WORK AND
WELL-BEING
IN SCIENCE
An International Study

SUMMARY OF FINDINGS

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Work and Well-Being in Science:

An International Study

Work and Well-Being in Science: An International Study

***Work and Well-Being in Science: An International Study* is the largest cross-national research initiative to understand key factors that affect the well-being of scientists.** The study focuses on scientists in physics and biology departments in four countries: India, Italy, the UK, and the US. It examines topics such as meaning and identity in work, the role of aesthetics in scientific work, scientists' assessments of their workplace cultures, and the ways in which scientists' work and lives have been affected by the COVID-19 pandemic.

The research firm Abt Associates surveyed 22,840 scientists at 233 universities and research institutes in the four countries between May-September 2021, yielding a total of 3,442 completed surveys (AAPOR Response Rate of 15.2%). The project research team is also conducting a total of more than 200 in-depth interviews with scientists in these countries.

The knowledge gained from this study will help us understand how scientists in different national contexts have been affected by the COVID-19 pandemic. The study will also help us work towards improving conditions for well-being and flourishing in scientific careers.

Demographic Overview (N = 3,442)

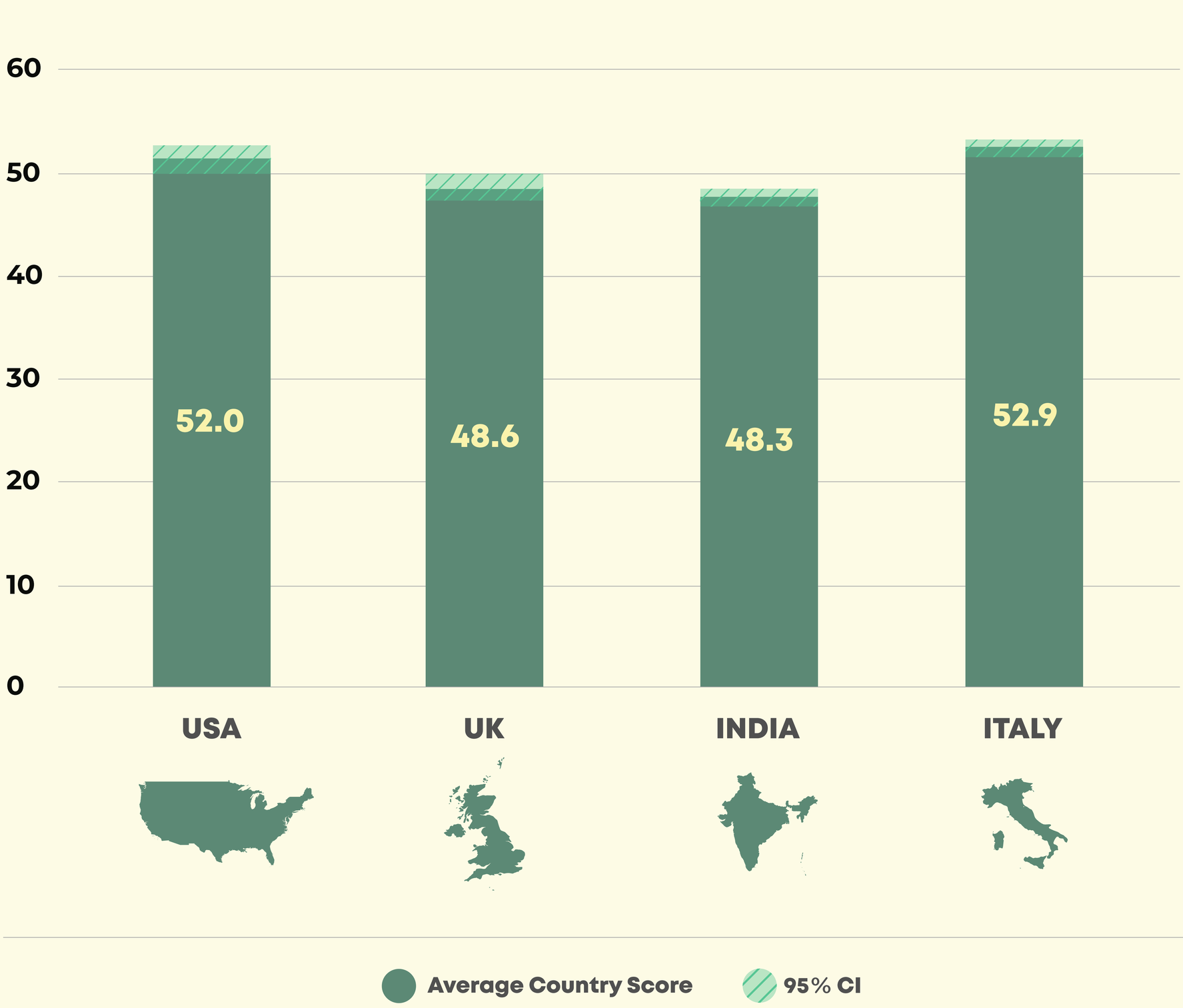
	Sample (Unweighted) Proportion	Weighted Proportion
COUNTRY		
USA	16%	54%
UK	27%	26%
INDIA	39%	10%
ITALY	19%	10%
GENDER		
FEMALE	40%	32%
MALE	60%	68%
DISCIPLINE		
PHYSICS	53%	52%
BIOLOGY	40%	38%
OTHER	7%	10%
POSITION		
POSTGRADUATE STUDENT	43%	29%
POSTDOC	14%	15%
RESEARCH SCIENTIST	9%	5%
JUNIOR FACULTY	10%	12%
MID-LEVEL FACULTY	11%	12%
SENIOR FACULTY	13%	26%

One

The Well-being of Scientists

We measured the overall well-being of scientists using a reduced version of the Flourishing Index developed by the Harvard Human Flourishing Program[1]. We examined the seven key domains identified by their measure, each scored from 0-10: life-satisfaction, physical health, mental health, meaning and purpose, character and virtue, close social relationships, and financial security. Scores closer to 70 indicate higher levels of well-being.

Well-Being



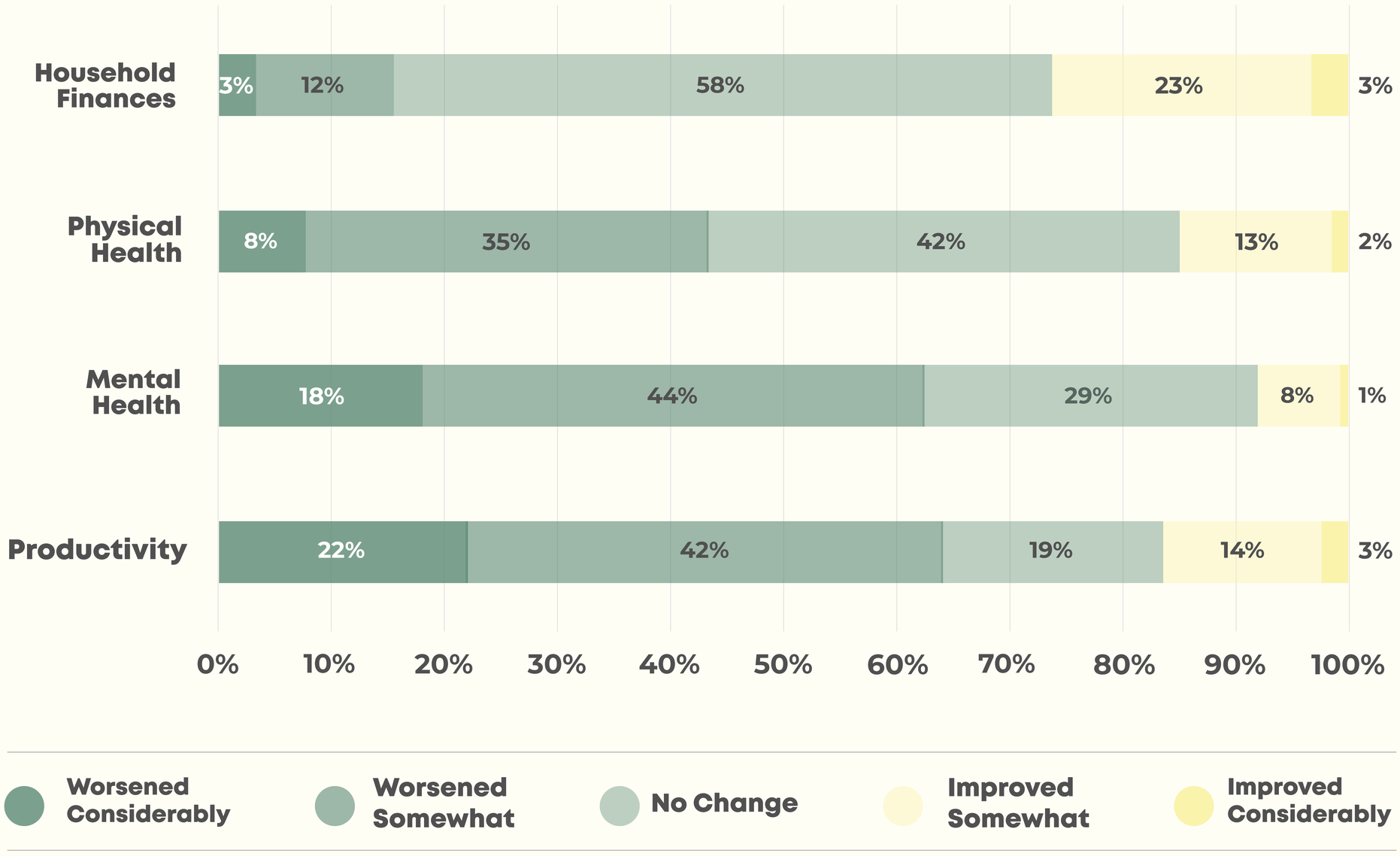
On average, scientists reported moderately high levels of well-being overall. The differences between countries may reflect the relative impact of the pandemic on scientists in these countries during the survey period.

Two

Impact of COVID-19 on scientists

We asked participants how the COVID-19 pandemic affected their productivity, mental health, physical health, and finances.

- The pandemic had significant negative impact on productivity. Overall, **64%** of scientists say their productivity worsened
- **62%** of scientists report that the pandemic worsened their mental health
- **58%** of respondents say that regular online meetings (e.g., Zoom) leave them exhausted
- Nearly **50%** say that work projects have been put on hold or delayed
- **51%** have seen an increase in mental health challenges among colleagues
- **40%** say that research collaborations have suffered
- **43%** of scientists say that their work feels more stressful than before the pandemic

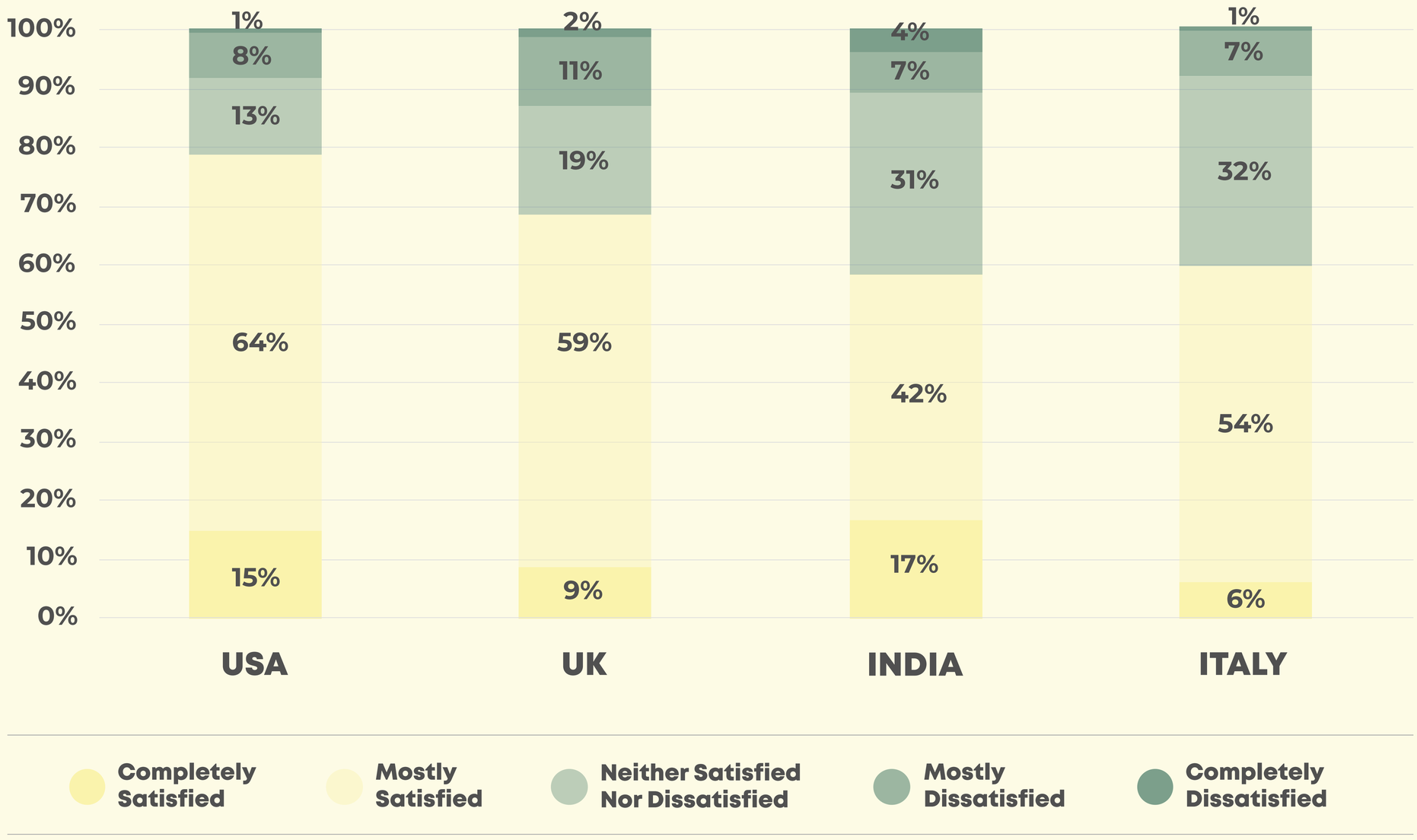


Three

Job Satisfaction and Burnout

- On the whole, scientists report high levels of job satisfaction. The majority of scientists **(72%)** reports being mostly or completely satisfied with their jobs.

Job Satisfaction

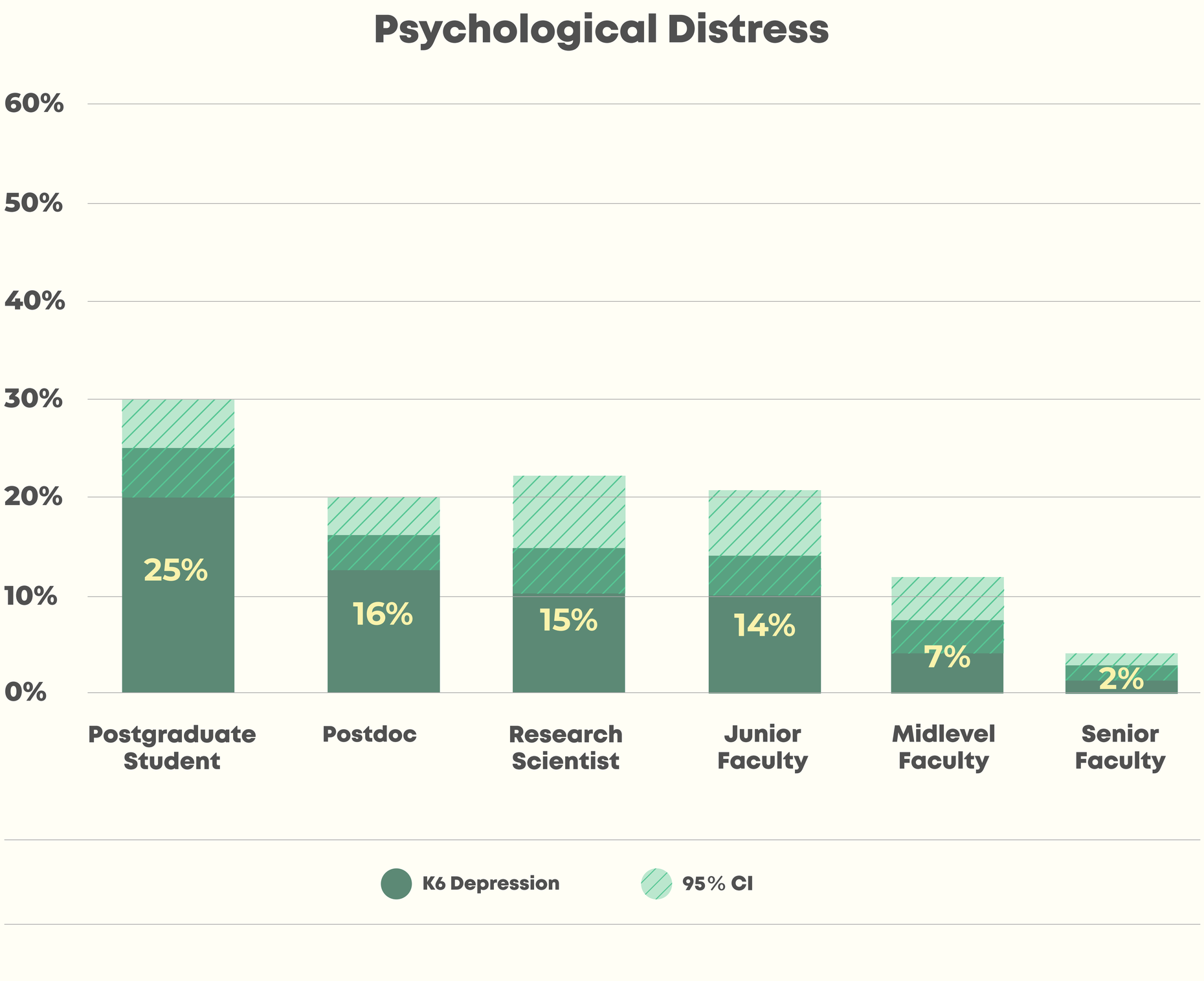


- We calculated burnout by aggregating scientists' reported agreement with three survey items measuring cynicism, emotional exhaustion, and diminished personal efficacy. We find relatively low levels of burnout.
- **22%** mostly or completely agree that they feel emotionally exhausted when they think of work
- **18%** of scientists mostly or completely agree that their job really makes no difference to the world
- **10%** mostly or completely agree that they would no longer continue with this line of work if they were financially secure
- UK scientists report the highest levels of burnout in our sample, and US scientists the least.
- Women scientists report significantly higher levels of burnout than men scientists

Four

Psychological Distress

We measured psychological distress using the K6 Screening Scale for Psychological Distress[2]. We found that a significant minority of scientists **(13%)** meets the threshold for serious mental illness (SMI) on this scale[3].



- We see significant differences in psychological distress by academic position, with **25%** of postgraduate students that could be classified to have SMI, but less than **2%** of full professors
- **17%** of women scientists experience psychological distress, compared to **11%** of male scientists

Five

Workplace Satisfaction

Scientists who participated in our survey report moderately high levels of workplace satisfaction.

72%
of scientists report that they enjoy working in their organization

72%
of scientists report feeling a sense of belonging to their organization

65%
of scientists feel respected in their organization

56%
of scientists trust the leadership in their organization. However, a substantial minority **(19%)** often feels that they cannot trust colleagues in their organization

Six

Organizational Culture

Scientists also report relatively positive evaluations of organizational culture, while noting room for improvement in certain areas.

42%
agree that their organization provides adequate mentoring

44%
agree that their organization nurtures creativity

66%
agree that their organization provides clear procedures for reporting misconduct and discrimination

44%
agree and **41%** are neutral regarding whether their organization provides adequate support for well-being and mental health

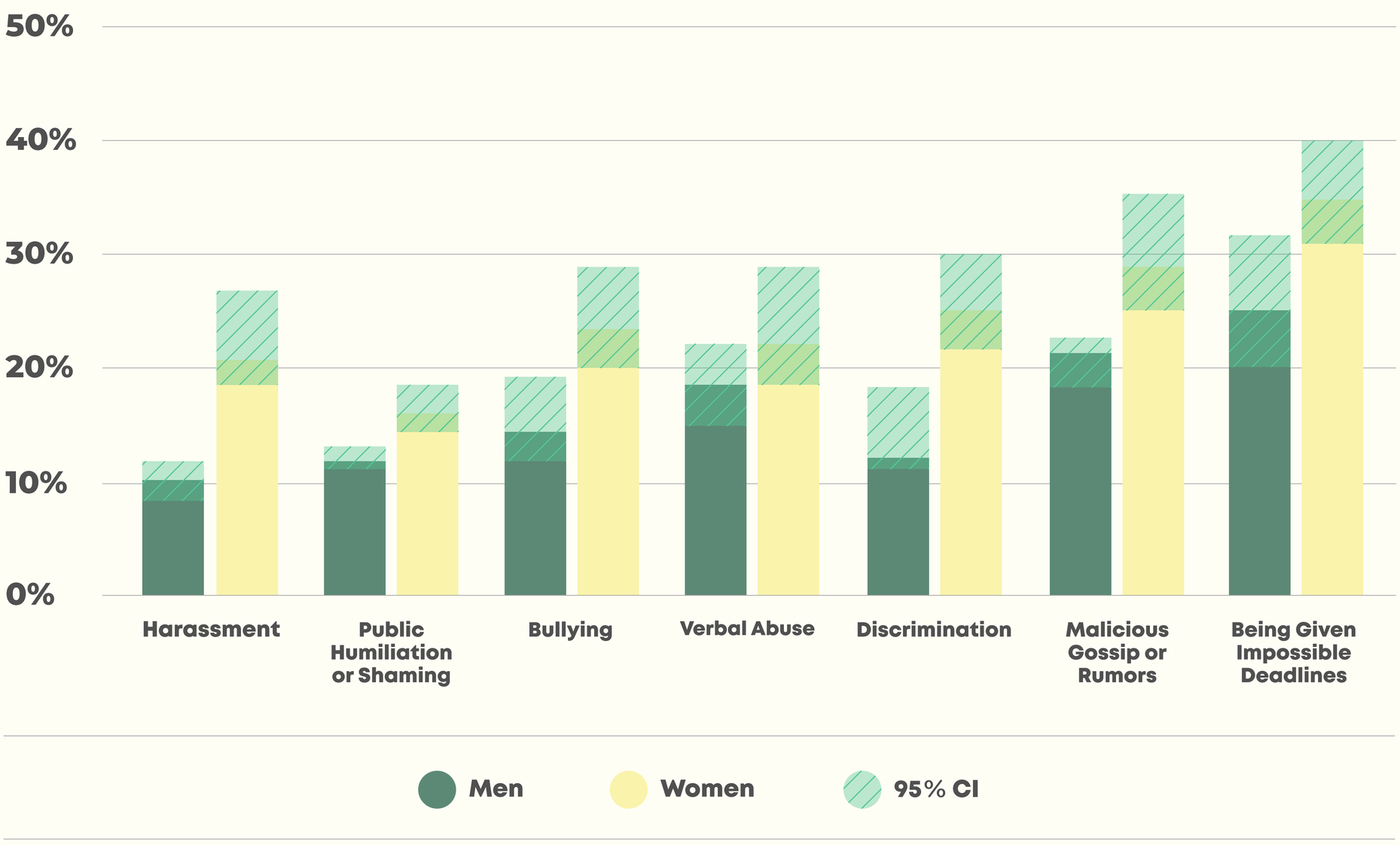
A significant minority of scientists have negative evaluations especially related to leadership training: **26%** disagree that their organization provides adequate training for leaders, and **20%** disagree that their organization leaders communicate clear expectations.

Seven

Mistreatment

Our survey finds significant gender differences in scientists' experiences of mistreatment on the job. Compared to male scientists, female scientists are significantly more likely to experience harassment, public humiliation or shaming, bullying, discrimination, and malicious gossip or rumors.

Mistreatment in Science



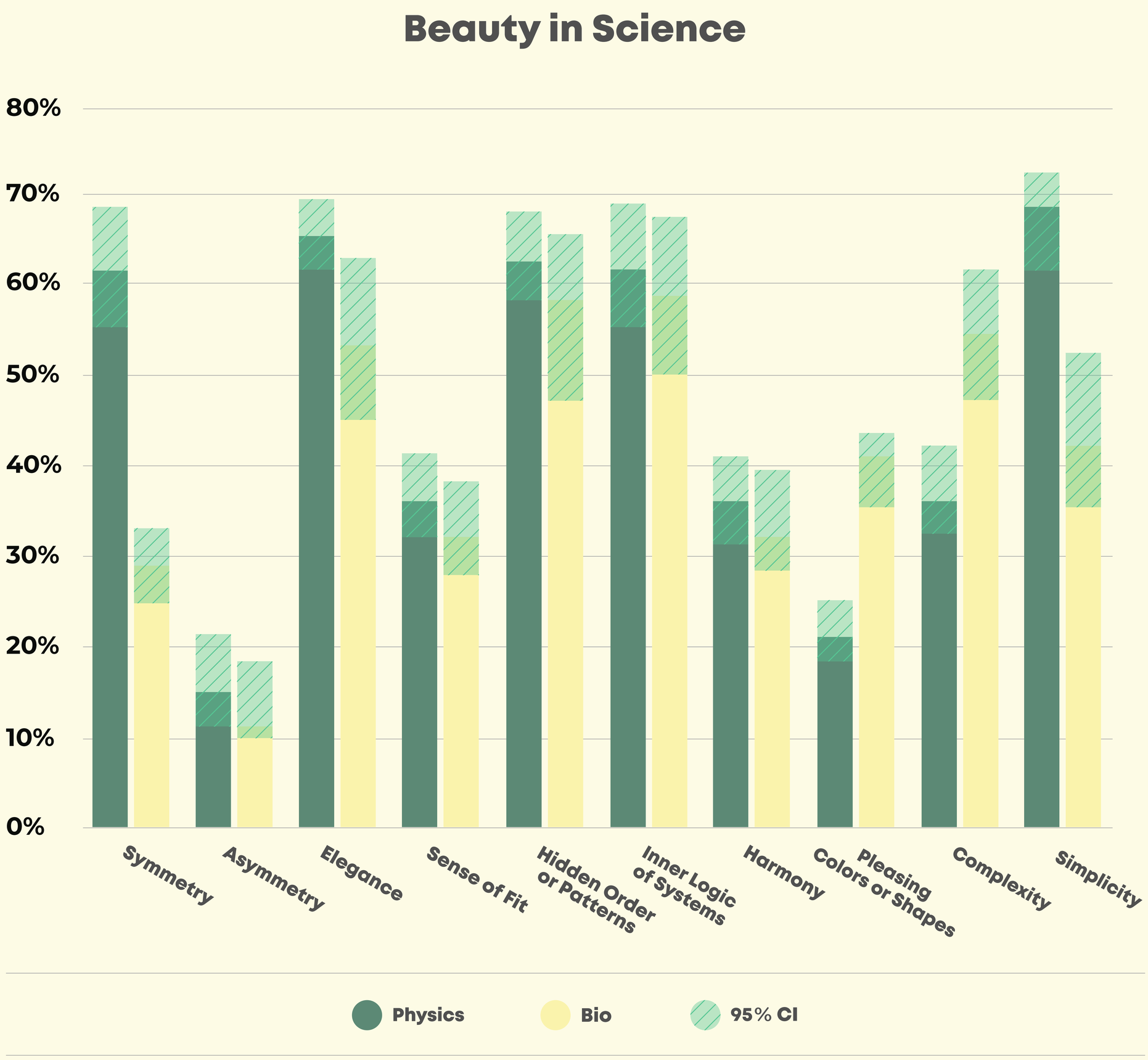
Eight

Aesthetic experience in science

Our survey examined the importance and prevalence of aesthetic experience in scientific work, as well as scientists' opinions about the role of aesthetics.

- **75%** of scientists encounter beauty in the phenomena that they study (e.g., cells, particles, etc.)
- **61%** of scientists encounter beauty in scientific theories
- **52%** of scientists encounter beauty in the process of scientific research
- **54%** of scientists encounter beauty in teaching science

We find disciplinary differences in the meaning of beauty in science: Physicists are more likely to associate beauty with symmetry and simplicity, while biologists associate beauty with complexity and pleasing colors or shapes. Most physicists and biologists almost equally associate beauty with the inner logic of systems and with hidden order or patterns.



Eight

Aesthetic experience in science (Continued)

Consequences of encountering beauty in science

- For **62%** of scientists, beauty motivated them to pursue a scientific career
- For **50%** of scientists, beauty helps them persevere when they experience difficulties or failure in their work
- For **57%** of scientists, beauty improves their scientific understanding

67% of scientists agree with the statement that it is important for scientists to encounter beauty, awe, and wonder in their research. Conversely, **11%** of scientists indicate that the pursuit of aesthetic considerations like symmetry and elegance is bad for scientific progress.

Overall, we find that more frequent experiences of wonder, awe, and beauty at work are associated with higher levels of job satisfaction and better mental health.

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For updates on the project and related publications, or more details on our methodology, please visit our website at www.wellbeinginscience.com

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[1]VanderWeele, T.J. (2017). On the promotion of human flourishing. Proceedings of the National Academy of Sciences, U.S.A., 31:8148-8156.

[2]Kessler R.C., Andrews G., Colpe L.J., Hiripi E., Mroczek D.K., Normand S.L., Walters E.E., Zaslavsky A.M. (2002) Short screening scales to monitor population prevalences and trends in non-specific psychological distress. Psychological Medicine, 32, 959–976, DOI: 10.1017/S0033291702006074

[3]Kessler, R. C., Green, J. G., Gruber, M. J., Sampson, N. A., Bromet, E., Cuitan, M., ... & Zaslavsky, A. M. (2010). Screening for serious mental illness in the general population with the K6 screening scale: results from the WHO World Mental Health (WMH) survey initiative. International journal of methods in psychiatric research, 19(S1), 4-22.