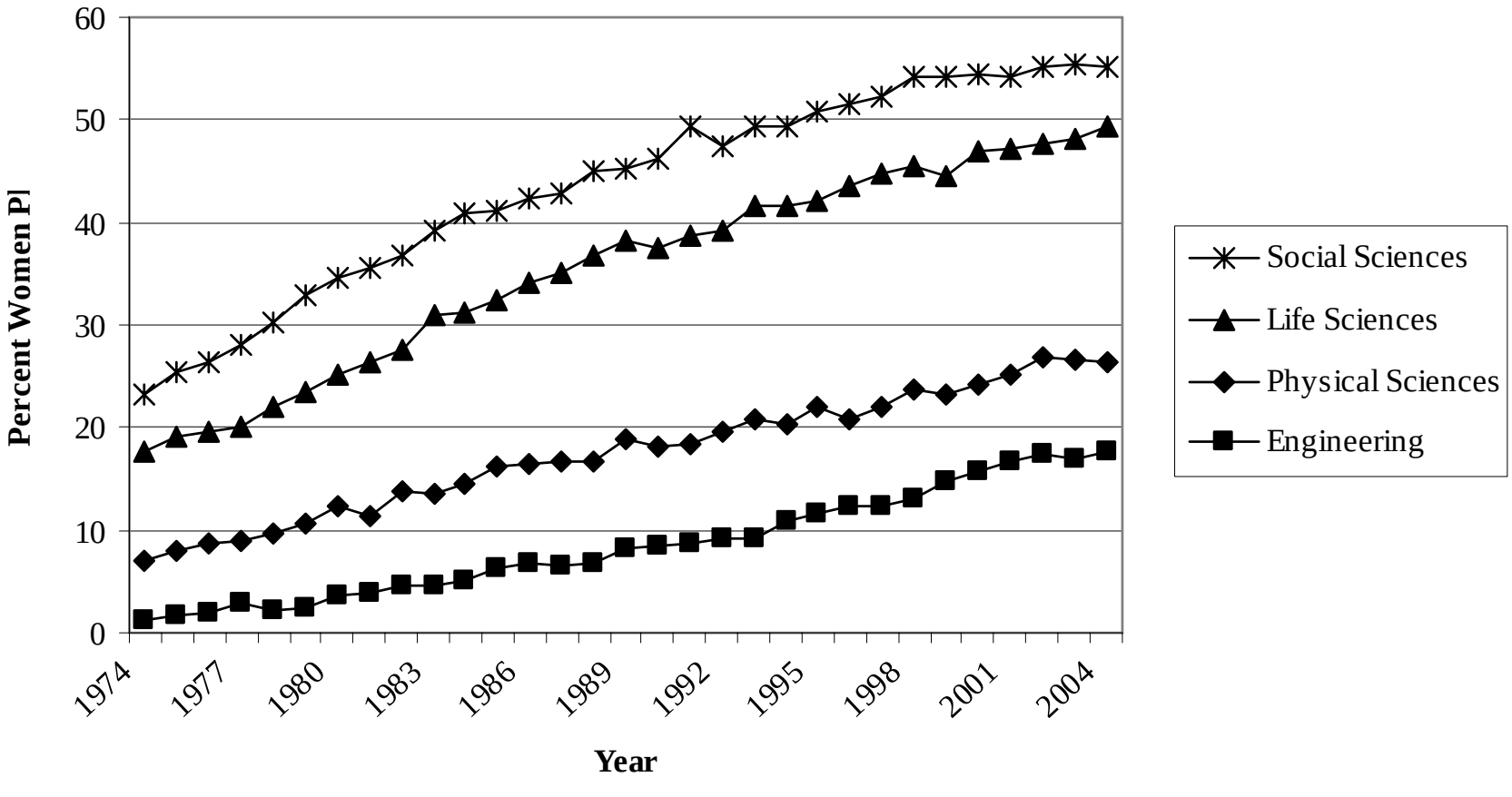
The Committee

- National Academy of Sciences report
  - Panel chaired by Donna Shalala
  - UW-Madison faculty member Jo Handelsman participated on panel; Janet Hyde provided additional guidance
  - Convened in December 2005; report issued in September 2006

Beyond Bias & Barriers

- Examine “the problem”
- Examine the evidence that “intrinsic differences” in intelligence account for observed differences in academic leadership by gender
- Examine the differential attrition of women and men throughout the pipeline
- Understand how discrimination (unconscious vs. deliberate) operates to produce disparities
- Understand the institutional constraints that produce the observed outcomes in leadership
- Call to Action with specific recommendations

Defining the Issues



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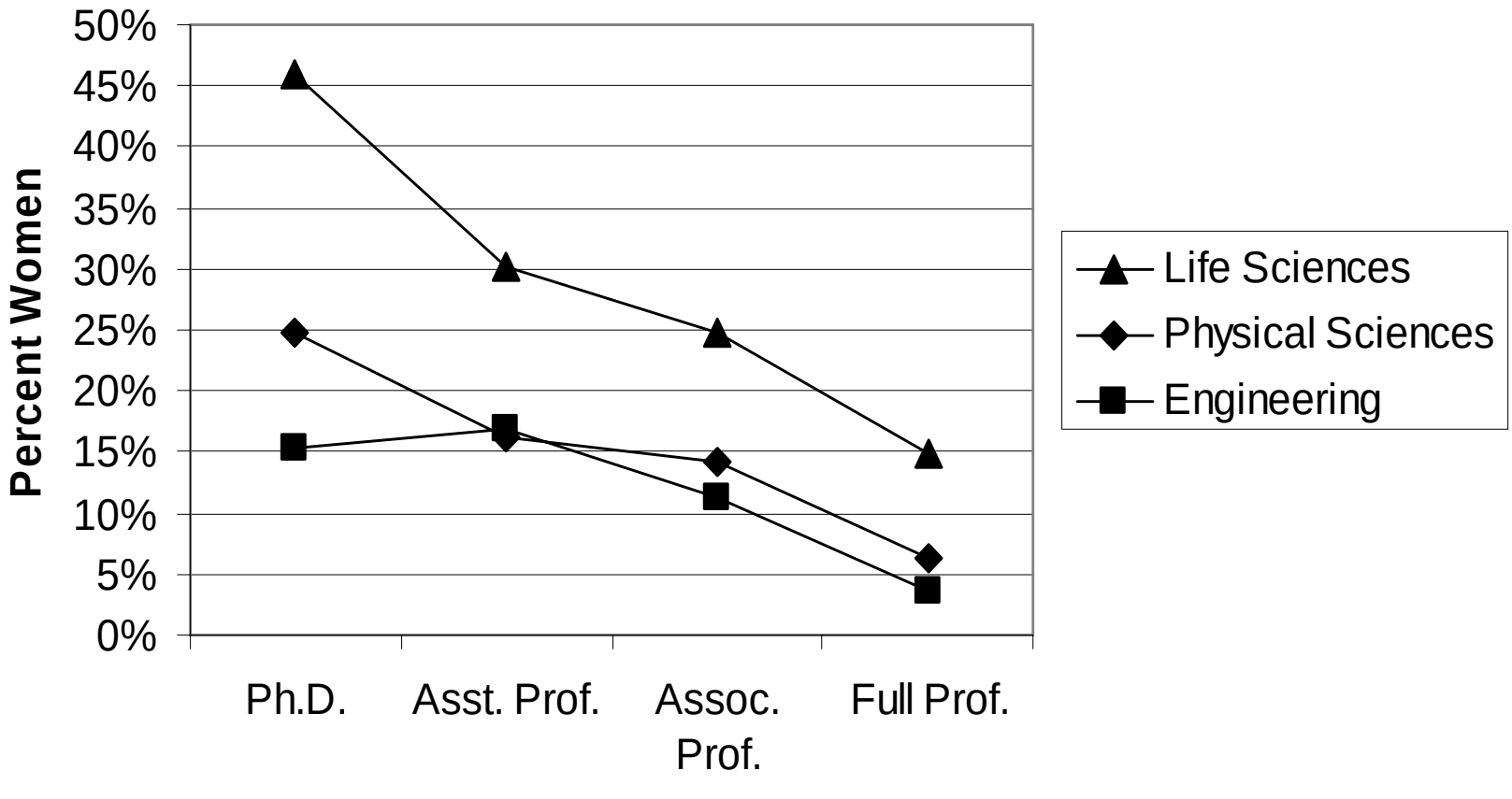
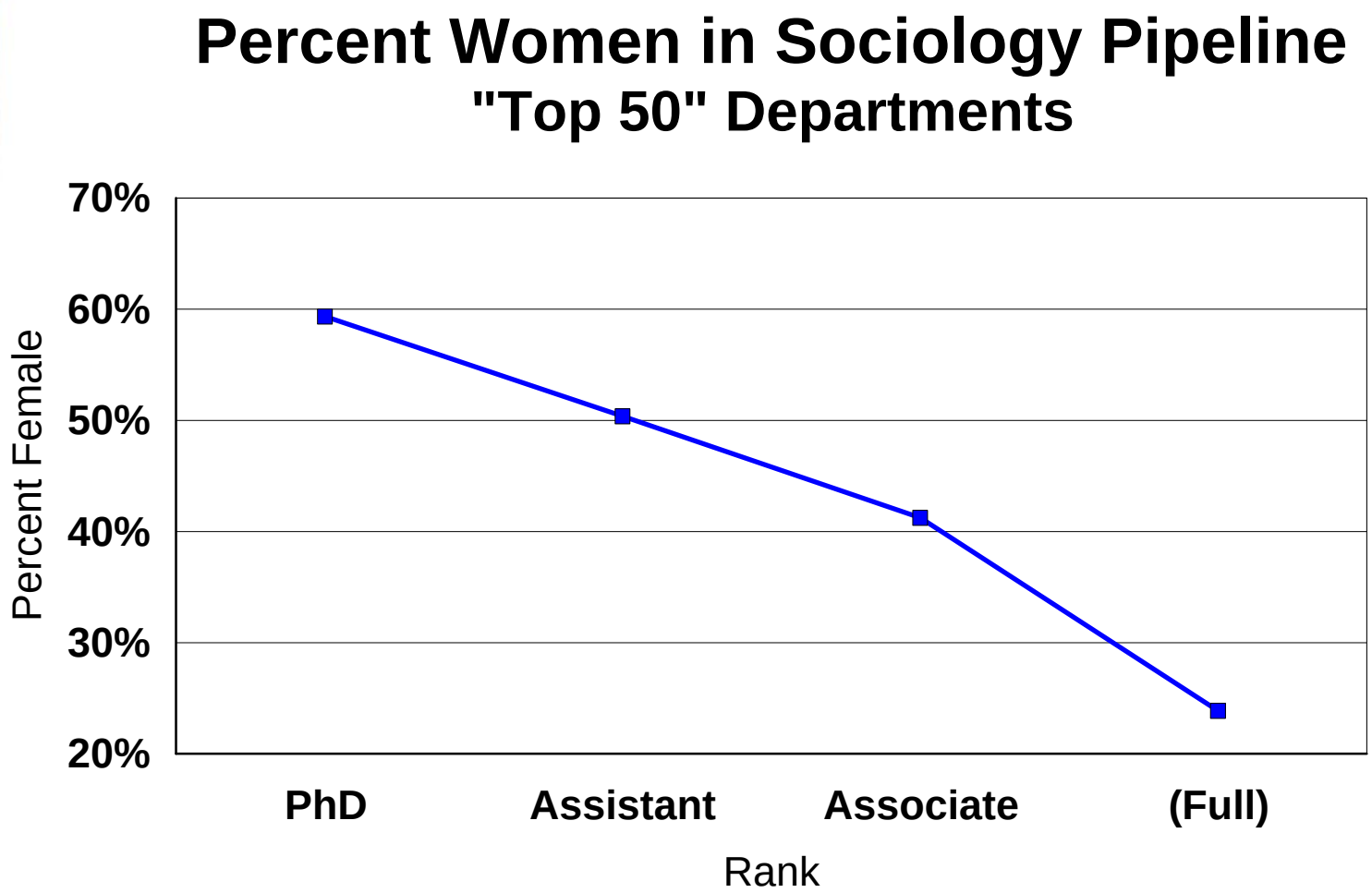
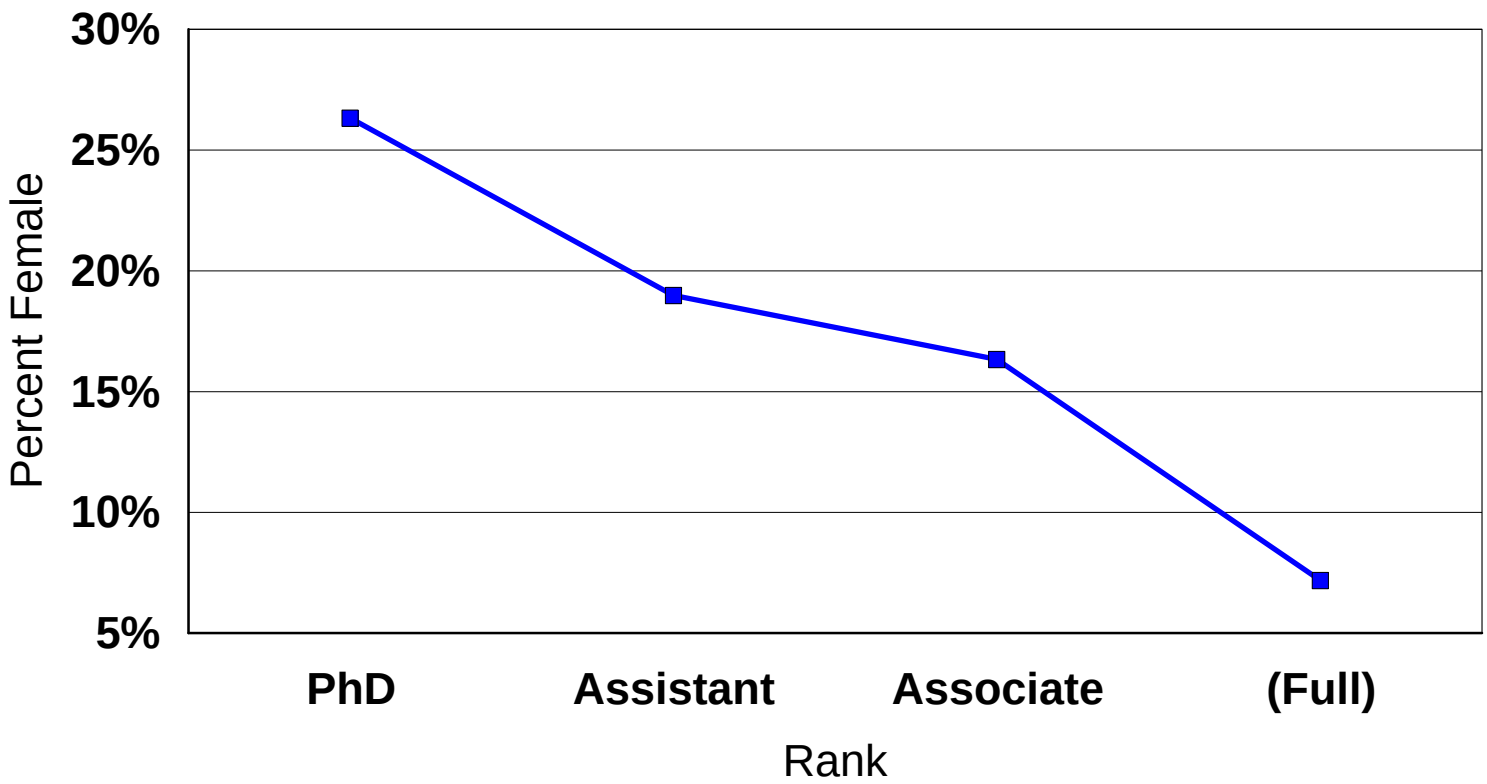


Defining the Issues-Sociology



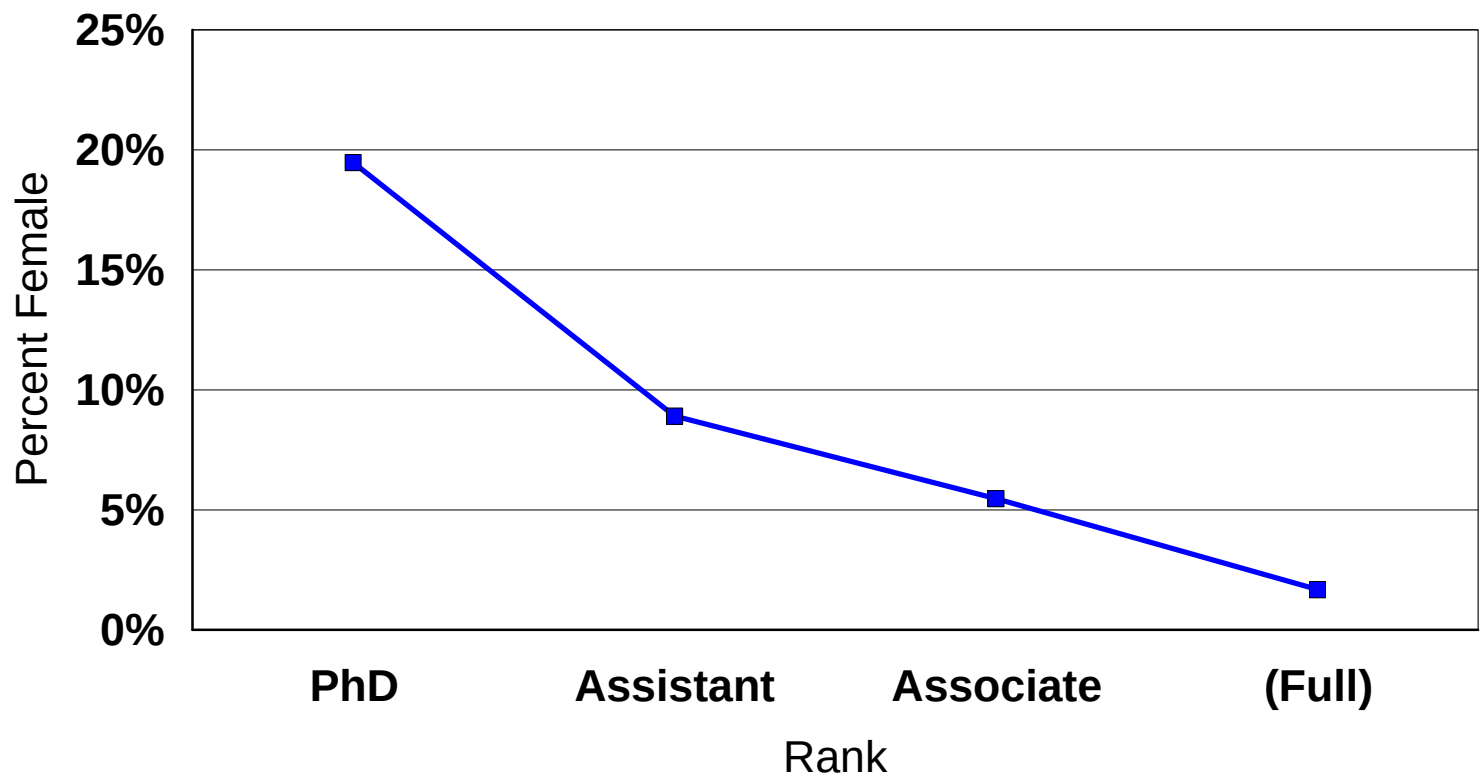
Defining the Issues-Economics



Defining the Issues

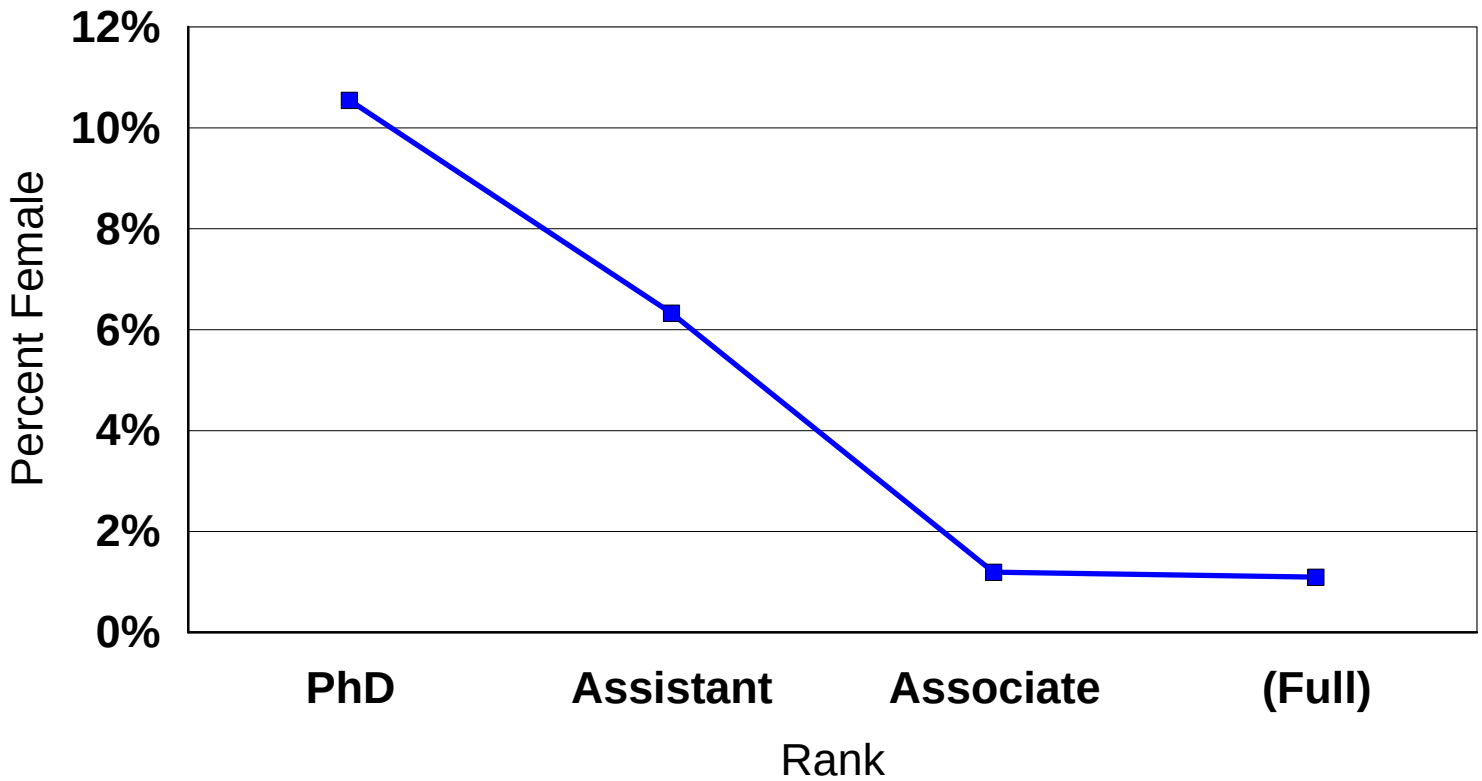
- Women from minority racial and ethnic backgrounds are virtually absent from the nation’s leading science and engineering departments

Defining the Issues-Sociology



Defining the Issues-Economics

Percent Minority Women in Economics Pipeline
"Top 50" Departments



Defining the Issues

"Increasing the number of women earning science and engineering doctorates will have little effect on the number of women in academic positions, unless attention is paid to recruiting women to these positions and retaining them once hired."

Findings—"Intrinsic Differences?"

- Women have the drive and capability to succeed in science and engineering
  - Brain structure and function
  - Hormonal modulation of performance
  - Human cognitive development
  - Human evolution

No "significant biological differences between men and women in performing science and mathematics that can account for the lower representation of women in academic faculty and scientific leadership positions in these fields."

Findings—The Pipeline?

- Women who are interested in science and engineering careers are lost at every educational transition
  - High school to college
  - Transition to graduate school
  - Doctorate to first position

"The problem is not simply the pipeline. In several fields the pipeline has reached gender parity."

Findings—Discrimination?

- Environments favor men
  - Deliberate/inadvertent
  - Accumulation of disadvantage
- Questioning own abilities and commitment to an academic career
- Minority group women subject to dual discrimination

Findings—Discrimination?

- *Unconscious* biases and prejudices
- An impressive body of controlled experimental studies and examination of decision-making process in real life show that:
  - On the average, people are less likely to hire a woman than a man with identical qualifications
  - People are less likely to ascribe credit to a woman than to a man for identical accomplishments
  - When information or time is scarce, people will far more often give the benefit of the doubt to a man than to a woman

What is “unconscious bias”

- Unconscious bias and assumptions
- Schemas
- Stereotyping
- Cognitive shortcuts
- Statistical discrimination
- Implicit associations

The tendency of our minds to judge *individuals* based on characteristics (real or imagined) of *groups*

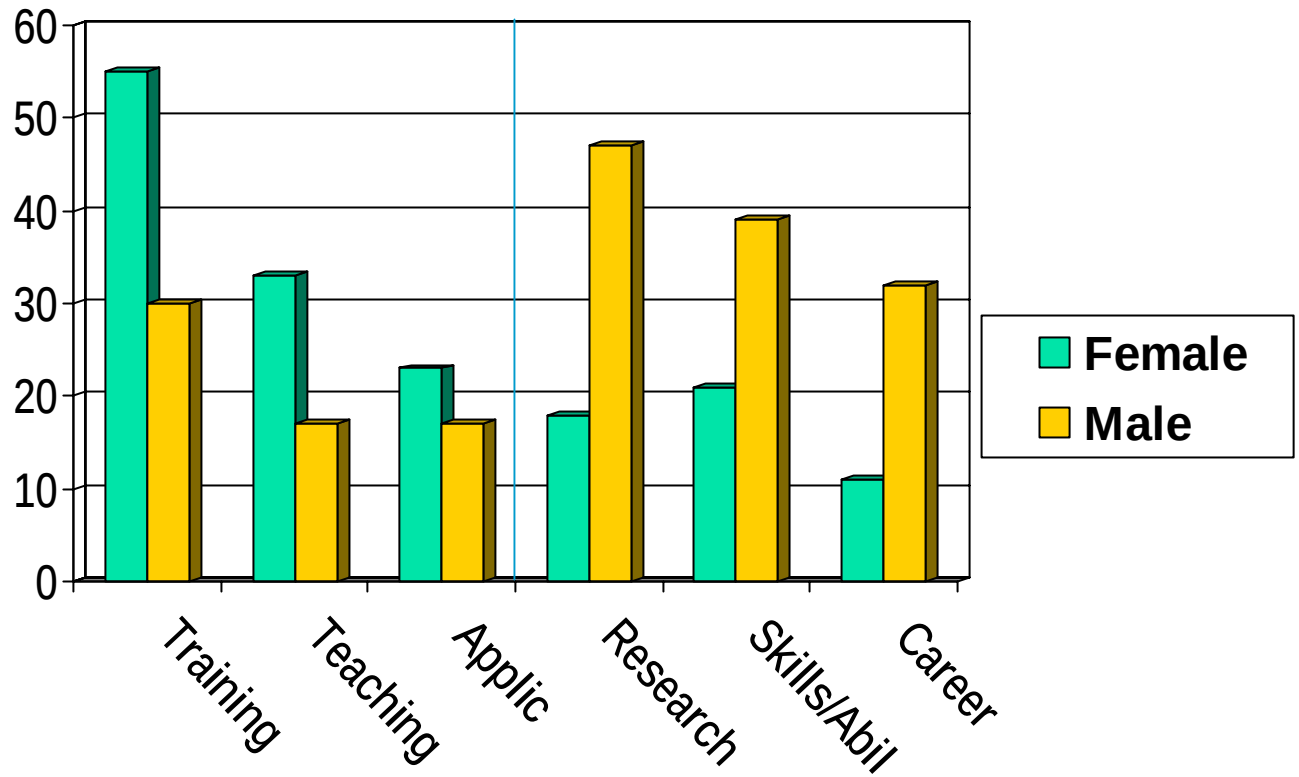
Steinpreis, Anders, and Ritzke 1999

- 238 academic psychologists sent a curricula vitae with either male or female name
  - Entry level: more likely to vote to hire man, more likely to indicate man had adequate teaching, research, and service experience
  - High level: no gender differences
  - No differences between male and female evaluators
  - More write-in comments for women

Trix and Psenka 2003

- 312 letters of recommendation for medical faculty hired at a large U.S. medical school
- Women's letters compared to men's more often:
  - Were *shorter*
  - Offered *minimal assurance*
  - Used *gender terms*
  - Contained *doubt raisers*
  - Used *stereotypic adjectives*
  - Used *grindstone adjectives*
  - Used fewer *standout adjectives*
  - Contained less *scientific terminology*

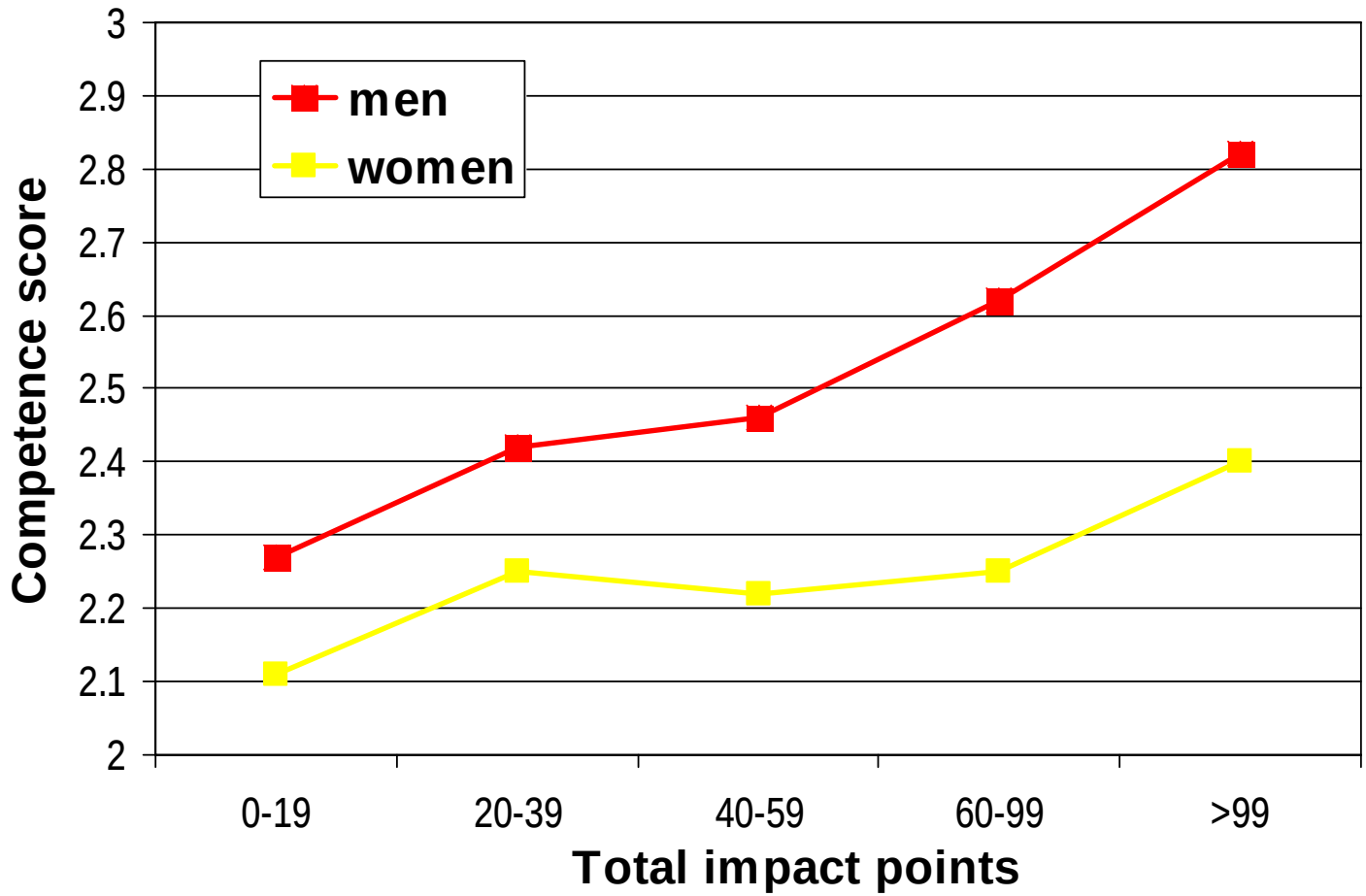
Top 3 semantic realms following the possessive for men and for women



Wenneras and Wold 1997

- 114 applications for prestigious research postdocs to Swedish MRC (52 women)
- Reviewers' scores vs. standardized metric from publication record = impact points
- Women consistently reviewed lower, especially in "competence"
- Women had to be 2.5x as productive as men to get the same score
- To even the score, women needed equivalent of 3 extra papers in a prestigious journal like Science or Nature

Wenneras and Wold 1997



Findings—Discrimination?

"Women are very likely to face discrimination in every field of science and engineering.

A substantial body of evidence establishes that most people—men and women—hold implicit biases."

Findings—Institutional Structures?

- Rules that appear neutral may function in a way that leads to differential treatment or produces differential outcomes for men and women
  - Academics need a “wife”
  - 90% of partners of women S&E faculty are employed full-time; 50% of partners of male S&E faculty are employed full-time

Findings—Institutional Structures?

- Tenure process coincides with family formation years
- Outside activities (e.g., family obligations) indicate a "lack of seriousness" about career
  - Use of programs designed to increase flexibility?
- Deviation or delay from "normal" path
- Salary increases/outside offers
- Childcare needs (conferences, field study, time in laboratory)

"Academic organizational structures and rules contribute significantly to the underuse of women in academic science and engineering."

Conclusions

- Career impediments for women deprive the nation of an important source of talented and accomplished scientists and engineers who could contribute to our nation's competitiveness
- Transforming institutional structures and procedures to eliminate gender bias is a major national task that will require strong leadership and continuous attention, evaluation, and accountability
- The committee's recommendations are large-scale and interdependent, requiring the interaction of university leaders and faculties, scientific and professional societies, funding agencies, federal agencies, and Congress.

Recommendations

- Trustees, university presidents, and provosts
- Deans, department chairs, and tenured faculty
- Higher education organizations
- Scientific and professional societies, journals, and honorary societies
- Funders—Federal funding agencies and private foundations
- Federal enforcement agencies
- Congress

Call to Action

"The fact that women are capable of contributing to the nation's scientific and engineering enterprise but are impeded in doing so because of gender and racial/ethnic bias and outmoded "rules" governing academic success is deeply troubling and embarrassing. It is also a call to action.

Faculty, university leaders, professional and scientific societies, federal agencies and the federal government must unite to ensure that all our nation's people are welcomed and encouraged to excel in science and engineering in our research universities. Our nation's future depends on it."