Measurement and Causality in Social Science

(or, “Social Science: what is it, and why does it suck?”)

Understanding Political Numbers

Feb 4, 2019

International Relations Diversity Initiative

If you are…

- A person of color
- Junior or Senior
- U.S. citizen
- *Curious about* graduate school in international relations or comparative politics

Friday, April 12, all-day event on graduate school, advice for applying, resources available for students of color, current research in our department…

If interested

- By Friday send me one paragraph explaining your scholarly interests, curiosities about graduate school, level of familiarity with graduate school
- By Friday meet with me to discuss these things

Agenda

Short Essay 1

Technical lesson: DAGs

Thinking about social science

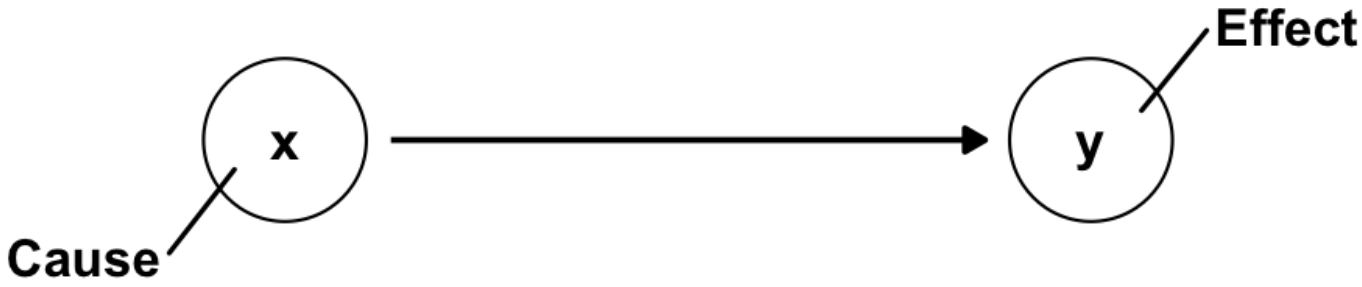
Measurement

Causality

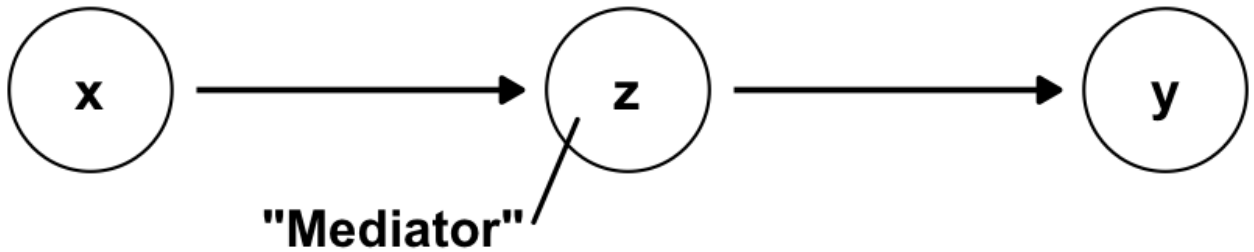
Short Essay 1

Technical Lesson

Directed Acyclic Graphs (DAGs)



They're good DAGs, Brent



Social Science

How it works

Method, method, method

Complexity? "Art, not science?"

Challenges of social science

Ethical problem of studying people

Measurement

Causality

Measurement

"Levels of Measurement"

Categorical measures

- Nominal measures: *unordered* classification
- Ordinal measures: *ordered* classification

Quantitative measures

- Interval measures: *fixed-interval* scales and indices
- Ratio measures: *true-zero* counts, proportions,

Measurement Concerns

Observability

Issues with self-reporting

Validity

Reliability

Measurement Concerns

Observability

Issues with self-reporting

Validity

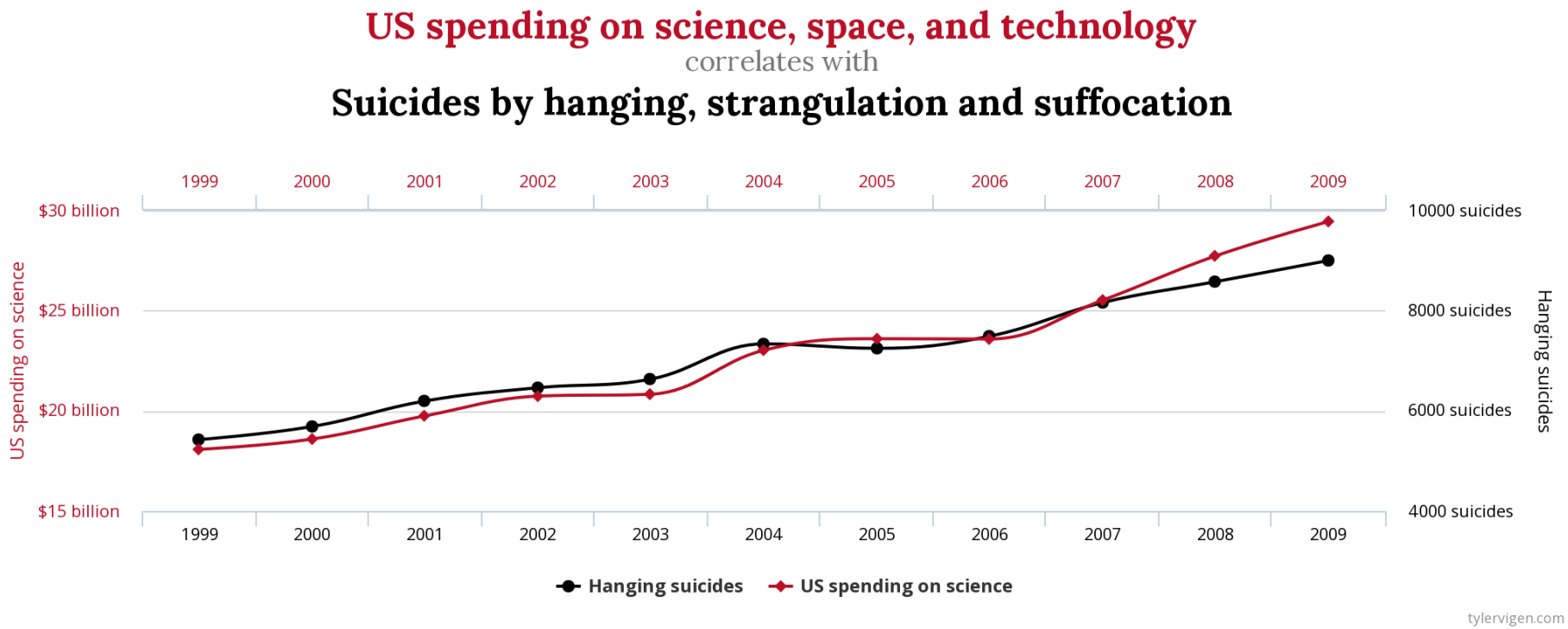
Reliability

A "heuristic model" for thinking about measurement:

$$Observed = Truth + Bias + Error$$

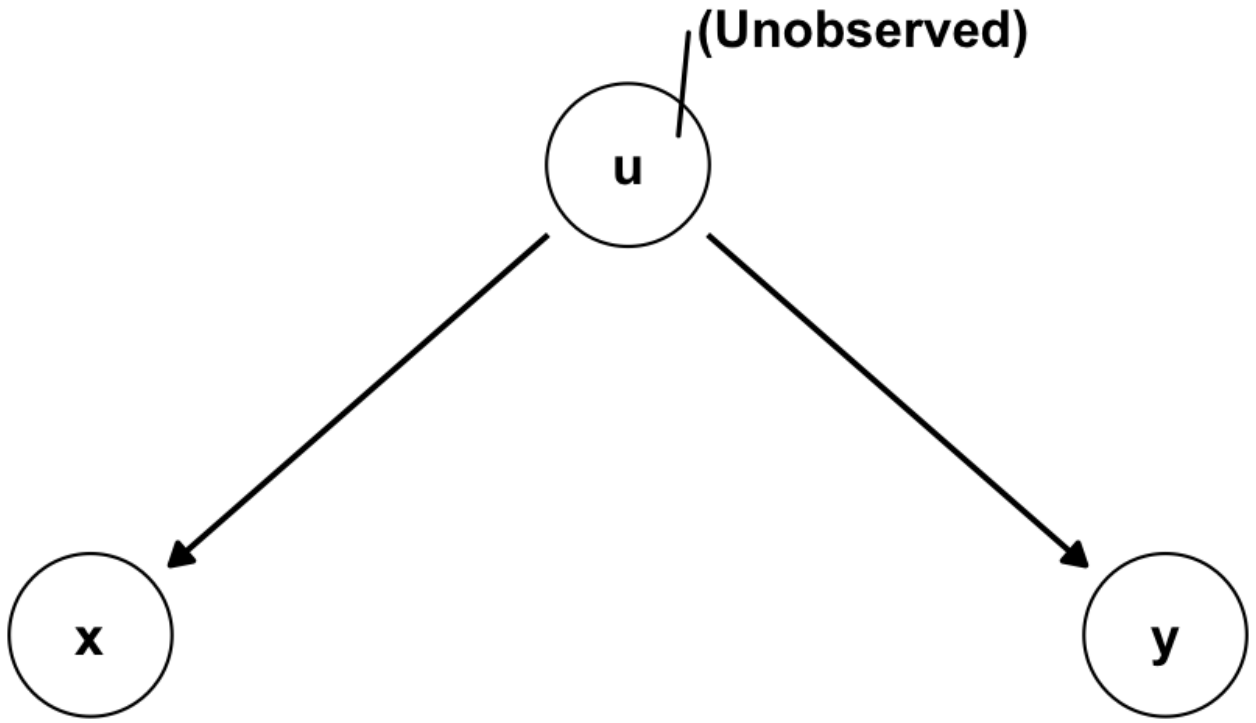
Causality (and its detractors)

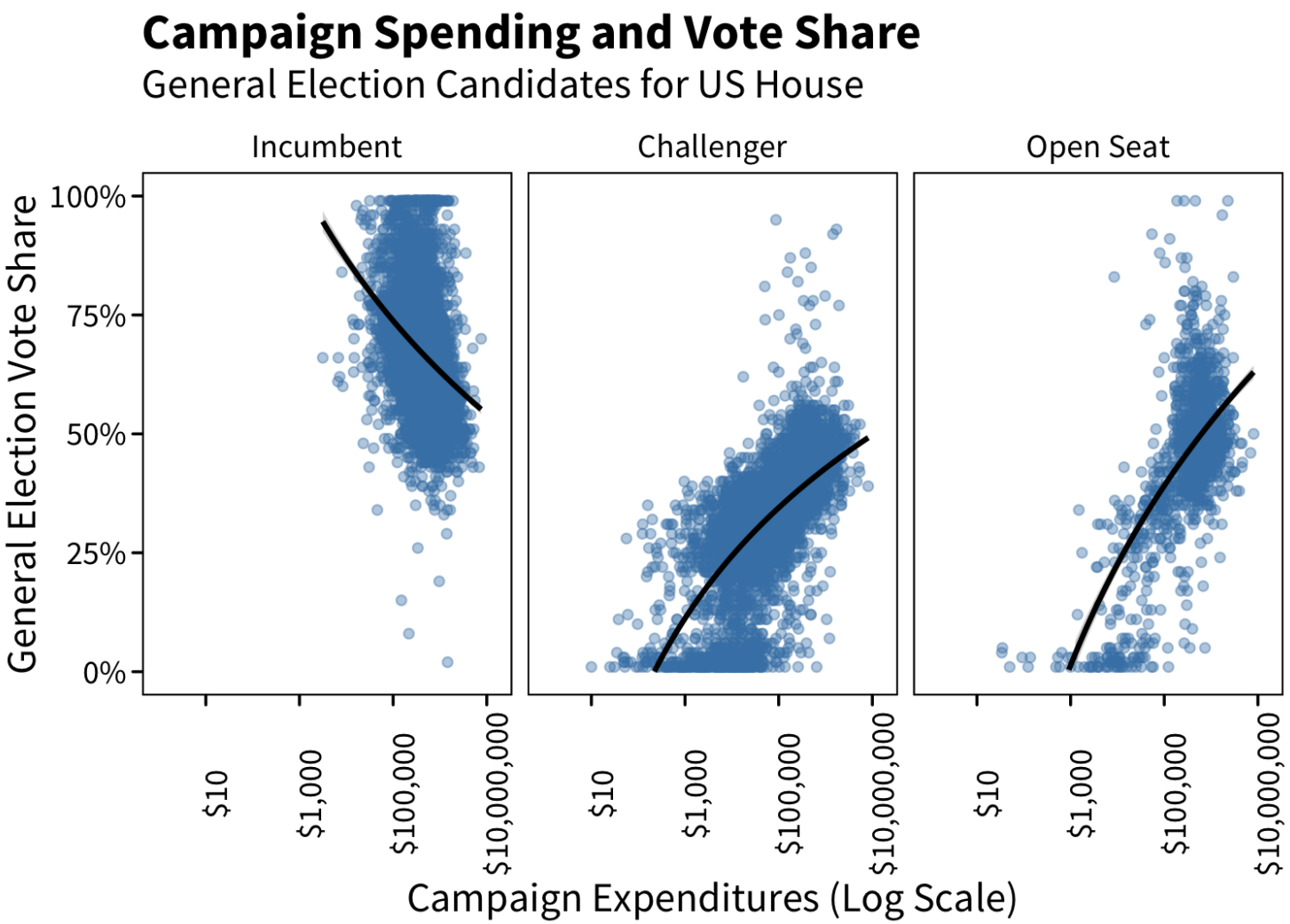
"Spurious" Correlation



http://tylervigen.com/spurious-correlations

Spurious correlation between X and Y




Campaign Spending and Vote Share
General Election Candidates for US House
Incumbent
Challenger
Open Seat
General Election Vote Share
100%
75%
50%
25%
0%
$10
$1,000
$100,000
$10,000,000
Campaign Expenditures (Log Scale)

Causality

> *Data can tell you that the people who took a medicine recovered faster than those who did not take it, but they can't tell you why. Maybe those who took the medicine did so because they could afford it and would have recovered just as fast without it.* — Judea Pearl, *The Book of Why*

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Counterfactuals

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Counterfactuals

All-else constant (i.e. "controlling for" other variables)

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All-else constant (i.e. "controlling for" other variables)

Experiments

Generalizing

Do our findings *generalize* beyond the study?

Looking ahead

Office hours: 2:30--4:30

On Wednesday: Unpacking data

In Section: R lessons!

Next week: graphics!

Check emails for: online schedule, syllabus, Datacamp