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 Experiments	✓	✓
Natural Experiments	✓	
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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  2. **Non-Randomized** - Treatment assignment NOT randomized but unlikely to be linked to potential outcomes - 'As-if' random
- In both cases treatment assignment is *independent of potential outcomes*
  - More precisely, *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)

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- We can also look at voters' *information* about corruption

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- **Outcome:** Vote Share for the Incumbent in 2004 election

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- What about the timing of publication?

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

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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
  - Ideally, we would also incorporate voters' *priors* about corruption, but they don't have data on that

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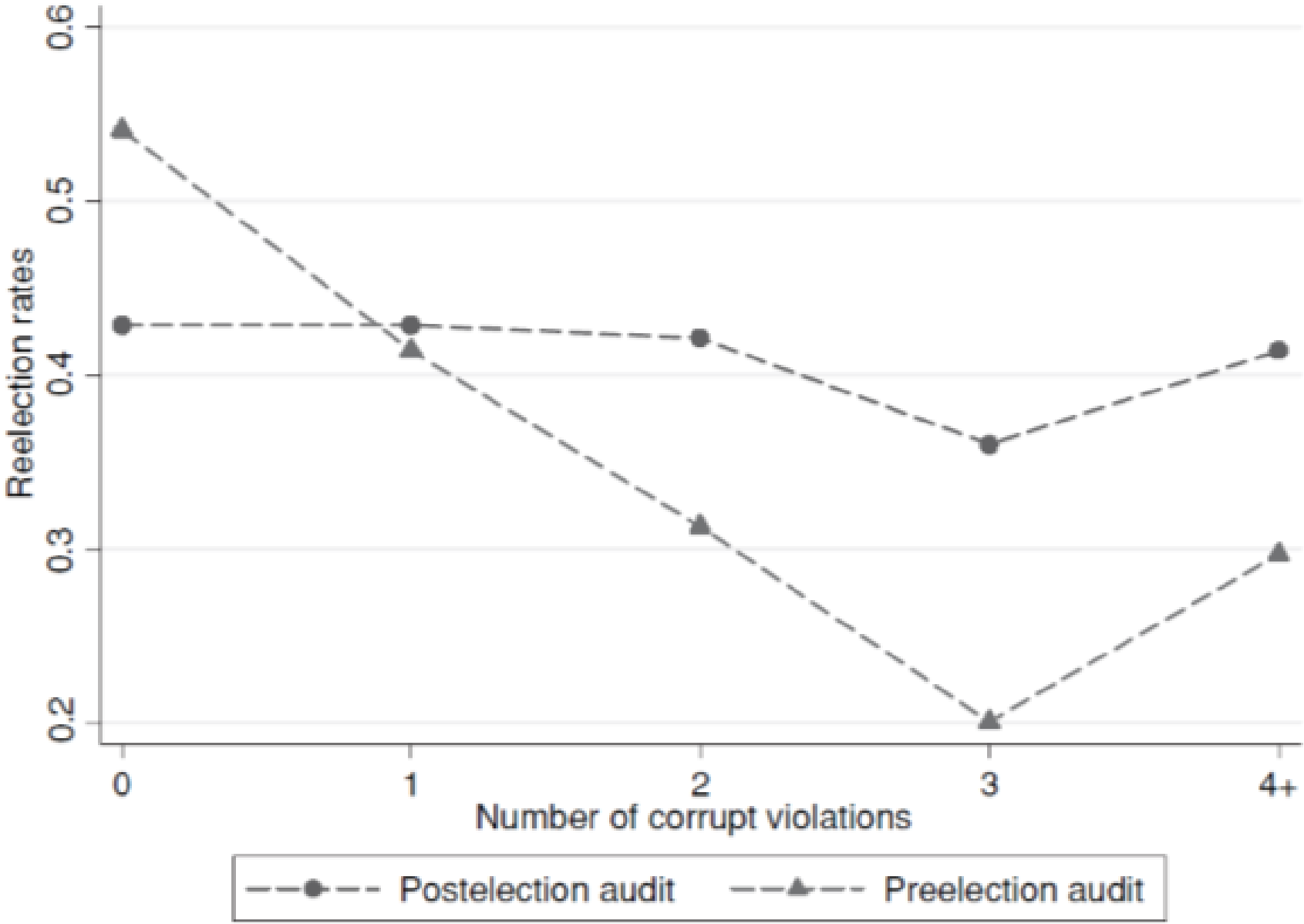
Reelection rates
0.2
0.3
0.4
0.5
0.6
0
1
2
3
4+
Number of corrupt violations
Postelection audit
Preelection audit

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  - So Ferraz and Finan test if the impact also depends on the presence of local radio

Section 3

Non-Randomized Natural Experiments

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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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  - We have to rely on qualitative evidence of the treatment assignment mechanism

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- **Treatment:** Smaller country (relative to size of ethnic group)
- **Control:** Larger country
- **Potential Outcomes:** Degree of political conflict between ethnic groups in smaller/larger countries
- **Treatment Assignment Mechanism:** African borders that cross ethnic group boundaries

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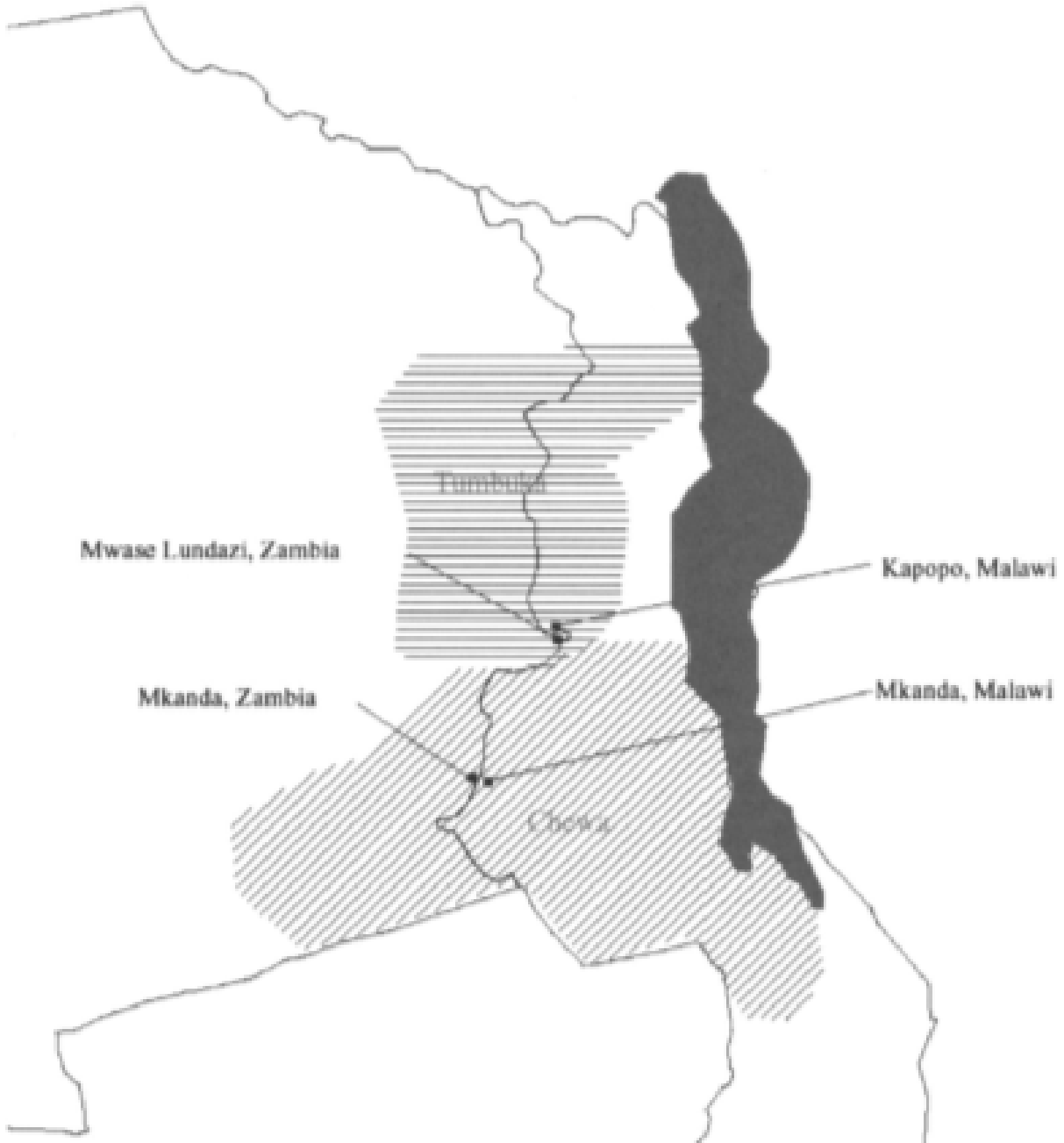
  - Zambia-Malawi border defined by geography: by the watershed of the hills
  - Splitting the Chewa and Tumbuka groups in half


AFRIQUE

FIGURE 1. Research Sites



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    - Same cultural practices within ethnic groups
    - Same perceived differences between ethnic groups

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- Despite similar cultural practices, *political relations* between the two groups are very different in Malawi:
  - They would not vote for a Presidential candidate from the other group
  - They would not inter-marry
  - Even controlling for age, gender etc.

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

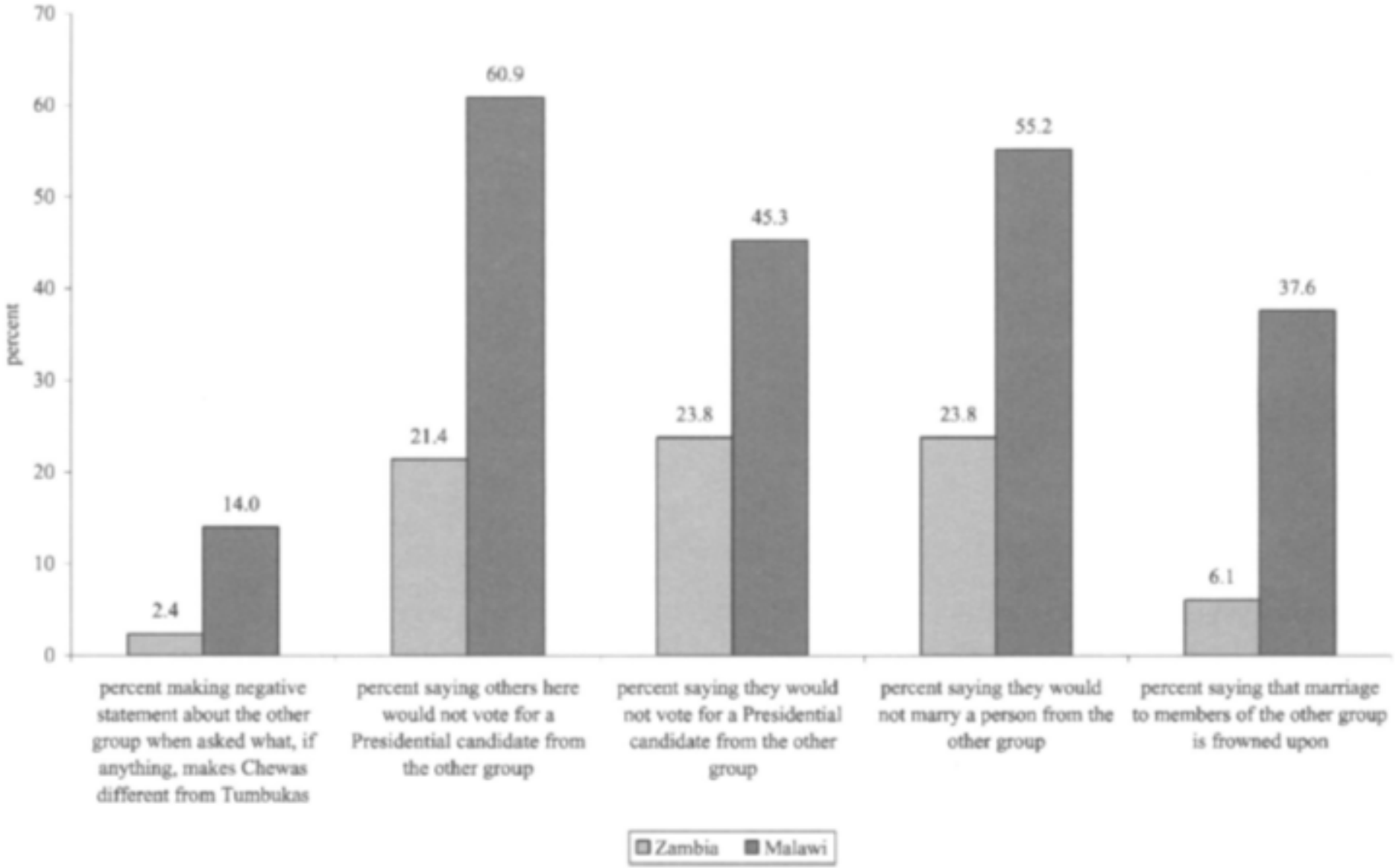

TABLE 1. The Determinants of Chewa—Tumbuka Relations

Dependent Variable	Country[a]	Tribe[b]	Gender[c]	Age	Number of Differences	Constant
Believes others in the area would not vote for a presidential candidate from the other group	1.98*** (0.370)	0.77* (0.360)	−0.60 (0.360)	0.31 (0.219)	0.07 (0.187)	−1.92*** (0.510)
Say *they* would not vote for a presidential candidate from the other group	1.16** (0.353)	0.91** (0.348)	−0.78* (0.349)	0.04 (0.208)	−0.07 (0.190)	−1.33*** (0.478)
Say they would not have married (have considered marrying) a member of the other group	1.89*** (0.410)	2.05*** (0.416)	−1.57*** (0.405)	0.16 (0.231)	0.07 (0.208)	−2.11*** (0.557)
Say that, in general, marriage to a person from the other group is frowned upon	2.43*** (0.533)	0.86* (0.428)	−0.91* (0.427)	0.37 (0.255)	−0.03 (0.238)	−3.24*** (0.718)

Note: Standard errors in parentheses. *N*s = 172, 175, 176, 172. * $p = .05$; ** $p = .01$; *** $p = .001$.
[a] Country coded 0 for Zambia, 1 for Malawi.
[b] Tribe coded 0 for Chewa, 1 for Tumbuka.
[c] Gender coded 0 for female, 1 for male.

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  - Eg. Zambia is *much* richer than Malawi due to copper revenues - maybe politics doesn't 'need' to be as conflictual
- The argument is internally consistent *for Malawi-Zambia*, but we don't know if it would generalize to other countries

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- What is Posner interested in? Large ethnic groups relative to country size
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- The argument is internally consistent *for Malawi-Zambia*, but we don't know if it would generalize to other countries
- So it is hard to test *the theory*

Section 4

Lack of Control

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  - Can we generalize from this case? Or is this an unusual case?
  - Natural experiments are **Opportunistic**

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- "Random assignment of the intervention is not sufficient to provide an unbiased estimate of the causal effect." (Sekhon and Titunik 2012)
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  1. **That the treatment is the factor we actually want to study**

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- Treatment and control groups are identified *after* randomization - it's our responsibility to make sure:
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     - We have to 'interpret' the treatment

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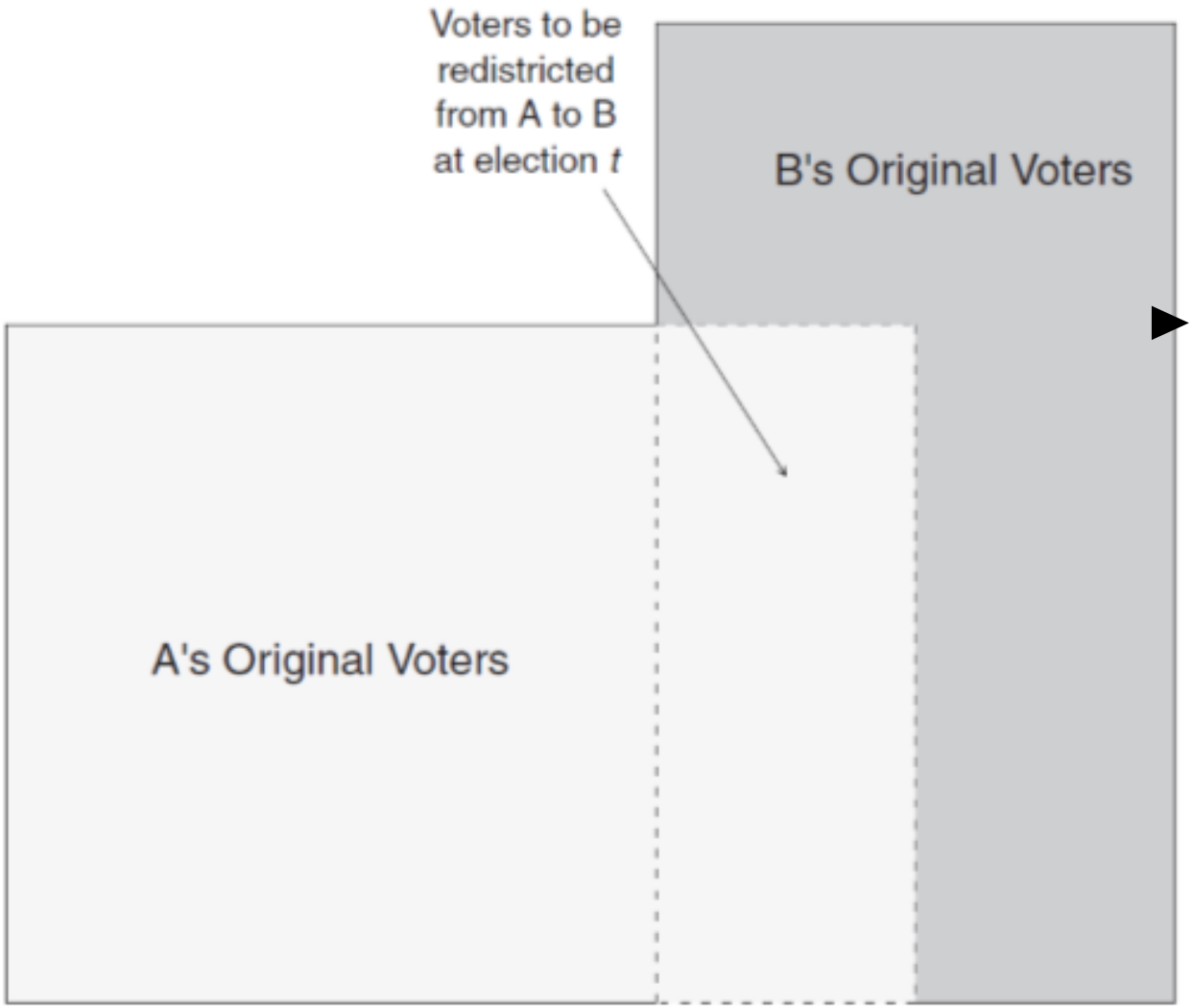
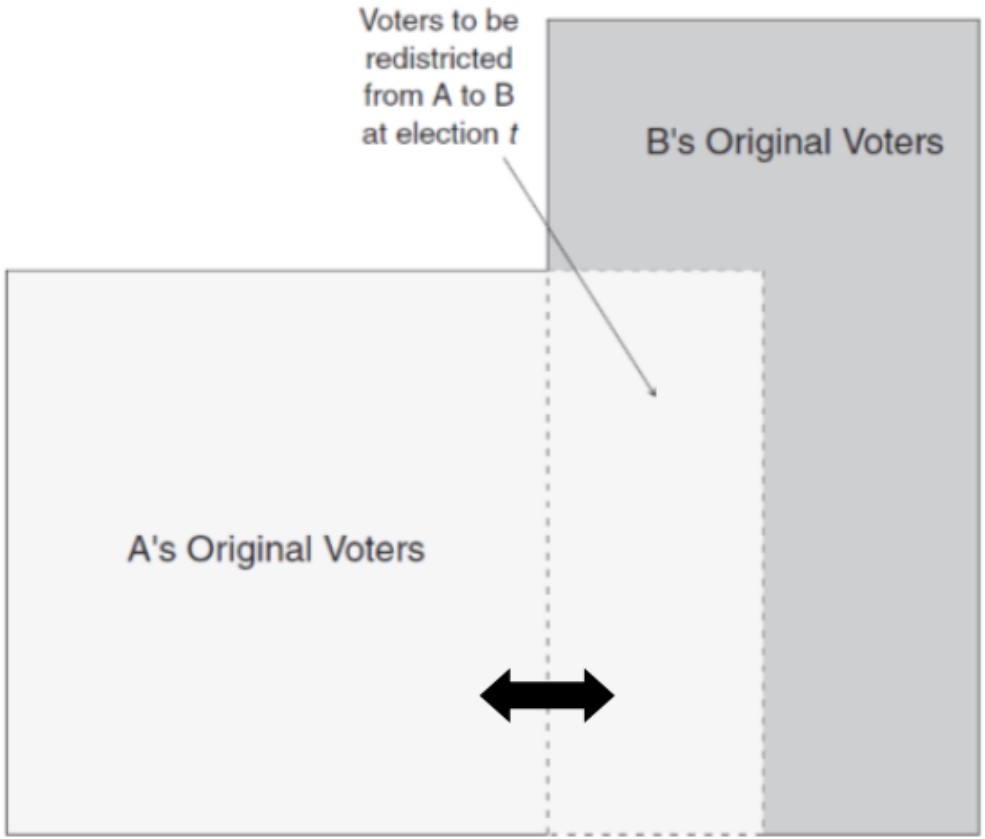
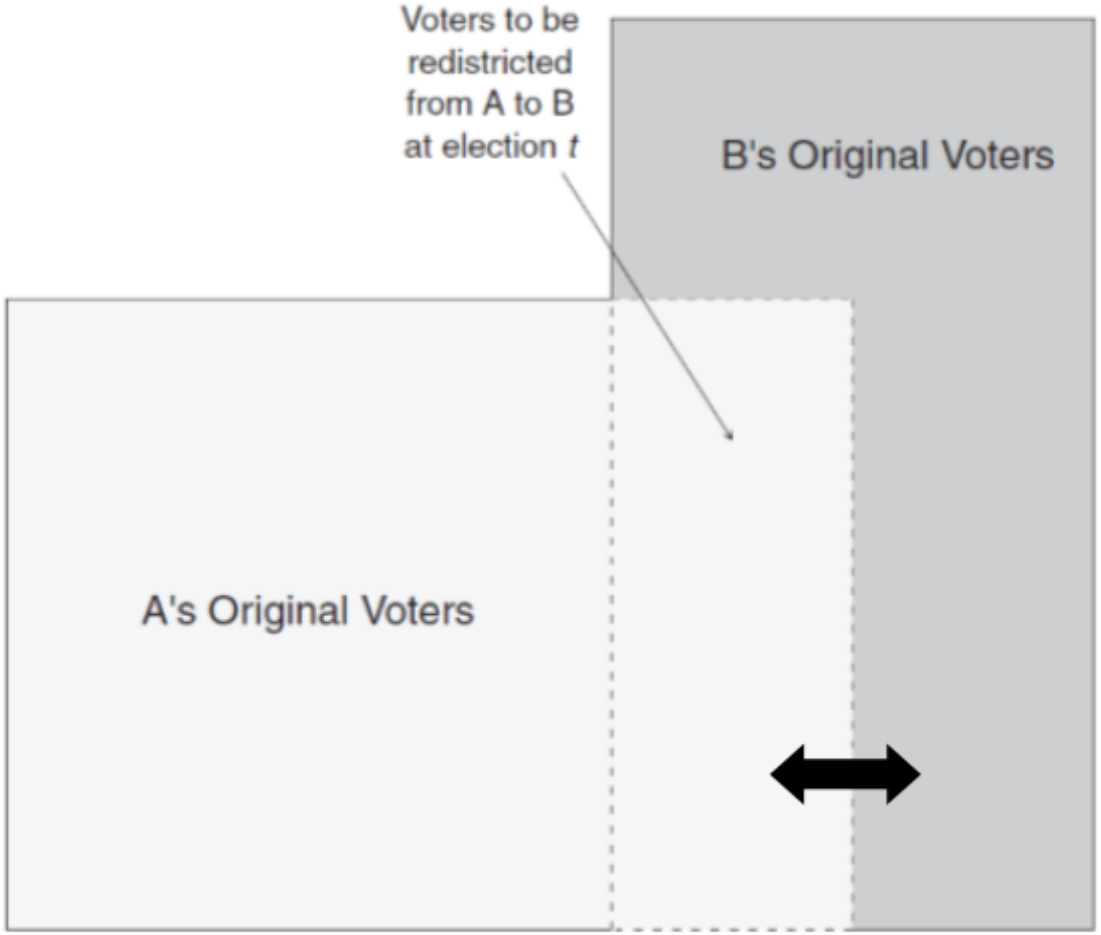
     - We can only compare those units *that were part of the original randomization*



- Ansolabehere et al (2000): Compare Switched Voters with B's Original Voters to estimate the personal vote for the incumbent



- Randomization guarantees potential outcomes are independent of treatment assignment *for all the voters who were part of the randomization*



- But Ansolabehere et al (2000) compare Switched voters with voters who were never part of the randomization: *The wrong control group!*

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	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