

Quantitative Reasoning II

Course Introduction: Readings

Introductions

Course Syllabus

Any
Questions?

Course Website

<https://github.com/eliah-o/Quantitative-Reasoning-II>

This is your go-to resource for:

- The course schedule
- Assignments
- Syllabus
- Lectures

Populi

Grades will be posted here.

Course Books

- 1) David Spiegelhalter, “The Art of Statistics: How to Learn from Data”
ISBN 978–1541675704
- 2) Hans Rosling et al., “Factfulness: Ten Reasons We're Wrong About the World and Why Things Are Better Than You Think”
ISBN 978–1250123824

Get these ASAP! Your first reading assignments are due by the next class (tomorrow).

Agenda

Factfulness: Book Introduction

Art of Statistics: Book Introduction

Homework Orientation

Factfulness

Introduction Quiz.

(Don't worry! It's not for a grade)

"One of the most important books I've ever read—an indispensable guide to thinking clearly about the world." —Bill Gates

FACTFULNESS

New York Times
Bestseller

Ten Reasons
We're Wrong About
the World—and Why
Things Are Better
Than You Think

Hans Rosling with Ola Rosling and
Anna Rosling Rönnlund

How did you do?

When Rosling administered this test, the average was 2/13 questions answered correctly.

Is this better or worse than a chimpanzee?



Why is the average score so low?

Average person isn't well informed?

No, “some of the most appalling results came from Nobel laureates and medical researchers”

Upgrade problem: Knowledge is outdated.

No:

1. “people who loved my lectures... weren't really hearing them. They might indeed be inspired, momentarily, but after the lecture they were still stuck in their negative worldview. The new ideas just wouldn't take.”
2. World Economic Forum (WEF) attendees, who have the most up-to-date information, on “future population growth and the availability of basic primary health care... still did worse than chimps.”

Dramatic Instincts and the Overdramatic Worldview

“Though the world faces huge challenges, we have made tremendous progress. This is a **fact-based worldview**.”

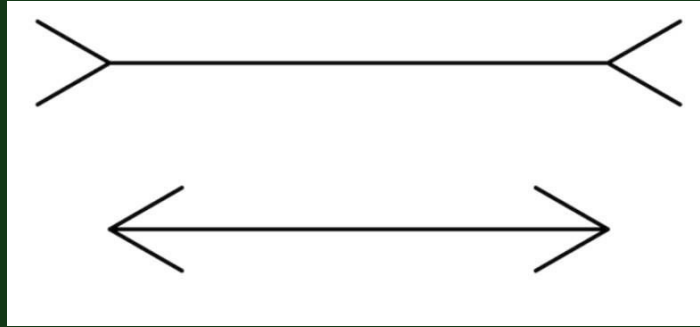
“The overdramatic worldview draws people to the most dramatic and and negative answers to my fact questions.”

“If your worldview is wrong, you will make systematically wrong guesses.”

“My experience, over decades of lecturing, and testing, and listening to the ways people misinterpret the facts even when they are right in front of them, finally brought me to see that **the overdramatic worldview is so difficult to shift because it comes from the very way our brains work.** ”

Optical Illusions and Global Illusions

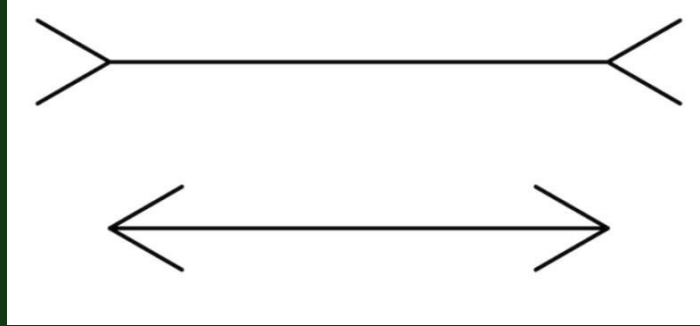
Look at the two horizontal lines below. Which is the longest?



“You might have seen this before. The line on the top looks longer than the line on the bottom. You know it isn’t, but even if you already know, even if you measure the lines yourself and confirm they are the same, you keep seeing different lengths.”

Optical Illusions and Global Illusions

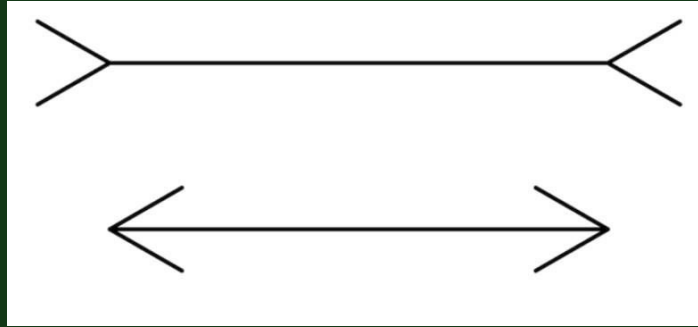
Look at the two horizontal lines below. Which is the longest?



“Illusions don’t happen in our eyes, they happen in our brains... Knowing that most people are deluded means you don’t need to be embarrassed. Instead you can be curious: **how does the illusion work?**”

Optical Illusions and Global Illusions

Look at the two horizontal lines below. Which is the longest?



“Similarly, you can look at the results from the public polls and skip being embarrassed. Instead be curious. How does this “**global illusion**” work? Why do so many people’s brain’s systematically misinterpret the state of the world?”

Dramatic Instincts and the Overdramatic Worldview

“The human brain is the product of millions of years of evolution, and we are hard-wired with instincts that helped our ancestors to survive in small groups of hunters and gatherers.”

Is there an evolutionary advantage to dramatic instincts?

“Gossip and dramatic stories... used to be the only source of news and useful information.”

Ex: Sugar and fat -> “ We crave sugar and fat, which used to be lifesaving forms of energy when food was scarce” but now “sugar and fat make obesity one of the largest health problems in the world today.”

Factfulness and the Fact-Based Worldview

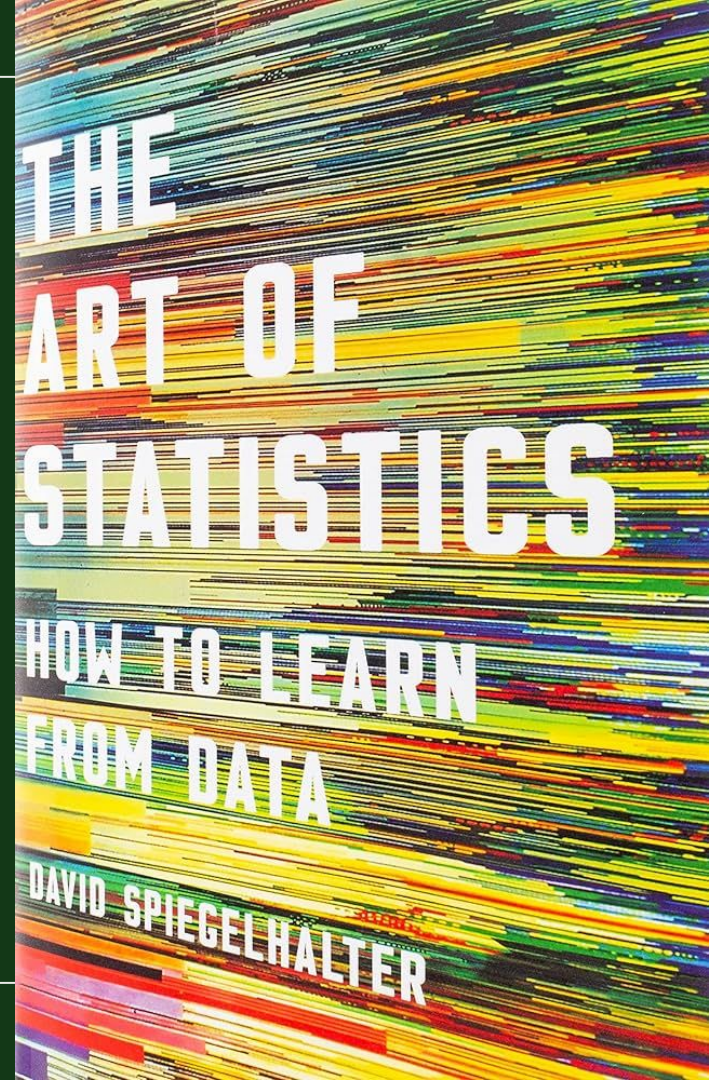
In this book, we'll learn how to replace the overdramatic worldview with a fact-based worldview.

How to recognize overdramatic stories and provide tools to control dramatic instincts.

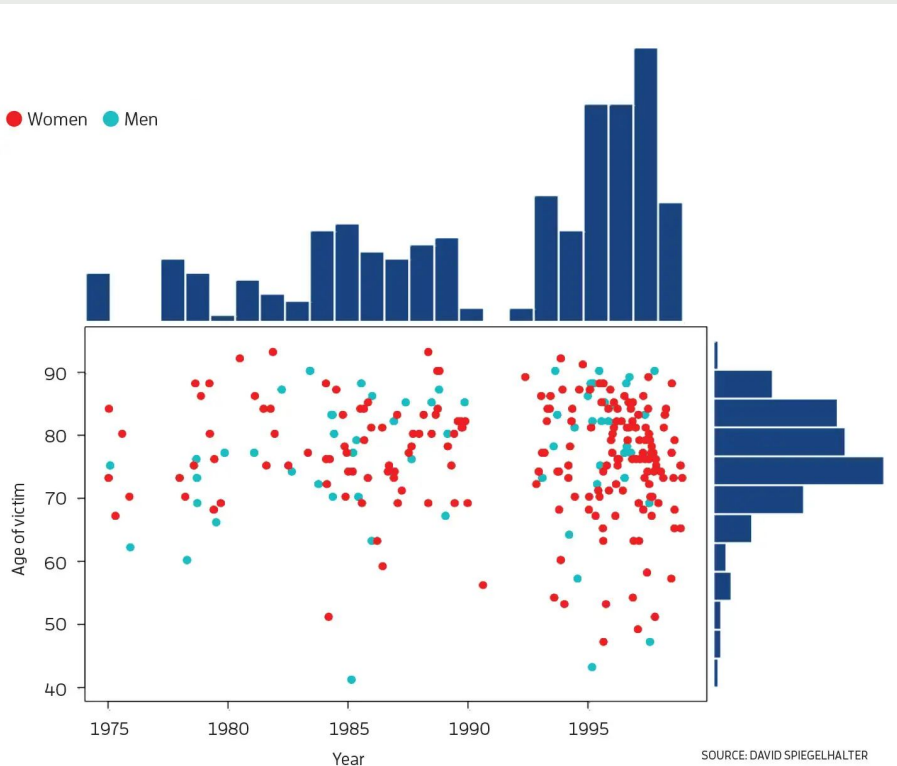
Help you beat the chimpanzees every time.



Our second resource
The Art of Statistics
David Spiegelhalter



Why we need statistics



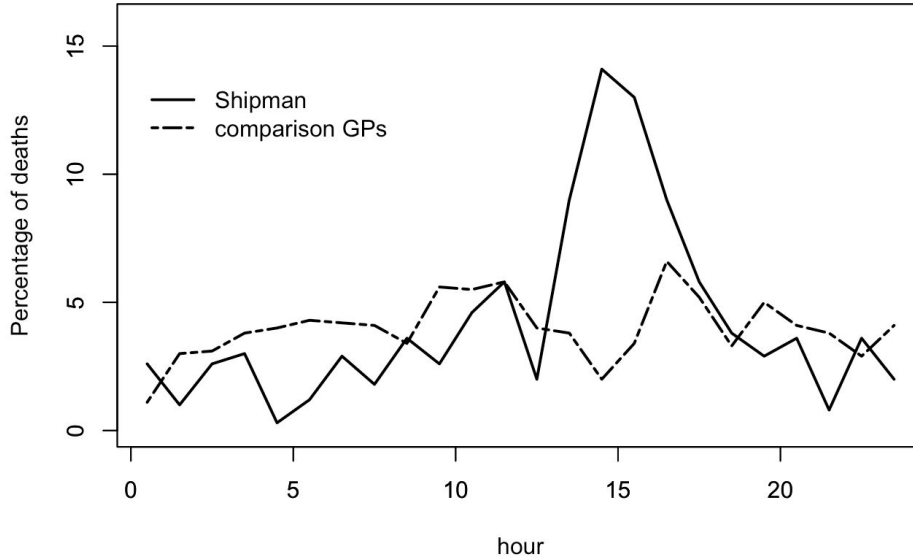
What patterns or trends do you see in this data?

What might this data represent?

These are the victims of Harold Shipman, Britain's most prolific convicted murder.

How might you catch Shipman using data ('forensic statistics')?

Why we need statistics



What story does this data tell?

“The data cannot tell us why they tended to die at that time, but further investigation revealed that he performed home visits after lunch, when he was generally alone with elderly patients.”

What skills does a statistician need to convict this criminal?

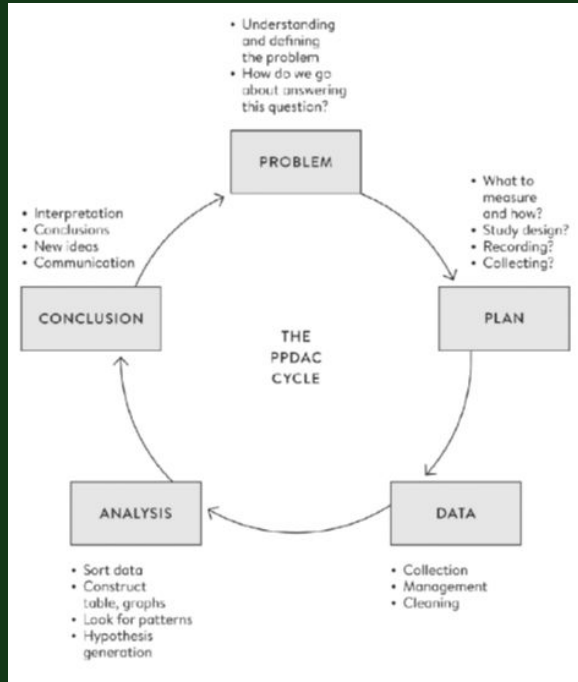
The ability to reduce the world to data.

Turning the World Into Data

How many trees are there on the planet?

Turning the world into data requires clear definitions.

Problem Solving Cycle



PPDAC
Problem
Plan
Data
Analysis
Conclusion

Homework Orientation

You will have questions that you need to answer before each class about the associated reading sections.

You will turn these in online through links in the course website:

<https://github.com/eliah-o/Quantitative-Reasoning-II>