

THE CONSISTENCIES & INCONSISTENCIES WITHIN THE GENDER GAP IN STEM

VIRA I. HEINZ 2020

GLOBAL LEADERSHIP CONFERENCE

BRIANNA BILLINGSLEY
& AMANDA FITZPATRICK

WASHINGTON & JEFFERSON COLLEGE

2019 COHORT

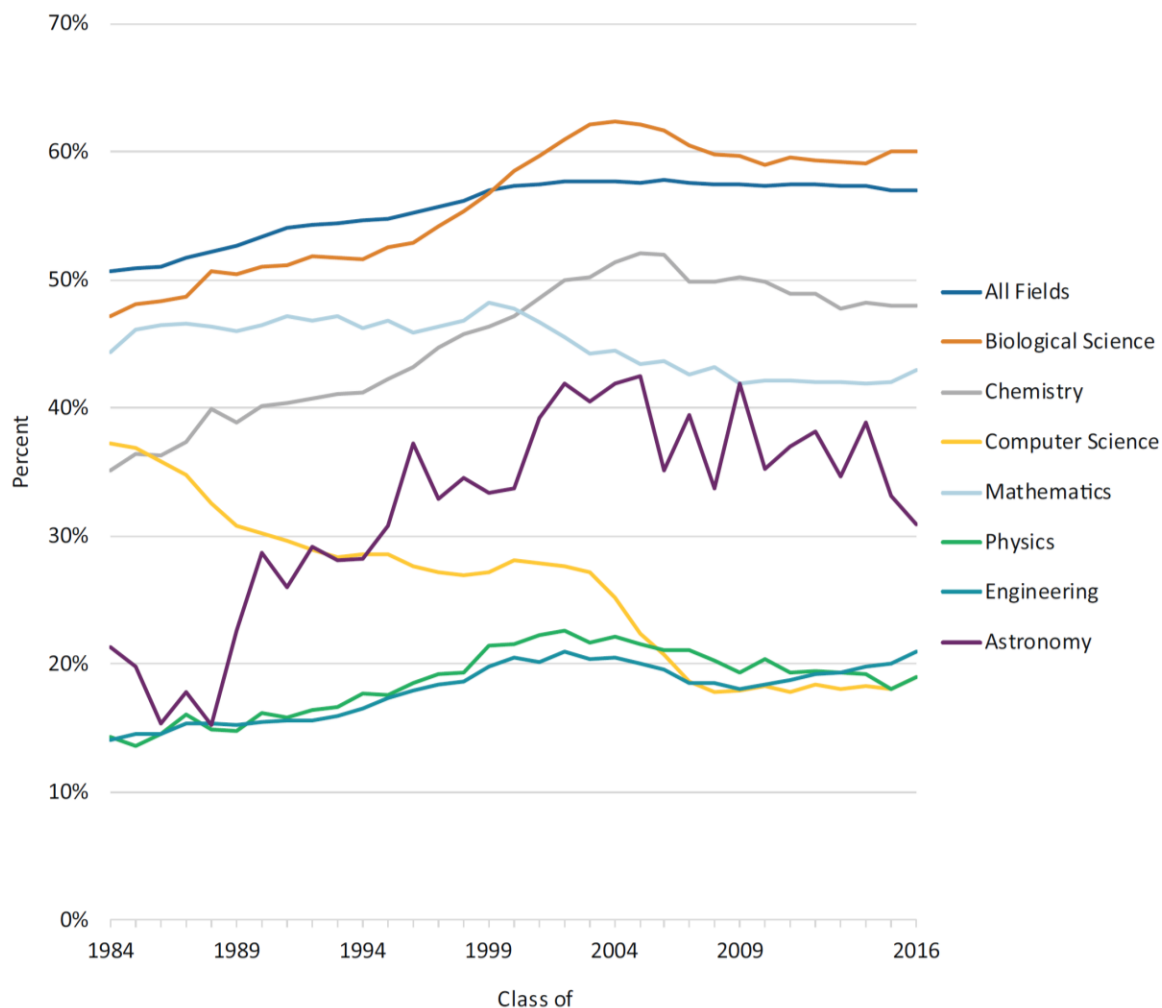
PHYSICS

WHO GETS A PHYSICS DEGREE?

Physics has one of the largest gender gaps in STEM, with only about 20% of all bachelor's degrees in physics awarded to women.

"Engineering as a whole is still struggling with the gender gap"
-Dr. Janjic

Percent of Bachelor's Degrees Earned by Women in Selected Fields, Classes of 1981 through 2016

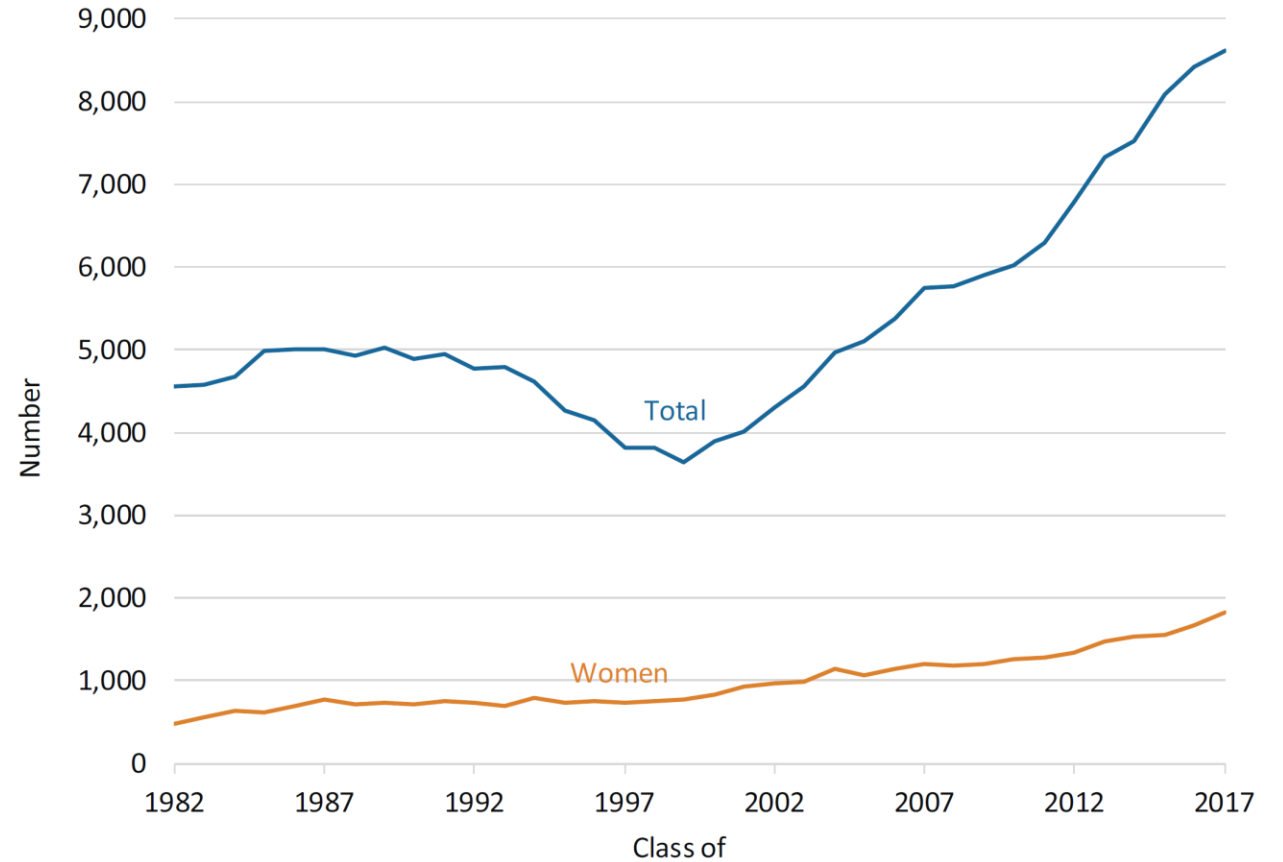


Source: National Center for Education Statistics. Data compiled by AIP Statistical Research Center

THE NUMBERS ARE RISING— SLOWLY

Through an analysis of journal publications, it was found that without additional support, it will take 258 years for the gender ratio in Physics to become 50/50 as it's currently 17% female.

Number of Bachelor's Degrees Earned in Physics, Classes 1982 through 2017



Source: AIP Statistical Research Center, Enrollments and Degrees Survey.

DR. CHAMBERLIN,
ASSISTANT PROFESSOR OF PHYSICS

"I feel lucky because my graduate advisor was a woman, and I feel that she had better empathy for my situation. It kept me in the program because I knew I had an ally. If you aren't able to have your direct supervisor support you, then it's important to find someone who can."

Gender Differences in Career Opportunities, Advancement, and Resources

Career Opportunities and Resources	Survey Source	Gender Differences
Number of promotions	PhD Plus 10 Survey, 2011	No significant difference
Number of publications	PhD Plus 10 Survey, 2011	No significant difference
Gave a talk as an invited speaker	Global Survey of Physicists, 2010	Men were 45% more likely
Acted as a manager	Global Survey of Physicists, 2010	Men were 33% more likely
Acted as a journal editor	Global Survey of Physicists, 2010	Men were 27% more likely
Supervised undergraduate students	Global Survey of Physicists, 2010	No significant difference
Supervised graduate students	Global Survey of Physicists, 2010	Men were 32% more likely
Had enough funding	Global Survey of Physicists, 2010	Men were 53% more likely
Had enough equipment	Global Survey of Physicists, 2010	Men were 36% more likely
Had enough office space	Global Survey of Physicists, 2010	No significant difference
Had enough lab space	Global Survey of Physicists, 2010	Men were 15% more likely
Had enough employees	Global Survey of Physicists, 2010	Men were 36% more likely

Gender Differences in Salary Amounts at Various Career Stages

Salary Amount	Survey Source	Gender Difference
Early career physics salaries (1 year after graduation)	Follow-up Surveys of Physics Bachelor's and PhDs, 2015–16	No significant difference
Early and mid-career astronomy salaries (1–8 years after graduation)	Longitudinal Study of Astronomy Graduate Students, 2007–2016	No Significant difference
Mid-career physics salaries (10–15 years after graduation)	PhD Plus 10 Survey, 2011	Men had 10% higher salary

- Though there are no salary gaps until later in the career, men are shown to be preferred for more career opportunities that can help advance their career.

Gender Differences in Career Compromises for Family Reasons

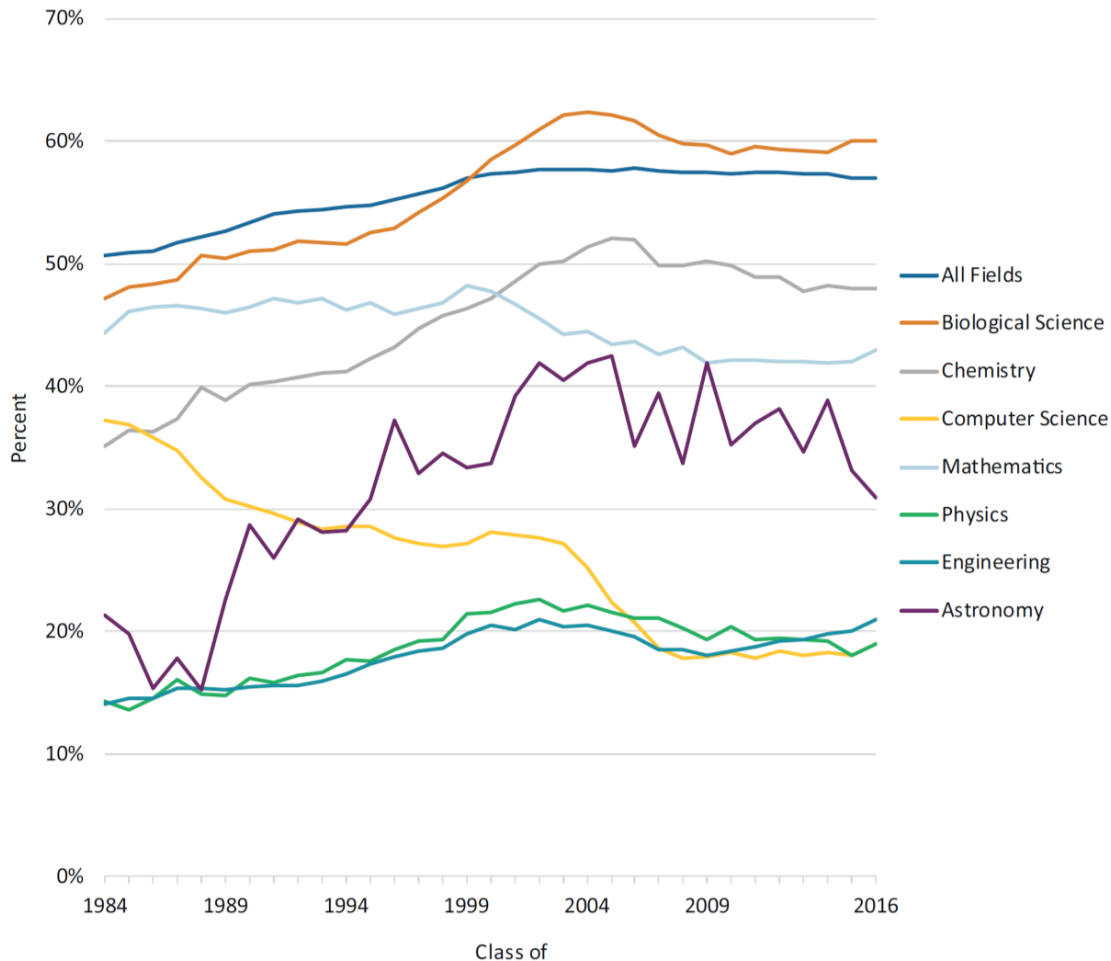
Career Compromises	Survey Source	Gender Difference
Relocated for a spouse	Longitudinal Study of Astronomy Graduate Students, 2007–2016	Women were 204% more likely
Declined job for a spouse	PhD Plus 10 Survey, 2011	Women were 346% more likely
Had a career break for family reasons	Global Survey of Physicists, 2010	Women were 400% more likely
Became a stay-at-home parent	Global Survey of Physicists, 2010	Women were 463% more likely
Chose a less demanding or more flexible schedule	Global Survey of Physicists, 2010	Women were 111% more likely
Changed employers or field of employment	Global Survey of Physicists, 2010	Women were 40% more likely
Spent less time at work	Global Survey of Physicists, 2010	Women were 104% more likely

WHO HAS TO MAKE SACRIFICES?

- Women are more expected to make familial sacrifices that will slow or hurt their career progression.
- This expectation is rooted in the stereotype that women must be family-oriented.

MEDICAL FIELDS

Percent of Bachelor's Degrees Earned by Women in Selected Fields, Classes of 1981 through 2016



Source: National Center for Education Statistics. Data compiled by AIP Statistical Research Center

WHO GOES TO MEDICAL SCHOOL?

Of undergraduate biology majors, more than 60% are women.

Biology is the most prevalent major for physicians and surgeons at more than 48%.

According to the Association of American Medical Colleges (AAMC), 2017 was the first year more women enrolled in U.S. medical schools than men.

DR. JANJIC

ASSOCIATE PROFESSOR OF PHARMACEUTICS

"There are times when I was 1 out of 50 in a room. So you can choose if that bothers you, or you can just accept that that's your reality, do your job and be as professional as you can be."

WHERE IS THE GENDER GAP IN BIOLOGY & MEDICINE?

***This begins with a difference
in opportunity.***

In the labs of the highest-achieving male biology professors – winners of the Nobel Prize, the National Medal of Science, and other prestigious awards – women are generally underrepresented, compared with their overall percentages in the field. Those labs serve as major pipelines to junior faculty positions at top research institutions, the study found.

"DON'T ACCEPT THE BIAS. IF YOU
THINK IT'S THERE, ACKNOWLEDGE
IT, BUT DO NOT INTERNALIZE
IT. ACKNOWLEDGE THE
CHALLENGE"

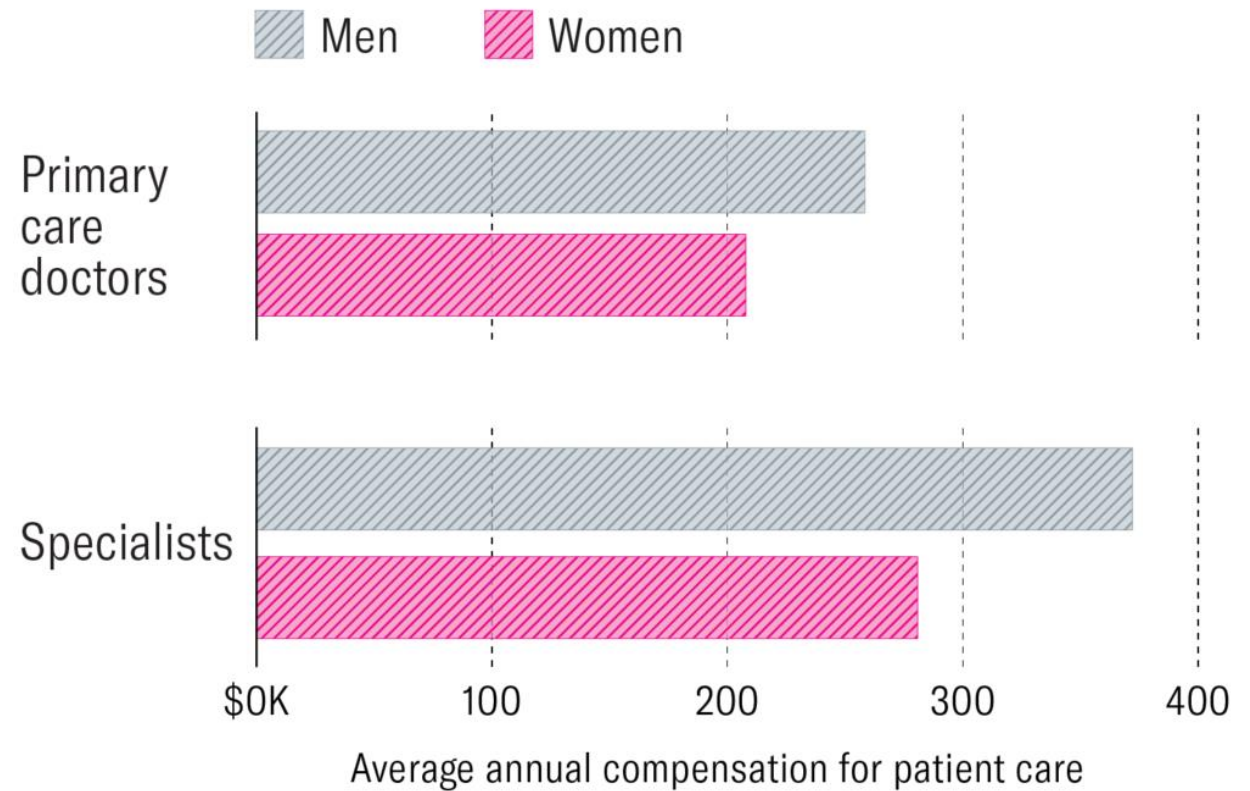
DR. JANJIC

ASSOCIATE PROFESSOR OF PHARMACY

PAY GAP IN MEDICINE

Doctors' Glaring Pay Gap

Across the board, women physicians in the U.S. make substantially less than their male counterparts.



Source: Medscape Physician Compensation Report 2019

“More women are choosing to become pediatricians than are choosing to become neurosurgeons, that’s true. But the gap persists within specialty, too.”

Sareh Parangi, MD
Harvard Medical School

PAY GAP IN MEDICINE: *STUDIES*



A 2013 study published in *Jama Internal Medicine* reported an absolute annual pay gap of \$53,315 between men and women physicians at U.S. public medical schools. After adjusting for potential confounding factors (age, years, rank, and specialty), the annual disparity was \$19,878.

"TO STAY POSITIVE IS GOOD
TO SAY, BUT YOU NEED
ACTUAL SUPPORT FROM
INSTITUTIONS."

DR. JANJIC

ASSOCIATE PROFESSOR OF PHARMACEUTICS

PAY GAP IN MEDICINE: *STUDIES*



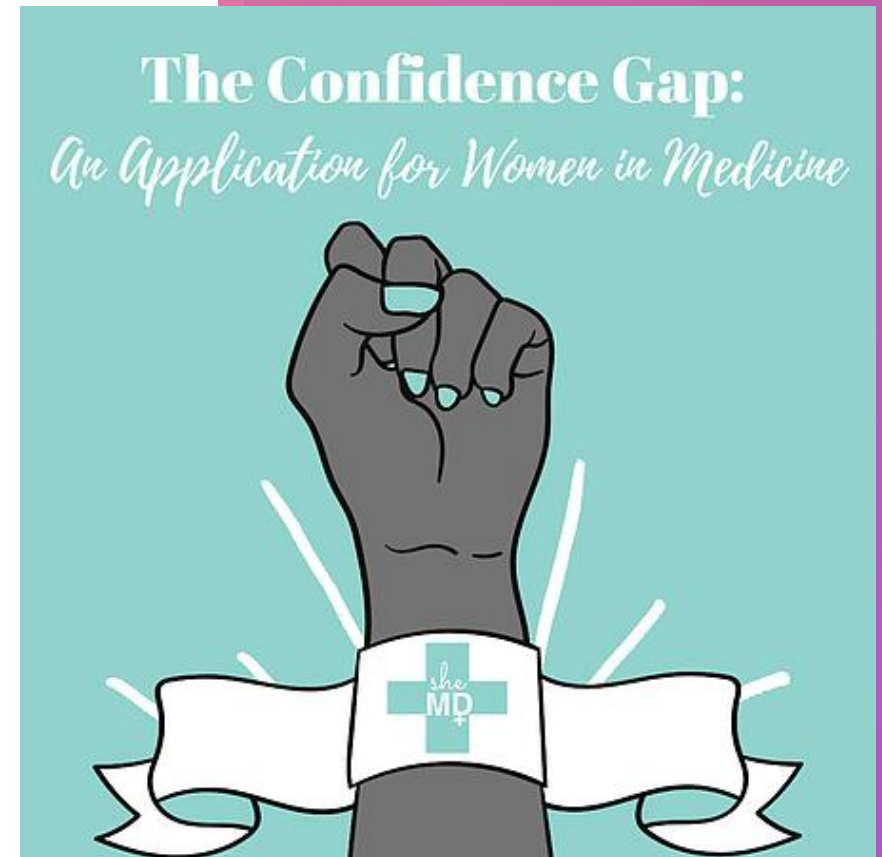
The 2018 AAMC Faculty Salary Survey uncovered a difference in median compensation between men and women at every rank across a majority of specialties and departments – and the gaps are bigger at higher levels of leadership. The report found that across the basic science disciplines, women earned 90 cents per \$1 earned by men, and 77 cents per dollar across clinical science disciplines.

**"WHY AS WOMEN DO WE
OFTENTIMES PREVENT
COMPETENCE FROM
BREEDING CONFIDENCE?"**

KIMBERLY JUN, STUDENT DOCTOR

THE CONFIDENCE GAP—WHO FEELS LIKE THEY BELONG?

- Johns Hopkins & NYU Schools of Medicine Study
 - Results showed that female medical students were more accurate than their male counterparts overall
 - However, women were less confident than men, rating their confidence level as “I’m sure” significantly less often than men
 - Female medical students were rated significantly less confident than their male peers



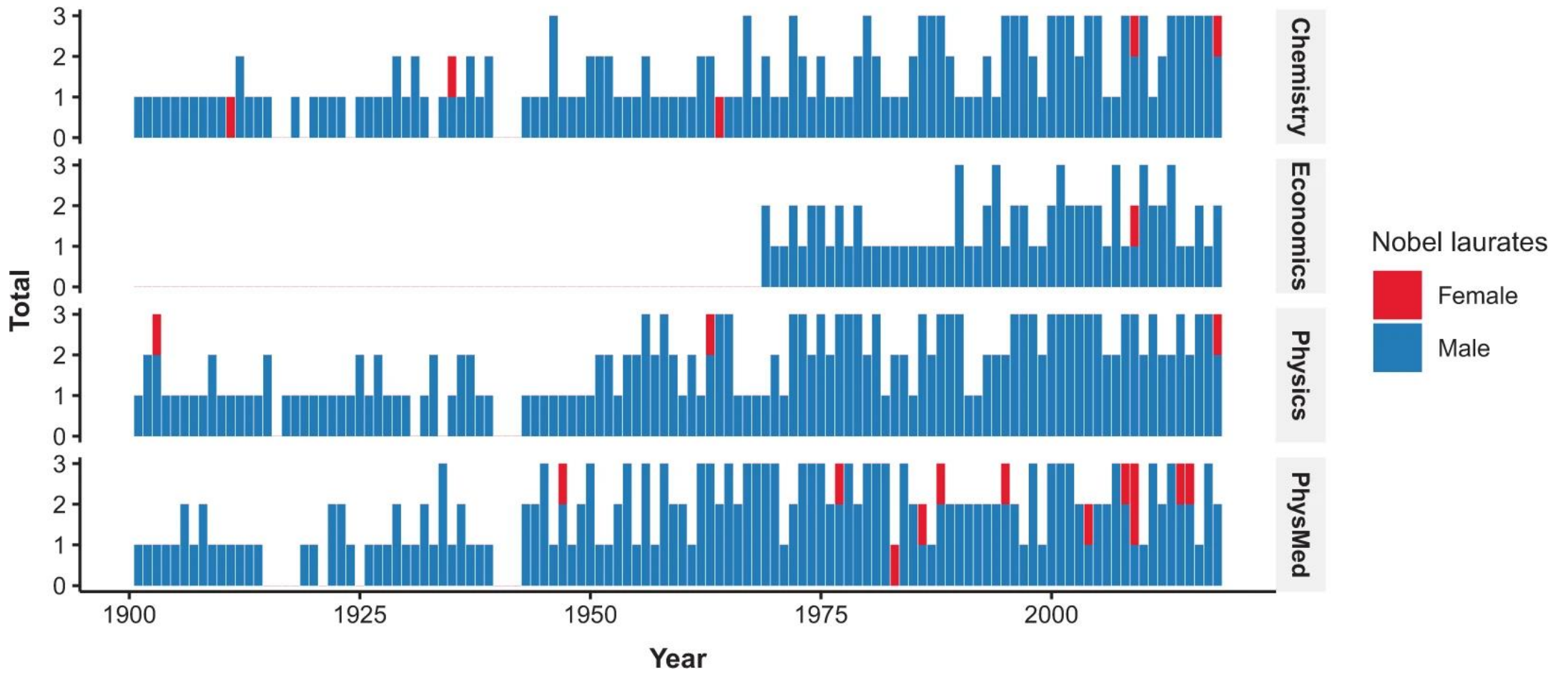
THE CONFIDENCE GAP—WHO FEELS LIKE THEY BELONG?

- "There is a common perception that males outperform females in mathematics and the sciences."
- "There are added demands felt by members of a stereotyped group in situations where their behavior can confirm that their group lacks a valued ability"
- Studies have shown that women consistently show lower confidence in their ability despite being equally capable on exams.
- Women also showed greater decreases in confidence compared to men after receiving low scores.

"DON'T SAY 'IT'S VERY
DIFFICULT FOR WOMEN TO
BEGIN WITH'
BECAUSE IT'S DEMORALIZING
LIKE IF YOU SAY, 'IT'S SO
FREAKING HARD,'
YOU WON'T EVEN WANT TO
TRY"

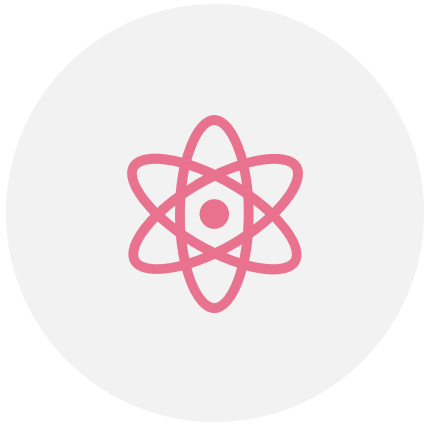
DR. JANJIC

ASSOCIATE PROFESSOR OF
PHARMACEUTICS



AWARDS & PUBLICATIONS

NOBEL PRIZE



SINCE THE FIRST NOBEL PRIZES WERE AWARDED IN 1901 THERE HAS BEEN 688 NOBEL LAUREATES WITHIN THE FIELDS OF CHEMISTRY, ECONOMICS, PHYSICS, AND MEDICINE; AMONG THESE ARE ONLY 20 WOMEN (21 PRIZES AS M. CURIE RECEIVED THE PRIZE TWICE)



IN PHYSICS, 3 WOMEN HAVE BEEN AWARDED OVER THE YEARS WHICH 0.4% OF THE LAUREATES.



IN MEDICINE, 12 WOMEN HAVE BEEN AWARDED OVER THE YEARS WHICH 6% OF THE LAUREATES.

COMBATING THE BIAS

"MUTUAL SUPPORT SHOULD BE
MORE ACCEPTED BECAUSE
OFTEN IN PHYSICS, IT FEELS
LIKE WOMEN ARE
SHAMED REGARDLESS OF
ABILITY."

DR. CHAMBERLIN,

ASSISTANT PROFESSOR OF PHYSICS

"I've always insisted that men have to be a part of the dialogue. Help others understand the difference in experience."

DR. JANJIC

ASSOCIATE PROFESSOR OF PHARMACEUTICS

"I want people to understand it's not just a one way that women have to overcome on their own, but it has to be a bridge between men and women. These issues belong to men, too."

SOURCES

1. American Institute of Physics Statistics aip.org/statistics
2. How Long Until Women are Equally Represented in STEMM Careers <https://www.forbes.com/sites/grrlscientist/2018/04/20/how-long-until-women-are-equally-represented-in-stemm-careers/#357505752552>
3. <https://www.aamc.org/news-insights/press-releases/majority-us-medical-students-are-women-new-data-show#:~:text=Women%20comprise%20the%20majority%20of,of%20first%20year%20medical%20students>.
4. Research reveals a gender gap in the nation's biology labs <https://news.mit.edu/2014/research-reveals-gender-gap-nations-biology-labs-0630>
5. How to Close the Gender Pay Gap in U.S. Medicine <https://hbr.org/2019/11/how-to-close-the-gender-pay-gap-in-u-s-medicine>
6. Closing the gender gap in medicine <https://www.aamc.org/news-insights/closing-gender-pay-gap-medicine>
7. The Confidence Gap: An Application to Women in Medicine <https://www.shemd.org/post/the-confidence-gap-an-application-to-women-in-medicine>
8. Self-monitoring: Confidence, academic achievement and gender differences in Physics, February 2011, Manjula Devia Sharma , Journal of Learning Design
9. Gender bias in Nobel prizes <https://www.nature.com/articles/s41599-019-0256-3#:~:text=In%20Medicine%2C%2012%20women%20have,gender%20ratios%20within%20the%20field>.