

POLS201 Spring 2019

More Measurement and the Ecological Fallacy

February 13

Before we Begin (Feb 13)

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- We will discuss theories and hypotheses Friday
 - Anonymous peer review with questions
- Early next week: Research Design A Building Assignment
- Be sure you read the three news articles and...
- Hand in your lab from Friday before I forget to ask.

Simpson's Paradox Video

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- <https://www.youtube.com/watch?v=ebEkn-BiW5k>

Recall The Bradley Effect

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- Observed discrepancies between voter opinions polls and election outcomes
- Bradley was predicted to win and results diverged dramatically from polls
- Douglas Wilder in Virginia saw the same trend
- Was latent racism an omitted variable, correlated with the IV?

A Second Example: Reading Curriculum Bias

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- We deploy a new reading curriculum more likely to be implemented in schools with large white student populations.
 - We observe a standardized test scores.
- A cultural bias in this particular standardized test systematically results in lower scores for minority students.
 - Why is this measurement problem a problem?

How do we know these things are problems?

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- Because the measurement error is correlated with the treatment.
- Intuitively: the effect of the treatment picks up something the measurement error.
- Are they false negatives or false positives?

Another big risk: measurement error of confounds

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- When we see a confound, we try to control for it.
- But measurement error of the confounds can be problematic

A critical reminder fromn the endogeneity discussion

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- When ommitted variables are correlated with your independent variables, you have a big problem.
- Consider the Hormone Therapy article.
 - Do you recall the “compliance effect”
 - People who take drugs as ordered are “different”
 - That “difference” is correlated with the drug taking
 - How would an experiement fix this? Why are those fixes problematic?

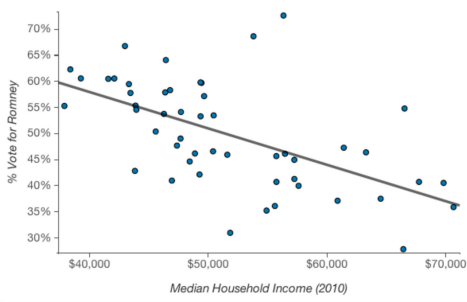
David Brooks wrote a brilliant book in 2001

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- *Bobos in Paradise* Presaged *Portlandia* by a decade
- He writes: *Like upscale areas everywhere. . . Montgomery County supported the [2000] Democratic ticket. . . by a margin of 63 percent to 34 percent.*
- So does wealth drive Democratic support?

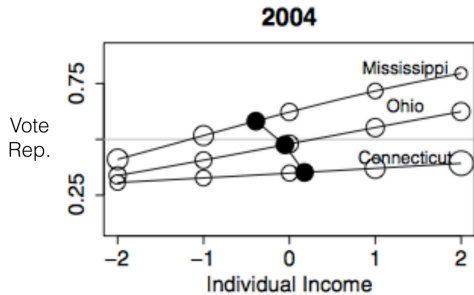
Unit of Analysis: States (2012)

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But wait... WHAT????

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The first graph does not show distributions

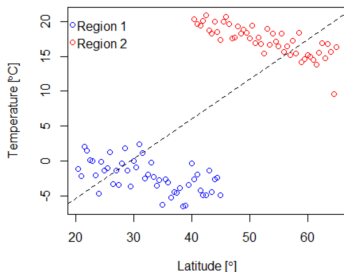
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- “In poor states, rich people are much more likely than poor people to vote for the Republican presidential candidate, but in rich states (such as Connecticut), income has almost no correlation with vote preference.” - Gelman(2009)

Wealthier individuals are still more likely to vote Republican

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- But the magnitude depends entirely on the state
- We have an example of the ecological fallacy
- “the association in the aggregate does not hold at the individual level.”
- Recall Simpson’s Paradox



Another Example

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- When comparing state-level data, Anti-Immigrant Attitudes INCREASE with the number of foreign-born population.
- So: does this mean that foreign born individuals are more likely to hold anti-immigration attitudes?
 - We still don't know. But we can reason that one does not follow from the other.

Moral: Be careful about your unit of analysis

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- If your hypothesis makes a claim about individuals, then compare individuals
- In general: choose a unit of analysis that matches your independent variable

External Validity and the Reproducibility Crisis

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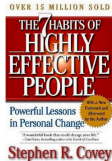
- External validity: the extent to which the results of a study can be generalized to other situations/people.
- Famously: experiments get high marks for internal validity, and low marks for external validity.
 - An exception: field experiments

We Discussed Selecting on the Dependent Variable

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- A natural mistake, to wit:

Sample Selection Bias



- How do we know that ineffective people don't have the same habits?

Best Illustration of External Validity Threat?

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- Sample selection bias
- Consider this example: Education \Rightarrow Income
- IV: Education Level
- DV: Income using IRS data
- How does this show “selecting on the dependent variable?”

Notice the Distinction between..

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- Selection Bias
 - Failure to assign treatment randomly
 - Random *Assignment* in KW
 - A problem for internal validity
- Sample Selection Bias
 - Failure to randomly select cases for study
 - Random *Sampling* in KW
 - A problem for external validity

Look for Natural Experiments

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- Sometimes mother nature cooperates and assigns randomly
 - or at least doesn't correlate on the IV
- Examples:
 - The famous NJ-PA minimum wage study.
 - The Fox News rollout
 - Vote by Mail rollout in CA
 - Weak but intriguing: the OR/WA tax regimes in Portland Metro

Why do experiments create ethical issues?

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- Suppose you ran a survey experiment in LC
- You create a hypothetical scenario and don't reveal it
 - Which would improve the quality of your experiment
- Suppose you deny HIV patients a potentially life saving drug
 - Which really did happen in the 1980's.