3: Causation

Empirical Methods

J. Seawright

Northwestern Political Science

Sept. 23, 2025

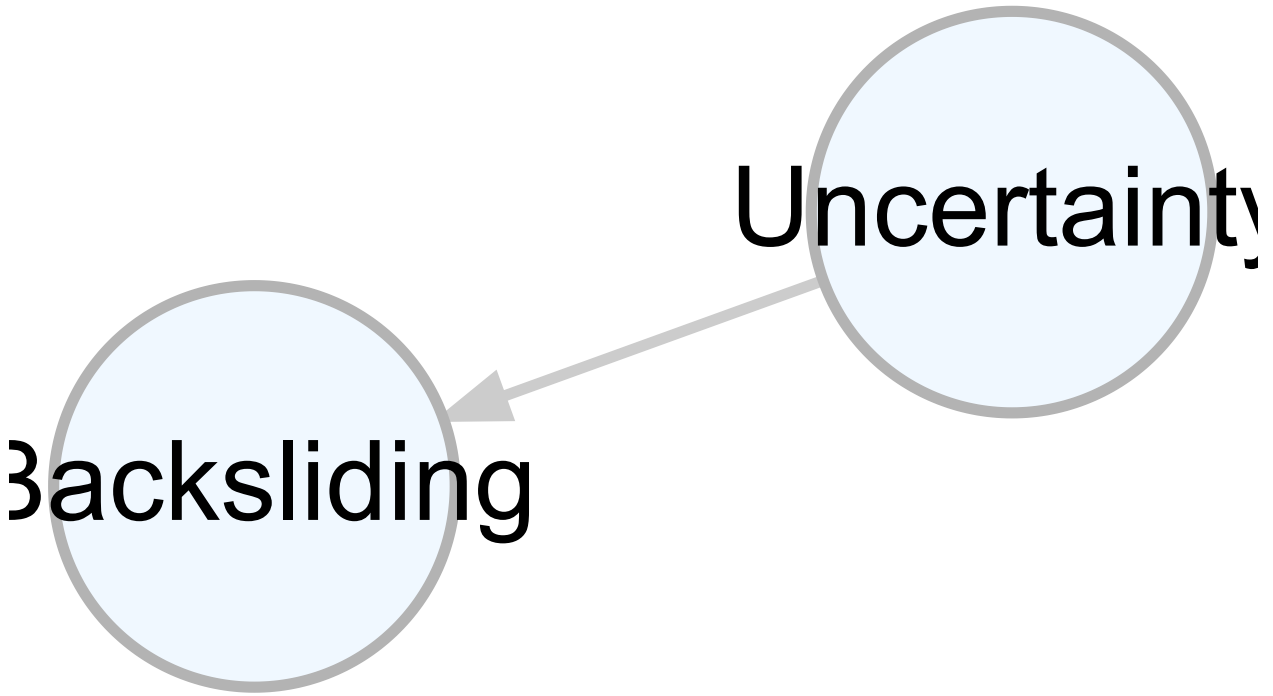
How do citizen attitudes affect the survival of democracy?

A Wolf in Sheep's Clothing: Citizen Uncertainty and Democratic Backsliding

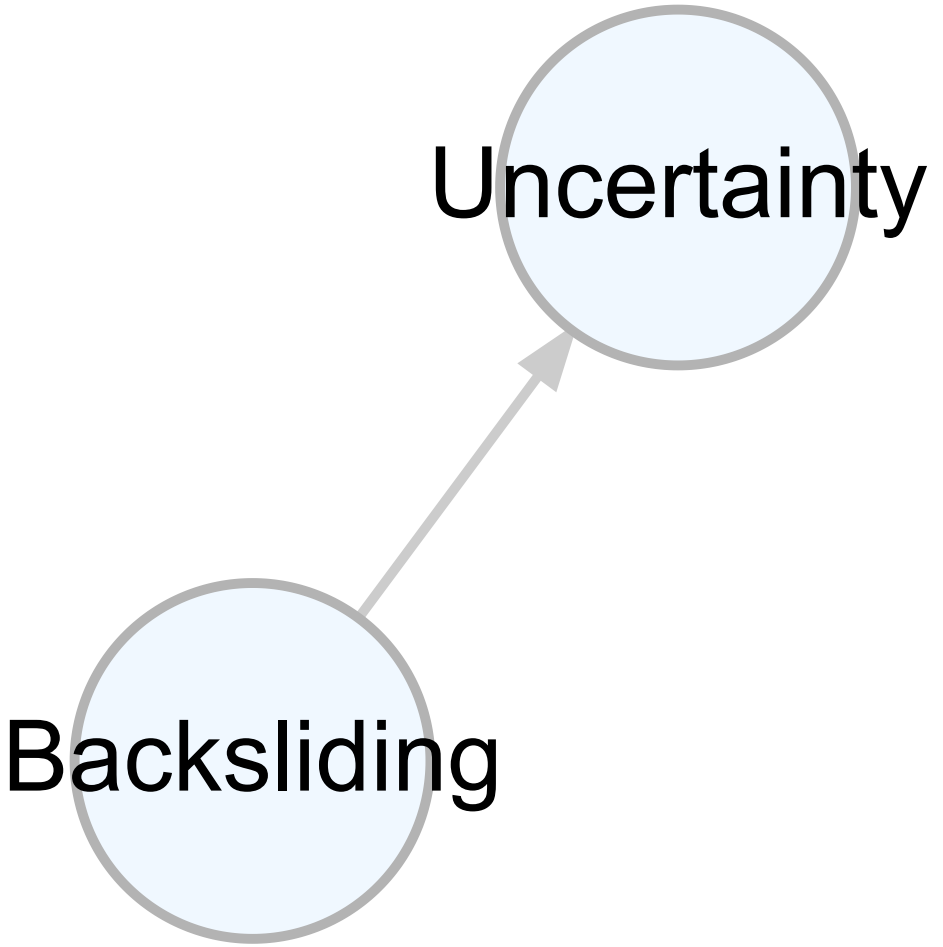
Caterina Chiopris, The Harvard Academy for International and Area Studies
Monika Nalepa, University of Chicago
Georg Vanberg, Duke University

A prominent contemporary phenomenon is "backsliding" of democratic countries into (semi-)authoritarian practices. Such episodes often unfold gradually over time in contexts where the ultimate intentions of governments are not clear. We present a model that focuses on the role of such uncertainty in backsliding. In the model, a government engages in a reform that may allow for subsequent actions that are inconsistent with the rule of law. Citizens must decide whether to replace the incumbent following the reform. A central implication of the model is that in a dynamic setting, citizen support for incumbents can give rise to democratic backsliding even if citizens are fundamentally opposed to authoritarianism. An original survey experiment conducted in Poland provides clear support for the model's implications.

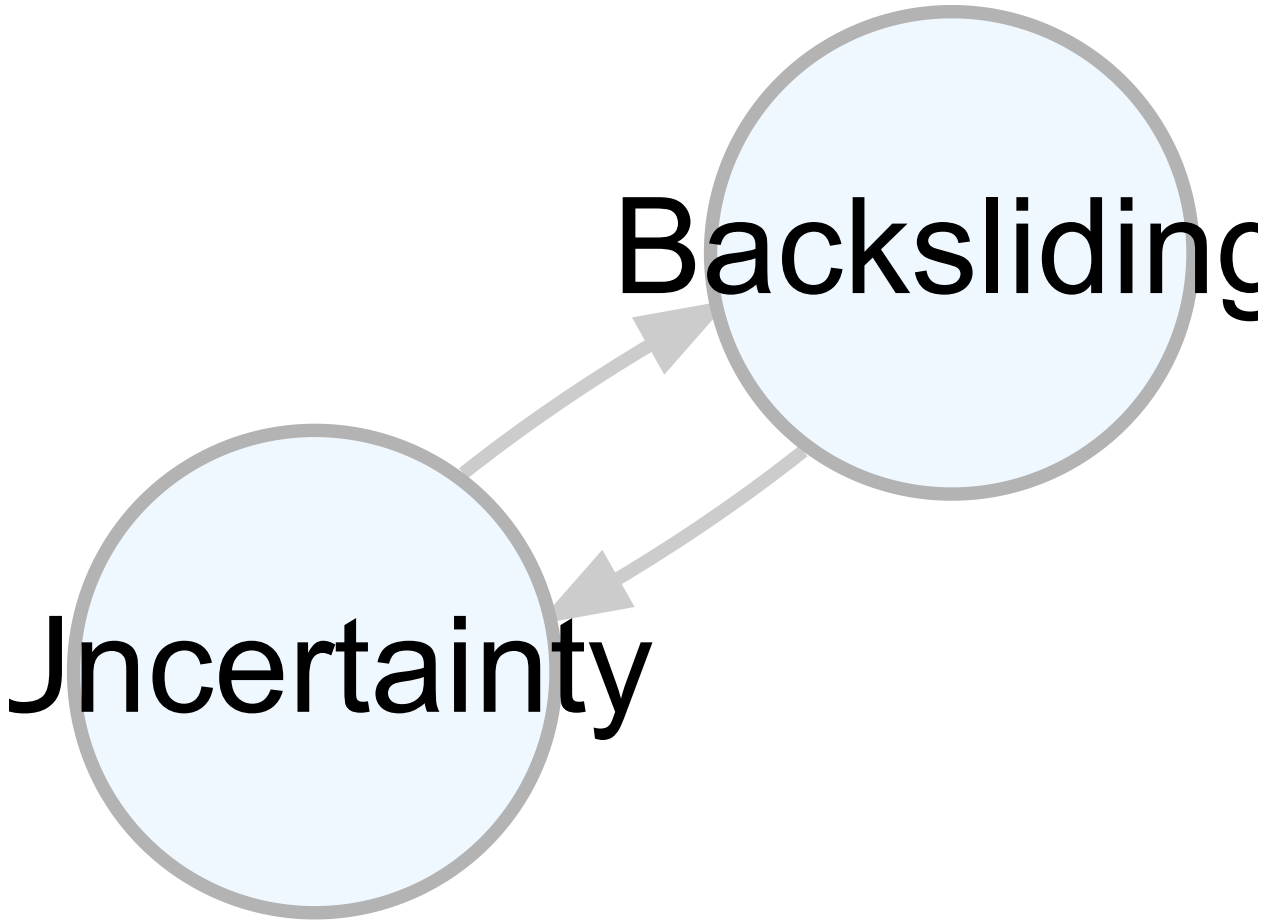
Causation



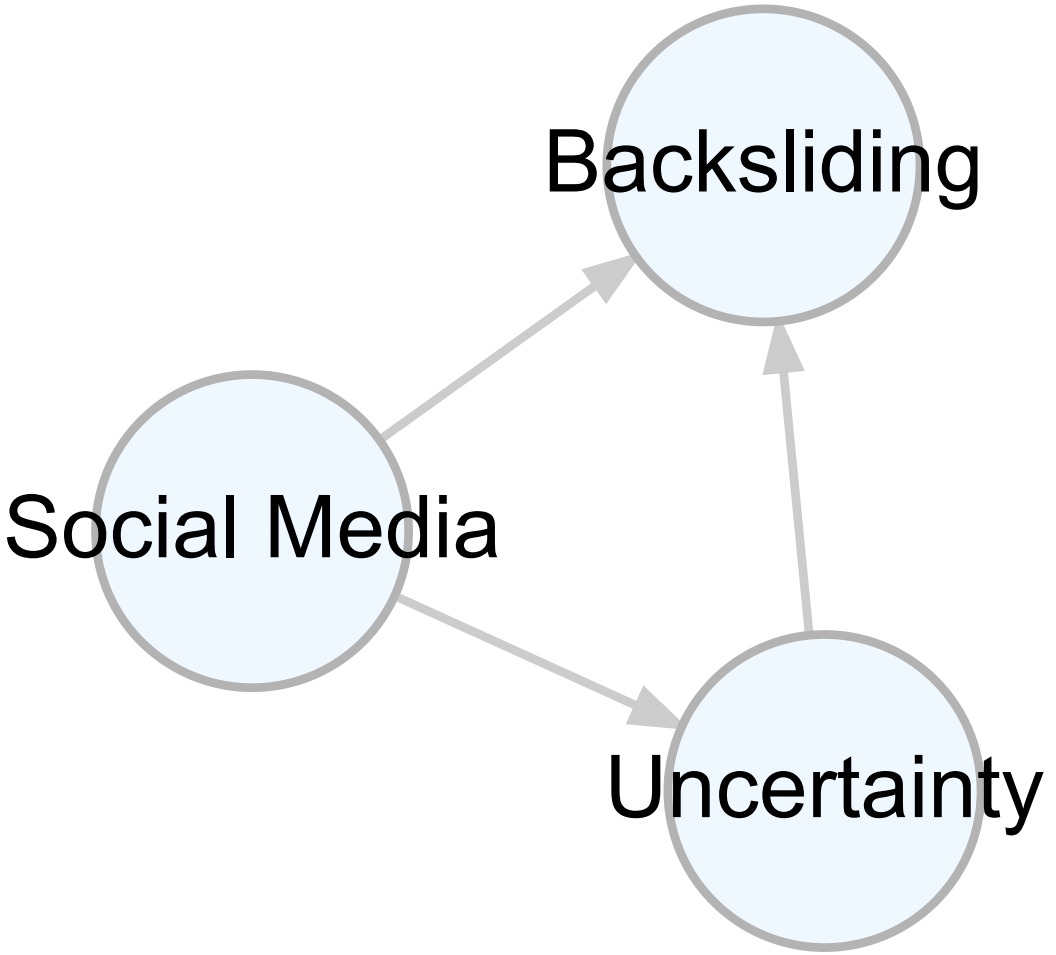
Reverse Causation



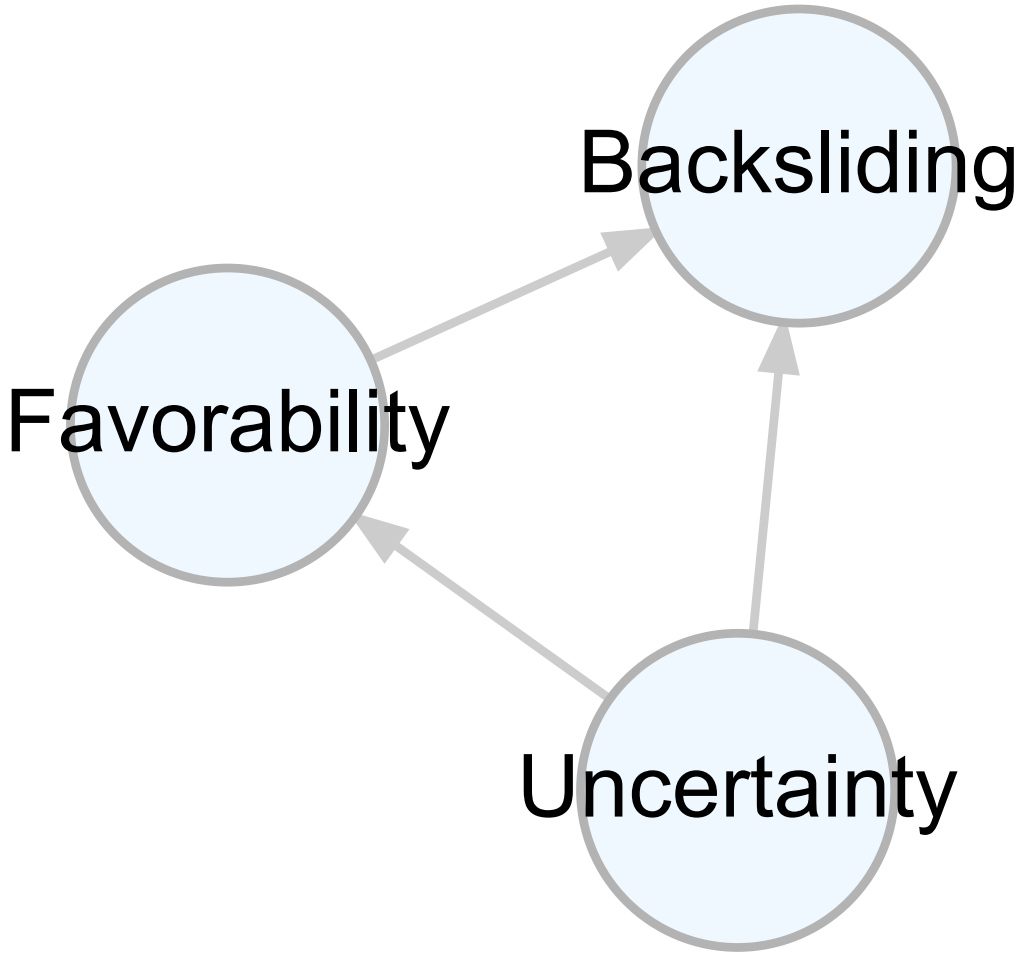
Reciprocal Causation



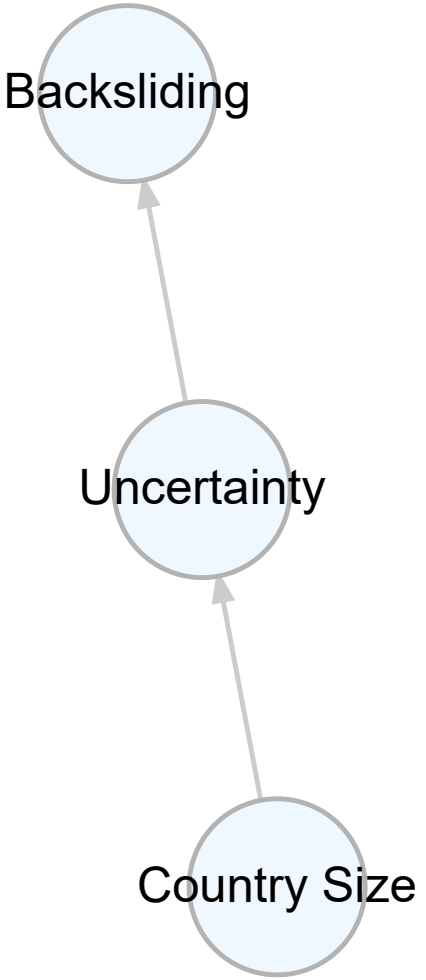
Confounding



Post-Treatment



Instrument



Fundamental Problem of Causal Inference

We can't usually tell by looking at data which of the graphs we just looked at reflects the real world, so we can't tell if we have a causal understanding or a distortion.

Fundamental Problem of Causal Inference

There are some questions we can ask to reason about that help us pinpoint what we know, or don't yet know, about a causal relationship.

The Four Questions

1. Is there a relationship between the treatment and the outcome?

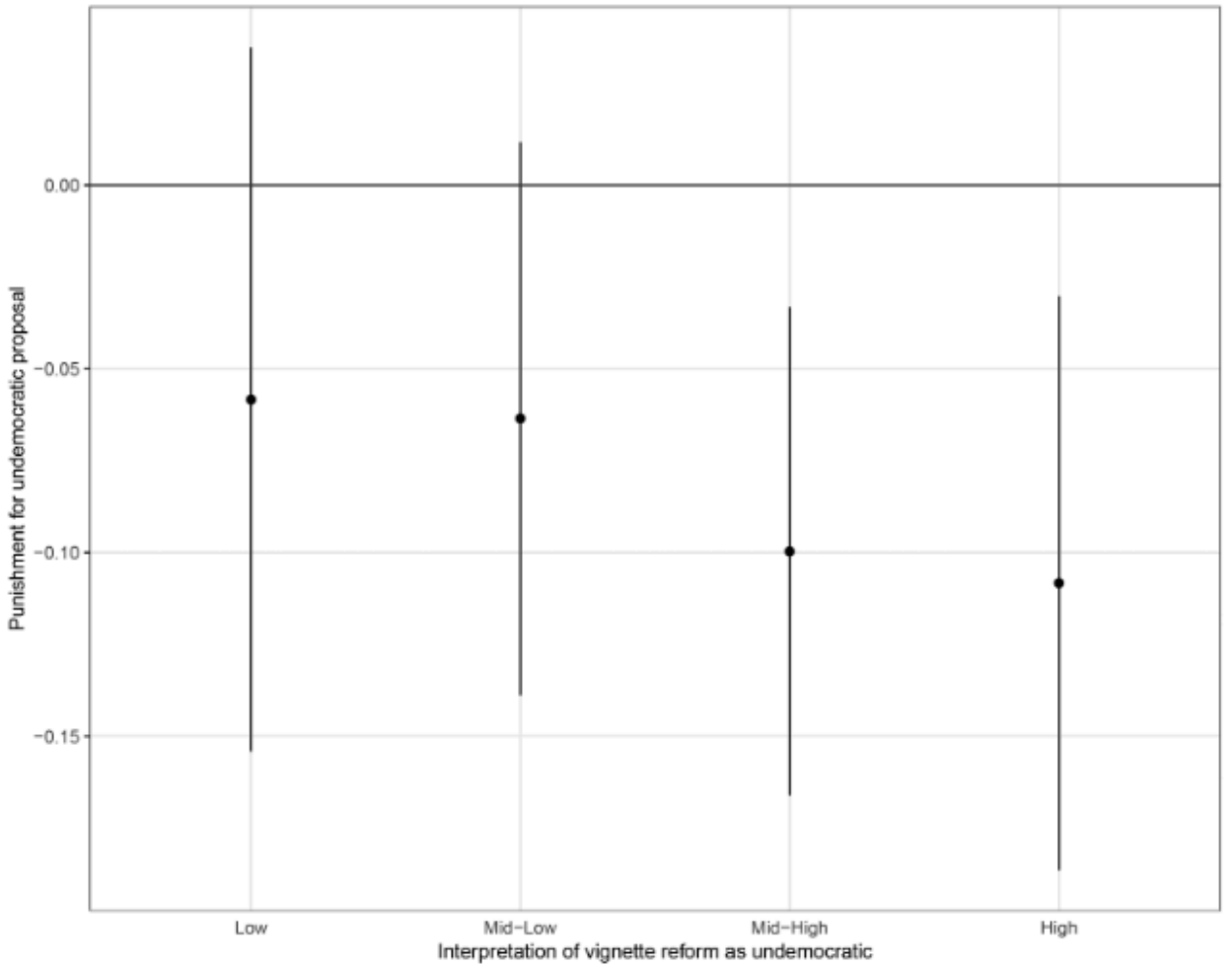


Figure 6. Conditional average marginal component effect, with 95% confidence intervals.

The Four Questions

1. Is there a relationship between the treatment and the outcome?

2. Could the outcome cause the treatment?

Table 3. Conjoint Experiment Table: Treatment Group

Candidate A	Candidate B
[profession], [age] Wants to strengthen relations with the European Union and limit the role of the Catholic Church in deciding about abortion rights	[profession], [age] Is in favor of upholding Christian values, also in public life, and wants greater guarantees of Polish sovereignty within the European Union
Wants to popularize participation in elections by opening polling stations both on Saturday and Sunday of the election weekend (currently the presidential and the Sejm and Senate elections are held only on Sundays)	Wants the government to be able to extend the terms of the Sejm and Senate for a year or more in situations of exceptional state emergency and to postpone the election date without consulting other state authorities[11]

The Four Questions

1. Is there a relationship between the treatment and the outcome?

2. Could the outcome cause the treatment?

3. Is there evidence of a causal pathway from the treatment to the outcome?

In our study, not too much; there isn't that much data about how people translated views about the policy into decisions.

The Four Questions

1. Is there a relationship between the treatment and the outcome?

2. Could the outcome cause the treatment?

3. Is there evidence of a causal pathway from the treatment to the outcome?

4. Have confounding variables been ruled out?

	Mean (St. Err) Control	Mean (St. Err) Treatment	T-Stat	P-value
Undemocratic assessment of the reform: Low				
Age	54.533 (1.336)	53.316 (1.029)	0.616	0.539
Democracy Index	0.287 (0.081)	0.186 (0.068)	1.856	0.064
Education	8.180 (0.241)	7.311 (0.218)	1.645	0.101
Gender	0.361 (0.044)	0.399 (0.035)	-1.085	0.279
Self-Placement in Left-Right Spectrum	4.852 (0.16)	4.580 (0.135)	1.262	0.208
Religiosity	1.615 (0.12)	1.425 (0.102)	1.169	0.243
Town Size	2.107 (0.202)	2.259 (0.16)	-0.537	0.591
Undemocratic assessment of the reform: Mid-Low				
Age	47.389 (1.254)	46.866 (0.839)	-0.473	0.637
Democracy Index	-0.204 (0.075)	-0.214 (0.054)	-0.565	0.572
Education	7.204 (0.227)	7.186 (0.149)	-0.475	0.635
Gender	0.481 (0.039)	0.494 (0.027)	0.526	0.599
Self-Placement in Left-Right Spectrum	4.068 (0.127)	4.343 (0.087)	-1.741	0.083
Religiosity	1.556 (0.101)	1.456 (0.064)	0.5	0.618
Town Size	1.944 (0.161)	1.980 (0.114)	-0.61	0.542
Undemocratic assessment of the reform: Mid-High				
Age	47.410 (1.174)	46.873 (0.769)	-0.07	0.944
Democracy Index	-0.020 (0.07)	-0.013 (0.044)	-1.202	0.23
Education	7.283 (0.212)	7.067 (0.144)	0.004	0.996
Gender	0.493 (0.035)	0.482 (0.023)	0.521	0.603
Self-Placement in Left-Right Spectrum	3.990 (0.117)	4.132 (0.075)	-1.01	0.313
Religiosity	1.507 (0.091)	1.456 (0.058)	-0.344	0.731
Town Size	2.044 (0.147)	2.067 (0.101)	0.052	0.958
Undemocratic assessment of the reform: High				
Age	50.831 (1.386)	53.591 (0.897)	-1.383	0.167
Democracy Index	0.354 (0.075)	0.483 (0.044)	-1.352	0.177
Education	7.865 (0.246)	7.704 (0.16)	0.598	0.55
Gender	0.493 (0.041)	0.451 (0.027)	0.54	0.59
Self-Placement in Left-Right Spectrum	3.689 (0.157)	3.630 (0.1)	0.301	0.763
Religiosity	1.027 (0.106)	1.215 (0.073)	-1.071	0.285
Town Size	2.426 (0.196)	2.445 (0.124)	-0.045	0.964

Table 5. *Covariate Balance*

Controlling for Confounders

Controlling for a confounder is choosing a set of cases that all have the same score on the confounding variable and looking at the relationship between the treatment and the outcome in only those cases.

Problems with Controlling for Confounders

- You can only control for variables that you actually think of controlling for.
- If you control for too many variables, you may not have very many cases left in each category.

Do Mask Mandates Work?

frontiers in Communication

BRIEF RESEARCH REPORT
published: 17 June 2020
doi: 10.3389/fcomm.2020.00044

Mask-Wearing Increased After a Government Recommendation: A Natural Experiment in the U.S. During the COVID-19 Pandemic

Matthew H. Goldberg[1], Abel Gustafson[1], Edward W. Maibach[2], Matthew T. Ballew[1], Parrish Bergquist[1], John E. Kotcher[2], Jennifer R. Marlon[1], Seth A. Rosenthal[1] and Anthony Leiserowitz[1]*

[1] *Yale Program on Climate Change Communication, Yale University, New Haven, CT, United States,* [2] *George Mason University Center for Climate Change Communication, George Mason University, Fairfax, VA, United States*

On the evening of April 3, 2020, the U.S. Centers for Disease Control and Prevention (CDC) announced new recommendations that all Americans wear face masks. President Trump mentioned this recommendation in his nationally televised public address on the evening of April 3, although some news outlets reported on the probable recommendation beforehand. News outlets began reporting on the actual recommendation late that same evening, and discussion of it in news and social media expanded quickly throughout the day on April 4.

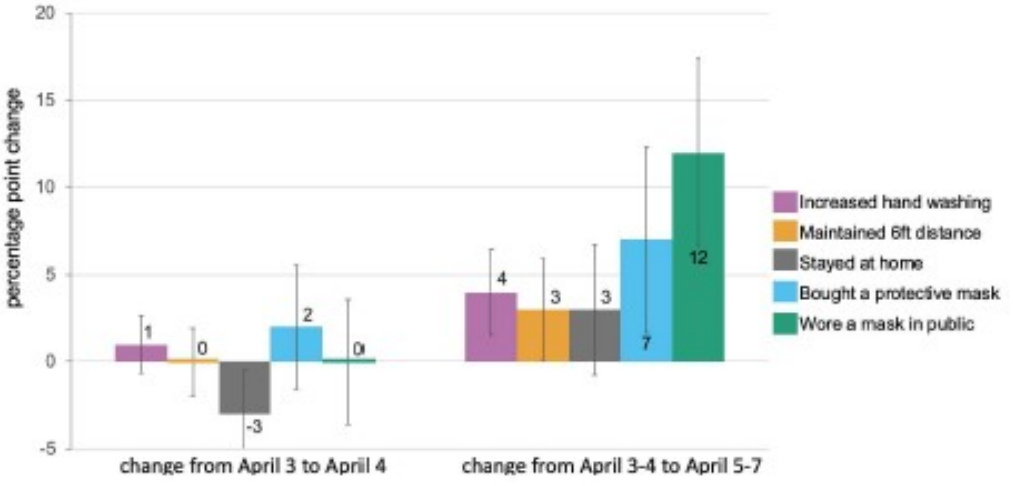


FIGURE 1 | Changes in Americans' COVID-19 preventive behaviors before and after the CDC recommendation that all Americans wear masks. Error bars represent 95% confidence intervals.

The New York Times

Bad News Wrapped in Protein: Inside the Coronavirus Genome

The genome of the new coronavirus is less than 30,000 “letters” long. (The human genome is over 3 billion.) Scientists have identified genes for as many as 29 ...

Apr 3, 2020

The Detroit News

Opinion: What the coronavirus bill means for Michigan

Recently, I helped pass the Senate bipartisan Coronavirus, Aid, Relief and Economic Security (CARES) Act, now law, that will take important steps towards ...

Apr 4, 2020

New York Times Australia

What 'Peaks,' 'Lockdowns' and 'Testing' Mean When Talking About Coronavirus

Peaks, Testing, Lockdowns: How Coronavirus Vocabulary Causes Confusion. Officials often use similar words when describing the pandemic, but they are not ...

Apr 3, 2020

CBS News

Coronavirus updates: CDC recommends use of non-surgical face masks

But one program is hiring workers laid off due to the coronavirus pandemic to help feed families in need in Los Angeles, Washington D.C., and Texas. Typically, ...

CNN

April 3 coronavirus news

Despite recent support from members of his coronavirus task force for a nationwide stay-at-home order, President Trump said Friday he'd "leave it up to the ...

Apr 3, 2020

The New York Times

Coronavirus Hot Spots Emerging Near New York City

Governor Cuomo compared a jump in coronavirus cases on Long Island to “a fire spreading,” and New Jersey announced an additional 200 deaths due to the ...

Apr 4, 2020

FDA.gov

Coronavirus (COVID-19) Update: FDA Coordinates National ...

Coronavirus (COVID-19) Update: FDA Coordinates National Effort to Develop Blood-Related Therapies for COVID-19. Share · Tweet · Linkedin · Email; Print.

Apr 3, 2020

The New York Times

Can an Old Vaccine Stop the New Coronavirus?

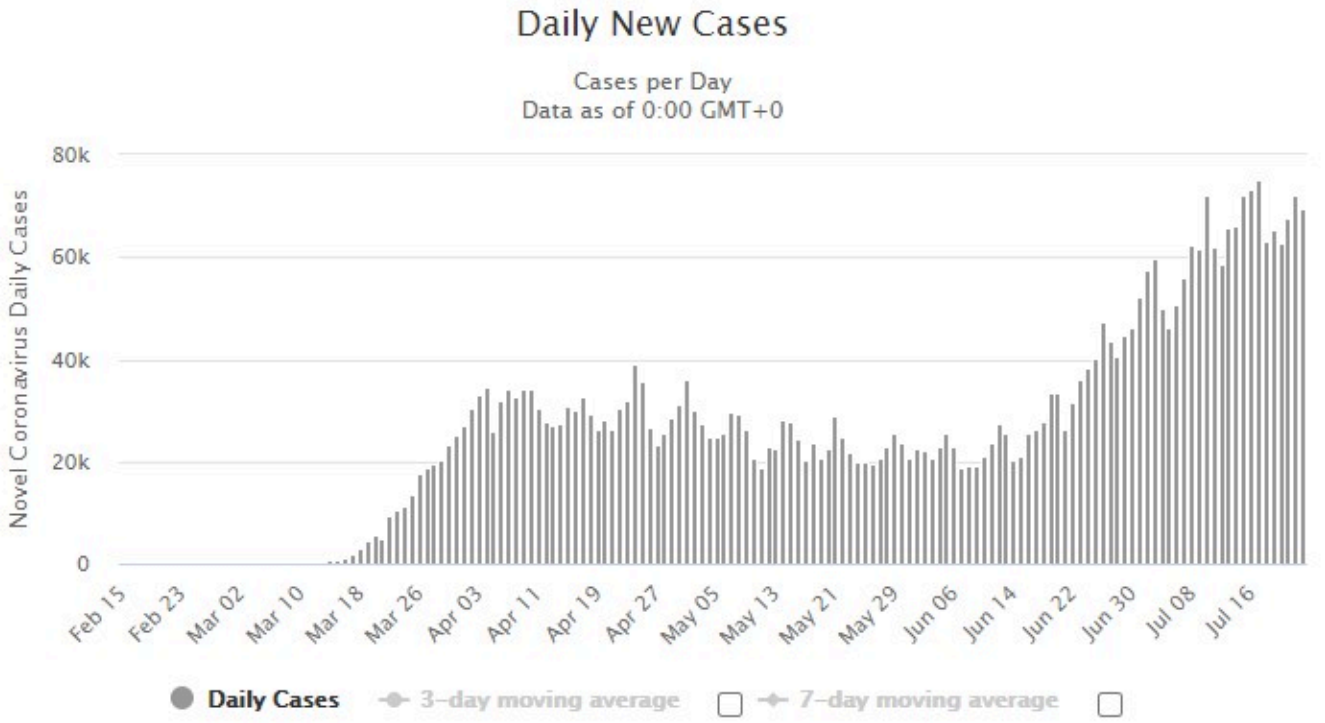
There is little evidence yet that the vaccine will blunt infection with the coronavirus, but a series of clinical trials may answer the question in just months. On Monday ...

Apr 3, 2020

Washington Post

Indian Country, where residents suffer disproportionately

Daily New Cases in the United States



COVID-19

By Wei Lyu and George L. Wehby

Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US

DOI: 10.1377/hlthaff.2020.00818
HEALTH AFFAIRS 39,
NO. 8 (2020): 1–7

Appendix Exhibit A1. The Signing and Effective Dates of State Orders For Face Mask Use for Public and Employees

State	Mandate for face mask use in public		Mandate for employee face mask use	
	Order Signing Date	Order Effective Date	Order Signing Date	Order Effective Date
Alabama			05/08/2020	05/11/2020
Alaska			04/22/2020	04/24/2020
Arizona			05/04/2020	05/08/2020
Arkansas			05/05/2020	05/08/2020
California				
Colorado			04/17/2020	04/17/2020
Connecticut	04/17/2020	04/20/2020	04/01/2020	04/03/2020
Delaware	04/25/2020	04/28/2020	04/25/2020	04/28/2020
District of Columbia	04/15/2020	04/17/2020	04/15/2020	04/17/2020
Florida			05/09/2020	05/11/2020
Georgia			04/23/2020	05/01/2020
Hawaii	04/16/2020	04/17/2020	04/16/2020	04/17/2020
Idaho				
Illinois	04/30/2020	05/01/2020	04/30/2020	05/01/2020
Indiana			05/01/2020	05/11/2020
Iowa				
Kansas				
Kentucky	04/28/2020	05/11/2020	04/28/2020	05/11/2020
Louisiana			04/30/2020	05/01/2020
Maine	04/29/2020	05/01/2020	04/29/2020	05/01/2020
Maryland	04/15/2020	04/18/2020	04/15/2020	04/18/2020
Massachusetts	05/01/2020	05/06/2020	05/01/2020	05/06/2020
Michigan	04/24/2020	04/27/2020	04/24/2020	04/27/2020
Minnesota			04/30/2020	04/30/2020
Mississippi			05/04/2020	05/07/2020
Missouri				
Montana				
Nebraska			05/04/2020	05/04/2020
Nevada			05/07/2020	05/09/2020
New Hampshire			05/01/2020	05/01/2020
New Jersey	04/08/2020	04/10/2020	04/08/2020	04/10/2020
New Mexico	05/15/2020	05/15/2020	05/05/2020	05/06/2020
New York	04/16/2020	04/17/2020	04/16/2020	04/17/2020
North Carolina				
North Dakota				
Ohio			04/30/2020	05/01/2020
Oklahoma				
Oregon			05/07/2020	05/15/2020
Pennsylvania	04/15/2020	04/19/2020	04/15/2020	04/19/2020
Rhode Island	05/05/2020	05/08/2020	04/14/2020	04/18/2020
South Carolina				
South Dakota				
Tennessee				
Texas				
Utah	04/10/2020	04/10/2020	04/10/2020	04/10/2020
Vermont			04/17/2020	04/17/2020
Virginia				
Washington			05/04/2020	05/05/2020
West Virginia			04/30/2020	05/04/2020
Wisconsin				
Wyoming			04/28/2020	05/01/2020

Notes: We collect information on statewide face mask use orders from searching multiple publicly available databases listing these

	Main results
16 or More Days Before	-0.01
	(0.56)
11 to 15 Days Before	-0.26
	(0.55)
6 to 10 Days Before	0.12
	(0.46)
1 to 5 Days After	-0.92***
	(0.25)
6 to 10 Days After	-1.07***
	(0.36)
11 to 15 Days After	-1.42***
	(0.32)
16 to 20 Days After	-1.66***
	(0.40)
20 or More Days After	-1.97***
	(0.56)
N	155343

Unmasked! The effect of face masks on the spread of COVID-19

Timo Mitze, Reinhold Kosfeld, Johannes Rode, Klaus Wälde 22 June 2020

Finding out whether face masks indeed reduce the spread of COVID-19 is thus important. Against the available evidence from clinical studies or previous pandemics, we ask: Can we identify a significant effect of face masks on the spread of COVID-19 by looking at the development of registered COVID-19 cases? Yes, we can. We zoom in on the case of Jena, a town of 110,000 inhabitants in the federal state of Thuringia, Germany.

Jena presents a unique case in Germany (see also Mitze et al. 2020), as the obligation to wear face masks in public transport, shops, and workplaces was introduced much earlier there (on 6 April) than in all other regions in Germany (around 27 April). The introduction of obligatory face masks was accompanied by a public campaign "*Jena zeigt Maske*" ("Jena shows mask"), which started one week earlier to make the local population aware of this novel measure.

Figure 1 Treatment effects of face masks in Jena over time