Introduction

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August 2022

Use of math in political science

Theory generating: Use Game Theory to model actors' interactions.

Prediction: Use computational model to predict political behaviors.

Hypothesis testing: Use econometrics to estimate treatment effects of the variables of interests.

Qualitative inference: Use set theory to make inference.

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Example 1: An experiment on media bias

Kao, J. C. (2020). How the Pro-Beijing Media Influences Voters: Evidence from a Field Experiment.

Kao (2020)

Research question: Whether exposure to biased media changes voting behavior?

Subjects: 600 Taiwan voters.

Treated group: Political news from Pro-China Media.

Control group: Nothing.

Placebo group: Sport or entertainment news from Pro-China media.

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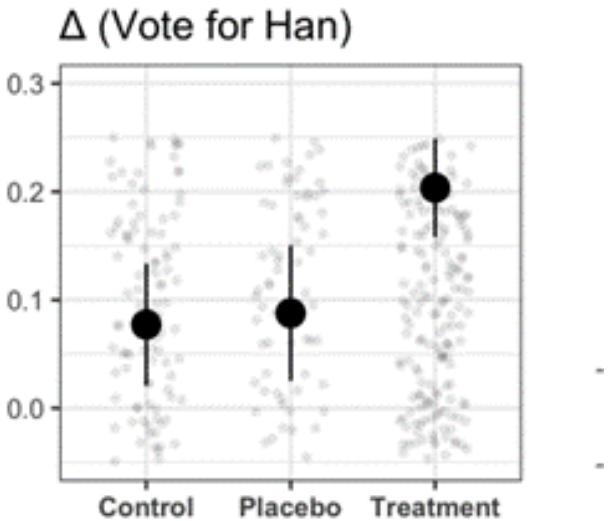
Experiment Result

Across the study's time-span, participants' intention to vote for the pro-China candidate increased by

- 8% for the control group;
- 10% for the placebo group;
- 20% for the treated group.



Kao 2020

But: how can we know that the difference is "significant" ?
Could it be caused only by chance?
How confident we can say that the difference is "caused" by the treatment?

Example 2: Democratic Survival and Development

Question: Are richer democracies more likely to survive?

	Democracy	Rich Democracy (>=$15,000 in ppp)	Poor Democracy ($= \$15,000 in ppp$)
2000	99	41	58
Still Democracy in 2020	84	40	44
Survival rate	85%	97.5%	76%

Questions

Is the difference significant only caused by chance?

No difference between treated group and control group but treatment status in Kao's experiment. But levels of development are not distributed randomly to countries.

Poor countries are also more likely to

- a. Be more ethnic diverse;
- b. Have presidential system rather than parliamentary system;
- c. Have less experience of being democratic.

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Example 2

Do levels of development per se lead to democratic survival?

Or other factors correlated with development cause democratic survival?

Statistical inference (econometrics) can help us!

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