

Shooting Political Polarization

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An Chomhairle um Thaighde in Éirinn

Pew Research Center: Political Polarization, 1994-2017

There is an increasing literature studying the political polarization

- How to measure it McCarty, Poole & Rosenthal 2006, Bonica 2014 , Gentzow, Shapiro & Taddy 2019
- Causes and consequences Fiorina & Abrams 2008, Gentzow 2016, Canen, Kendall, Chad & Trebbi 2021

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But:

- It has been mainly studied as an unique measure;
- Not looked on how different topics interact **Heterogeneity**

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Is political polarization contagious?

- Uses as a politically divisive topic the issue of gun rights by exploiting as exogenous variation mass shooting events (MSE)

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- Studies how the polarization in the divisive topic increases

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- Studies how the polarization in the divisive topic increases
- Shows that political polarization propagates from the divisive topic to the others
- Studies how a divisive event impacts the policy making of the House of Representatives in the short and long run.

- **Political Polarization**

Fiorina & Abrams 2008, Bonica 2014, McCarty, Poole & Rosenthal 2016, Moskowitz, Rogowski & Snyder 2018, Iyengar & al. 2019, Gentzow, Shapiro & Taddy 2019

- **Contribution:** First paper showing whether and how the political polarization is contagious and additional evidence about the multidimensional concept;

Related Literature and Contribution

- **Political Polarization**

Fiorina & Abrams 2008, Bonica 2014, McCarty, Poole & Rosenthal 2016, Moskowitz, Rogowski & Snyder 2018, Iyengar & al. 2019, Gentzow, Shapiro & Taddy 2019

- **Contribution:** First paper showing whether and how the political polarization is contagious and additional evidence about the multidimensional concept;

- **Drivers of Congressional Gridlock**

Binder 1999, Gagliarducci, Paserman & Patacchini 2020, Lee 2021

- **Contribution:** I show how divisive events may affect the congressional gridlock both in the short and long run.

Preview of the results

- Divisive events increase polarization in multiple political themes

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 - The effect is not driven by extreme politicians
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 - The effect is not driven by extreme politicians
 - Politicians talk about their opponents using more negative terms after these events (on Twitter)
- I model a theoretical framework based on identity and conflict to support my findings
- In the highly polarized days the congressional gridlock increases, with the discussed policies less likely to ever pass

- Challenges and methodology
- Main results and heterogeneity
- Possible mechanisms
- Effects on policy making

- ① Measure political polarization in different themes
 - I build a new measure of polarization using congressional speeches in the House of Representatives from 1999 to 2016 (“United States Congressional Record”)
 - Applying different text analysis techniques Text as Data
- ② Exogenous trigger to polarization
 - I will leverage on a plausible exogenous variation on a divisive topic: mass shooting events

Sentiment analysis and polarization

$$Polarization_{i,s,t} = abs[Sentiment Score_{i,s,t}^D - Sentiment Score_{i,s,t}^R]$$

where:

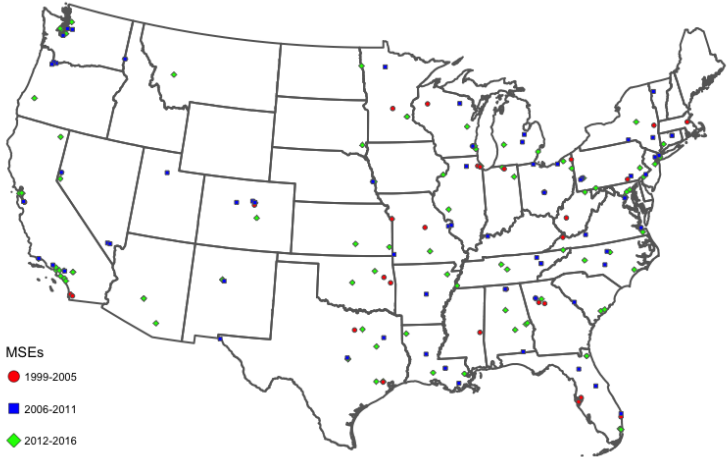
- $Polarization_{i,s,t}$ in Topic i , in state s , at day t ;
- $Sentiment Score_{i,s,t}^J = \sum_{j=1}^n Positive Words_{i,s,t}^J - \sum_{j=1}^n Negative Words_{i,s,t}^J$

Word Cloud

Potential Concerns

- 1 Measure political polarization in different themes
 - I build a new measure of polarization using congressional speeches from 1999 to 2016 (“United States Congressional Record”)
 - Applying different text analysis techniques Text as Data
- 2 Exogenous trigger to polarization
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MSEs variation across places and time



Definition

Empirical equation

Empirical Strategy (Dynamic DID):

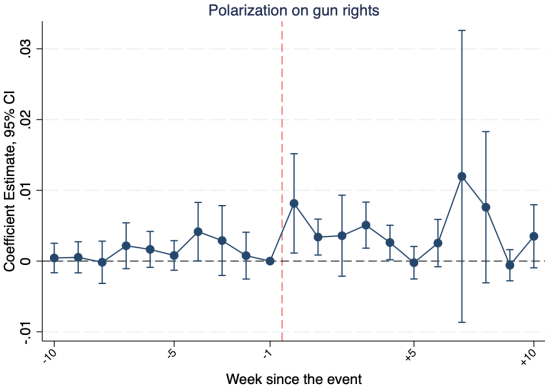
$$Polarization_{i,s,t} = \beta_0 + \beta_1 MSE_{s,t-1} + \gamma \mathbf{X}_{s,t} + \mu_s + \lambda_t + \epsilon_{s,t}$$

- $Polarization_{i,s,t}$ Polarization on topic i , in state s at time t ;
- $MSE_{s,t-1}$: dummy=1 if in state s at time $t-1$ (the day before) there's been a MSE;
- $\mathbf{X}_{s,t}$ a battery of baseline controls at state level interacted with year fixed effects;
- μ_s and λ_t are respectively state and day of the meeting fixed effects;
- Standard errors are clustered by state. Controls

Polarization on gun rights topic after MSE

	<i>Polarization on Gun Rights</i>			
	(1)	(2)	(3)	(4)
MSE	0.0014** (0.0006)	0.0014** (0.0006)	0.0015** (0.0006)	0.0016** (0.0006)
Mean Outcome	0.0065	0.0065	0.0065	0.0065
Observations	20,997	20,997	20,932	20,932
Date of Speech FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Seasonality Trends	No	No	Yes	Yes
State x Year FE	No	No	No	Yes
Controls x Congress	No	Yes	Yes	Yes

Event study - Polarization on gun rights after a MSE

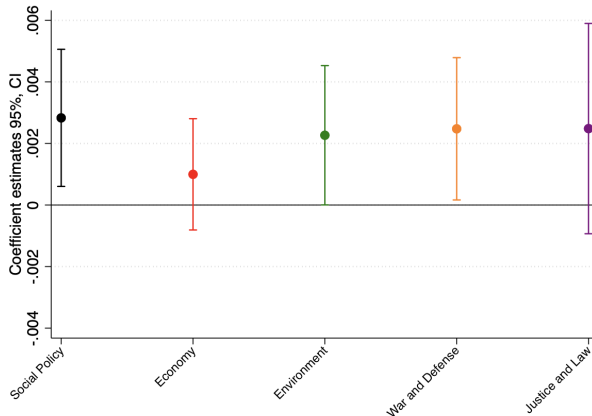


Event Study eq

Month level event study

Is polarization on a divisive topic contagious?

Is polarization on a divisive topic contagious?



Table

Event Studies

Further results and Robustness checks

- Heterogeneity
 - Is this driven by more salient events? **Yes** Saliency
 - Does the timing matters? **Not really** Timing
- Robustness Checks
 - Different time windows Time Windows
 - New DID estimation robust to variation in treatment timing and heterogeneous treatment effect (Borusyak, Jaravel & Spiess 2022, De Chaisemartin & D'Haultfoeuille 2020) BJS

- Is there selection into the speaker? Are the extreme congresspeople talking more after a salient shock on a divisive topic? ⇒ **No** Extreme vs Moderate

Possible Mechanisms

- Is there selection into the speaker? Are the extreme congresspeople talking more after a salient shock on a divisive topic? ⇒ **No** Extreme vs Moderate
- Affective Polarization
 - After a shock on a divisive topic politicians use more negative terms in talking about the members of the other party? ⇒ **Yes, on Twitter** Twitter

Possible Mechanisms

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- Affective Polarization
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- Why does polarization move in some topics and not in others?

Why does polarization move in some topics and not in others?

- I develop a theoretical model considering two macro topics world: economic and cultural (Bonomi, Gennaioli, Tabellini 2021)
- After a shock politicians express their positions to attract votes
- They face two elections, the first for being party leader and the second one for winning the state (district)
- Opinions are represented as points over a line $[0,1]$ for each topic
- Main assumption: the support of the marginal distribution over cultural topic is $X_c = \{0, 1\}$, while over economic topic is continuous
- There exists an equilibrium where parties L and R have polarized opinions on the cultural topics, and not in economic topics. Example

Political polarization and policy making

- So far I show how a shock on a salient and divisive topic impacts political polarization;

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- Polarization is contagious impacting different topics;

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- **Are there any implications on the democratic process?**

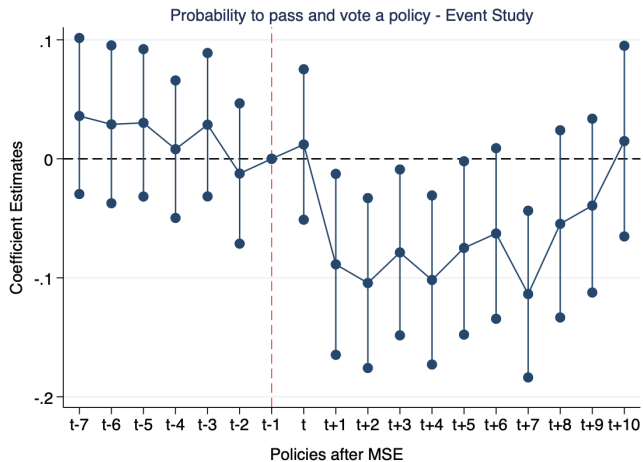
Political polarization and policy making

- So far I show how a shock on a salient and divisive topic impacts political polarization;
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- ⇒ After a divisive shock the probability to pass a bill in the House of Representatives decreases

Political polarization and policy making

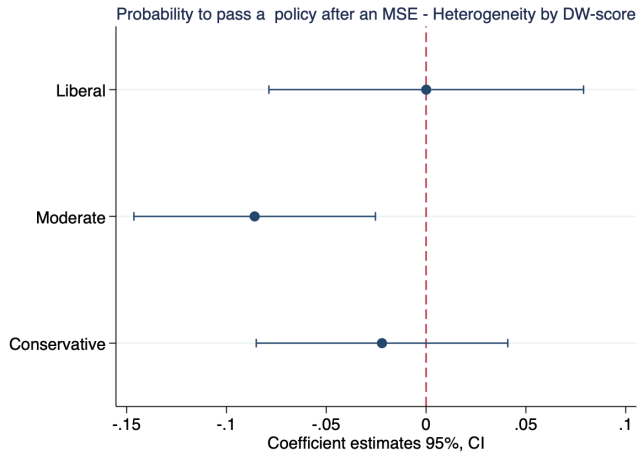
- So far I show how a shock on a salient and divisive topic impacts political polarization;
 - Polarization is contagious impacting different topics;
 - **Are there any implications on the democratic process?**
- ⇒ After a divisive shock the probability to pass a bill in the House of Representatives decreases
- ⇒ The probability to have a more extremist candidate increases over time

Probability to pass a new policy after a MSE - Short term



Table

Heterogeneity by policy leaning



Long term effects - Policy Making

	<i>Probability to pass in the future</i>	
	(1)	(2)
MSE	-0.1796*** (0.0370)	-0.1718*** (0.0278)
MSE X extreme		-0.0144 (0.1077)
Observations	3,528	3,528
Mean Outcome	0.5890	0.5890
Year-Month FE	Yes	Yes
Topic FE	Yes	Yes

Long term effects - House of Representatives composition

	<i>Probability of electing extreme candidate</i>			
	TWFE (1)	TWFE (2)	BJS (3)	BJS (4)
MSE	0.0660** (0.0298)	0.0726** (0.0287)	0.0732**	0.0727**
Congress FE	Yes	Yes	Yes	Yes
Congressional district FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Mean Outcome	0.2954	0.2954	0.2954	0.2954
Observations	3,695	3,695	3,695	3,695

→ After an MSE the probability to have a more extreme candidate increases (no matter the party color) Party Event Study

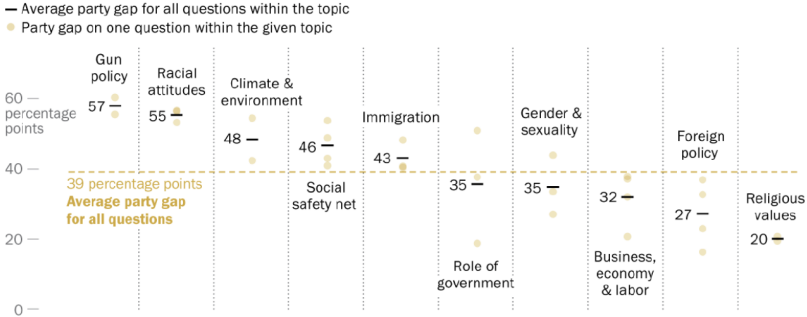
Conclusion

- Divisive events may increase polarization in different political themes \Rightarrow Polarization is contagious;
- Not all the topics are impacted equally \Rightarrow Polarization is a multidimensional concept;
- This have a further consequence on the policy making both in the short and long term

THANK YOU
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Motivation

Difference between Republicans and Democrats on 30 political values items



Notes: Data above represents gaps on 30 different values questions grouped thematically. See appendix for full details and question wording. Partisans include leaners.

Source: Survey of U.S. adults conducted Sept. 3-15, 2019.

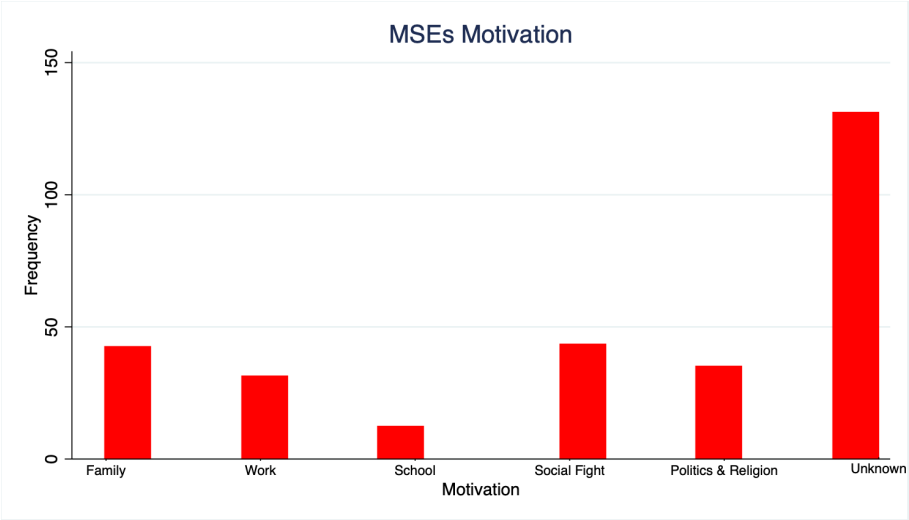
PEW RESEARCH CENTER

MSE Definition

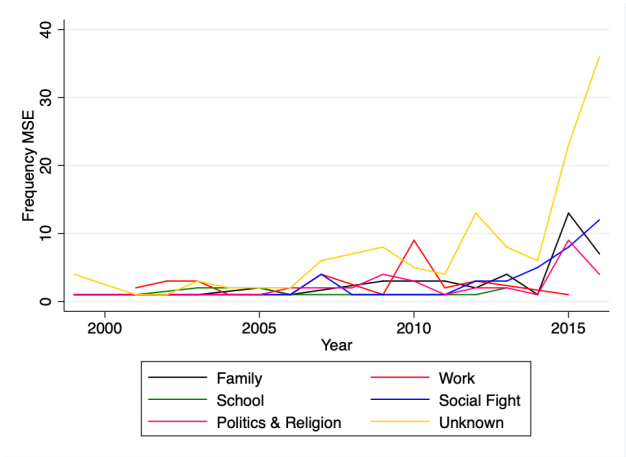
- **Definition:** A mass shooting is an event that involved at least four victims (excluding shooter) in any public or private place. The event is not related to gangs, drugs, or organized crime.
- **Sources:** “FBI Active Shooter Safety Resources” and “Stanford mass shootings in America” (Luca, Malhotra & Poliquin 2020, Hasin 2021)

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Motivation



Motivation over time



Gun Related Surveys (Mark A. Conley (2019))

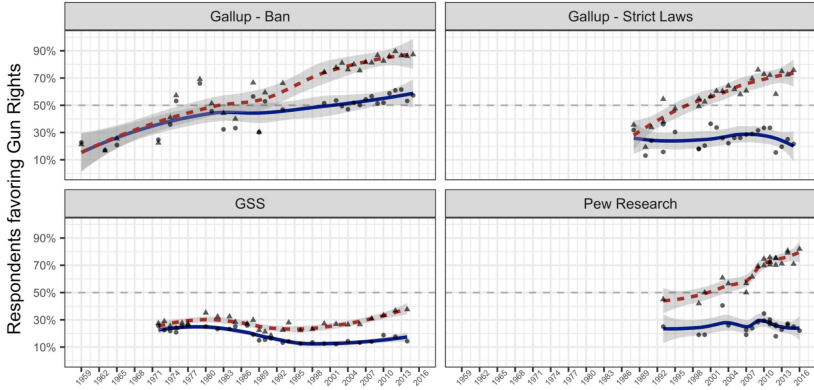
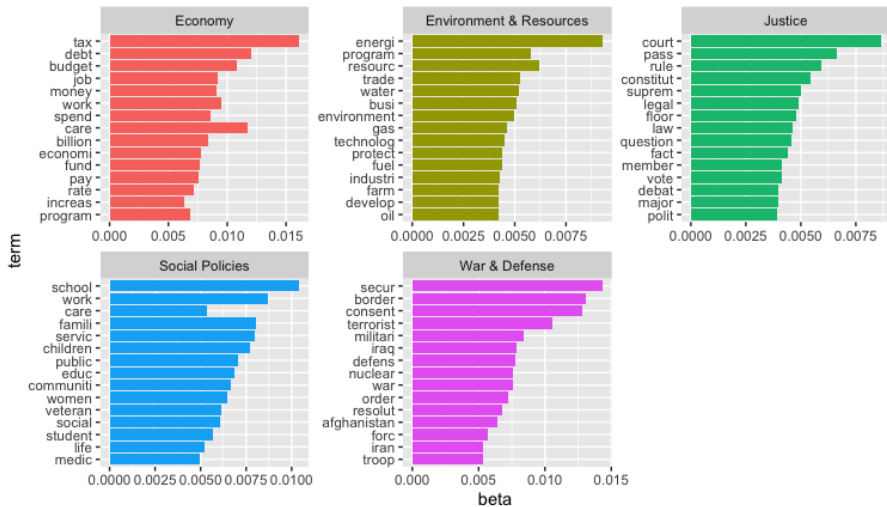


Fig. 1. Gun Rights and Party Identification Triangular points and the dotted lines represent Republicans; Circular points and the solid lines represent Democrats.

- Text Normalization
- Topic Modeling (Structural Topic Modelling - Latent Dirichlet Allocation - CorEx [LDA](#))
- Identify the part of the speeches on Guns and on the other topics [Guns](#)
- Sentiment Analysis using dictionary based approach

Topic Modeling (LDA)

What LDA says is that each word in each document comes from a topic and the topic is selected from a per-document distribution over topics.



STM and LDA: How do they work?

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- 1 Assume k number of topics;
- 2 Distribute these k topics across document m by assigning each word a topic;
- 3 For each word w in document m , assume its topic is wrong but every other word is assigned the correct topic;
- 4 Probabilistically assign word w a topic based on two things:
 - what topics are in document m ;
 - how many times word w has been assigned a particular topic across all of the documents (beta: per-topic word distribution);
- 5 Repeat this process a number of times for each document

How do you define a speech on guns?

- Analyse news about shootings from NY Times metropolitan desk the day (or the day after) the MSE;
- Collect the most common bigrams: "gun violence"; "gun rights"; "gun owner" ...
- Select the speeches that present the same bigrams

Republican speaker on gun rights

”...we have a Nation that feels less secure, a Nation looking to Congress for answers regarding our national security posture, the policies of this administration’s, of this Congress and answers, also legitimately, about how to protect our communities while also protecting the constitutional privileges of due process and the Second Amendment. They are very legitimate questions we cannot turn a deaf ear to. We answer to the American people. They entrust us to serve...” – Republican speaker from Florida after the Orlando shooting in June 2016

Democrat speaker on gun rights

”...Nearly a third of the worlds mass shootings occur right here in our country, and yet, this Congress, defying the wishes of our constituents, refused to take any reasonable steps to keep dangerous guns out of the wrong hands.This Congress has refused to ban military grade assault rifles whose primary purpose is to kill as many people as possible at one time. This Congress refuses to close the loophole that lets criminals buy firearms online or at gun shows without a background check. And, most shockingly, this Congress is refusing to prevent those suspected of terrorism from buying weapons that could be used in the next attack. This Congress offers lots of thoughts and sympathies when people are massacred by firearms, but no action to stop the carnage. It is time for this Congress to do its job before we have to say more prayers for innocent victims...” – Democrat speaker from Florida after the Orlando shooting in June 2016

Word Cloud -Sentiment Analysis



Potential concerns

① Measurement error:

- Likely to be as good as random (both in positive and negative words);
- Likely to affect both Democrats and Republicans;
- Likely to be solved by the identification strategy (DiD).

② Definition of polarization:

- Distance in how politicians speak about a certain topic;
- It is impacting the language used to talk about a topic not the content.

③ Looking ahead for additional measure (Linguistics literature)

Control variables

- Time invariant at baseline multiplied by year FEs:
 - Demographic characteristics
 - Education level
 - Unemployment rate
- Time variant: primary elections periods (Democratic and Republican primaries)

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Polarization in different Topics after MSE - Social Policy

	<i>Polarization on Social Policy</i>			
	(1)	(2)	(3)	(4)
MSE	0.0028*** (0.0010)	0.0028*** (0.0010)	0.0026** (0.0010)	0.0044 (0.0032)
Mean Outcome	0.0308	0.0308	0.0308	0.0308
Observations	20,997	20,997	20,974	20,979
Date of Speech FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Seasonality Trends	No	No	Yes	Yes
State x Year FE	No	No	No	Yes
Controls x Congress	No	Yes	Yes	Yes

Polarization in different Topics after MSE - Economy

	<i>Polarization on Economy</i>			
	(1)	(2)	(3)	(4)
MSE	0.0010 (0.0006)	0.0011 (0.0007)	0.0009 (0.0007)	-0.0028* (0.0015)
Mean Outcome	0.0330	0.0330	0.0330	0.0330
Observations	20,997	20,997	20,974	20,974
Date of Speech FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Seasonality Trends	No	No	Yes	Yes
State x Year FE	No	No	No	Yes
Controls x Congress	No	Yes	Yes	Yes

Polarization in different Topics after MSE - Environment

	<i>Polarization on Environment</i>			
	(1)	(2)	(3)	(4)
MSE	0.0020** (0.0008)	0.0021** (0.0008)	0.0018** (0.0008)	0.0026*** (0.0009)
Mean Outcome	0.0219	0.0219	0.0219	0.0219
Observations	20,997	20,997	20,974	20,974
Date of Speech FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Seasonality Trends	No	No	Yes	Yes
State x Year FE	No	No	No	Yes
Controls x Congress	No	Yes	Yes	Yes

Polarization in different Topics after MSE - War and Defense

	<i>Polarization on War and Defense</i>			
	(1)	(2)	(3)	(4)
MSE	0.0025*** (0.0009)	0.0025*** (0.0008)	0.0025*** (0.0009)	0.0034* (0.0018)
Mean Outcome	0.0272	0.0272	0.0272	0.0272
Observations	20,997	20,997	20,974	20,974
Date of Speech FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Seasonality Trends	No	No	Yes	Yes
State x Year FE	No	No	No	Yes
Controls x Congress	No	Yes	Yes	Yes

Polarization in different Topics after MSE - Justice and Law

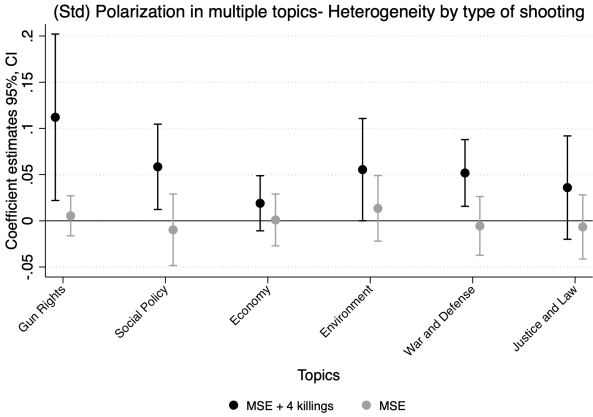
	<i>Polarization on Justice and Law</i>			
	(1)	(2)	(3)	(4)
MSE	0.0015* (0.0008)	0.0014* (0.0007)	0.0027 (0.0022)	0.0031 (0.0035)
Mean Outcome	0.0477	0.0477	0.0477	0.0477
Observations	20,997	20,997	20,974	20,974
Date of Speech FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Seasonality Trends	No	No	Yes	Yes
State x Year FE	No	No	No	Yes
Controls x Congress	No	Yes	Yes	Yes

Event Study Approach

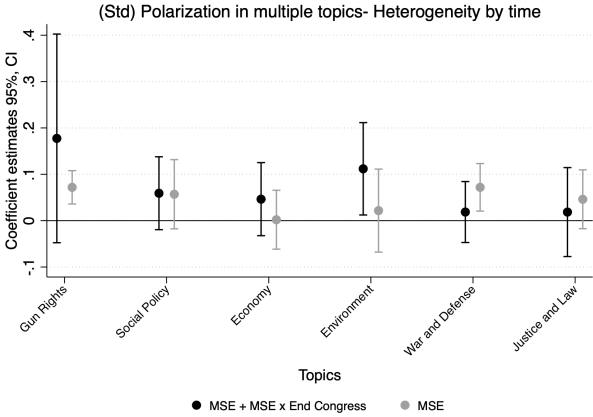
$$\text{Polarization}_{s,t}^i = \mu_s + \lambda_t + \sum_{\tau=-q}^{-2} \gamma_{\tau} \text{MSE}_{s,\tau} + \sum_{\tau=0}^m \delta_{\tau} \text{MSE}_{s,\tau} + x_{s,t} + \mu_s + \lambda_t + \epsilon_{s,t}$$

- $\text{Polarization}_{s,t}^i$ is polarization on topic i , in state s , at time t ;
- I include q lags and m leads, the omitted category is $t = -1$;
- $x_{s,t}$ is a battery of control variables;
- μ_s and λ_t are respectively state and time fixed effects

Heterogeneity by saliency - More than 4 Killings



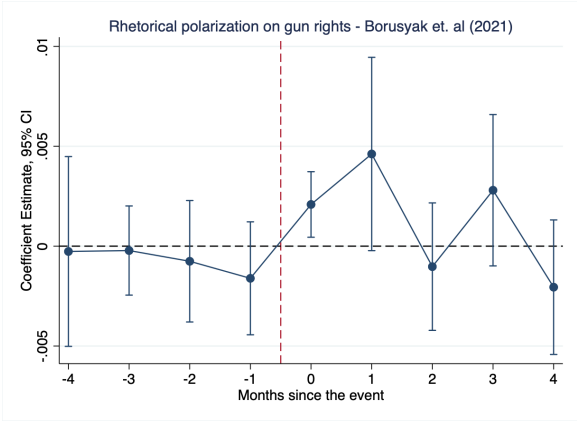
Heterogeneity by timing - Close election events



Different Time Windows

	<i>Polarization on Gun Rights</i>		
	(1)	(2)	(3)
MSE month window	0.0036*** (0.0011)		
MSE semester window		0.0040*** (0.0014)	
MSE year window			0.0026*** (0.0009)
Mean Outcome	0.0065	0.0065	0.0065
Observations	20,997	20,997	20,997
Date of Speech FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Seasonality Trends	Yes	Yes	Yes
State x Year FE	Yes	Yes	Yes
Controls x Congress	Yes	Yes	Yes

Borusyak, Jaravel & Spiess 2022 Event study



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Extreme speakers and salient events

	<i>Extreme candidate: DW-Nominate</i>		
	(1)	(2)	(3)
MSE	-0.0310 (0.0205)	-0.0040 (0.0592)	-0.0276 (0.0360)
Observations	505,056	505,056	505,056
Mean Outcome	0.2876	0.2876	0.2876
Date FE	Yes	Yes	Yes
State FE	Yes	Yes	No
State Time Trends	No	Yes	No
State x Year-month FE	No	No	Yes

Extreme speakers and salient events

	<i>Extreme candidate: DW-Nominate</i>		
	(1)	(2)	(3)
MSE	-0.0310 (0.0205)	-0.0040 (0.0592)	-0.0276 (0.0360)
Observations	505,056	505,056	505,056
Mean Outcome	0.2876	0.2876	0.2876
Date FE	Yes	Yes	Yes
State FE	Yes	Yes	No
State Time Trends	No	Yes	No
State x Year-month FE	No	No	Yes

- After a salient event, the probability that an extreme politician speaks it is not statistically different than the one of a moderate. [Back to Main](#)

How does politicians tweet after a salient event?

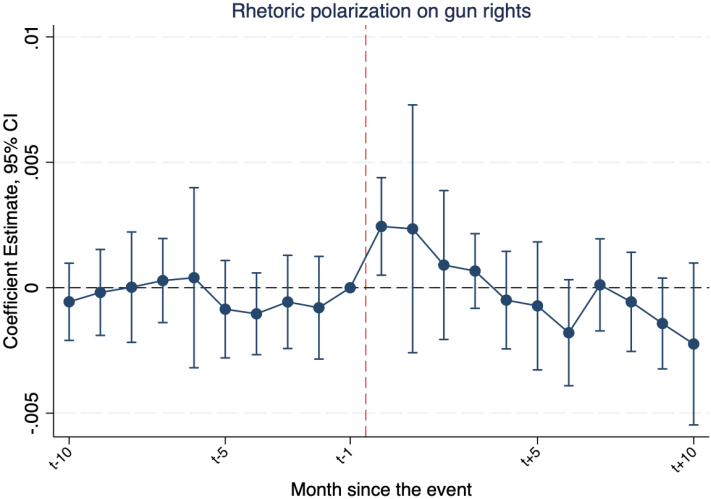
	<i>Sentiment on Tweets about Opponents</i>		
	(1)	(2)	(3)
MSE	-0.1463** (0.0618)	-0.1457** (0.0580)	-0.1497** (0.0573)
Observations	12,458	12,458	12,458
Mean Outcome	0.5279	0.5279	0.5279
Week FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes
State x Year FE	No	Yes	Yes
Controls	No	No	Yes

How does politicians tweet after a salient event?

	<i>Sentiment on Tweets about Opponents</i>		
	(1)	(2)	(3)
MSE	-0.1463** (0.0618)	-0.1457** (0.0580)	-0.1497** (0.0573)
Observations	12,458	12,458	12,458
Mean Outcome	0.5279	0.5279	0.5279
Week FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes
State x Year FE	No	Yes	Yes
Controls	No	No	Yes

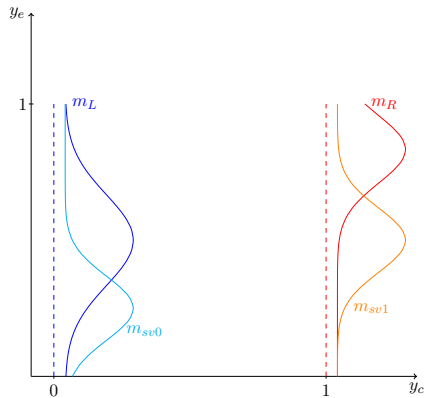
- Politicians impacted by the MSE have a more negative sentiment score in their tweets when they talk about their opponents after the occurrence [Back to Main](#)

TWFE event study



Event Study - Macro Topics

Theoretical Model Example



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Probability to vote and pass a new policy the week after a MSE

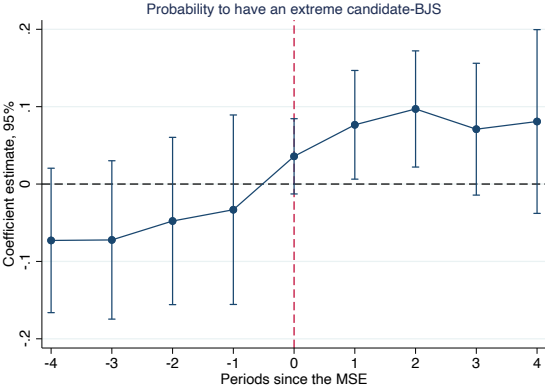
	<i>Probability to vote and pass a new law</i>	
	(1)	(2)
MSE	-0.0463*** (0.0164)	-0.0465** (0.0225)
Observations	4,550	4,550
Year-month FE	Yes	Yes
Topic FE	Yes	Yes

Divisive events and House of Representatives composition

	<i>Probability of electing Democratic candidate</i>			
	TWFE (1)	TWFE (2)	BJS (3)	BJS (4)
MSE	-0.0005 (0.0306)	0.0159 (0.0299)	-0.0503 (0.0342)	-0.0323 (0.0323)
Congress FE	Yes	Yes	Yes	Yes
Congressional district FE	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes
Mean Outcome	0.4858	0.4858	0.4858	0.4858
Observations	3,695	3,695	3,695	3,695

→ After an MSE the probability to elect a Republican or a Democrat does not change significantly [Back to Main](#)

Divisive events and House of Representatives composition - Event Study



Divisive events and House of Representatives composition - Event Study (TWFE)

