

# Political Analysis: Introduction and Research Design

Week 1

15 January, 2018

Prof. Andrew Eggers

# Our aims

- **Improve your ability to assess evidence on empirical questions.**
- **Give you the tools to do your own data analysis.**

# Assessing evidence on empirical questions

For example:

- Does first-past-the-post discourage political engagement compared to other electoral systems?
- Do majority-Islamic countries have worse human rights records, controlling for wealth and other factors?
- Does satellite technology help avoid interstate wars?
- Does decentralization of the political system change its political culture? (Prelims specimen exam paper)
- What causes party systems to change over time? (Prelims specimen exam paper)
- What explains the rise of populism in advanced democracies? (Prelims specimen exam paper)





# Assessing evidence better: exams and essays

*Explain the basis of empirical evidence you cite.*

“Evans and Tilley say X, but  
Fisher says Y”

“Evans and Tilley’s regression  
analysis of the British Election  
Study indicates X, but Fisher  
(using the same data) says Y once  
we properly control for age and  
education”

*Assess the empirical evidence you cite.*

“Evans and Tilley say X.”

“Evans and Tilley say X, but their analysis  
does not account for important  
factors ...”

“Evans and Tilley say X, but their analysis  
only indirectly addresses the question  
because ...”

“Evans and Tilley say X, and their analysis  
is particularly credible because ...”

# Assessing evidence better: the rest of your life



Department  
for International  
Development

How to Note  
March 2014

## Assessing the Strength of Evidence

### Contents

<b>Introduction.....</b>	<b>2</b>
Background: research and evidence in DFID .....	2
Why does the strength of evidence matter? .....	2
What is the purpose of this guidance note? .....	2
Scope and coverage of this Note .....	3
A note on terminology .....	3
Applying this guidance note.....	4
<b>Part I: Describing a single study .....</b>	<b>5</b>
Type of research.....	5

# Doing your own data analysis

**Then:** Data hard to get and (learn to) process; only specialists did data analysis



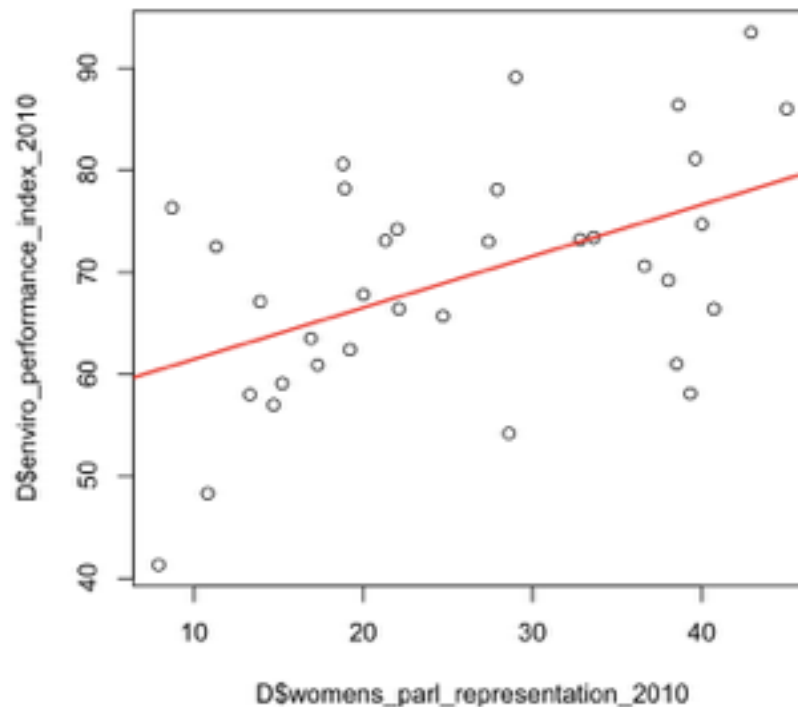
**Now:** Data easy to get and (learn to) process; everyone can do data analysis





# What you'll learn

```
# download the Lijphart dataset
D = read.csv("http://andy.egge.rs/data/L.csv")
# make a scatterplot
plot(D$womens_parl_representation_2010, D$enviro_performance_index_2010)
# add a regression line
abline(lm(D$enviro_performance_index_2010 ~ D$womens_parl_representation_2010),
col = "red", lwd = 2)
```



# Why should I learn to do my own data analysis?

- To better assess evidence
- To produce your own evidence: tutorial essay, research paper, dissertation, beyond
- To get a job, or do more interesting things at a job: “the intern who stopped making coffee”
- You may not know yet why!

# Political Analysis: a snapshot

## Lectures by week:

1. Introduction and Research Design (AE)
2. Concepts and Measurement (AR)
3. Descriptive Statistics and Visualization (AR)
4. Case Selection (RH)
5. Bivariate Relationships (AE)
6. Multivariate Relationships (AE)
7. Inference (AE)
8. Synthesis and Review (RH)

## Data labs by week:

2. R basics
4. Descriptive statistics
6. Regression analysis I
8. Regression analysis II

For the time & location of lab sessions, see email from PPE office.

## Lecturers:



Andrew  
Eggers



Andrea  
Ruggeri

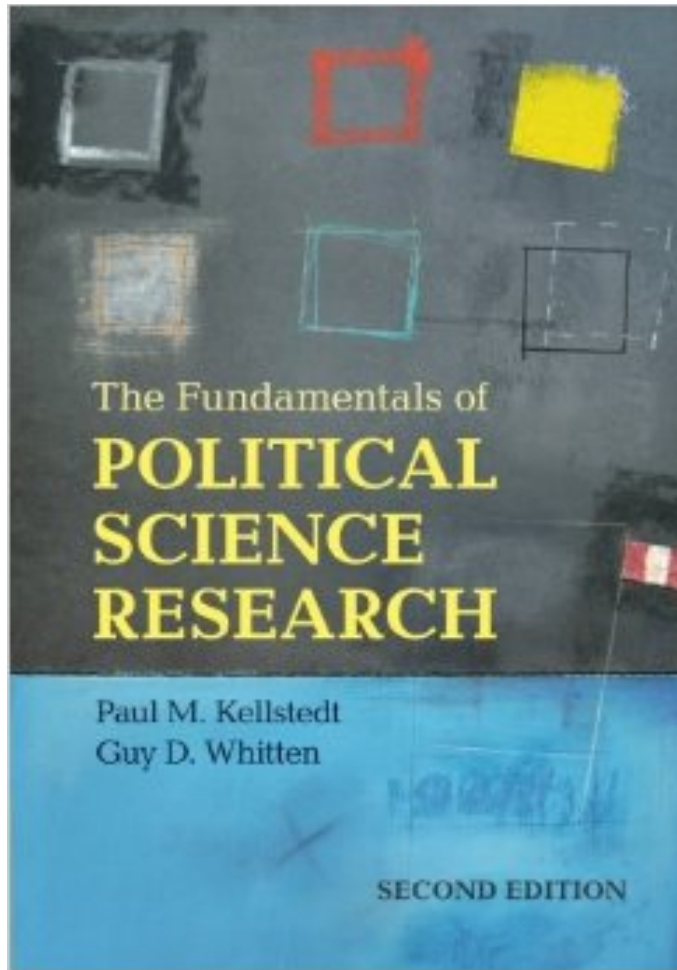


Robin  
Harding

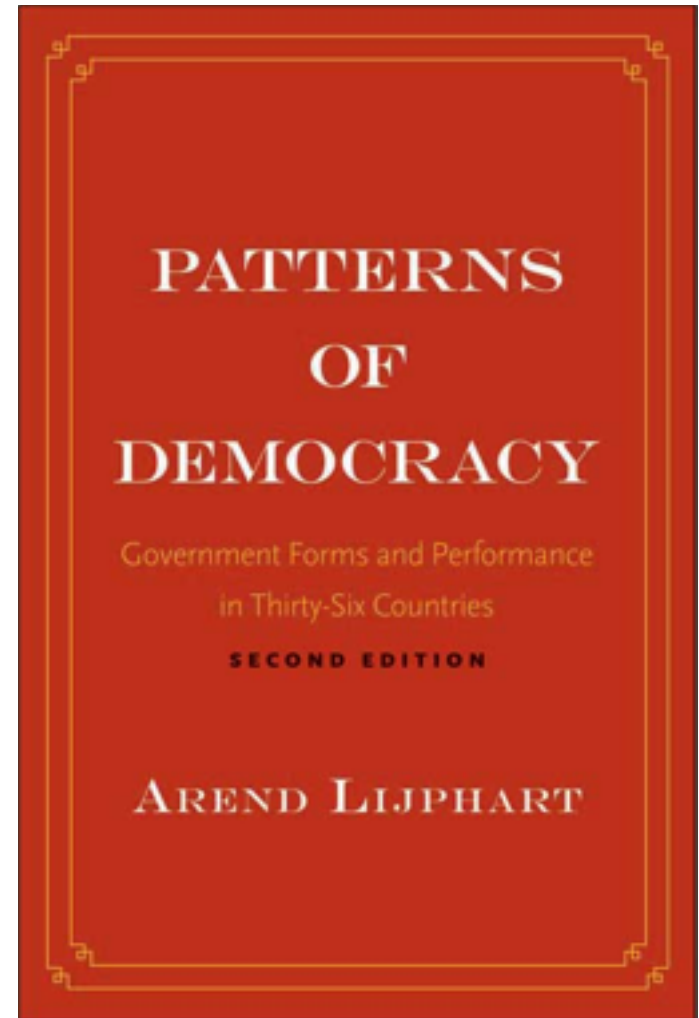
**Assessment:** 2000-word essay (on one of three questions related to Lijphart's claims about effects of consensus democracy) to be submitted by 12 noon Tuesday 1 May 2018

**You won't understand what you're doing in the labs or the essay assignment unless you attend the lectures and/or read the textbook.**

# Books in the course



Main concepts, techniques



Thematic context in which  
to apply those ideas

# Software in the course



The programming language we will use



The user interface we will use  
(the program you should download)



R logistic regression

r logistic regression

r logistic regression glm

r logistic regression tutorial

r logistic regression predict

About 6,740,000 results (0.80 seconds)

One way to get help when you're stuck

# A typology of research questions

## Descriptive questions:

- What proportion of UK citizens support leaving the EU?
- Do democracies have better human rights records than non-democracies?



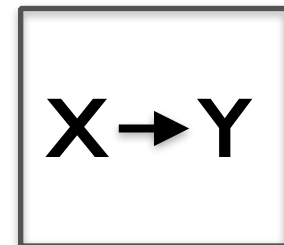
## Explanatory questions (reverse causal questions):

- Why do democracies seldom fight wars against each other?
- Why are incumbent legislators so likely to win re-election?
- What caused the French revolution?



## Forward causal questions:

- What is the effect of campaign spending on election outcomes?
- What is the effect of consensus democracy on political stability?





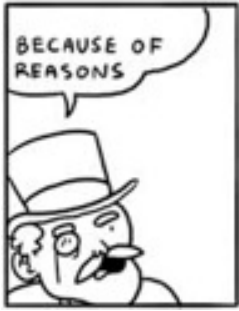
## Research design for descriptive questions

Consider this question: “Is respect for human rights higher in democracies than in non-democracies?”

### Requires

- defining concepts (democracy, respect for human rights), deciding on a procedure for measuring them (Week 2)
- communicating the resulting measures (Week 3) and their relationship (Week 5)





## Characteristics of reverse causal questions ("why" questions)

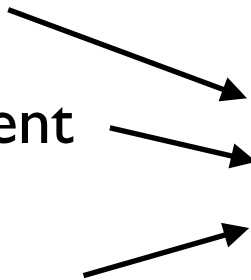
Some start from a single event and seek to explain why it happened.

### Potential causes

Bad harvests

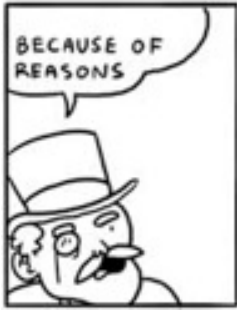
The Enlightenment

War debts



### An event: the French revolution





## Characteristics of reverse causal questions (“why” questions) (2)

Others start from a **pattern** and seek to explain why it holds.

### Potential explanations

Economic  
development

Education and values

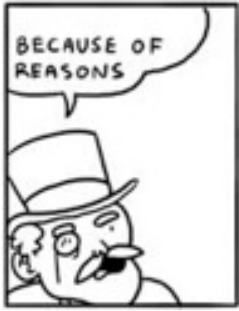
Popular sovereignty



### A pattern:

democracies tend not  
to fight one another

	country	exec_parties_1945_2010	exec_part
1	ARG	-0.93	-1.01
2	AUL	-0.73	-0.65
3	AUT	0.63	0.64
4	BAN	-1.58	-1.33
5	BAR	-1.28	-1.20
6	BEL	1.14	1.08
7	BOT	-1.43	-1.42
8	CAN	-1.08	-1.03
9	CR	-0.37	-0.38
10	DEW	1.31	1.25
11	FDN	1.58	1.48
12	FRA	-0.86	-0.89
13	GER	0.78	0.63
14	GRC	-0.64	-0.55
15	ICE	0.53	0.55
16	IND	0.65	0.63
17	IRG	0.17	0.28

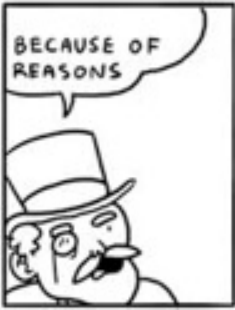


## How do we assess explanations?

A good explanation

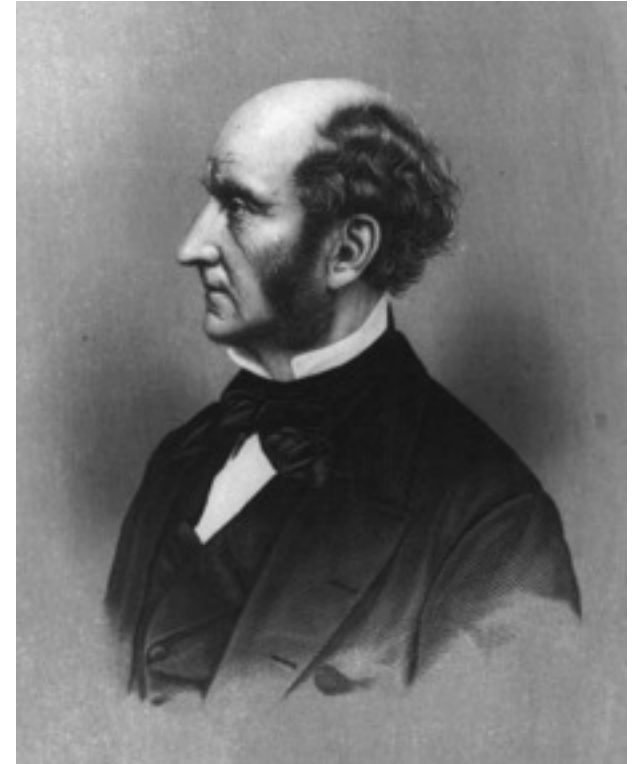
- is, or would have been, useful for prediction
- includes an account of **how** the causes produced the effects (mechanisms, or theory)
- converts a **puzzle** into a “matter of course” (Peirce, 1903) [inevitability]
- is “hard to vary” (Deutsch, 2011), i.e. doesn’t work if you alter elements of it

For more on answering explanatory questions, see Andrew Gelman and Guido Imbens, “Why ask why? Forward causal inference and reverse causal questions”, unpublished manuscript 2013.



# Mill and reverse causal questions

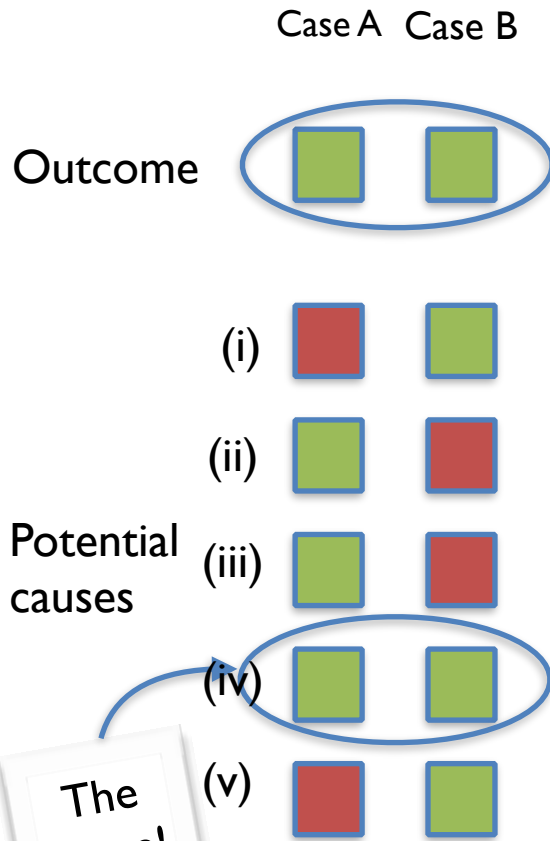
Mill's methods clarify why explanation in the social sciences is messy.



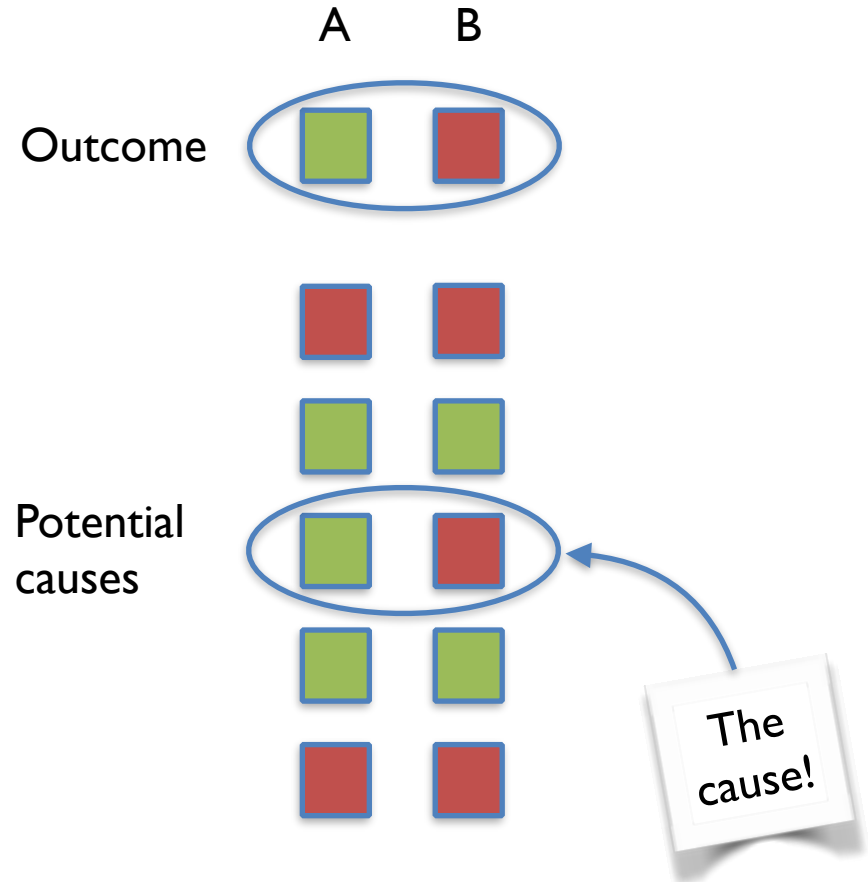
**John Stuart Mill**  
*A System of Logic* (1843)

Suppose all of the potential causes can be enumerated and accurately measured.  
Then these two methods will *in certain circumstances* tell us the cause of an outcome:

## Method of agreement



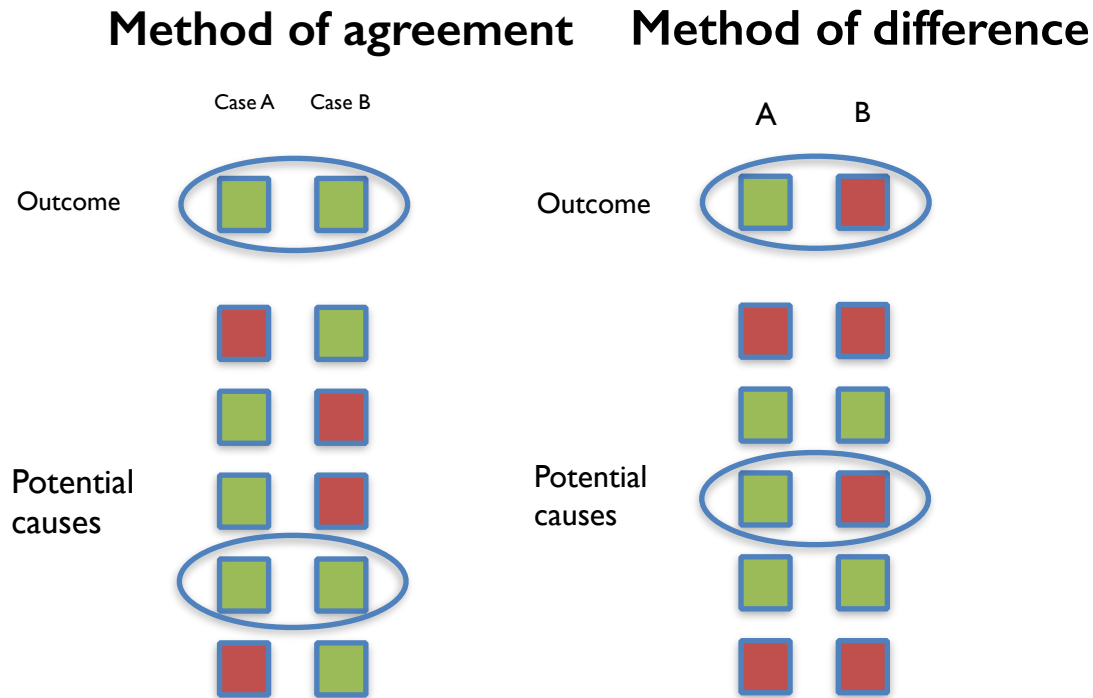
## Method of difference



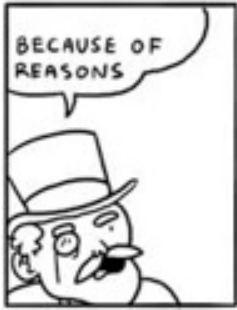
Reverse causal inference from just two cases!!!

# Problems with applying Mill's methods in social science research

- What if there is more than point of agreement or difference?
- How do you know if you have listed all of the potential causes?
- How do you judge agreement when factors are not binary?
- What if there is measurement error or randomness?
- What if two causes both need to be present?



“... in the sciences which deal with phenomena in which artificial experiments are impossible (as in the case of astronomy), or in which they have a very limited range (as in mental philosophy, social science, and even physiology), *induction from direct experience is practiced at a disadvantage in most cases equivalent to impracticability.*” (Mill, *A System of Logic*)

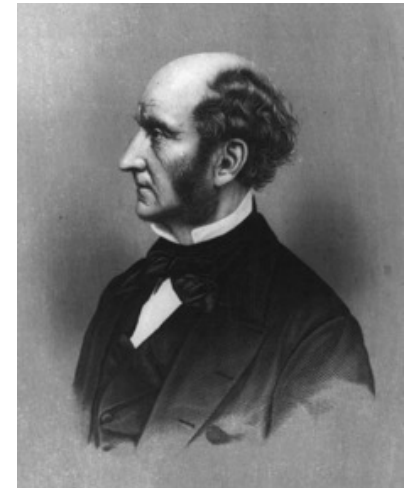


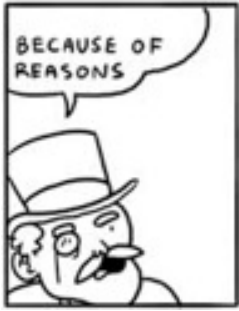
## Answering reverse causal questions in a messy world

There are important phenomena we don't know or can't observe.

=> Mill's methods can't be applied. (He knew that!)

Explanations in social science will be messy & contested.





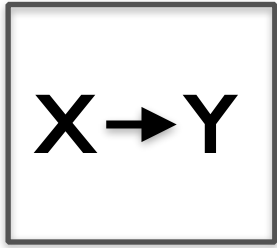
## Research design for reverse causal questions

Types of explanations:

- 1) **Theoretical:** “I offer a theory that shows how the observed pattern is actually not puzzling at all.”
- 2) **Empirical:** “I produce a new measure of [democracy, spending, public opinion] that shows how the observed pattern is not puzzling at all.”
- 3) **Combination of theoretical and empirical:** e.g. “Democracies do not fight each other considerably less than would be expected when you consider their wealth.”

In social science, there can be many “good” explanations for a phenomenon and no clear way to choose one.





Forward causal questions: What is the effect of X on Y?

We think in terms of **counterfactual scenarios**.

*what would  
have happened  
if I had taken the aspirin?  
(treatment)*

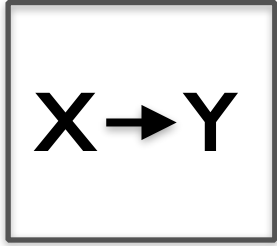
**vs**

*what would  
have happened  
if I had **not** taken the aspirin?  
(control)*



Fundamental problem of causal inference  
(Holland, 1986):

We only ever observe **one of these** for any particular individual.



## Fundamental problem of causal inference (1)

Consider these forward causal questions:

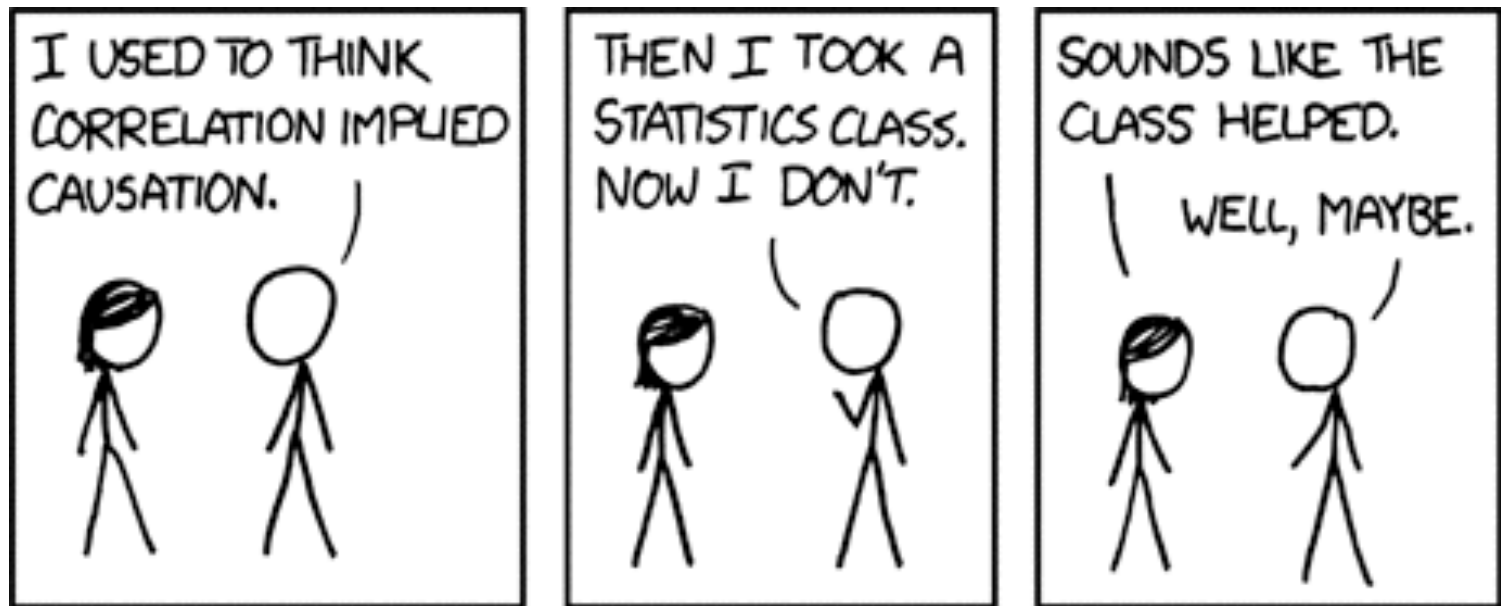
- Does aspirin relieve headaches?
- Does a job training program increase participants' income?
- Do door-to-door campaigns increase voter turnout?
- Does consensus democracy increase political stability?

(1) How does the **fundamental problem of causal inference** apply?

(2) Could we measure the effect with a “before-and-after” comparison?

$X \rightarrow Y$

## Fundamental problem of causal inference (2)

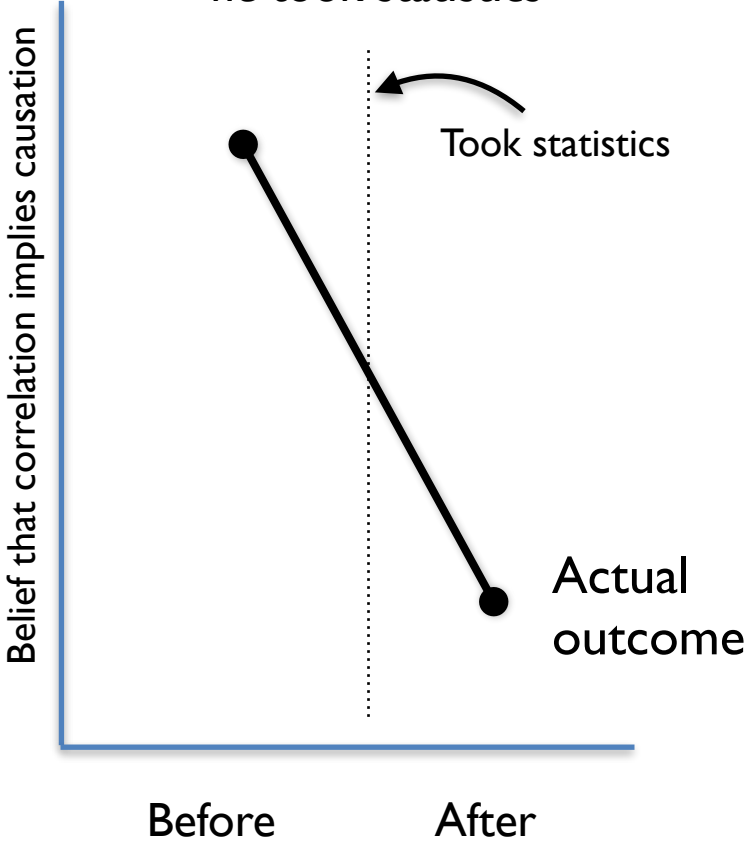


<http://xkcd.com/552/>

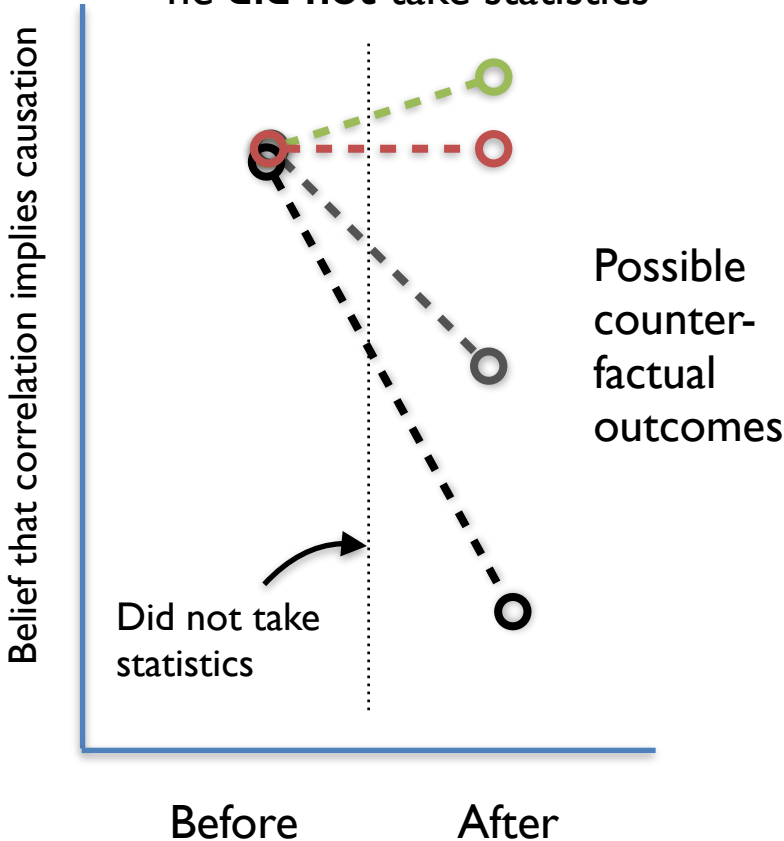
$$X \rightarrow Y$$

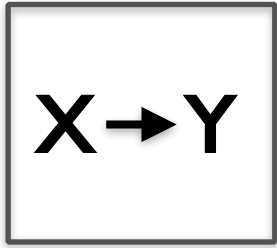
# The problem with the before-and-after design

What we observe:  
outcomes before and after  
he took statistics



What we **don't** observe:  
outcomes after  
he **did not** take statistics





But sometimes the “before-and-after” design is convincing!

When I flipped the light switch, the light turned on.

George W Bush approval rate before 9/11 57%; after 88%.

Why is it convincing in these cases?

Approval rating of U.S. President, from Kellstedt and Whitten p. 28)

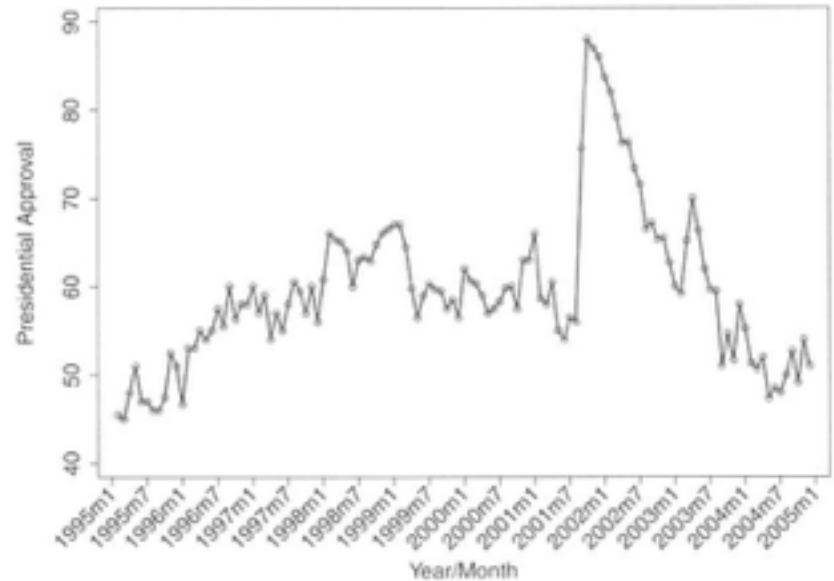


Figure 2.1. Presidential approval, 1995–2005.

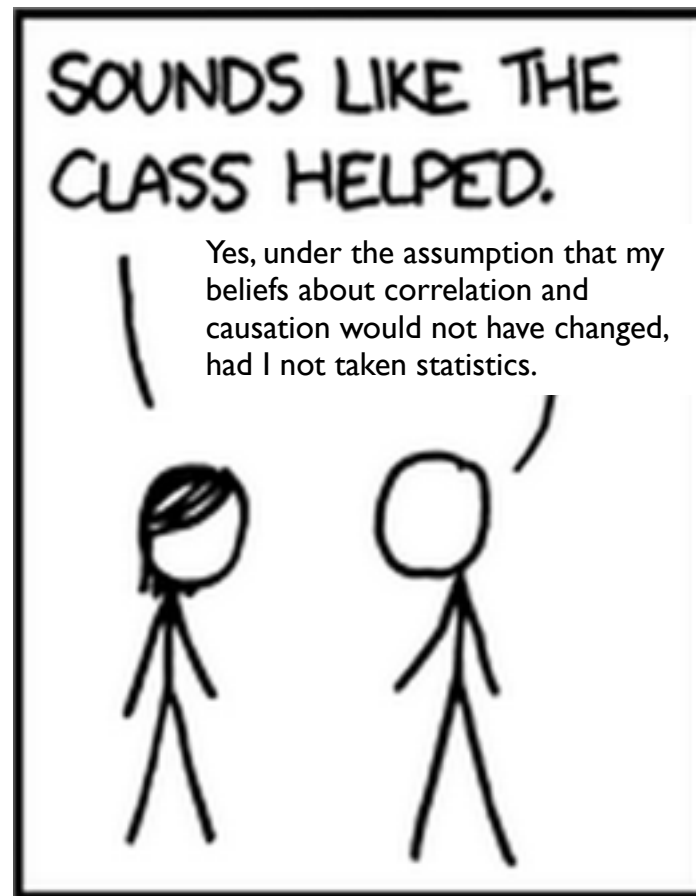
$$X \rightarrow Y$$

# Dealing with the fundamental problem of causal inference

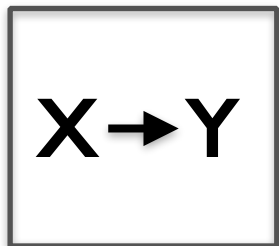
We make comparisons among outcomes we do observe

and

we clearly state the assumptions under which our comparisons will give the right answer.



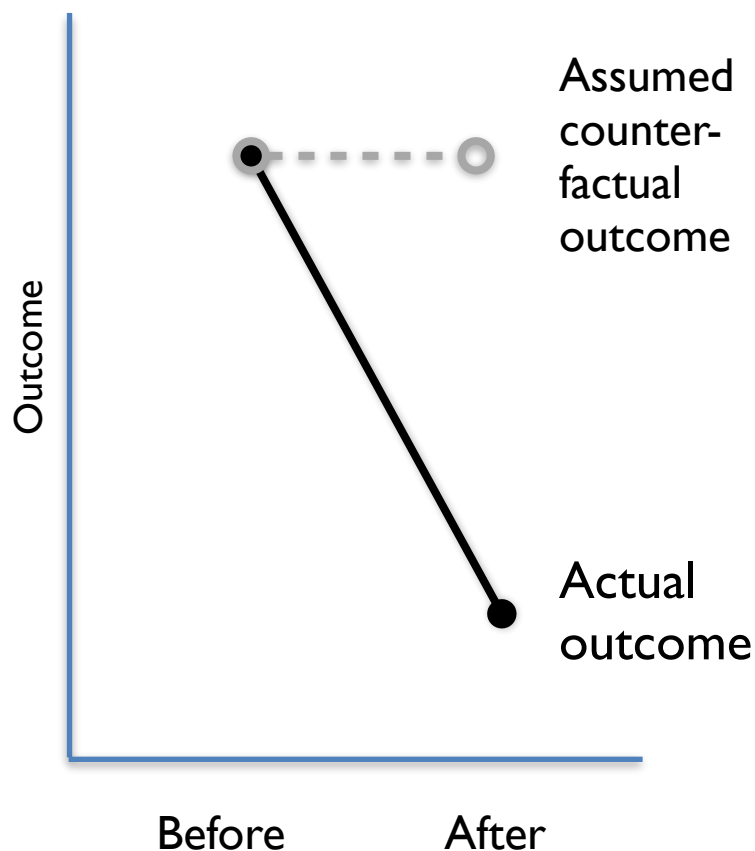
<http://xkcd.com/552/>



# What makes the “before-and-after” plausible

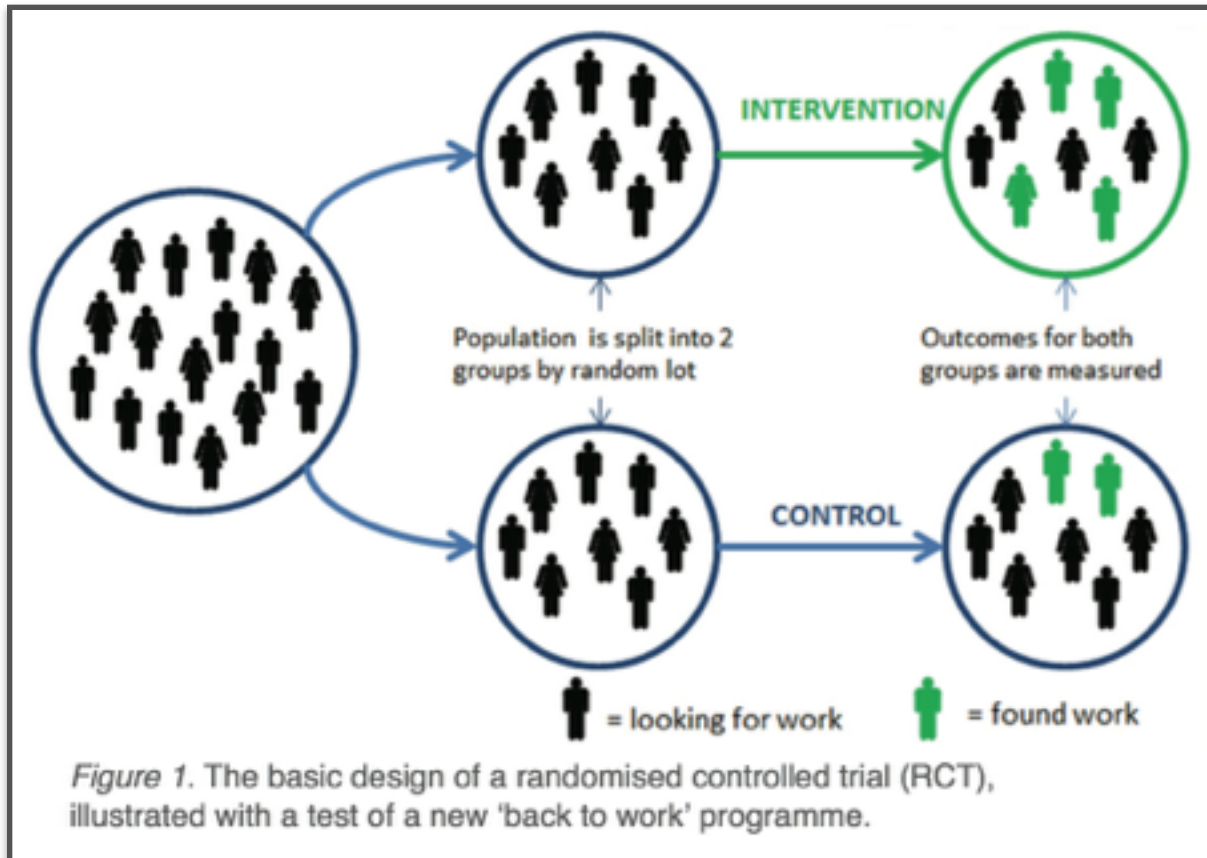
**Comparison:** Same unit(s), before and after an intervention.

**Key assumption:** No change in outcome if treatment not applied.



$X \rightarrow Y$

# The gold standard: randomized control trial (RCT)

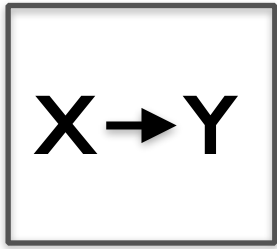


How would you use an RCT to study

- the effect of aspirin on headaches
- the effect of a job training program on income
- the effect of door-to-door campaigns on voter turnout
- the effect of consensus democracy on political stability

What is the key assumption under which correlation implies causation?





# The most common design: regression analysis

## Comparison:

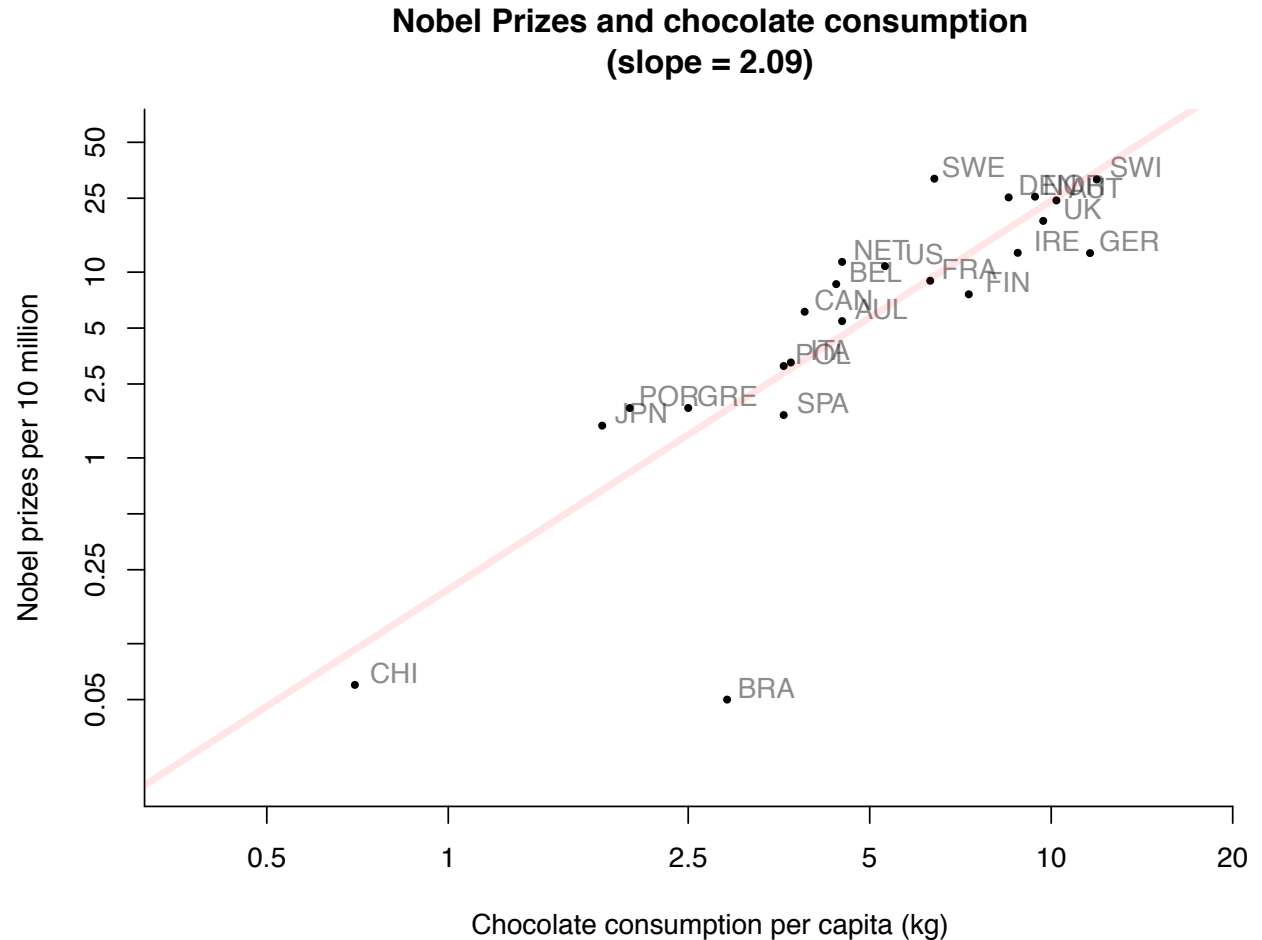
Different units at the same point in time, possibly controlling for other variables.

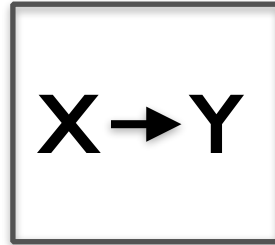
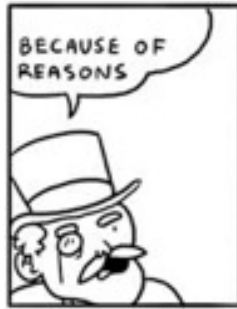
(see Week 6)

## Key assumption:

*Confounding variables* (a.k.a. *selection bias*)

are properly accounted for.

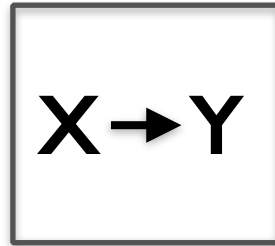




# Implications (I)

Every time you read an article/book in Politics (IR, Economics), ask what kind of research question is being asked:

- Descriptive (what is X? what is relationship between X and Y?)
- Explanatory/reverse causal (what explains/caused Y?)
- Forward causal (what is the effect of X?)



## Implications (2)

For research addressing **explanatory** questions:

- keep in mind the fundamental messiness, and where it comes from
- note the kind of explanation (theoretical, empirical, both) being offered

For research addressing **forward causal** questions:

- ask what RCT one could hypothetically run
- note the kind of design actually used (RCT, before-and-after, regression analysis, etc), the assumptions under which correlation implies causation in this design, and ask whether these assumptions are met



## John Stuart Mill says: social science is hard!

“Nothing can be more ludicrous than the sort of parodies on experimental reasoning which one is accustomed to meet with, not in popular discussion only, but in grave treatises, when the affairs of nations are the theme. . . . ‘How can such or such causes have contributed to the prosperity of one country, when another has prospered without them?’ Whoever makes use of an argument of this kind, not intending to deceive, should be sent back to learn the elements of some one of the more easy physical sciences.”