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## Hey Guys, Women Count! A review of *Invisible Women: Data Bias in a World Designed for Men* by Caroline Criado Perez

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## Hey Guys, Women Count! A review of *Invisible Women: Data Bias in a World Designed for Men* by Caroline Criado Perez

### Abstract

Criado-Perez, Caroline. 2019. *Invisible Women: Data Bias in a World Designed for Men*. (New York: Abrams Press). 304 pp. ISBN: 978-1784706289

The author provides a plethora of examples and data to illustrate how women have been miscounted in many areas including daily life, the work place, design of spaces and technologies, health care, and public systems. *Invisible Women* provides cited data that could be examined in multiple data literacy courses. This text reminds readers that gender equity still needs attention. The author's extensive bibliography and examples also provide a basis for exploring data gaps of other invisible populations.

### Keywords

data bias, feminism, social justice

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### Cover Page Footnote

Cinnamon Hillyard is an Associate Professor of Mathematics and Associate Vice Chancellor for Undergraduate Learning at the University of Washington Bothell. Her research focuses on how people use quantitative information to make decisions and how undergraduate education can foster the development of quantitative literacy. She is a Carnegie National Faculty member where she has led multiple initiatives around the Carnegie Pathways program including developing programs to support learning mindsets, belonging, and motivation. She has also held leadership positions in the National Numeracy Network and Math Association of America's working group on Quantitative Literacy.

In the United States, the six-year graduation rate for female college students (65%) now surpasses that of their male counterparts (59%).<sup>1</sup> So gender inequality is a thing of the past, right? Unfortunately, not. Perez's book, *Invisible Women: Data Bias in a World Designed for Men*, reminds us that we still have so much more work to do. Using multiple data sources, Perez demonstrates how women have been and continue to be slighted by societal structures and policies in the United States and several other countries. Three themes center her arguments: (a) the female body is not considered when designing spaces, technologies, or medical care; (b) male sexual violence against women is not adequately measured; and (c) women still do the majority of unpaid care work, much of which remains invisible and has a significant impact on women's lives (313).

*Invisible Women* makes the case that a clear data gender gap exists, illustrated two different ways in Perez's book. The first gap occurs when the data exists and shows how women experience something differently than men, but that data is ignored and/or is not disaggregated by gender so that differences are highlighted. For example, less than 1% of peer-reviewed journal articles "published around the time of the Zika and Ebola epidemics . . . explored the gendered impact of the outbreaks" (299). The second gap is marked when data on women is not collected because men are seen as the prototype for normal. For example, emotional support of students is often done primarily by female faculty and staff. However, this time and energy is often not counted toward workload because it does not require a significant amount of time for many male faculty (97).

On first read, *Invisible Women* is overwhelming because the text is filled with data points to make the case of the gender data gap. Perez's density of evidence includes sources from public data sets across many regions and sectors as well as validated scientific studies. I initially tried to listen to the audiobook, but soon realized that, although I was following the general arguments, I wanted to have a paper copy to study the numbers in depth and look up the related sources. This book is not a light read, but a valuable resource text.

The book provides a wealth of data that could be explored in any data science, statistics, quantitative literacy, or women's study college course. Perez includes over 70 pages of endnotes citing her sources that instructors and students could use to explore topics in depth. In most cases, each citation also includes a link to an electronic source. The topics include examples from daily life, the workplace, design of spaces and technologies, health care, and public systems. Each topic is explored with significant detail and compelling stories to illustrate the ideas. Each case provides further evidence that women have been ignored in data gathering and decision making. Below are just a few of the numerous examples in Perez's book.

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<sup>1</sup> [https://nces.ed.gov/programs/coe/indicator\\_ctr.asp](https://nces.ed.gov/programs/coe/indicator_ctr.asp) (Last updated April 2020.)

**Health Care.** Health care solutions are often based on data collected on men. Male bodies are more likely to be used in medical textbooks to illustrate neutral body parts (197). At least 69% of published studies in cardiovascular research used only male cells (205). The vast majority of drugs have gender-neutral dosing instructions determined by the metabolic rate, body-fat percentage, and other biological characteristics of the average white male (215). These are just a few of the examples Perez provides of how women’s invisibility in medical studies and guidelines has marginalized their health care.

**Sexual Harassment and Assault.** Women are the primary victims of sexual harassment and assault. Reliable data on sexual harassment is hard to find due to underreporting, and when reported, it is often not included in crime statistics (66). Underreporting is common in the workplace “because [women] fear reprisals and because they fear nothing will be done” (139). Sometimes harassment is seen as the norm. For example, during the 2016 election, “Hillary Clinton received almost twice as many abuse tweets as Bernie Sanders” (279). When harassment and sexual assault is normalized, it will not be seen as something that needs attention.

**Pregnancy.** Pregnancy is seen as a rare and special case. Google did not recognize the needs of its pregnant employees until a top executive was pregnant (112–113). Treatments for common illnesses like the flu are virtually unknown for pregnant women because they are excluded from all clinical research (200–201). Most seatbelts don’t protect pregnant women even though a pregnant crash dummy was created in 1996 and “car crashes are the number one cause of fetal death” (188). Although there may be ethical reasons for doing a full clinical study in some of the above cases, Perez notes that there should still be tracking of pregnant women’s health outcomes, but this data is not collected.

**Design.** Women are often not considered in the design of spaces and technologies. Piano keyboards are designed to fit male hand sizes, which may explain why most concert pianists are male (157–159). Voice recognition software is designed to recognize male voices, so women’s commands can be ignored or confused by new technologies (162–164). Even though a large number of instances of harassment and assault happen in public transit systems, the vast majority of transit agencies have not installed security measures at bus stops (54). When women are not considered in the design of spaces and technologies, women’s needs are not well-served.

**Higher Education.** Our own academy is not immune to gender inequities. In Chapter 4, “The Myth of Meritocracy,” Perez argues that “a belief in your own personal objectivity, or a belief that you are not sexist, makes you less objective and more likely to behave in a sexist way” (94). This idea is an Achilles’ heel for academia. The data in this chapter describes the multiple instances of gender inequality in higher education, including discrepancies in hiring and promoting female professors, how parental leave policies have benefited fathers more than

mothers, how male authors are more likely used in course readings, and the invisible service work of women in higher education. These are not trends of the past. The gender gap in higher education is real and extends beyond campus dynamics to professional conferences and in research settings. Perez provides ample data as evidence of these realities. This chapter should be a discussion point with our colleagues.

One of the most important points Perez makes in her book is that data is not as objective as people think. Data is, in fact, biased. This should be a key argument in all data literacy courses, and several courses such as those at the University of Washington (Bergstrom and West 2020) and Princeton (CDH 2019) are making good progress toward this goal. Perez writes data has “been presented to us as objective facts, but the reality is, the facts have been lying to us. They have all been distorted by failure to account for half of humanity—not the least by the very words we use to convey our half-truths. This failure has led to gaps in the data” (21).

She points out that the act of collecting and analyzing data is inherently biased if we don’t include more than half of the population in our data set or when gender is held as a constant rather than a variable in during analysis. Ironically, it felt like Perez cherry-picked some data to make her own arguments in a few cases. However, with the numerous citations in the book, it would make a great assignment for students to look at her data as well as other related data sets to analyze her arguments for validity and bias.

Perez’s book, however, falls short in suggesting solutions. It provides ample examples of the inequalities and places where the female perspective is left out, but doesn’t address why. Perez notes, “It’s time for women to be seen” (25). However, women make up over 50% of the population. Pointing to more examples and data will not solve the gender data gap. One solution Perez suggests toward progress is to let women solve the problem. She illustrates this solution by telling the story of Daina Taimina, a Latvian mathematician who discovered how to represent hyperbolic space by creating a crocheted model (311). This is an inspiring story of a woman solving a problem that had been studied by men for many years. Although I have no doubt women can solve this problem, men must also be part of the solution. Men need to recognize the privilege they hold in many spaces, use that privilege to advocate for women, and include women in problem-solving. We all need to ensure design, measurement, and analysis include multiple points of view.

*Invisible Women* is a great resource for exploring gender inequalities. Many of the arguments and data in the book could also be extended to explore data gaps in other invisible groups, including non-binary genders and racial minorities. It is increasingly important to collect and disaggregate data to reveal structural and institutional bias. Put this book in the hands of your female, non-binary, *and* male students to explore the current reality in our data stories and help them create a new one. During the current COVID-19 pandemic, these gender and racial inequalities

are also highlighted with data. (For example, see Gupta [2020] and Wood [2020].) These inequalities still exist, and we need to create space in our classes to help students make sense of the data to empower them to make changes.

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