Credentialed Contrarians: The Misrepresentation of Climate Change Expertise in Congress

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Abstract

Does partisan politics distort the representation of climate change expertise in U.S. policymaking? To examine this question, we classify each Congressional witness who testified on climate change between 1997 and 2016 in terms of both their expert credentials and their climate change beliefs. In contrast to prevailing wisdom, we find that Republicans are slightly more likely to call credentialed experts than Democrats. However, this pattern is largely driven by the presence of *credentialed contrarians*, i.e., experts who have contradicted widely accepted conclusions of their own community. Although these individuals represent less than one percent of climate change experts outside of Congress, they account for over a quarter of expert testimonies in Congress. More generally, these findings illustrate how politicians at odds with the expert community can strategically and repeatedly select the small minority of individuals who both lend credibility to their political views and meet shared standards of professionalized expertise.

Introduction

There are growing concerns about how political polarization may bias the use of expert research in the policymaking process (Scheufele, 2014; National Academy of Sciences, 2017). Nowhere is this more relevant than in the case of climate change: from selective sharing among elites, to misrepresentation of evidence to the public, to biased funding of research, scholars have illustrated a wide range of mechanisms through which climate change research can be distorted in the political sphere (McCright and Dunlap, 2000, 2003; Jacques, Dunlap, and Freeman, 2008; Oreskes and Conway, 2010; Bonds, 2016; Holman and Bruner, 2017; O'Connor and Weatherall 2019; Weatherall, O'Connor and Bruner 2020). Yet, evidence of bias from within the policymaking process itself has been more limited, with scholars finding less clear evidence of misrepresentation there (McCright and Dunlap 2003; Fisher, Leifeld, and Iwaki 2013; Farrell, 2015; Liu, Vedlitz, Stoutenborough, and Robinson, 2015). In this study, we illustrate how a more subtle form of politicization of climate change research within the policymaking arena has made it difficult to identify the full extent of its influence.

Building on theories of expert communication in Congress (Fenno, 1973; Krehbiel, 1991; Bimber, 1996; Diermeier and Feddersen, 2000; Sinclair, 2017), we show how policymakers strategically invite specific researchers likely to support their views while still adhering to observable standards of professionalized expertise. To demonstrate this phenomenon, we analyze the list of all witnesses who testified on climate change in Congress between 1997 and 2016. For each witness, we classify (1) whether or not they are a credentialed expert—using their presence or absence on the citation list of the Intergovernmental Panel on Climate Change (IPCC) as the primary indicator—and (2) whether or not they are aligned with three key conclusions of the expert community. We then explore how the distribution of witnesses varies as a function of party control in Congress, as well as how it compares to the distribution of climate change experts outside of Congress.

Our analysis yields three key findings. First, in contrast to the prevailing “anti-expert” narrative of the Republican Party on climate change, we find that Republican-controlled committees are modestly more, rather than less, likely to call credentialed experts to testify on climate change than Democratic-controlled committees. However, our second finding helps to explain the first: the climate change experts called by Republicans are disproportionately likely to be *credentialed contrarians*, i.e., credentialed experts who have contradicted the predominant conclusions of the expert community. Third, this strategic selection of credentialed contrarians leads to a significant bias in the overall representation of climate change expertise presented to Congress: although this group represents less than one percent of IPCC-cited experts, they account for twenty-seven percent of the testimonies given by IPCC-cited experts before Congress.

This study helps bridge the gap between the relative dearth of empirical evidence documenting the misrepresentation of climate change expertise within Congress compared with the far stronger body of evidence demonstrating this phenomenon outside of Congress. By shedding light on how politicians strategically select from the small minority of experts who reject the predominant conclusions of their own expert communities, we can see how the totality of climate change research can be significantly misrepresented while appearing to respect observable standards of expertise. In doing so, this study points to one possible explanation for the enduring resistance among many members of Congress to accepting the predominant conclusions of the expert community on climate change.

Methods

To examine the witnesses invited to testify on climate change in Congress, we used the Government Publishing Office's (GPO) Federal Digital System which contains transcribed testimonies of congressional committee hearings from 1997 through 2016. Following Fisher, Leifeld, and Iwaki (2013), hearings with titles containing one or more key terms¹ were selected for manual inspection, and those which were identified as being unrelated to climate change were then excluded. In total, 263 hearings from seventeen different committees were chosen for analysis, eleven from the House and six from the Senate. In total, these hearings include 1,536 witness testimonies.

Each witness associated with each testimony was then coded according to a two-by-two typology (Table 1). First, each witness was labeled as either having or not having the relevant expert credentials. The main measure employed for expert credentials is whether a witness is cited by the Intergovernmental Panel on Climate Change (IPCC), an international body of experts which seeks to comprehensively summarize the best available evidence across all relevant peer-reviewed literatures (Bolin, 2007). To encode this information, each witness was cross-checked against the combined citation list of the Intergovernmental IPCC Assessment Reports of 2001, 2007, and 2014. Two additional measures used were whether the witness holds a PhD and whether the witness is affiliated with a university. These additional measures were coded via internet-based background research and subsequent manual classification. All three of these measures comport with established conceptual schemes for perceived expertise (Kuhn, 1962; Collins and Evans, 2007).

Second, each witness was labeled as either having mainstream or contrarian views compared with the rest of the expert community. "Mainstream" was defined as a witness agreeing with all three fundamental conclusions of the IPCC, namely, (a) that global warming is happening, (b) that it is primarily human-caused, and (c) that it is dangerous for humanity (IPCC, 2014). "Contrarian" was defined as a witness disagreeing with at least one of these conclusions. The main measure used in this study was, following Petersen, Vincent, and Westerling (2020), the absence (mainstream) or presence (contrarian) of each witness on a list of individuals maintained by the watch-dog organization known as the *DeSmog Blog*.² As a secondary measure, each witness was also cross-checked against a list developed by Farrell (2015; 2016) who utilizes a network approach to classifying such individuals by their associations with organizations known to financially support research activity aimed at undermining the perception of a climate consensus.

¹ The complete list of terms were: climate, global warming, greenhouse, carbon, sea level, ice melt, sea rising, ocean rising, anthropogenic, wild fire.

² The *DeSmog Blog* includes individuals who they define as being involved in "misleading the public and stalling action on global warming."

Figure 1. Witness Classification Scheme. Each witness is assigned a value for the (1) strength of their expert credentials and (2) their stance on climate change, respectively. Although each of these concepts is best understood on a continuous spectrum, we simplify the coding process by transforming each into binary form. This creates a two-by-two classification space.

Finally, to identify party control for each witness’s testimony, we use the party affiliation of the chair of the committee holding a given hearing. We focus on chairs because they have authority over the content of the hearing, including which witnesses are invited to testify (Keller, 2009). That said, this measure of party control is imperfect because the minority party is able to exercise a limited degree of influence through the “Minority Witness Rule.”³ Because committee chairs are chosen by the majority party in each chamber, the partisan affiliation of chairs matches the majority party in that chamber. Of the 263 congressional hearings in the dataset, 189 of the hearings were held under a Democratic majority (88 in House, 100 in Senate, and 1 Joint) and 74 were held under a Republican majority (44 in House, 29 in Senate, and 1 Joint).

Results

Republicans slightly more likely to call expert credentialed witnesses

We use linear regression models to examine the association between party control and the probability that the witness called is credentialed (Table 2). Contrary to prevailing wisdom, we find that witnesses who testify before Republican-controlled committees are slightly more likely to be credentialed experts than witnesses who testify under Democratic control. We find that 11% of testimonies under Democratic control come from IPCC-cited witnesses, while 16% of

³ The minority party maintains the right to select witnesses for at least one day of a hearing, though this rule is primarily used to incentivize the chair to ensure that the selection of witnesses includes representatives of the viewpoints of the minority party (www.everycrsreport.com/reports/RS22637.html). In practice, minority members of a committee usually select one of the witnesses (out of an average of seven per hearing).

testimonies under Republican control do (Table 2, column 1). The pattern is similar for the alternative measures of expert credentials, with 36% and 42% of testimonies coming from PhD-holders under Democratic and Republican control, respectively, and 16% and 22% of testimonies coming from university affiliates (Table 2, columns 3 and 5). This positive association in the likelihood of calling a credentialed witness associated with Republican control is consistent, although not always statistically significant, both with and without additional controls for the two Congressional chambers and different committees (Table 2, columns 2, 4, and 6).⁴

Table 2. Probability that a witness has expert credentials. Linear regression estimates of the association between party control and the probability that the witness called is credentialed. The outcome variable takes the value of ‘1’ if the witness is credentialed and ‘0’ otherwise. The bolded row next to *Constant* represents the probability that a witness called is credentialed under a Democratic majority. The bolded row next to *Republican majority* represents the change in that probability associated with switching from Democratic to Republican control. The standard error for each point estimate is directly below in parentheses. Standard errors are clustered at the level of each committee hearing.

	Probability that Witness is Credentialed					
	(1)	(2)	(3)	(4)	(5)	(6)
Republican Majority	0.054* (0.033)	0.085** (0.042)	0.058 (0.045)	0.078 (0.062)	0.063* (0.037)	0.080* (0.048)
Constant	0.11*** (0.016)	0.067 (0.058)	0.36*** (0.022)	0.33 (0.29)	0.16*** (0.016)	0.27 (0.23)
Credential Measure:	Cited by IPCC		Holds PhD		University Affiliated	
Chamber-Committee Controls:	No	Yes	No	Yes	No	Yes
Observations:	1,566	1,541	1,566	1,533	1,566	1,541

*p<0.1; **p<0.05; ***p<0.01

Republicans significantly more likely to call contrarian witnesses

Next, we use linear regression models to examine the association between Republican control of the committee and the probability that the witness called is contrarian (Table 3). Across models, we find a positive and statistically significant association between Republican control and the likelihood that a witness is contrarian. Using the DeSmog measure, we find that 5% of testimonies under Democratic control come from a contrarian witness, while 11% of testimonies under Republican control do (Table 2, model 1). Similarly, using the Farrell (2015; 2016) measure, we find that 4% of Democratic-controlled testimonies come from contrarian witnesses, while 9% of Republican-controlled testimonies do (Table 2, column 3). These differences by party control are robust to inclusion of Congressional chamber and committee fixed effects (Table 2, columns 2 and 4).

⁴ We chose to use OLS rather than a generalized linear model (e.g., a probit model) because it provides ease of interpretation, where the results can be interpreted directly in terms of probabilities. Furthermore, Angrist and Pischke (2009) show that a linear probability model can still provide an unbiased estimate of the coefficient of interest, even when the outcome variable is dichotomous. For robustness, we show in the Supplementary Index that all results are consistent using a probit model.

Table 3. Probability that a witness is contrarian. Linear regression estimates of the association between party control and the probability that the witness called is contrarian are shown. The outcome variable takes the value of ‘1’ if the witness is contrarian and ‘0’ otherwise. The bolded row next to *Constant* represents the probability that a witness called is contrarian under a Democratic majority. The bolded row next to *Republican majority* represents the change in that probability that is associated with switching from Democratic to Republican control. The standard error for each point estimate is directly below in parentheses. Standard errors are clustered at the level of each committee hearing.

	Probability that Witness is Contrarian			
	(1)	(2)	(3)	(4)
Republican Majority	0.057*** (0.020)	0.073*** (0.028)	0.047*** (0.017)	0.063** (0.025)
Constant	0.046*** (0.007)	0.00 (0.00)	0.038*** (0.005)	0.067* (0.038)
Contrarian Measure:	DeSmog List		Farrell (2015) List	
Chamber-Committee Controls:	No	Yes	No	Yes
Observations:	1,566	1,541	1,566	1,541

*p<0.1; **p<0.05; ***p<0.01

Republicans significantly more likely to call credentialed contrarians

The previous findings treat the two main outcome measures in this study—expert credentials and contrarianism—separately. In this section, we use linear regression to assess the likelihood that a witness is *both* credentialed and contrarian (Table 4). Using the combined IPCC-DeSmog measure, we find that the likelihood of calling a credentialed contrarian under Democratic control is 2%, while it is 5% under Republican control (Table 4, column 1). Using the PhD-DeSmog measure, the likelihoods are 4% and 8% under Democratic and Republican control, respectively (Table 4, column 3). Using the university-DeSmog measure, the likelihoods are 2% and 6%, respectively (Table 4, column 5). These differences by party control are statistically significant in models both with and without additional controls for the two Congressional chambers and different committees. The results are substantively similar using the alternative set of measures based on Farrell (2015; 2016) (see Table S5 in the Supplementary Information).

Table 4. Probability that a witness is both credentialed and contrarian. Linear regression estimates of the association between party control and the probability that the witness called is a credentialed contrarian are shown. The outcome variable takes the value of ‘1’ if the witness is a credentialed contrarian and ‘0’ otherwise. The bolded row next to *Constant* represents the probability that a witness called is a credentialed contrarian under a Democratic majority. The bolded row next to *Republican majority* represents the change in that probability that is associated with switching from Democratic to Republican control. The standard error for each point estimate is directly below in parentheses. Standard errors are clustered at the level of each committee hearing.

	Probability that Witness is Credentialed Contrarian					
	(1)	(2)	(3)	(4)	(5)	(6)
Republican Majority	0.030** (0.013)	0.024 (0.016)	0.038** (0.017)	0.040* (0.023)	0.044*** (0.016)	0.050** (0.021)
Constant	0.015*** (0.004)	0.00	0.037*** (0.006)	0.00	0.019*** (0.005)	0.00
Credentialed Measure:	IPCC-Cited		Has a PhD		University Affiliated	
Contrarian Measure:	DeSmog List					
Chamber-Committee Controls:	No	Yes	No	Yes	No	Yes
Observations:	1,566	1,541	1,566	1,541	1,566	1,541

*p<0.1; **p<0.05; ***p<0.01

Credentialed contrarians more likely to repeatedly testify

In the remainder of the Results section, we supplement the previous regression analyses with additional descriptive statistics to illustrate the distinctive role that credentialed contrarians play in Congressional testimony on climate change compared with the other three witness groups (uncredentialed contrarians, uncredentialed mainstream, credentialed mainstream). First, we consider, for each witness group, how often the same individual is called back to testify in Congress on climate change. To do so, we compute the average number of testimonies per individual for each group, under Democratic and Republican control, respectively (Figure 1). Using the IPCC-DeSmog measures, we find that the average number of testimonies per individual for all other groups except credentialed contrarians is between 1.2 and 1.5 for the time period of study (1997 – 2016). In contrast, a credentialed contrarian witness testifies an average of 3.4 times under Democratic control, and 4.8 times under Republican control.

Figure 2. Average number of invited testimonies per individual witness between 1997 and 2016, by witness type and party control. An individual witness who has mainstream views—or who has contrarian views but without expert credentials—is unlikely to testify more than once during the period under study. In contrast, an individual credentialed contrarian witness testifies an average of 3.4 times under Democratic control, and 4.8 times under Republican control.

The fact that an individual credentialed contrarian is far more likely to be called repeatedly to testify is consistent with the observation that there are very few such experts available to call in the first place. After all, these individuals are rare by definition: they are members of a small minority within an expert community that openly disagrees with what most other experts in that community believe. In this case, the combined thirty-six testimonies delivered by this group during the period under study is delivered by a total of only five individuals. (These five individuals are profiled in detail in the Supplementary Information.)

Credentialed contrarians highly overrepresented in Congress

If credentialed contrarians are rare by definition—and if such individuals are repeatedly called to testify in Congress more so than other witness groups—then this provides prima facie evidence that they are overrepresented in Congressional testimony on climate change. To explore this question of misrepresentation directly, we need to first establish a benchmark for what appropriate

representation should look like. To do this, we can exploit the fact that our primary measure of expertise—presence on the combined citation list of the three IPCC Assessment Reports released between 2001 and 2014—means that there are a finite number of potential expert credentialed witnesses. We can cross-check this list of individuals against the list of contrarians provided by the DeSmog list and compute what percentage of potential expert-credentialed witnesses are also contrarians. We can then compare this percentage with the actual percentage of expert-credentialed witness testimonies on climate change provided by credentialed contrarians.

These estimates are displayed in Table 5. We find that 0.7% of all IPCC-cited experts are contrarian. In contrast, we find that 13% of credentialed testimonies under Democratic control were credentialed contrarians, while 27% of such testimonies were credentialed contrarian under Republican control. In other words, credentialed contrarians are overrepresented in Congress under Democratic-controlled committees by a factor of 19 and under Republican-controlled committees by a factor of 38.

Table 5. Overrepresentation of credentialed contrarians in Congress. The first row shows the percentage of all credentialed experts (i.e., cited by the IPCC) that are contrarian (i.e., listed on the DeSmog Blog). The second two rows show, by party, the percentage of credentialed expert witnesses in Congress that are contrarian.

	Total	Contrarian Representation
All individuals cited in IPCC Assessment Reports (2001 - 2014)	2,646	0.7%
All testimonies from IPCC-cited witnesses under Democratic control	129	13.0%
All testimonies from IPCC-cited witnesses under Republican control	71	26.8%

Discussion and Conclusion

In this study, we bring to light new evidence on the politicization of climate change research in legislative politics. Our analysis of witness testimony in congressional climate change hearings from 1997 through 2016 generates three novel findings. First, the simplistic “anti-expert” narrative of the Republican Party on climate change does not fit the observed data, as Republicans are modestly more, rather than less, likely to call credentialed experts to testify when holding hearings on climate change. Second, this increased representation of climate change experts is largely driven by the increased presence of *credentialed contrarians*, i.e., experts who have publicly contradicted at least one of three fundamental and widely accepted findings of the expert community. Third, the repeated testimonies of these select individuals creates a significant bias in the representation of climate change expertise: although this group represents less than one percent of climate change experts in the world, they account for over a quarter of the testimonies given by credentialed experts before Congress.

One surprising finding is that, even though credentialed contrarians are more than twice as likely to be called by Republicans (Table 4), these witnesses are over-represented even under Democratic control (Table 5). However, this observation must be evaluated in light of the fact that party control in Congressional committees is not fully dictatorial. Because of the “Minority Witness Rule” (see footnote 4), it is probable that at least one witness testimony per hearing is effectively chosen by the minority party. Unfortunately, there is no information available in the public transcripts to consistently distinguish these witnesses. We speculate that this could explain the overrepresentation of credentialed contrarians under Democratic control. Consequently, our study likely under-estimates the true differences between parties in their likelihood of calling credentialed contrarians.

Notwithstanding this limitation, these findings have implications for understanding the nature of professionalized expertise, and how it is represented in the policymaking process. Even when an expert community moves toward a consensus, some disagreement within that community will continue to exist (Anderegg et al., 2010; Kitcher, 2001). Consequently, politicians can exploit this disagreement by strategically selecting from among qualified experts those who are the most likely to convey and validate the empirical claims that help to justify those politicians’ policy goals while still adhering to the observable boundaries of expertise. In the case of climate change, recognition of this more subtle form of bias allows us to see the full extent to which climate change expertise has been misrepresented in Congress.

References

- Anderegg, W. R. L., J. W. Prall, J. Harold and S. H. Schneider. 2010. “Expert credibility in climate change.” *Proceedings of the National Academy of Sciences* 107(27):12107–12109. URL: <http://www.pnas.org/cgi/doi/10.1073/pnas.1003187107>
- Angrist, Josh and Jörn-Steffen Pischke, 2009. "Mostly Harmless Econometrics: An Empiricist's Companion," Economics Books, Princeton University Press, edition 1, number 8769, April.

- Bimber, Bruce. 1996. *The Politics of Expertise in Congress: The Rise and Fall of the Office of Technology Assessment*. Albany, NY: SUNY Press.
- Bolin, Bert. 2007. *A History of the Science and Politics of Climate Change: The Role of the Intergovernmental Panel on Climate Change*. Cambridge.
- Collins, Harry and Robert Evans. 2007. *Rethinking Expertise*. University of Chicago Press.
- Diermeier, Daniel and Timothy J. Feddersen. Information and Congressional Hearings. *American Journal of Political Science*, Jan., 2000, Vol. 44, No. 1 (Jan., 2000), pp. 51-65.
- Kuhn, Thomas S. 1962. *The Structure of Scientific Revolutions*. Chicago University Press.
- Farrell, Justin. 2015. "Network structure and influence of the climate change counter-movement." *Nature Climate Change* 6(4):370–374. URL: <http://www.nature.com/doi/10.1038/nclimate2875>
- Farrell, Justin. 2016. "Corporate funding and ideological polarization about climate change." *Proceedings of the National Academy of Sciences of the United States of America* 113(1):92–7. URL: <http://www.ncbi.nlm.nih.gov/pubmed/26598653>
- Fisher, D. R., Leifeld, P., & Iwaki, Y. 2013. Mapping the ideological networks of American climate politics. *Climatic Change*, 116(3–4), 523–545. <https://doi.org/10.1007/s10584-012-0512-7>
- Fenno, Richard F. Jr. 1973. *Congressmen in Committees*. New York: Little, Brown and Co.
- Keller, Ann Campbell. 2009. *Science in Environmental Policy: The Politics of Objective Advice*. MIT Press.
- Krehbiel, Keith. 1991. *Information and Legislative Organization*. Ann Arbor, MI: University of Michigan Press.
- Holman, B., & Bruner, J. 2017. Experimentation by industrial selection. *Philosophy of Science*, 84(5), 1008-1019.
- Intergovernmental Panel on Climate Change. 2014. *Fifth Assessment Report*. www.ipcc.ch/report/ar5/
- Jones, Bryan D. and Frank R. Baumgartner. 2005. *The Politics of Attention: How Government Prioritizes Problems*. University of Chicago Press.
- Kitcher, Philip. 2001. *Science, Truth, and Democracy*. Oxford University Press.
- Liu, Xinsheng, Arnold Vedlitz, James W. Stoutenborough and Scott Robinson. 2015. "Scientists' views and positions on global warming and climate change: A content analysis of congressional testimonies." *Climatic Change*.

McCright, Aaron M. and Riley E Dunlap. 2003. "Defeating Kyoto : The Conservative Movement's Impact on U.S. Climate Change Policy." *Social Problems* 50(3):348–373.

O'Connor, C., & Weatherall, J. O. 2019. *The Misinformation Age: How False Beliefs Spread*. Yale University Press.

Oreskes, N., and Conway, E. M. 2010. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*. United States: Bloomsbury Publishing.

Petersen, Alexander Michael and Emmanuel M. Vincent & Anthony LeRoy Westerling. 2020. "Addendum: Discrepancy in scientific authority and media visibility of climate change scientists and contrarians." *Nature Communications* 11, 553.

Sinclair, Barbara. 2017. *Unorthodox Lawmaking: New Legislative Processes in the U.S. Congress*, 5th Edition. Thousand Oaks, CA: CQ Press.

Weatherall, J. O., O'Connor, C., & Bruner, J. P. 2020. "How to beat science and influence people: policymakers and propaganda in epistemic networks." *British Journal for the Philosophy of Science*, 71(4), 1157-1186.

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