

FLS 6441 - Methods III: Explanation and Causation

Week 5 - Natural Experiments

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Classification of Research Designs

	Independence of Treatment Assignment?	Researcher Controls Treatment Assignment?
Controlled Ex- periments	✓	✓
Natural Experi- ments	✓	
Observational Studies		

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		Independence of Treatment Assignment	Researcher Controls Treatment Assignment?
Controlled Experiments	Field Experiments	✓	✓
	Survey and Lab Experiments	✓	✓
Natural Experiments	Natural Experiments	✓	
	Instrumental Variables	✓	
	Discontinuities	✓	
Observational Studies	Difference-in-Differences		
	Controlling for Confounding		
	Matching		
	Comparative Cases and Process Tracing		

Section 1

Natural Experiments

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- ▶ We don't get to choose the population and sample

Natural Experiments

- ▶ Natural Experiments can be:
 1. **Randomized** - Treatment assignment a genuine 'experiment', just not run by the researcher
 2. **As-if Randomized** - Treatment assignment not randomized but unlikely to be linked to potential outcomes
- ▶ In both cases treatment assignment is *independent of potential outcomes*
 - ▶ More precisely, at least a *part* of treatment assignment is independent of potential outcomes

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 - ▶ Identify risks of reverse causation, omitted variables, (Self-)selection

Verifying Randomization

- ▶ How does John Snow argue that households' assignment to water company is as-if random (p.13-14 of Dunning 2012)?

Section 2

Randomized Natural Experiments

Ferraz and Finan (2008)

- Do voters punish corrupt politicians?

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- ▶ Corruption is hard to manipulate (ethically)
- ▶ We can also look at voters' *information* about corruption

Ferraz and Finan (2008)

- ▶ **Population:** Brazilian municipalities with population less than 450,000
- ▶ **Sample:** 373 Municipalities with audits either side of 2004 elections and first-term mayors
- ▶ **Treatment:** CGU Audit before election
- ▶ **Control:** CGU Audit after election
- ▶ **Treatment Assignment Mechanism:** Randomized (Caixa)
- ▶ **Outcome:** Vote Share for the Incumbent in 2004 election

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- ▶ What about the timing of publication?
 - ▶ PMDB imbalance?

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► Methodology

$$\text{► } VS_{ms} = \alpha + \beta \text{Audited Early}_{ms} + X_{ms} + FE_s + \epsilon_{ms}$$

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- $VS_{ms} = \alpha + \beta \text{Audited Early}_{ms} + X_{ms} + FE_s + \epsilon_{ms}$
- Result: No Effect

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- ▶ We need treatment and control groups reflecting this

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- ▶ The *content* of the audit report information varies
- ▶ We need treatment and control groups reflecting this
- ▶ Ideally, we would also incorporate voters' *priors* about how corrupt candidates are vary, but they don't have data on that

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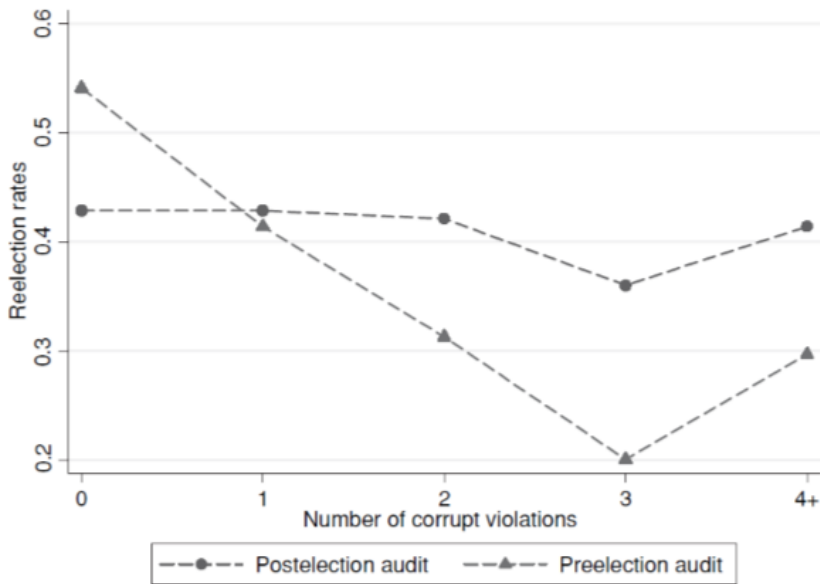
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- $VS_{ms} = \alpha + \beta \text{Audited Early}_{ms} + \beta_2 \text{Corruption}_{ms} + \beta_3 \text{Audited Early}_{ms} * \text{Corruption}_{ms} + X_{ms} + FE_s + \epsilon_{ms}$



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- ▶ Audits may also have changed competition within the elite
- ▶ Or campaign strategies - maybe parties ran 'cleaner' candidates before they knew the outcome of the audit report

Section 3

Non-Randomized Natural Experiments

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- How can we achieve causal inference without randomization?

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- ▶ Can we find real-world treatment assignments that ignored potential outcomes?
 - ▶ "As good as random", "As-if random"

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 - ▶ But we cannot test this
 - ▶ We have to rely on qualitative evidence of the treatment assignment mechanism

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- ▶ **Potential Outcomes:** Degree of political conflict between ethnic groups in larger/smaller countries
- ▶ **Treatment Assignment Mechanism:** African borders that cross ethnic group boundaries

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- ▶ Splitting the Chewa and Tumbuka groups



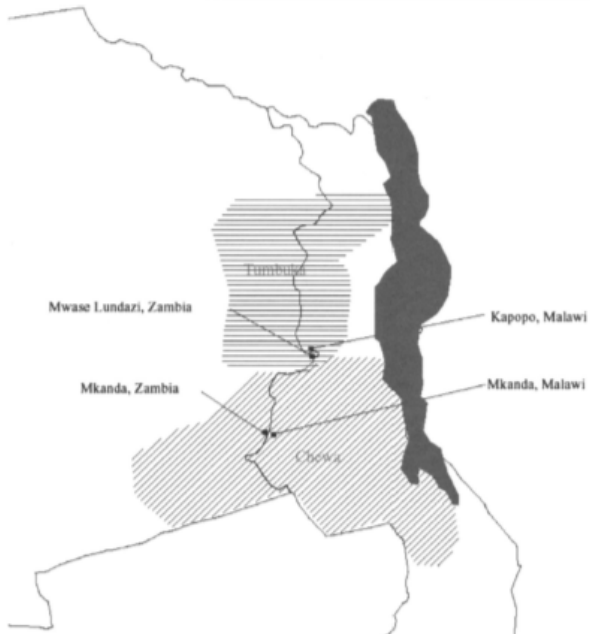
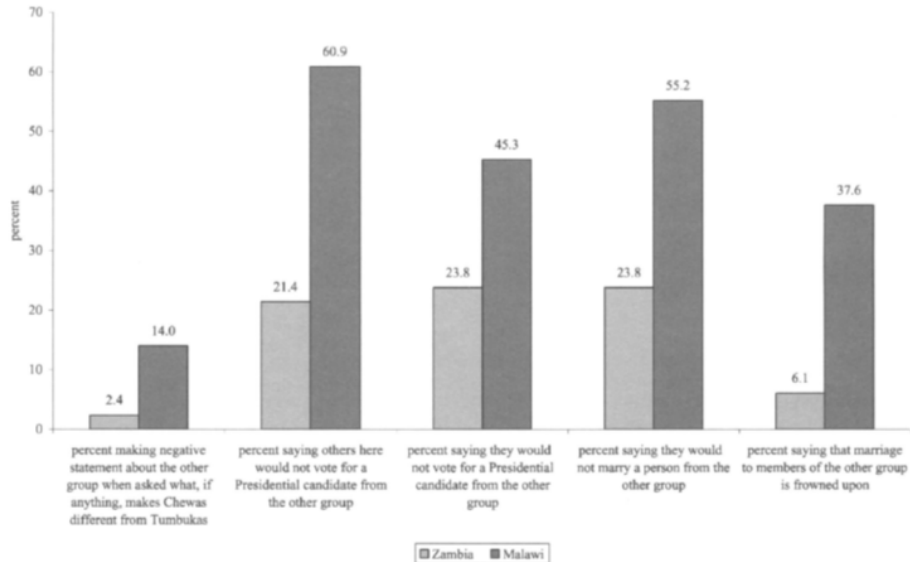
FIGURE 1. Research Sites

FIGURE 2. Chewa—Tumbuka Relations in Zambia and Malawi Compared



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- What is treatment here?

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- ▶ What is treatment here? Being in Zambia/Malawi
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- ▶ What is treatment here? Being in Zambia/Malawi
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- ▶ But lots of things are different about Zambia!
- ▶ Eg. Zambia is *much* richer than Malawi due to copper revenues - maybe politics doesn't need to be as conflictual

Section 4

The Problem of Not Controlling Treatment Assignment

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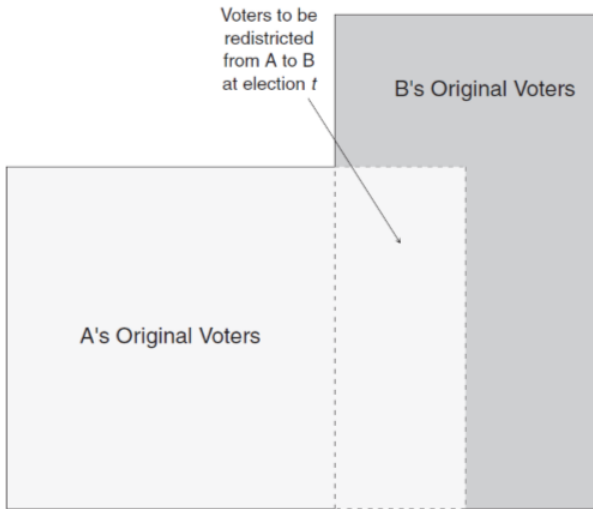
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 - ▶ We have to 'interpret' the treatment
 - ▶ Sometimes treatments are 'bundles'
 - ▶ Sometimes treatments are 'repeated', creating interactions or changing expectations



The Problem of Not Controlling Treatment Assignment

	A's Original Voters	Switched Voters	B's Original Voters
2000 election context		Same	Same
Duration of exposure to incumbent in district B		4 years	12 years
1996 and prior election context	Same	Same	

The Problem of Not Controlling Treatment Assignment

	A's Original Voters vs. Switched Voters	B's Original Voters vs. Switched Voters
Potential Outcomes Independent of Treatment Assignment?	Yes	No
What is 'Treatment'?	Different election context, different candidates	Difference in duration of exposure to incumbent