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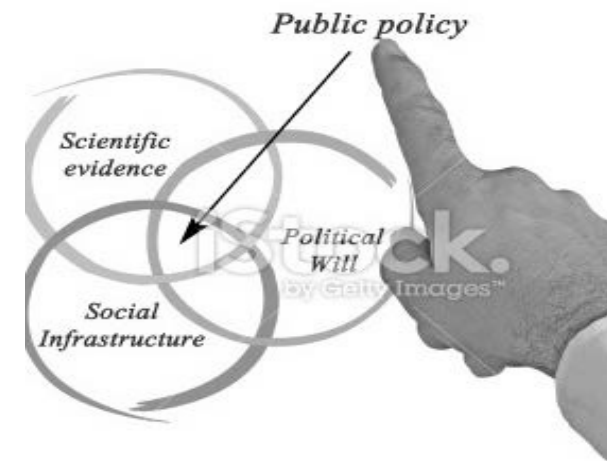
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# Counteracting the Politicization of Science

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# People are beginning to doubt the efficacy of “facts” when invoked in political debates

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## THE WAR ON SCIENCE



## “Post-truth” = 2016 word of the year

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**“circumstances in which objective facts are less influential in shaping public opinion than appeals to emotion and personal belief”**

**If “facts” are less important, what seems to be more important?**



# Roadmap

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- (1) Define the “politicization of science”**
- (2) Identify its effects in empirical studies**
- (3) Discuss results from research designed to test ways to counteract politicization from three large nationally representative studies**
- (4) Conclusions / Next Steps**
- (5) Q & A**

# Defining Politicization

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Politicization's defining features:

- (1) There exists a scientific finding or body of knowledge  
*e.g., a “consensus position”*
- (2) Any scientific finding contains some uncertainty  
*falsify conclusions rather than confirm them with certainty*
- (3) An actor or actors accentuate the inherent uncertainty of science  
*typically in pursuit of a particular agenda*

**Thus, politicization occurs when an actor emphasizes the inherent uncertainty of science to cast doubt on the existence of scientific consensus.**

# Politicization is a defining aspect of a subset of politically-contested issues

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# Politicization's Effects

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**Politicization undermines the impact of consensual scientific evidence, generates anxiety, and decreases support for alternative energy sources (Bolsen et al. 2014).**



# Politicization's Effects Depend on Human Reasoning

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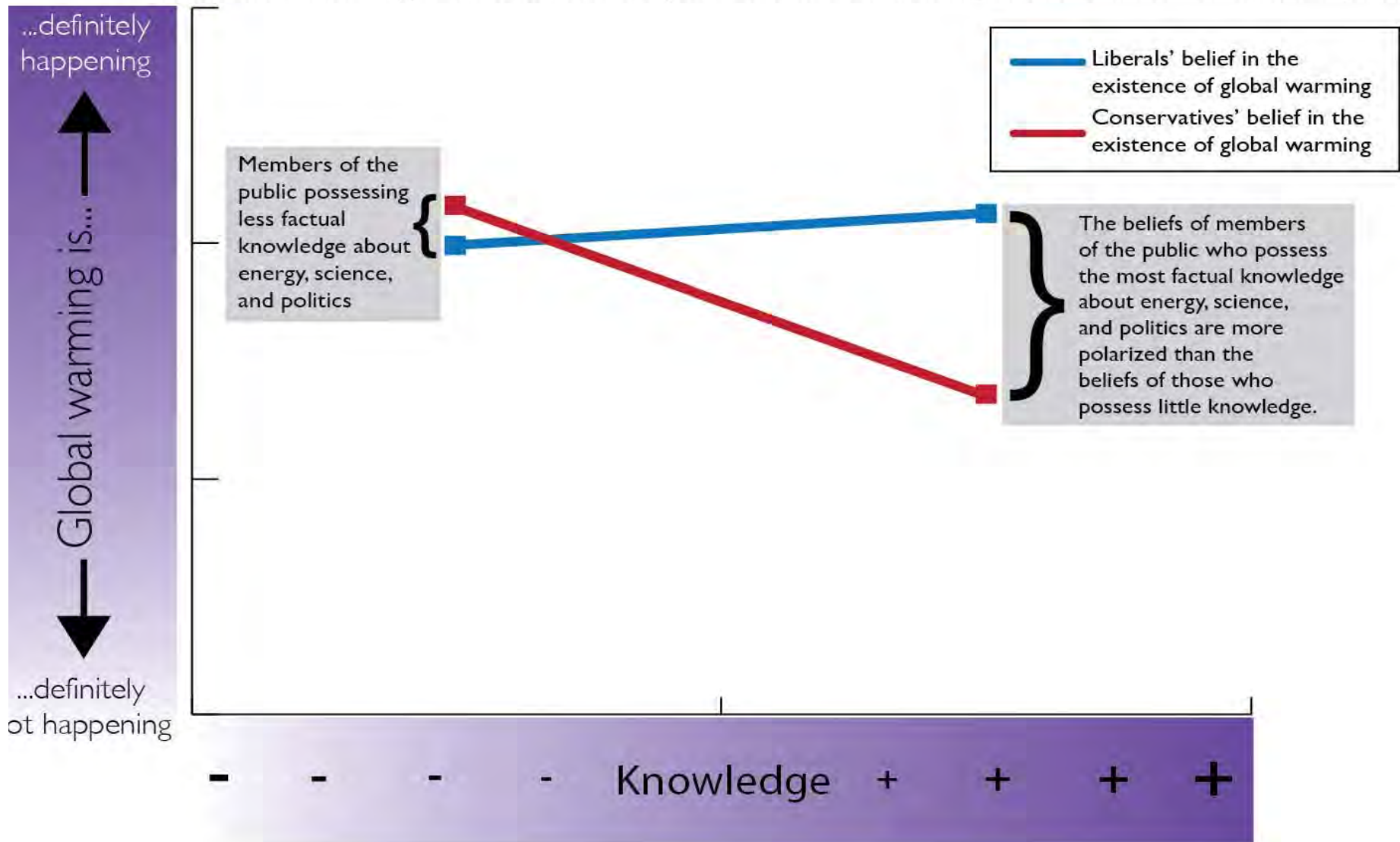
Source: Gromet et al., 2013, Light Bulb Study with Env. Label



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## Knowledge Polarizes Global Warming Debate Among Liberals and Conservatives

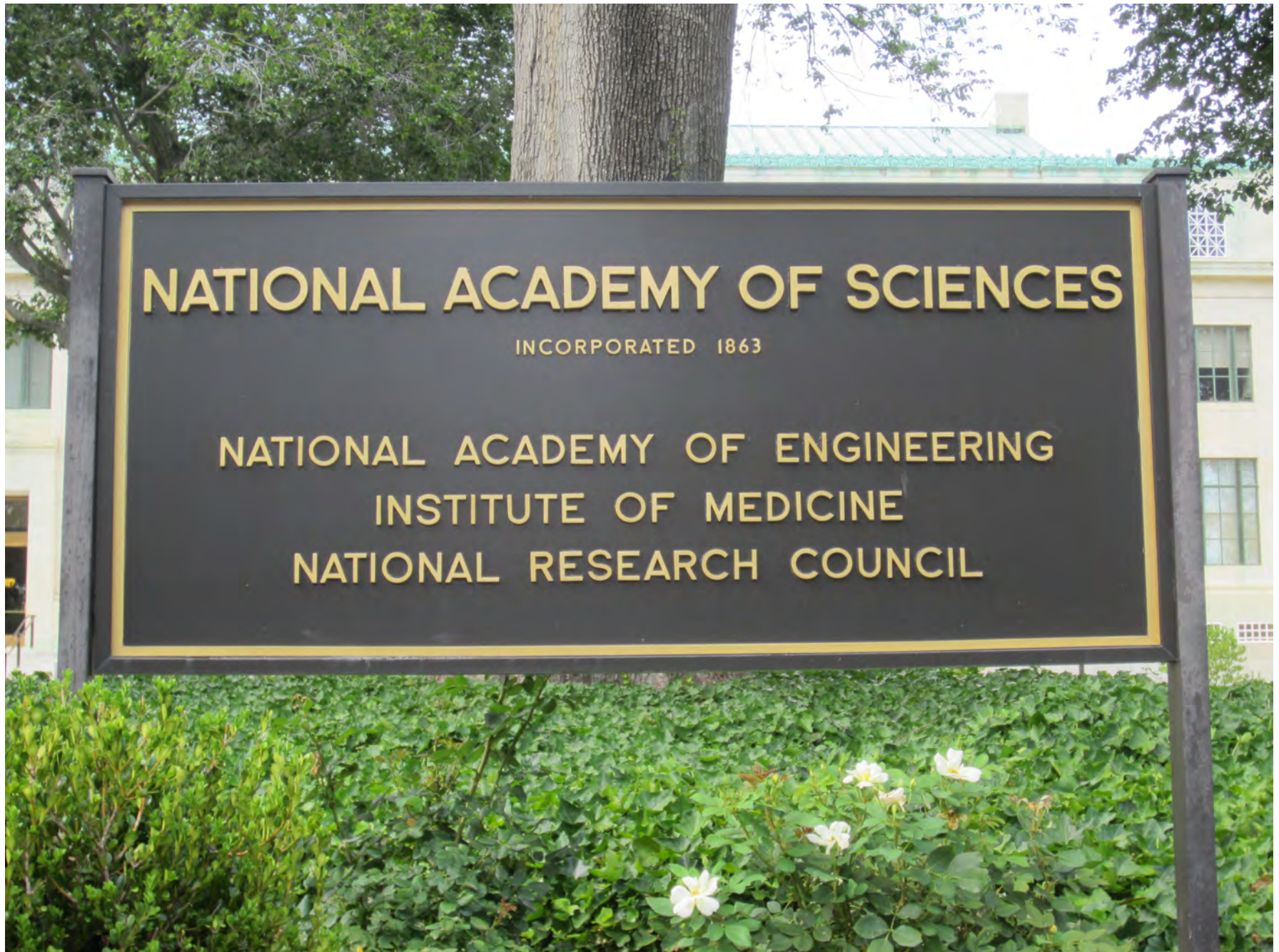
New research by social scientists Toby Bolsen of Georgia State and IPR's Jamie Druckman and Fay Lomax Cook shows that, contrary to common expectations, increased knowledge does not depolarize global warming debates. In fact, the opposite occurs: Partisan polarization increases among citizens who are more knowledgeable.



Source: Bolsen, Druckman, and Cook 2015, *Annals of the American Academy of Political and Social Science*

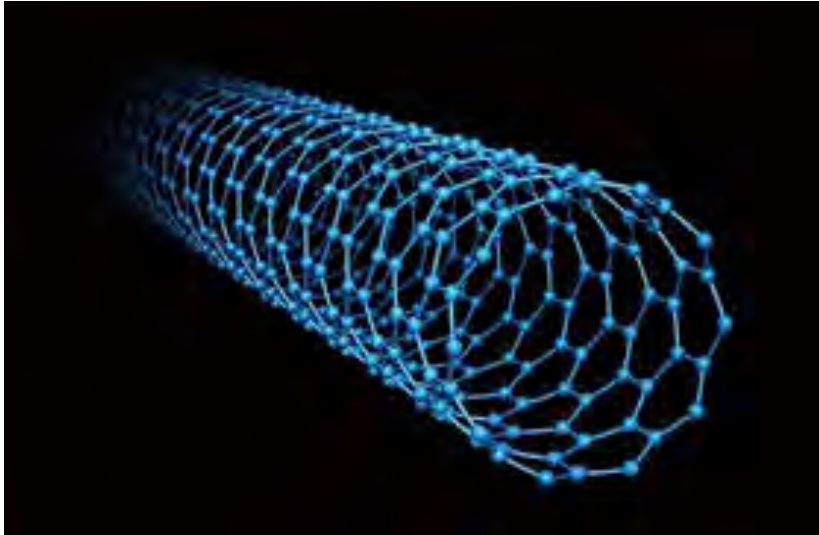
# What Can We Do to Combat Politicization?

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# Bolsen and Druckman - Counteracting Politicization

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**Carbon Nanotubes**

## Hydraulic Fracturing



# Nationally Representative Survey Experiments

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- Large survey (N= 2,484) that focused on distinct ET's and participants
- Survey Implemented over the Internet focusing on:
  - Carbon Nanotubes (CNTs)
  - Hydraulic Fracturing (Fracking)
- Identical experimental design for each technology with random assignment to one of 6 conditions
- **Key DVs measured:** (1) support for the use of the ET; (2) extent to which the government should decrease or increase investments into research on this ET; (3) extent to which ET will ensure long-term energy sustainability; (4) Anxiety & perceived threat. (Also explore info. seeking).

# Dependent Measures for Fracking Study

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## Fracking Dependent Variables

Do you oppose or support the use of fracking (which while involving a type drilling, fundamentally differs from conventional drilling in its novelty and allows for the recovery of substantial energy reserves) as an approach to obtain energy in the United States?

1	2	3	4	5	6	7
<i>strongly oppose</i>	<i>moderately oppose</i>	<i>slightly oppose</i>	<i>neither oppose nor support</i>	<i>slightly support</i>	<i>moderately support</i>	<i>strongly support</i>

Do you believe the United States' government should decrease or increase investments into research that advances fracking as an approach for obtaining energy?

1	2	3	4	5	6	7
<i>decrease a great deal</i>	<i>decrease a moderate amount</i>	<i>decrease a little</i>	<i>neither increase nor decrease</i>	<i>increase a little</i>	<i>increase a moderate amount</i>	<i>increase a great deal</i>

**Table 2. Experimental Conditions, and Hypotheses**

<b>Cond.</b>	<b>Scenario/Stimuli</b>	<b>Hypothesis<sup>1</sup></b>
1	No info.	Baseline Condition
2	Consens Sci. Info.	Consensus scientific information in support of ET reduces threat & anxiety, and increases support. ( <i>H. 1</i> )
3	Polit. Sci. Info.	Politicization renders the impact of positive consensus scientific info. impotent. There is an increase in threat and anxiety, and decrease in overall support. ( <i>H. 2</i> )
4	Warning to Dismiss Politicized Information → Polit. Sci. Info.	Warning to dismiss leads people to reject future politicized messages and become open to consensual scientific information, leading to a decrease in threat and anxiety, and an increase in overall support. ( <i>H. 3</i> )
5	Politicized Scientific Information → Correction	The correction has no counteractive effect, due to directional motivated reasoning, leading to increased threat and anxiety, and decreased overall support. ( <i>H. 4</i> )
6	Acc. Motivation → Polit. Scientific Information → Correction	Accuracy will overcome directional motivated reasoning and elevate the impact of consensual scientific information, leading to decreased threat and anxiety, and increased support. ( <i>H. 5</i> )

# Experimental Results: Mean Scores Across Conditions

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**Table A4. Mean Overall Support for technologies**

	Fracking	CNTs
Pure control	3.77 (0.64)	3.80 (0.70)
Scientific information	5.93 (0.94)	6.06 (0.79)
Politicized scientific information	2.02 (1.00)	2.40 (1.49)
Warning + Politicized scientific information	5.56 (0.80)	5.39 (0.69)
Politicized scientific information + correction	3.72 (0.79)	4.00 (0.71)
Acc. motivation + politicized sci. info + correction	4.71 (0.49)	4.60 (0.67)

The scores reported above are mean responses to the three-item scaled dependent variable discussed in the main text (1–7 point scale) with higher scores indicating increased support for fracking / CNTs; the standard deviation is listed in parentheses.



# Results

**Table 5. Percent Expressing Support for Each Technology**

	Fracking	CNTs
Pure Control	<b>17%</b>	<b>22%</b>
Scientific Information	<b>95%</b>	<b>94%</b>
Politicized Scientific Information	<b>4%</b>	<b>17%</b>
Warning + Politicized Scientific Information	<b>95%</b>	<b>95%</b>
Politicized Scientific Information + Correction	<b>20%</b>	<b>32%</b>
Accuracy Motivation + Politicized Scientific Information + Correction	<b>85%</b>	<b>76%</b>

The data above report the percentage of respondents in each experimental condition who express support greater than the mid-point on the 7-point scale (i.e., > 4) for each technology.

# Experimental Results: Mean Scores Across Conditions

**Table A5. Mean level of anxiety**

	Fracking	CNTs
Pure control	3.37 (0.94)	3.02 (1.18)
Scientific information	1.93 (1.04)	1.54 (0.75)
Politicized scientific information	4.04 (1.44)	4.20 (1.31)
Warning + Politicized scientific information	2.06 (0.86)	1.84 (0.68)
Politicized scientific information + correction	3.31 (0.77)	3.26 (0.92)
Acc. motivation + politicized sci. info + correction	2.65 (0.92)	2.49 (0.78)

The scores reported above are mean responses to the question, “As you think about [fracking/CNTs] as an approach to obtain energy, how much anxiety do you feel?” on a 5-point scale with higher scores indicating greater anxiety; the standard deviation is listed in parentheses.

# Experimental Results: Mean Scores Across Conditions

**Table A6. Mean level of perceived threat**

	Fracking	CNTs
Pure control	4.54 (1.46; 186)	4.92 (1.10; 202)
Scientific information	2.56 (1.45; 188)	2.51 (1.45; 193)
Politicized scientific information	5.33 (1.70; 191)	5.63 (1.40; 187)
Warning + Politicized scientific information	3.43 (1.11; 184)	3.83 (0.93; 196)
Politicized scientific information + correction	4.72 (1.41; 212)	5.12 (0.84; 199)
Acc. motivation + politicized sci. info + correction	4.34 (1.03; 187)	4.55 (0.80; 191)

The scores reported above are mean responses to the question, “Indicate how dangerous or safe you think it is to use [fracking / CNTs] as an approach to obtain energy” on a 7-point scale with higher scores indicating greater perceived danger; the standard deviation and N for each condition is listed in parentheses.

**Table A8: Request for Additional Information [See note 16 in the main text for a discussion of the results]**

<b>Condition</b>	<b>Fracking</b>	<b>CNTs</b>
Pure control	43% (N=186)	43% (N=206)
Scientific Information	7% (N=189)	9% (N=194)
Politicized Scientific Information	56% (N=190)	73% (N=192)
Warning + Politicized scientific information	21% (N=185)	20% (N=196)
Politicized scientific information + correction	40% (N=213)	48% (N=203)
Acc. motivation + politicized sci. info + correction	38% (N=189)	39% (N=196)

This table reports the percentage of respondents in each condition who requested to be re-contacted via email with

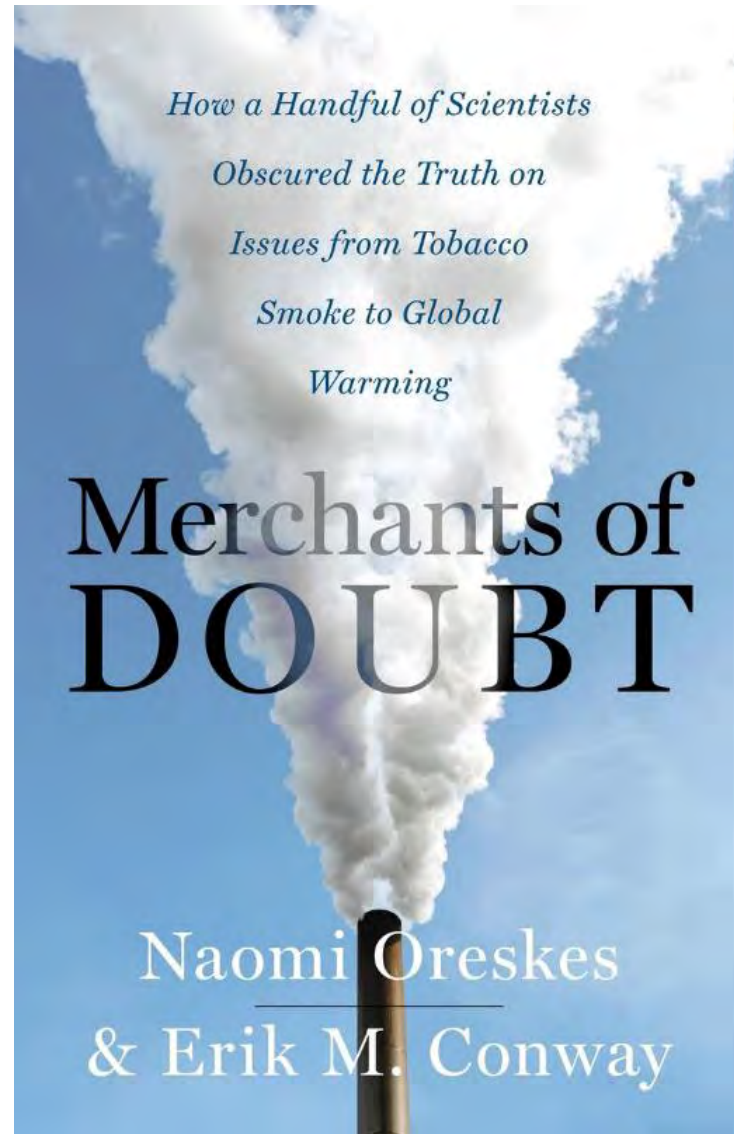
# Summary of Results

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- ➔ Politicization undermines consensual scientific information
- ➔ Impact can be counteracted by warnings or corrections, with warnings being more effective than corrections.
- ➔ Corrections can be especially effective at combating politicization in the presence of an accuracy motivation.
- ➔ Identify the mechanisms that drive politicization and impact of counteractive efforts on distinct technologies with unique participants for each study. Largely replicate findings across samples and technologies.

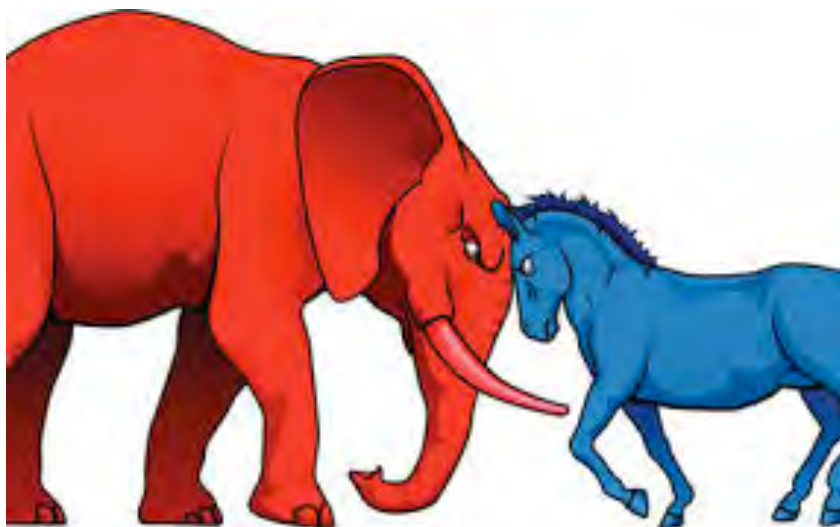
# Counteracting the Politicization of Climate Science

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## Do Partisanship and Politicization Undermine the Impact of a Scientific Consensus Message on Climate Change (Bolsen & Druckman, 2018)

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# Experimental Design and Procedure

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- Survey Experiment →
  - Representative U.S. sample in July, 2014; (N = 924) (excluding pure Independents).
  - Measured demographics including partisanship and political/energy knowledge (with 11 factual questions).



# Experimental Design and Procedure

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- Random assignment to one of five experimental conditions to address questions:
  - Control (i.e., introduction about climate change and then outcome measures)
  - Receipt of scientific **consensus** statement.
  - **Politicization** claim + scientific consensus statement.
  - **Warning** not politicized (inoculation) + politicization claim + scientific consensus statement.
  - Politicization claim + scientific consensus statement + **correction** not politicized.

# Outcome Measures (Presented Here)

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1. Extent **believe** climate change is primarily due to human activity as opposed to Earth's natural changes.
2. **Policy Beliefs** (scaled with  $\alpha = .91$ ).
  - Decrease or increase investment in ways to reduce impacts of climate change.
  - Importance of planning for ways to reduce climate change.
  - Opposition or support for laws to cut emissions of greenhouse gases.

# Summary

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- **Five Experimental Conditions** → (1) control; (2) consensus information only; (3) politicization claim + consensus information; (4) warning + politicization claim + consensus information; and, (5) politicization claim + consensus information + correction.
- All groups then answered → belief in human-induced climate change and policy belief items.
- **Expect** →
  - High Knowledge Republicans resist impact of the consensus message.
  - Politicization eliminates effect of the consensus message.
  - Warning/correction restore effect of consensus message.

# Analyses

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- Given partisan subgroup expectations, present results:
  - By **FOUR** groups:
    - **Party Identification:** Democrat or Republican.
    - **Knowledge:** median split on objective 11 fact questions (also looked at distinct flips, etc..)
    - Thus: → low knowledge Democrats (213), low knowledge Republicans (173), high knowledge Democrats (286), high knowledge Republicans (264).
- Regressions with experimental dummy variables, relative to the control group (\*\* $p \leq .01$ ; \*\* $p \leq .05$ ; \* $p \leq .10$  for two-tailed tests).

# Low Knowledge Democrats

	Human-Induced Climate Change	Policy Beliefs	Policy Beliefs
Consensus	0.474** (0.238)	0.0125 (0.0422)	-0.0127 (0.0397)
Politicization	-0.151 (0.233)	0.0181 (0.0412)	0.0322 (0.0386)
Warning	-0.215 (0.240)	0.0188 (0.0428)	0.0363 (0.0401)
Correction	-0.197 (0.233)	0.00804 (0.0415)	0.0259 (0.0389)
Human-Induc.			0.0630*** (0.0114)
Constant	4.651*** (0.166)	0.718*** (0.0298)	0.420*** (0.0608)
Observations	210	205	205
R-squared	0.052	0.001	0.133

- The consensus message → ↑ belief in human-induced, ≠ policy beliefs, BUT indirectly influences policy beliefs.
- Politicization → ELIMINATED the effect.
- Warnings and Corrections → FAILED to restore the consensus effect.

# Low Knowledge Republicans

	Human-Induced Climate Change	Policy Beliefs	Policy Beliefs
Consensus	0.517* (0.289)	0.0288 (0.0555)	-0.0154 (0.0518)
Politicization	-0.381 (0.273)	0.118** (0.0528)	0.140*** (0.0488)
Warning	-0.350 (0.280)	-0.0536 (0.0538)	-0.0321 (0.0497)
Correction	-0.299 (0.284)	-0.0147 (0.0550)	0.000812 (0.0508)
Human-Induc.			0.0757*** (0.0143)
Constant	4.138*** (0.204)	0.554*** (0.0396)	0.245*** (0.0687)
Observations	159	156	156
R-squared	0.086	0.079	0.224

- The consensus message → ↑ belief in human-induced, ≠ policy beliefs, BUT indirectly influenced policy beliefs.
- Politicization → ALMOST ELIMINATED all effects (odd effect on policy belief).
- Warnings and Corrections → FAILED to restore the consensus effect.

# High Knowledge Democrats

	Human-Induced Climate Change	Policy Beliefs	Policy Beliefs
Consensus	0.349** (0.178)	0.0230 (0.0293)	0.00459 (0.0280)
Politicization	0.481*** (0.188)	0.0351 (0.0311)	0.00948 (0.0298)
Warning	0.402** (0.177)	0.00161 (0.0292)	-0.0206 (0.0279)
Correction	0.208 (0.182)	-0.0231 (0.0301)	-0.0328 (0.0286)
Human-Induc.			0.0536*** (0.00934)
Constant	5.356*** (0.127)	0.840*** (0.0208)	0.553*** (0.0538)
Observations	286	282	282
R-squared	0.030	0.015	0.120

- The consensus message → ↑ belief in human-induced, ≠ policy beliefs, BUT indirectly influenced policy beliefs.
- Politicization → Does NOT eliminate effects (e.g., counter-argument!)
- Warnings and Corrections → Nothing to correct *per se* but correction short of significance.

# High Knowledge Republicans

	Human-Induced Climate Change	Policy Beliefs	Policy Beliefs
Consensus	-0.347 (0.261)	0.0195 (0.0589)	0.0620 (0.0483)
Politicization	-0.315 (0.249)	0.0179 (0.0557)	0.0585 (0.0457)
Warning	-0.151 (0.256)	-0.0157 (0.0575)	0.00372 (0.0470)
Correction	-0.400 (0.279)	0.0140 (0.0635)	0.0628 (0.0521)
Human-Induc.			0.129*** (0.0115)
Constant	3.800*** (0.192)	0.473*** (0.0429)	-0.0168 (0.0560)
Observations	261	257	257
R-squared	0.012	0.002	0.335

- The consensus message → NON-EFFECTS (belief in human induced affects policy beliefs but not due to consensus message).
- Politicization → NON-EFFECTS.
- Warnings and Corrections → NON-EFFECTS.



# Summary

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- A scientific consensus statement increases belief in human-induced climate change for all partisan subgroups, **with the exception of high knowledge Republicans**.
  - Increased belief in human-induced climate change, in turn is associated with increased support for climate mitigation policies (i.e., van der Linden et al.'s gateway belief model on indirect policy effects that could connect to geoengineering efforts).
- High knowledge Republicans reject the consensus statement's direct application to human-induced climate change beliefs thereby undermining (or at least vitiating) its indirect impact on policy support.
- With the exception of high knowledge Democrats, **politicizing science largely eliminates the impact of the consensus statement** on beliefs about human-induced climate change and then ultimately policy support.
- Efforts to counteract politicized statements fail.

# Next Steps

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- The impact of other politicization messages (e.g., with partisan sources).
- Other ways to counter-act politicization (e.g., van der Linden et al. 2017).
- Ways to message resistant partisan subgroups – appeal to their values and recognize belief ≠ policies (e.g., Campbell and Kay 2014).

# Conclusions

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- Society has a stake in overcoming persistent public conflict rooted in decision-relevant science.
- The collective welfare of society demands empirically informed collective action.
- Politicization can undermine the public's otherwise intact capacity to understand decision-relevant science.
- Scientists and scientific organization are a source of counteractive communication efforts. How can consensus be credibly communicated?
- How can we stimulate an accuracy motivation among citizens?

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Thank you!!

## Citation List

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Bolsen, Toby, and James N. Druckman. 2018. "Do Partisanship and Politicization Undermine the Impact of a Scientific Consensus Message about Climate Change?" *Group Processes and Intergroup Relations* 21(3): 389–402.

Bolsen, Toby, and James N. Druckman. 2015. "Counteracting the Politicization of Science." *Journal of Communication* 65(5): 745–769.

Bolsen, Toby, James N. Druckman, and Fay Lomax Cook. 2015. "Citizens', Scientists', and Policy Advisors' Beliefs about Global Warming." *The ANNALS of the American Academy of Political and Social Science* 658(1): 271–295.

Bolsen, Toby, James N. Druckman, and Fay Lomax Cook. 2014. "How Frames Undermine Support for Scientific Adaptations: Politicization and the Status Quo Bias." *Public Opinion Quarterly* 78(1):1–26.

Bolsen, Toby, Justin Kingsland, and Risa Palm. 2018. "The Impact of Frames Highlighting Coastal Flooding in the U.S.A. on Climate Change Beliefs." *Climatic Change* 147(1–2): 359–368.

Gromet, Dena M., Howard Kunreuther, and Richard P. Larrick. "Political ideology affects energy-efficiency attitudes and choices." *Proceedings of the National Academy of Sciences* 110, no. 23 (2013): 9314-9319.