BOSTON CONSULTING GROUP

What's Keeping Women out of Data Science?

Background information for journalists

BCG GAMMA

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Methodology

- Online survey of STEM[1] students to understand the parameters of students' choice of career path as well as their perceptions and preferences of data science
- Evaluation: Why do so few STEM women enter the field of data science, and what are the underlying differences across countries?
- Goal: To understand what companies can do better to attract and recruit female STEM talent to data science
- Sample size: More than 9,000 STEM men and women from Australia, Canada, China, France, Germany, India, Japan, Spain, the United Kingdom, and the United States (800–1,000 per country)
- Condition: Under-35s either currently completing a STEM degree at a university or who have recently completed a STEM degree and have entered the workforce (in a data-science-related role[2] or in some other field)

1. STEM: Sciences, technology, engineering and mathematics
2. Range of roles in scope: From data scientist or analytics architect to data engineer or machine-learning engineer to analytics software or analytics UX/UI engineer

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Results at a glance

- Data science is one of the hottest and fastest-growing fields in companies around the world. But it remains a highly male-dominated field, with women making up as few as 15% of data science professionals globally. This gender imbalance is a significant threat to sustainable growth and to unbiased, safe AI

- Responses to a BCG global survey of over 9,000 current and former students across 10 countries make it clear that a significant share of the problem lies in the hands of companies themselves

- Despite the hype around AI, data science has an image problem with many students. Almost 50% of women studying for a relevant degree perceive the field as theoretical and low-impact, or as “nerdy” and uncomfortably competitive. Students are simply picking up on an unfortunate reality in the market: Far too many companies still continue to struggle to create real impact with AI, and many companies still fail to instill a culture of collaboration and inclusion in their analytics teams

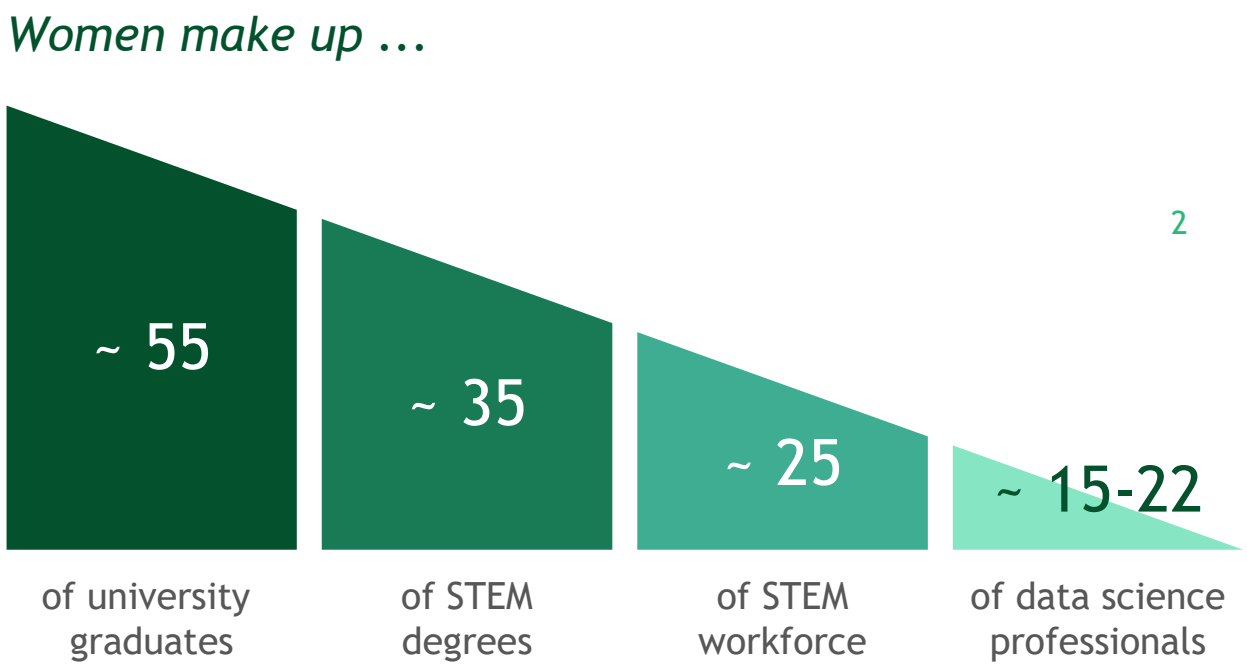
- Given the many negative perceptions, active and open communication is key. But almost 50% of all female students surveyed feel poorly informed about their data science career options. Companies tend to emphasize the technical side of data science without addressing the practical and cultural issues that women in particular highlight as critical

- Relying on the hype around AI is not enough. Companies must pay attention to how they "live" and present their own data science cultures: celebrating real business impact, not just technical skills; and creating a work culture that is visibly collaborative rather than artificially competitive. And they must bring this transparency directly to students with tangible examples of real-life data science content and ways of working

Source: BCG Women in Data survey 2020

Data science struggles with a massive gender gap: Risk for competitiveness and quality of AI

Share of women at each stage of the STEM talent funnel (in %)



- Data scientists are in extremely high demand across industries, with companies striving to harness the transformative potential of AI
- Diversity is a critical factor in this rapid growth
  - Attracting the best talent to the field to support the rapid growth
  - Building algorithms and AI which avoid dangerous biases
- But data science still struggles with a massive diversity problem—women only make up 15% to 22% of data science professionals
- Significant gap between women trained in STEM/data science and women working in data science
- At risk: Slow growth, competitive disadvantage, biased AI

Source: World Economic Forum Global Gender Gap Report 2018, BCG research

Three reasons the field of data science struggles to attract STEM women

1

Many women see data science as theoretical and low-impact

2

Many women see data science as "nerdy" and competitive

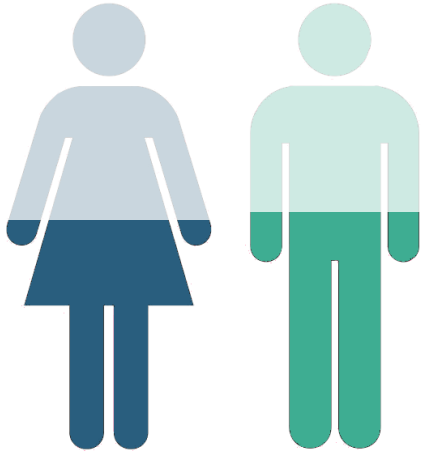
3

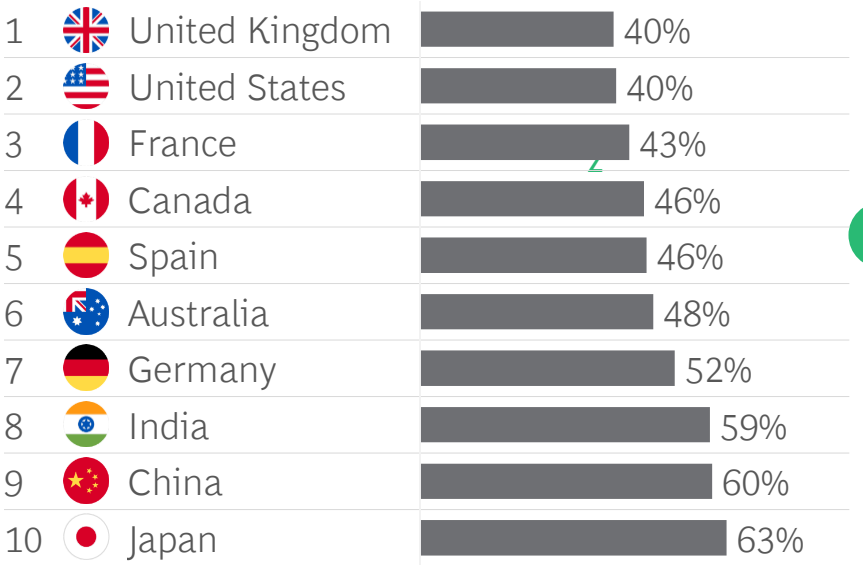
STEM women feel poorly informed about data science careers

Source: BCG Women in Data survey 2020

Data science has an image problem: Negative perceptions of data science are widespread among many students

Share of students who view the field of data science as abstract and of low tangible impact (in %)



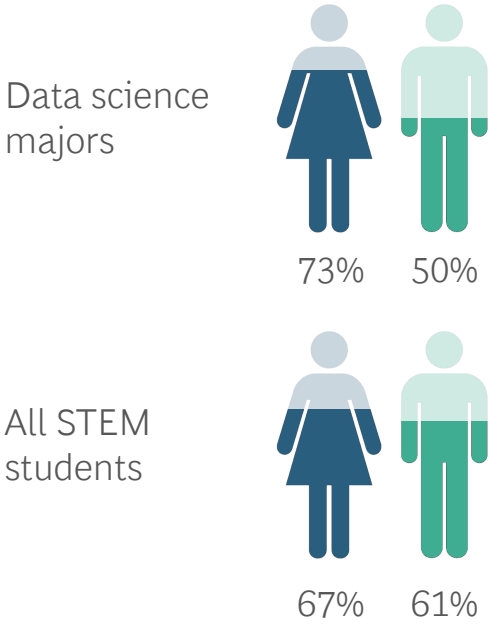


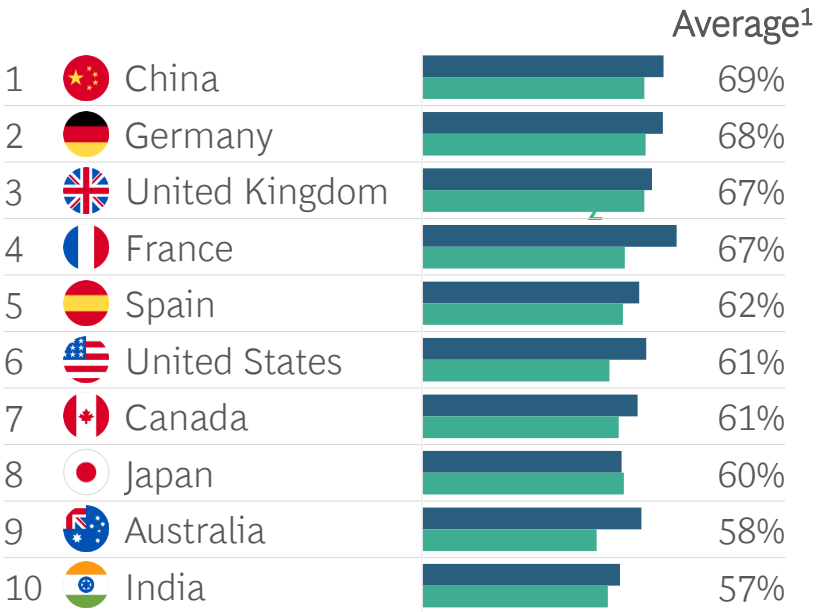
- Bad rap: Many STEM men and women have a negative perception of the field as abstract, theoretical, lacking impact and purpose
- Students are simply picking up on the reality, with many companies still struggling to drive impact with AI[1]
- Companies are not doing enough to spotlight the purpose and value-add of data science in their businesses
- Students in Japan and China have the strongest view of data science as theoretical and low-impact (with ~60% each)

1. See also the 2019 MIT Sloan/BCG joint report "Winning with AI" (https://sloanreview.mit.edu/projects/winning-with-ai/)
Source: BCG Women in Data survey 2020

These perceptions fuel the gender gap: Differences in preferences cause women to be deterred disproportionately

Share of students with a work preference for applied problems with high tangible impact (in %)



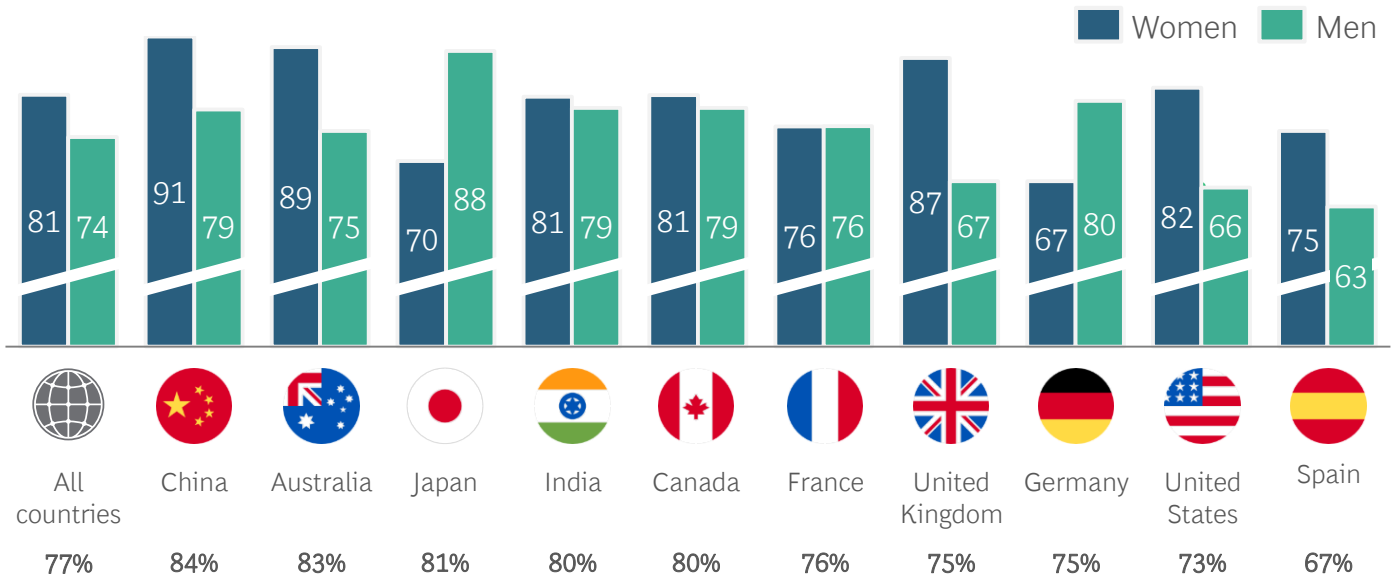


- Work preferences differ significantly between STEM men and women
- The negative perception of data science as low-impact and theoretical is 50% more likely to be at odds with personal work preferences for women data science majors than for men
- China and Germany are at the critical end of both lists, having both a high share of negative perception and strong personal preference for impactful work

1. All STEM students
Source: BCG Women in Data survey 2020

Data science culture is seen as "more competition-based" than other jobs, a strong disincentive for many STEM women

Share of students[1] who view data science culture as significantly more competitive than other jobs (in %)

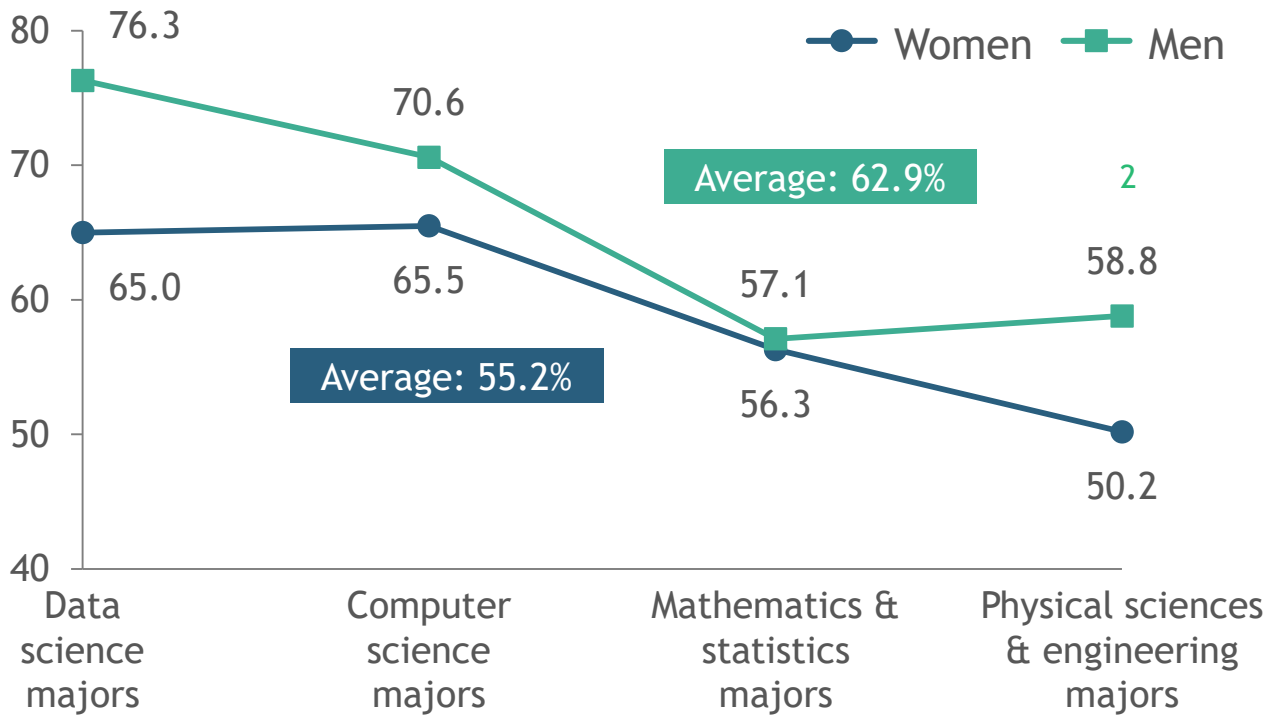


- Across countries surveyed, 81% of women and 74% of men pursuing a data-science-related degree view the field's work culture as significantly more competitive[2]
- Here too, students are picking up on the reality of how many employers present data science to them:
  - Frequent emphasis in recruiting on coding competitions
  - Recruiting "hackathons" with a boiler-room atmosphere

1. Only students pursuing a data-science-related degree 2. with employees seen to be working in competition with one another rather than collaboratively
Source: BCG Women in Data survey 2020

Companies must "sell" the field more tangibly: Many students feel underinformed on data science

Share of students claiming a good understanding of data science as a career option (in %)



- Many students do not have a good understanding of what the day-to-day work of a data scientist in the workplace entails
- Women feel less well-informed than men: 45% of female STEM students do not feel well-informed about data science jobs
- Even among data science and computer science majors—who are naturally closest to the topic—still 35% of women feel that they have a poor understanding

Source: BCG Women in Data survey 2020

Some countries are leading the way on making data science careers transparent to women

Share of female students claiming a good understanding of data science (in %)

Leaders

~65%

Australia 63%,
France 66%, Spain 65%

Middle of the pack

~55%

Canada 57%, India 57%,
UK 57%, US 53%

Laggards

~45%

China 46%, Japan 47%,
Germany 39%

- We examined career transparency across three dimensions: Understanding of the workplace role, qualifications, and career path options
- Australia, France, and Spain rank highest—STEM students there feel best-informed about data science careers—while Germany, Japan, and China lag behind
- A virtuous cycle?: Countries with a higher share of women already in tech jobs[1] (e.g., Australia at 28%) lead the list, while countries with a low current share (e.g., Japan at 13%) are also least successful at informing students

1. Honeypot 2018 Women in Tech Index
Source: BCG Women in Data survey 2020

Companies must actively do more to make data science attractive

Make data science impact and purpose more visible

- First and foremost: Building an own company culture that celebrates concrete business impact from AI and data science
- Actively sharing business impact stories externally (e.g., recruiting website)
- Codifying purpose beyond "we are clever with data"

2 Foster a culture of non-competition

- Building a company analytics culture that shuns the "my model is stronger than your model" approach to development and that celebrates diverse collaboration
- Avoiding recruiting instruments that highlight competition (e.g., coding competitions, "hackathons")

Focus on info-sharing with students (online, on campus) on tangible, real-life examples

- Bringing real use cases: Why? How? What was the impact? What did we achieve?
- Bringing real data scientists who can highlight ways of working, not just recruiters

Source: BCG Women in Data survey 2020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