Bias: How People of Science View Minorities

Saige Burnett; Dr. Lisa Willis; Ronak Patel
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Abstract

The data gap is often used as an example to prove that women today live with the consequences of bias from the past. People today live in extreme poverty, are overlooked for jobs and are paid less for the jobs they do have because of unconscious bias. Unconscious bias applies stereotypes onto different groups of people, harming their image and their chance at equal opportunities.There is gap in data and diverse personnel in governments, science and positions of power, and this gap has the potential to be dangerous. In this presentation I will be highlighting a proposed experiment that could test how the science faculty's bias affects women, ethnic minorities, and women of ethnic minorities, all in comparison to the majority candidate (white, male, white male). I used hypothesis data that I made up in sample sizes of 150 to provide figures for the presentation based on the data from a real experiment in (Eaton et al., 2019). The results show that women are seen as less competent than men, and that Black and Middle Eastern students are seen as less competent than White and Chinese students. Combining the results it is seen that Black women and Middle Eastern men are seen as the least competent than any other group, in comparison to White and Chinese males which are seen as the most competent. This data is then linked to factors such as the distribution of privilege and the social ladder. The presentation offers ways in which people can reduce their bias by awareness, bias training, discussion and empathy.

'When accustomed to privilege, equality often feels like oppression'

—Unknown
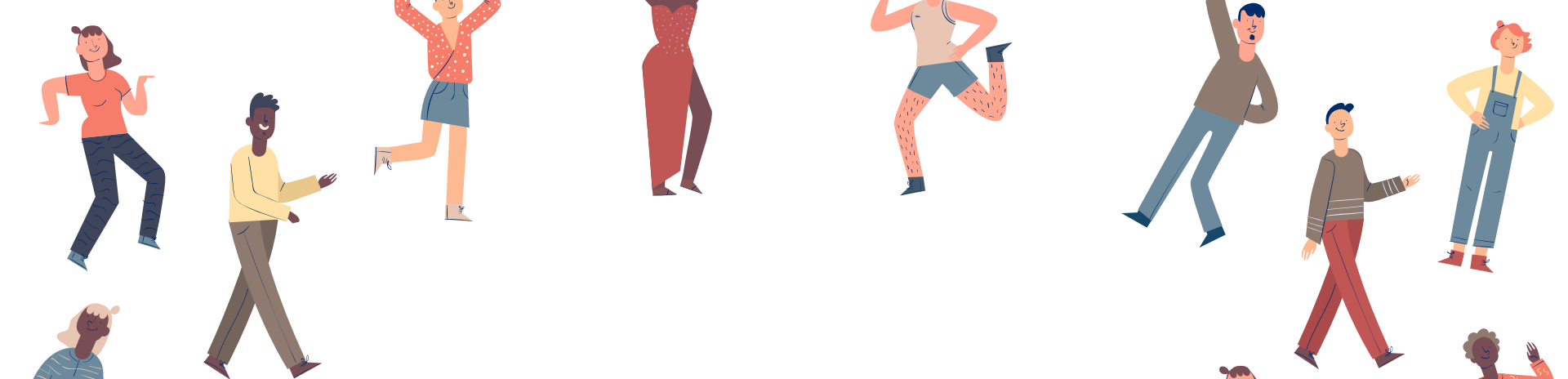
Introduction

The Data Gap

It is no secret that women have been left out of science for the majority of known history. Because of this there is a lack of consideration for women in the science industry, which then results in a data gap (Perez, 2020).

What is a data gap?

A data gap is a an absence of information of social groups that results in a policy or invention knowingly or unknowingly presenting bias (Perez, 2020).

Whew... so what does that mean?

It means that the world as we know it is designed for the majority

Women

For women, this means that most of modern science is a result of a man's work.
(Perez, 2020)

Ethnicity

For ethnic minorities, it means that policies are instituted with only the white perspective in mind
(Romero, 2017)

Why Should You Care?

Because bias has prevented millions of people from getting jobs, homes, and fair pay. Diversity promotes innovation and creates solutions that can work for everyone. (Perez, 2020)

Examples of Marginalized Groups

- Women

- Racialized and Indigenous groups

- People with disabilities

- Immigrants

- LGBTQ+

METHOD

The outlined experiment is based on the one done in (Eaton et al., 2019)

Procedure:

1. Present Applications to science faculty and ask them to rate the proposed applicants on a 1-10 scale based on their competency.
2. Look at how the competency ratings differ based on the applicants' name and assigned gender.
3. Create a set of data to represent the hypothesis that people who are the least marginalized will face the least bias in the applications. Sample size is 150 ratings.
4. Compare the data to find out if there is a significant difference between the competency of the applicants.

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01

Gender Bias

*Note that the data displayed is test data and not the direct result of an experiment

Bias Against Women

Women face all sorts of discrimination simply because of their gender, here are some ways women are affected by bias:

- They are seen as 'soft' and 'nurturing' instead of 'ambitious' and 'aggressive' (Moss-Racusin et al., 2013)
- They are often overlooked for jobs in STEM because it is a male dominated field (Moss-Racusin et al., 2013)
- Despite producing the same quality of work, women can be paid less (Moss-Racusin et al., 2013)
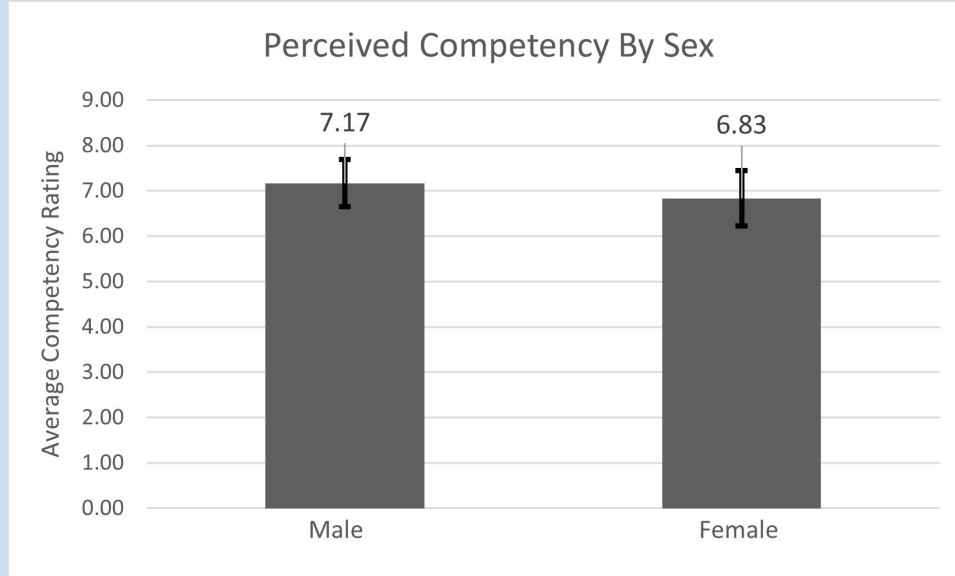
Perceived Competency by Gender

Perceived Competency By Sex

Figure 1

- Faculty were asked to rate candidates based on their competency

- The male and female resumes were identical except for 1 aspect...

  The names.

Figure 1. There was found to be a significant difference between the average competency rating of the applicants by gender.

*Data displayed is TEST data

Observations and Reasoning

Men are often associated with words such as 'assertive' and 'confident'. When these same words are applied to a female 'assertive' is interpreted as 'aggressive' and 'confident' as 'bossy' (Brommer, 2014).

Bias against women is often unconscious and is a result of a lack in thinking opposed to unruly hate. A separate study testing gender tracking of Technology Transfer Office (TTO) workers found that the primary reason TTO's did not track gender was because of a "lack of consideration" (Sohar et al., 2018).

02

Racial Bias

*Note that the data displayed is test data and not the direct result of an experiment

The Results

Figure 2

Figure 2. The employers saw the White and Chinese applicants to be more competent than the other candidates (Eaton et al., 2019).

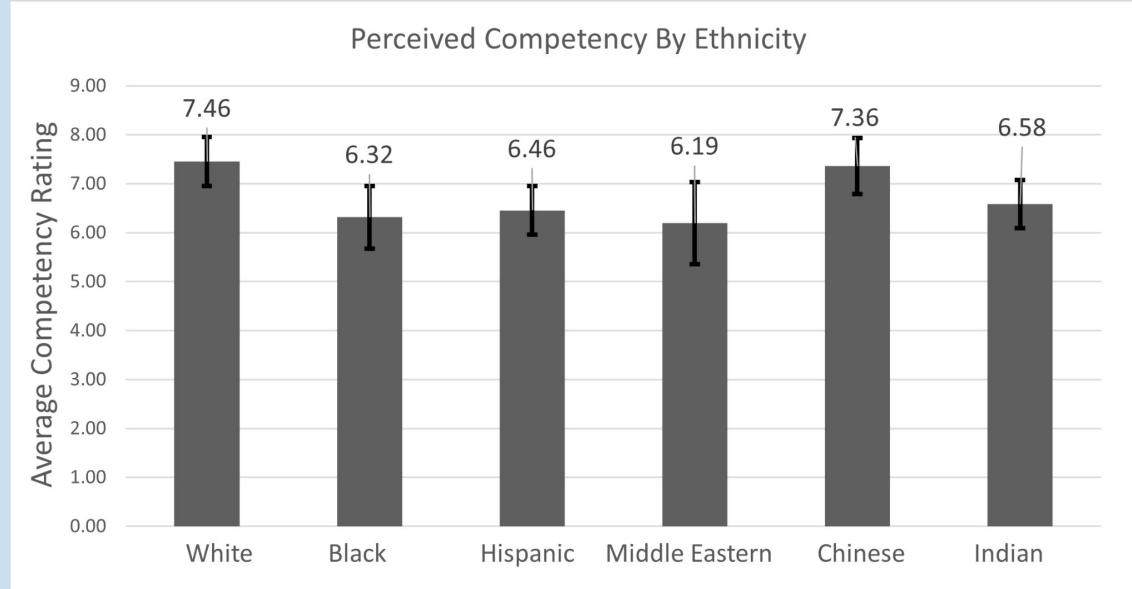Figure 2. And figured Black and Middle Eastern candidates to be the least competent of all.

Figure 2. The difference between the white applicant and the Black, Hispanic, Middle Eastern and Indian applicants was significant.

*Data shown is not the direct result of an experiment

03

Intersecting Identities

*Note that the data displayed is test data and not the direct result of an experiment

People and Privilege
(Crenshaw, 1991)

	White	Black	Hispanic
Male	Most Privilege	Some Privilege	Some Privilege
Female	Some Privilege	Little Privilege	Little Privilege

Privilege: a special right, advantage, or immunity granted or available only to a particular person or group. (Oxford Languages. (n.d.). Privilege. In *Oxford Languages*. https://languages.oup.com/google-dictionary-en/)

Ethnic groups have different levels of privilege as a result of racism. The chart above explains just a fraction of how privilege is divided among different groups.
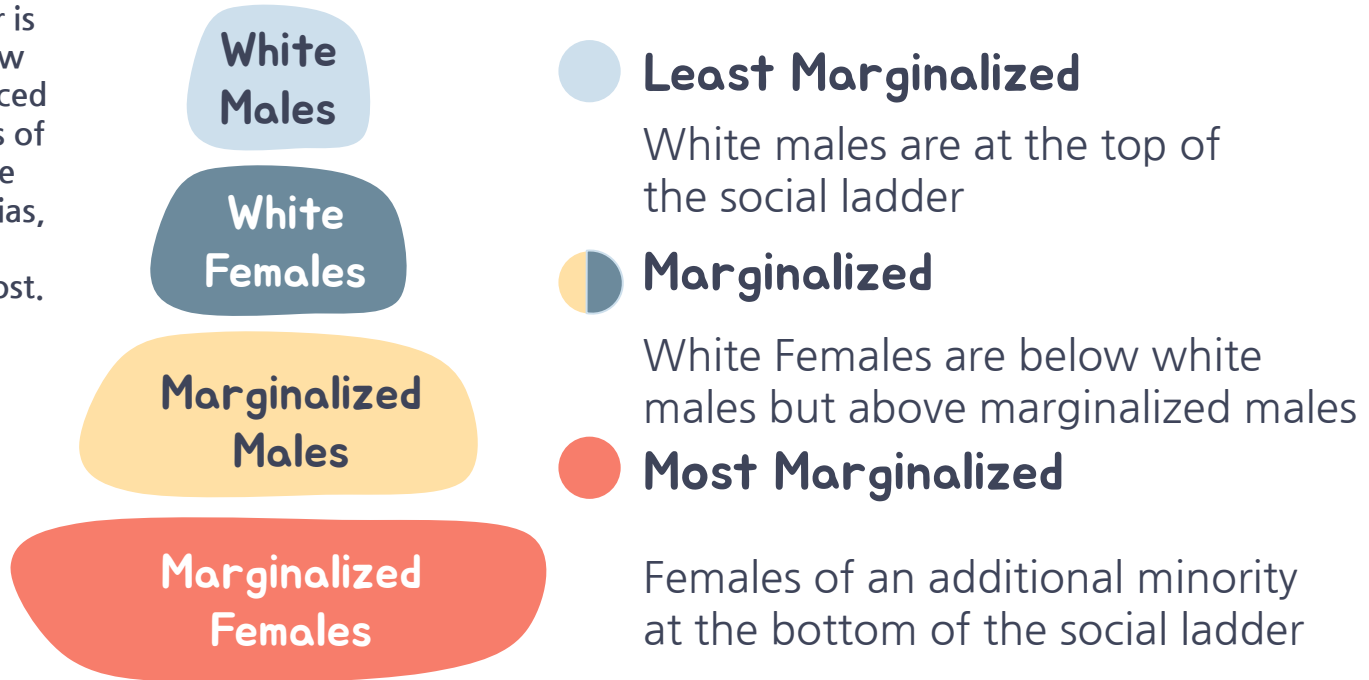
The Social Ladder
(Crenshaw, 1991)

The social ladder is used to visually show the levels of bias faced by different groups of people. Those at the top face the least bias, and those at the bottom face the most.

White Males

White Females

Marginalized Males

Marginalized Females

Least Marginalized

White males are at the top of the social ladder

Marginalized

White Females are below white males but above marginalized males

Most Marginalized

Females of an additional minority at the bottom of the social ladder

Note that everything isn't always linear... and the social ladder can change to discriminate against some groups more than others at different times and circumstances.
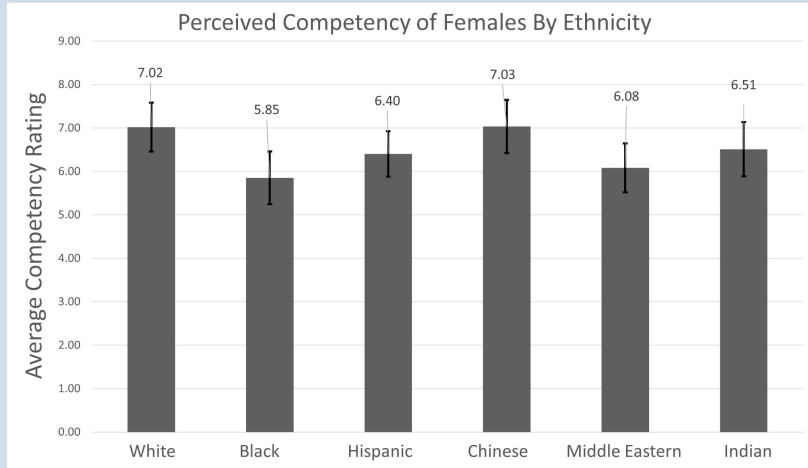
Going through the Data

Perceived Competency of Females By Ethnicity

Average Competency Rating

White	Black	Hispanic	Chinese	Middle Eastern	Indian
7.02	5.85	6.40	7.03	6.08	6.51

Figure 4

Perceived Competency of Males By Ethnicity

Average Competency Rating

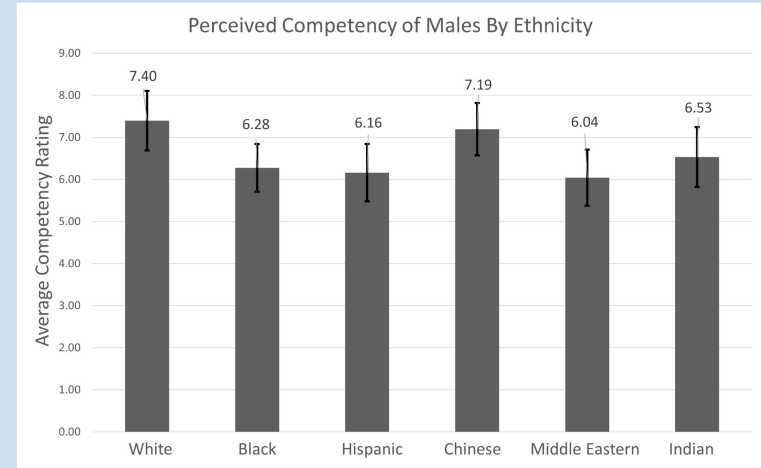| White	Black	Hispanic	Chinese	Middle Eastern	Indian
7.40	6.28	6.16	7.19	6.04	6.53

Figure 5

Figures 4 and 5. After breaking down the results, the experiment concluded that Black Females and Middle Eastern Males are seen as less competent than any other intersecting group. By contrast White and Chinese males are seen as more competent than any other group (Eaton et al., 2019). The Hispanic and Middle Eastern groups are the only two where the female was ranked higher than the male. The difference between the White female and the Black, Hispanic and Middle Eastern female was significant. The difference between the White male and the Chinese male was insignificant, the rest of the male groups were significant.
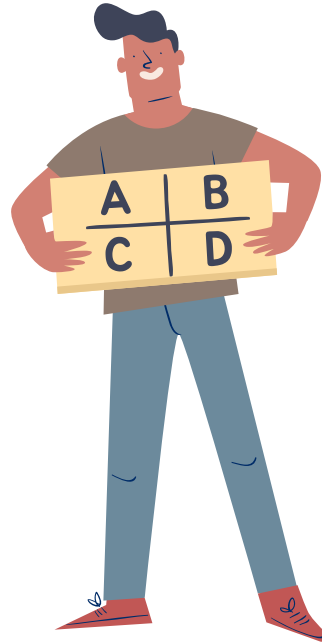
*Data shown is not the direct result of an experiment

How to Reduce Bias?

A Be aware of it when making decisions! (Moss-Racusin et al., 2018)

B Bias Train! (Moss-Racusin et al., 2018)

C Be empathetic to minorities (Burns et al., 2017)

D Keep it in the conversation! (Moss-Racusin et al., 2018)

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women in scholarship, engineering, science & technology

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Thank You