Making Policy with Data

An Introductory Course on Policy Evaluation

Instructor: Prof Yiqing Xu

Spring 2017
UC San Diego
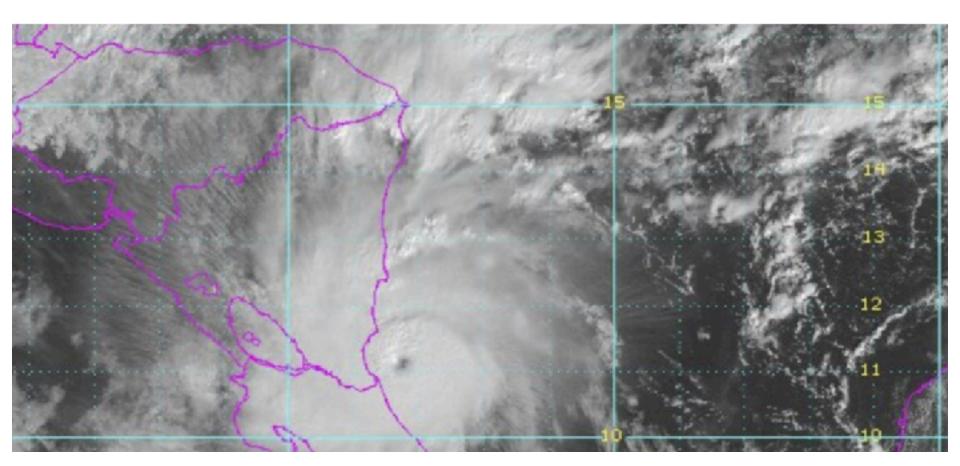
Why Do We Need Data for Public Policy Making?

Scientists are frantically copying U.S. climate data, fearing it might vanish under Trump

By **Brady Dennis** December 13, 2016 ✉
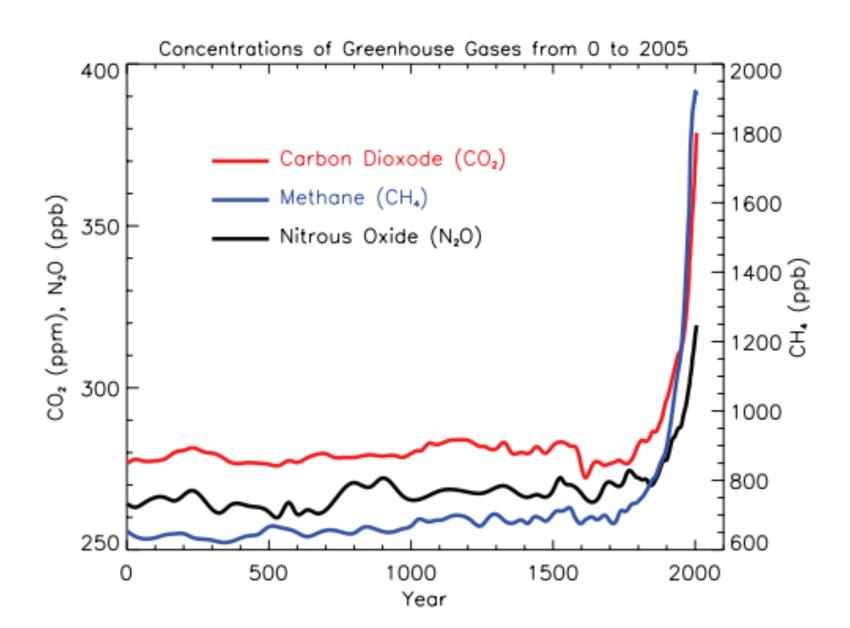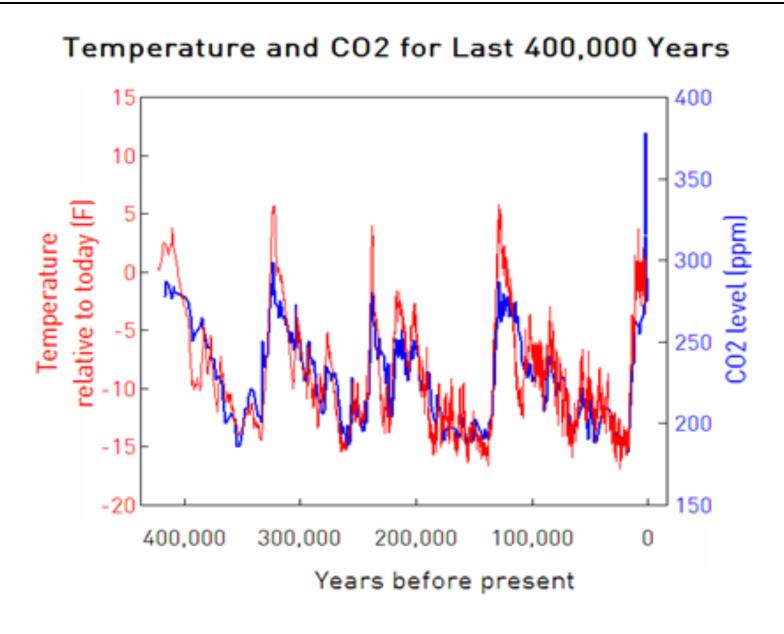
Why Do We Need Data for Public Policy Making?
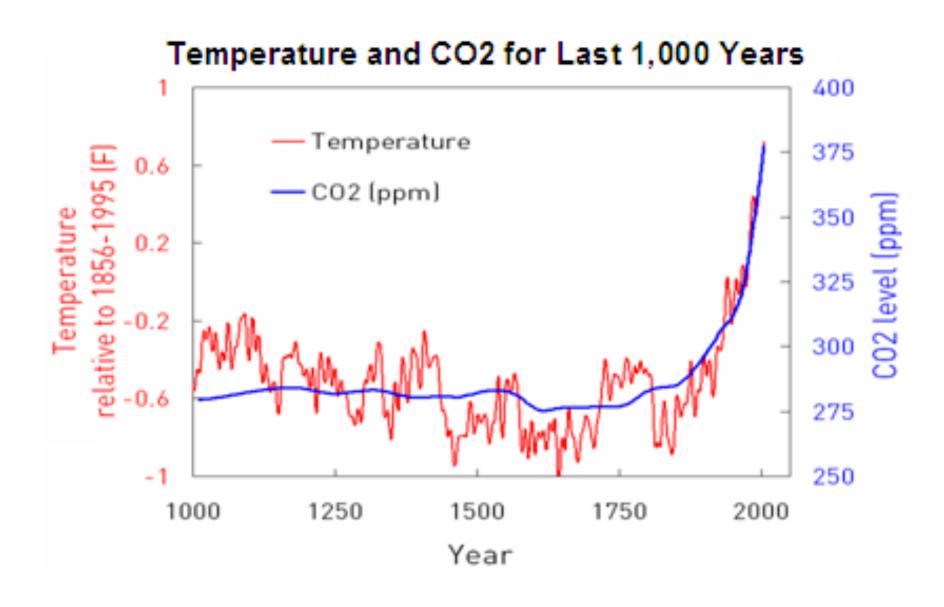
Informed Decision-making

1. To understand the cause of a problem
2. To understand the effect of a policy (or lack thereof)
3. To understand the cost and constraints of implementing a policy

Eg. Causes of Climate Change

Is Human Activities *Causing* Climate Change?

Concentrations of Greenhouse Gases from 0 to 2005

Is Human Activities *Causing* Climate Change?

Temperature and CO2 for Last 400,000 Years

Is Human Activities *Causing* Climate Change?

Temperature and CO2 for Last 1,000 Years

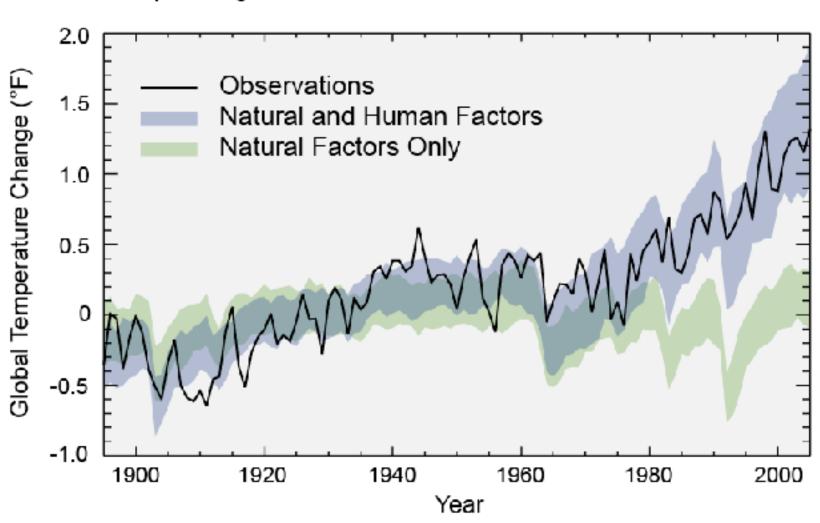# Is Human Activities *Causing* Climate Change?

Separating Human and Natural Influences on Climate

Eg. The Effect of A Job Training Program

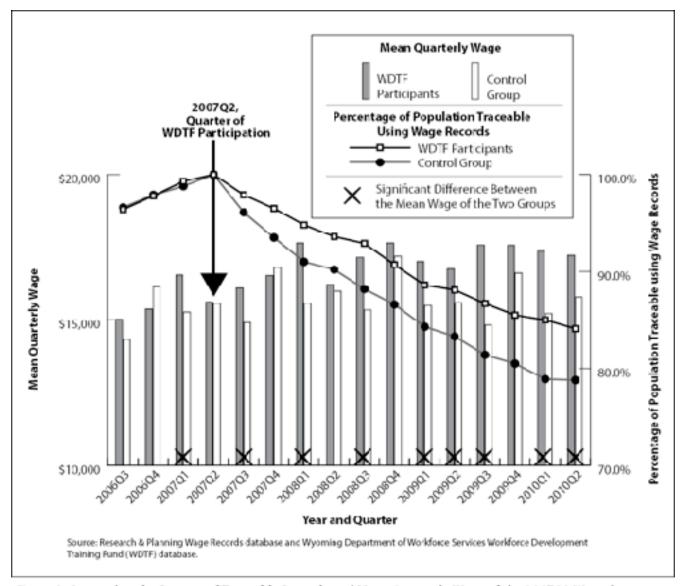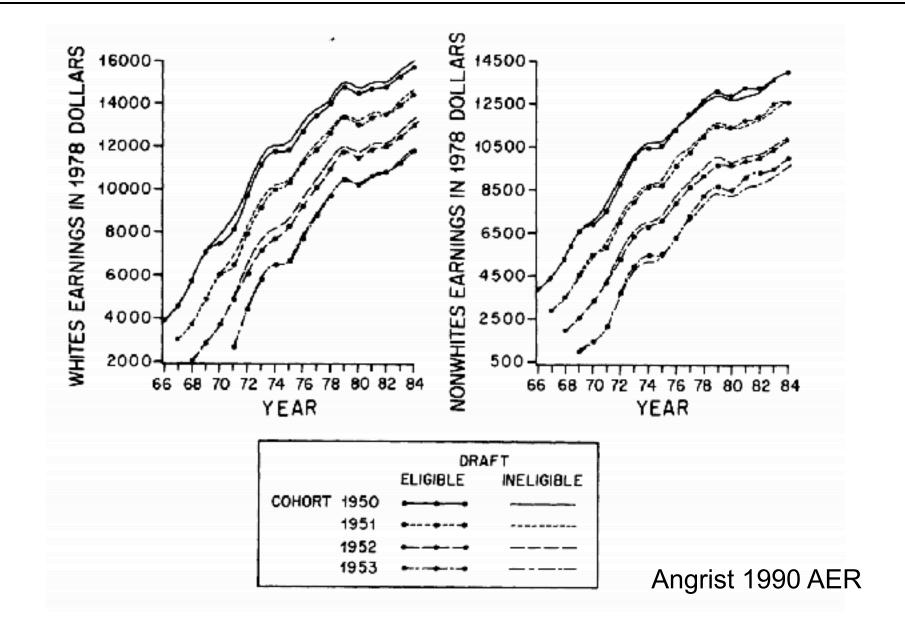# What's the *Effect* of A Job Training Program?

Figure 2: Comparing the Percent of Traceable Records and Mean Quarterly Wage of the 2007Q2 Wyoming Workforce Development Training Fund (WDTF) Participants to the Control Group

Eg. How Much Have Veterans Sacrificed?

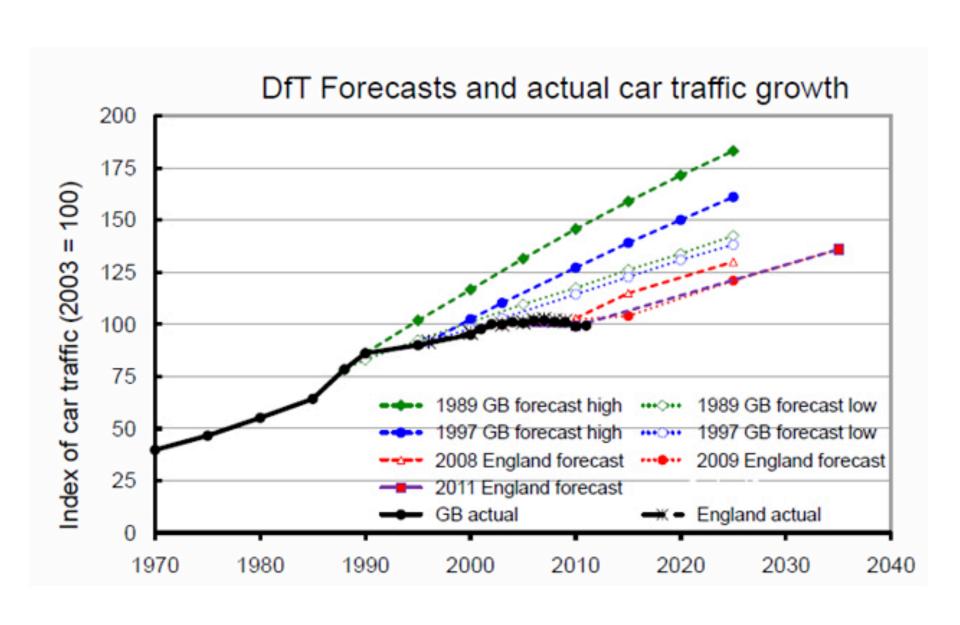# What is a Veteran's Lifetime Earning Loss of Fighting the Vietnam War?

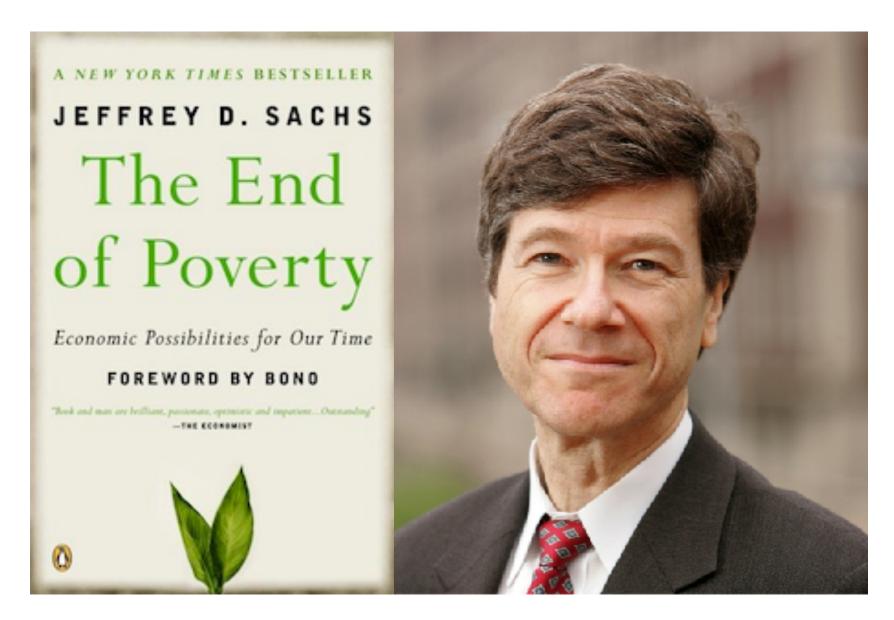Angrist 1990 AER

Why Do We Need Data for Public Policy Making?

Informed Decision-making

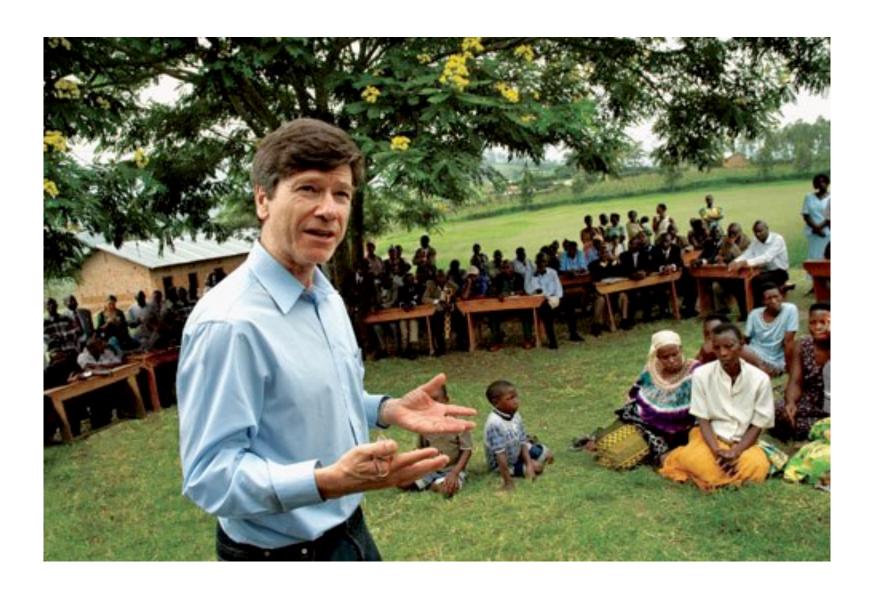1. To understand the cause of a problem
2. To understand the impacts/consequences of a policy (or the lack of therefore)
3. To understand the cost and constraints of implementing a well-intentioned policy

Why Do We Need to Learn "Methods" for Informed Policy Making?

DfT Forecasts and actual car traffic growth

Index of car traffic (2003 = 100)

Legend:
- 1989 GB forecast high
- 1989 GB forecast low
- 1997 GB forecast high
- 1997 GB forecast low
- 2008 England forecast
- 2009 England forecast
- 2011 England forecast
- GB actual
- England actual

Highly Recommended

The Millennium Villages

Does It Take a Village?

Jeffrey Sachs dazzled the development world with his plan to end poverty. But now critics say there's no way to prove whether it works.

Ted Miguel:

No one takes the Millennium Villages seriously as a research project – no one in development economics

So What Do We Do?

Goals

Three Objectives

- Introduce an analytical framework of policy evaluation

- Survey the most commonly used research designs

- Provide basic data analytical skills

  - *R programming*

  - *Key concepts of statistics*

Overview of Class Sessions

- *Course Introduction*

- *Basic R Programming*

- *Randomized Trials*

- *Review of Key Concepts in Stats*

- *Matching and Regression Recap*

- *Regression Discontinuity Design*

- *Difference-in-Differences*

- *(Optional) Synthetic Control Method*

- *Do cheaper and more comprehensive insurance program lead to better health?*

- *Can government-sponsored job training program boost wages of trainees?*

- *Does minimum wage hurt employment?*

- *Does minimum legal drinking age save lives?*

What Are Not Covered

- Mathematical details of the methods

- More complex issues with each of the methods

- More complex designs, such as

  - Instrumental variables

  - Synthetic controls (maybe)

- They will be covered in a graduate-level class (POLI 273)

House-Keeping

Your Teaching Staff — Charlie McClean

- Political Science PhD student (third year)

- I study voting, elections, and comparative institutions, but am particularly interested in youth political participation

- Regional focus: Asia (especially Japan)

- Background: I worked for 3 years at the Council on Foreign Relations in Washington, DC (happy to talk about think tanks, internships, etc.)

Office Hours and Course Website

- Instructor: Professor Yiqing Xu
  – Office Hours (SSB 377): TH 11:00-noon; F 2:30-3:30

- Teaching Assistant: Charlie McClean
  – Office Hours (SSB 346): TU 11:00am-12:30pm

- Course Website

  https://piazza.com/ucsd/spring2017/poli171

- *No Emails* to the instructor or TA unless they are of personal nature

Grading

- Four take-home assignments (40%)
  - You can work together (maximum 2 people)
  - You need to write your solutions independently
  - Let us know the name of your coworker

- Mid-term (20%) and Final (30%)
  - In class, closed book.
  - Format: True/False, reading research articles and data reports, analytical questions, research designs

- Class participation (10%)
  - Lecture attendance required
  - Quizzes in lecture based on reading assignments will count toward your grade
  - Answering questions on Piazza will be rewarded

Expectation

- Backgrounds diff; don't be afraid

- Growth mindset: work hard and learn as much a possible

- Ask questions whenever your want!

- Use Piazza for all non-personal questions such that other people can learn from the Q&A

- Interrupt me at any time!

Four Problem Sets

1. R refresher

2. Randomized Trials

3. Regressions and Matching

4. RD and Diff-in-Diffs

Academic Integrity

- We expect you to maintain the highest standards of academic integrity

- Students should familiarize themselves with UCSD regulations:
  https://academicintegrity.ucsd.edu/excel-integrity/define-cheating/index.html
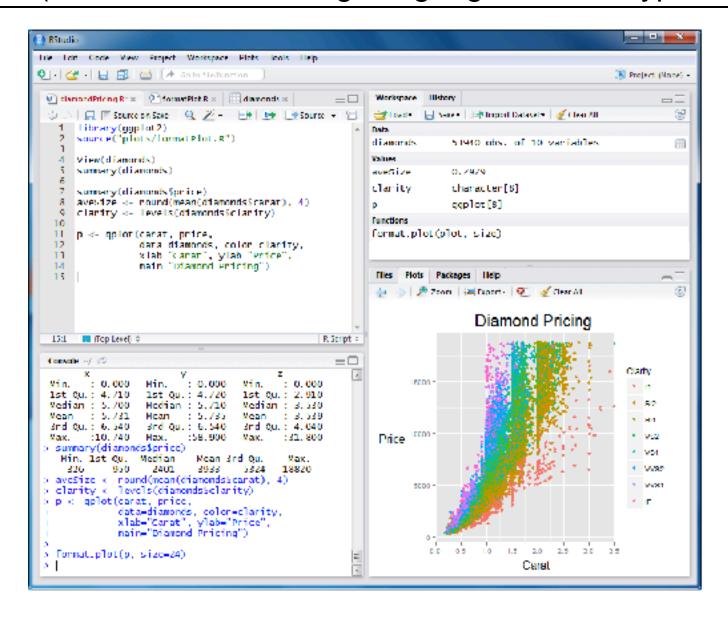
- Complete all academic assignments by yourself.
- Don't use any aids during an exam.
- Acknowledge and cite source material in your papers or assignments.
- Don't alter a graded exam and submit for regrade.
- Don't copy another student's assignment, in part or in total, and submit it as your own work.
- Don't purchase help or assignment completion from anyone (and no, buying it does not make it "yours")
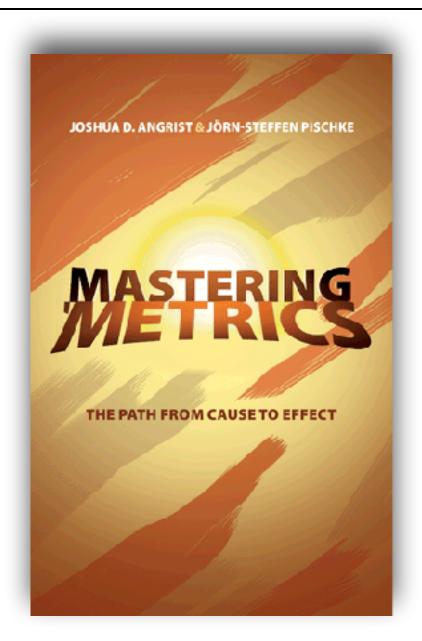- Don't copy your online quiz or assignment answers from the internet or from anyone.

- We use *R* throughout this course

  - Free, powerful, open

  - Useful skill for today's job market

- We recommend *RStudio*, one of the best GUIs of R

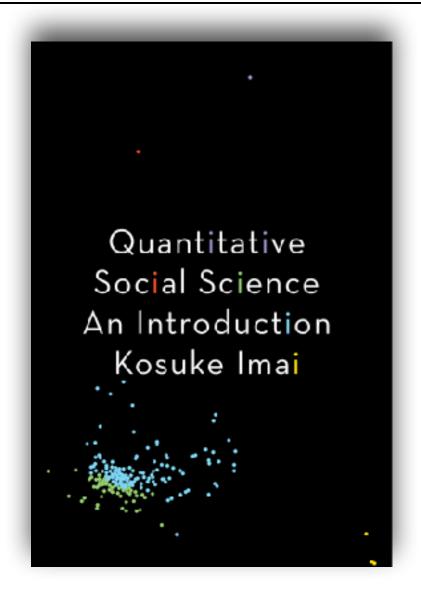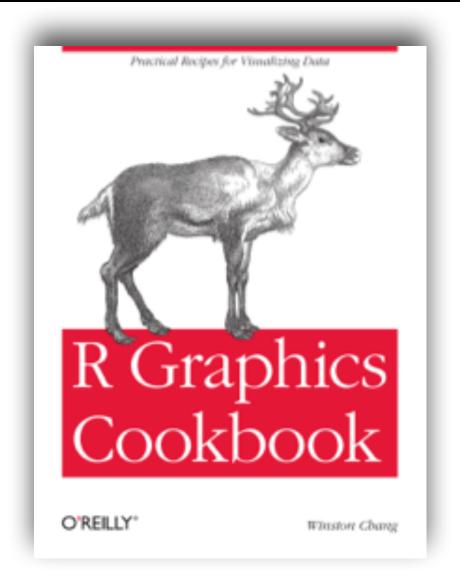# It's Cool! (well, to achieve that goal, google "hacker typer"…)

JOSHUA D. ANGRIST & JÖRN-STEFFEN PISCHKE

MASTERING 'METRICS

THE PATH FROM CAUSE TO EFFECT

R Programming
for Data Science

Roger D. Peng

Books (Optional)

Next Class: *R* Refresher