Political Parties and Climate Change Skepticism: Evidence from Close Gubernatorial Elections

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Abstract

Many theorize that public opinion follows the political elite on climate change skepticism, yet evidence of a causal link is lacking. I use a regression discontinuity design to establish the impact of the political party of a gubernatorial election winner on the global warming beliefs of constituents. I find that the election of a Republican governor significantly decreases the probability of a Republican constituent believing in global warming by approximately 11 to 16 percentage points; there is no such impact on a Democratic constituent. These results provide one explanation for the increased political polarization in global warming beliefs despite the scientific consensus.

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1. Introduction

Recent polls reveal that a majority of U.S. adults are concerned about climate change[1]. For example, a March 2016 Gallup poll finds that 64% of U.S. adults say they are worried a "great deal" or "fair amount" about global warming (Gallup, 2016) and a 2016 Pew Research Poll finds that 74% of U.S. adults care "a great deal" or "some" about the issue of global climate change (Pew Research Center, 2016). Yet, there are substantial differences in climate change beliefs and concern across segments of U.S. society; individual party affiliation is recognized as one of the particularly strong predictors of climate change beliefs (e.g. Borick and Rabe, 2010; Egan and Mullin, 2017; Hornsey et al., 2016). Moreover, research suggests that political polarization on climate change has increased over recent years (e.g. Dunlap and McCright, 2008; McCright and Dunlap, 2011).[2] In contrast to the political polarization, there is a strong consensus in the scientific community that climate change is real. According to the Intergovernmental Panel on Climate Change (IPCC), climate change has caused widespread impacts on human and natural systems, continued greenhouse gas emissions will cause further warming and changes to the climate system[3], and limiting climate change risks would require substantial reductions in greenhouse gas emissions (IPCC, 2014).

[1] I use the terms "climate change" and "global warming" interchangeably throughout the manuscript. Global warming was the more popular term in the 1970s and 1980s but continues to appear in the lexicon. "Climate change" often implies a wider range of impacts, such as increased climate variability and sea level rise. The question on the survey that I analyze uses the term "global warming."

[2] Political polarization is not limited to climate change. A literature documents growing political polarization on a variety of economic and social issues (Abramowitz and Saunders, 2008; Baldassarri and Gelman, 2008; Brewer, 2005; Evans, 2003; Jacobson, 2005).

[3] A growing literature seeks to quantify the economic effects of climate change. Dell et al. (2014) provide a review of studies using weather shocks over time to identify economic impacts. Examples of papers using this approach are Barreca et al. (2016), Dell et al. (2012), and Deschênes and Greenstone (2007). Another recent review on the economic costs of climate change is provided by Tol (2018).

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Why is it that political polarization on climate change has increased when the scientific consensus is clear? In this paper, I provide one potential explanation; climate change platforms and policies of the political elite impact the climate change beliefs of their constituents. Specifically, I find that party affiliation of political leaders differentially affects the climate change beliefs of individuals identifying with the Republican versus Democratic party.[4] This finding is consistent with the Druckman et al. (2013) experimental evidence that elite partisan polarization—high levels of homogeneity within elected representatives of a party and high levels of ideological differences across elected representatives of parties—increases the impact of party endorsements on public opinion and lessens the importance of substantive information.

Estimating the impact of political elite opinion on mass opinion is empirically challenging. Absent a credible identification strategy, we would be concerned about endogeneity because areas that vote for Republican representatives could be quite different along many unmeasured dimensions as compared to areas that vote for Democratic representatives. I circumvent these endogeneity concerns by leveraging close gubernatorial election outcomes to identify how the governor's political party affects mass opinion. The regression discontinuity design (RDD) estimates the causal effect of a Republican gubernatorial win on the probability that a constituent believes there is solid evidence of global warming. This identification strategy originates with Lee (2001, 2008) and has been utilized elsewhere in the literature to determine the causal impact of elections (for example, Beland, 2015; Leigh, 2008). The intuition is that, if the political party of the winning candidate has no bearing on constituent global warming beliefs, then constituent global warming beliefs should not change discontinuously at the threshold between gubernatorial races that narrowly had Republican winners versus those that narrowly had Democrat winners.

[4] Similar to Costa and Kahn (2013), I take political ideology as a set of prior beliefs. Given their political affiliation/ideology, individuals are "treated" with a Republican governor.

I match multiple waves of the National Surveys on Energy and Environment (NSEE) from 2008-2015 with gubernatorial election results to generate a sample of US individuals from all 50 states. I first estimate nonparametric local linear regressions, as suggested by de la Cuesta and Imai (2016), Gelman and Imbens (2017), and Skobron and Titiunik (2015). When using the overall sample, I find consistent negative point estimates for the effect of a Republican gubernatorial win on global warming beliefs of constituents, but the estimates are not statistically significant. However, I do find evidence of significant heterogeneity in the treatment effect; a Republican gubernatorial win significantly decreases the probability of a Republican constituent believing in global warming by approximately 11 to 16 percentage points whereas there is no significant effect of a Republican win on the global warming beliefs of Democrat constituents. I then use several parametric specifications to formally test for differential effects on constituents of different party affiliations. Here, I confirm that the effect of a Republican gubernatorial win on climate change beliefs is significantly stronger for Republican constituents than for Democratic constituents. In the preferred specification, Republican individuals are approximately 9 percentage points less likely to believe in climate change relative to Democratic individuals when a Republican candidate wins a close gubernatorial election.

I make several important contributions with this paper. While some have theorized that the public follows the lead of the political elite on climate change, Egan and Mullin (2017) note that "scholars have not identified a direct causal link between climate change skepticism campaigns and individual attitudes." Thus, the most important contribution is that I provide the first causal evidence that the climate change stance of a political leader impacts climate change beliefs of constituents. This finding has important implications for how climate change skepticism could persist into the future despite the scientific evidence. A second contribution is that I provide new

quasi-experimental evidence that political communication impacts opinion in general. Many earlier papers find a strong correlation between political communication and opinion, but the evidence typically lacks credible identification strategies (Gabel and Scheve, 2007; DellaVigna and Gentzkow, 2010). Several experimental papers do control elite communication in a laboratory or survey setting to establish causality (e.g. Druckman, 2004; Druckman et al., 2013). While such studies have high internal validity, the external validity of the results remains an open question. A third contribution is to the growing literature on the impacts of political ideology. In particular, there is growing evidence that political ideology affects the extent of one's pro-environmental behavior.[5] Finally, a more minor contribution is that I add to the RD literature that uses vote margin in gubernatorial elections as the running variable. I provide further evidence of the validity of using the RD design in this context.

To claim that I am identifying the impact of political elite on climate change beliefs, I must first establish why it could be plausible for this to happen. First, it must be the case that Republican governors typically deny climate change while Democratic governors accept the science of climate change. Next, there must be theory and evidence that political and media communication influences individuals' political opinions. Lastly, there should be reason to expect that the political opinion impact will depend on the political affiliation of the constituent. In the subsequent section, I provide evidence to support these three arguments.

2. Related Literature

2.1 Evidence that Republican governors deny climate change

[5] For example, Costa and Kahn (2013a) show that political ideology matters for the response to a electricity conservation "nudge," Costa and Kahn (2013b) find that liberal households consume less electricity, and Kahn (2007) finds that members of the Green Party make more environmentally friendly transportation choices.

There is a political divide among elected representatives along partisan lines with regards to environmental issues. As discussed by Cragg et al. (2013), the League of Conservation Voters ("LCV") annual Scorecards provide a popular measure of how "pro-environment" a member of Congress is in their voting positions. The LCV score represents the percentage of the votes where an elected official cast a vote for the pro-environment position. Cragg et al. (2013) highlight that the average LCV score for the Leadership of the Democrats in 2009 was 93% and that of the Republican Leadership was 0%. Multiple academic articles have detailed the history of climate change denial within the conservative movement (e.g. Egan and Mullin, 2017; Elasser and Dunlap, 2013; Jacques et al., 2008; McCright and Dunlap, 2003). The literature discusses the role of think tanks, conservative donors, media coverage, and politicians. These actors tend to work together to challenge the evidence of climate change, and conservative politicians "have become a vital force denying global warming" (Elasser and Dunlap, 2013). Therefore, many argue that climate change denial is now firmly entrenched in the platform of the Republican elite.

Governors are the elected executive heads of each U.S. state. As detailed by Beland (2015), governors wield considerable political power in the United States political system as the head of the executive branch. "The governor sets policies, prepares and administers a budget, recommends legislation, signs laws, and appoints department heads…Governors can veto state bills, which gives them considerable control over policies" (Beland, 2015). Governors in most states can also use line-item veto on bills involving taxing or spending.

A 2014 report categorizes the nation's governors into four groups according to their climate change beliefs (Koronowski, 2014).[6] At the time of the report, only Democrats were labeled as

[6] The four categories are green, orange, red, and climate denier. "Green governors not only accept climate change science but are proactively implementing policies to fight climate change and prepare their states for the impacts of extreme weather. Orange governors either accept climate science or have not openly denied it but also have not yet taken serious action to help their state prepare for its impacts. If a governor has made no public statement on climate

"green" for proactively implementing climate change policies. Moreover, "fifteen out of twenty nine sitting Republican governors openly deny climate science" (Koronowski, 2014). That is, over half of Republican governors in 2014 were categorized as "climate deniers." In contrast, "None of the country's Democratic governors have made public statements denying climate change" (Koronowski, 2014). While there are several exceptions during the sample period[7], almost all Republican governors either deny climate change or remain silent on the issue.

2.2 Evidence that Political and Media Communication Influences Opinion

This study relates to the vast empirical literature on persuasive communication. DellaVigna and Gentzkow (2010) provide a review of the empirical evidence on persuasion directed at consumers, voters, donors, and investors. Here, I concentrate on the most directly related studies concerning the effects of communication on political opinion and behavior. Presumably, politicians consider public beliefs on climate change when designing their platforms and policies. Additionally, political messaging from politicians and public opinion may be correlated because of various omitted variables that affect both political elite and mass opinion. Thus, much of the extant evidence should be interpreted as correlational (DellaVigna and Gentzkow, 2010).

Field experiments provide some evidence of a causal link between communication and opinion. Moreover, field experiments place the experimental treatments in the context of the real

science, has not taken action, or has openly objected to federal safeguards that help blunt the impacts of climate change, they are placed in the red category. Governors who deny the science behind climate change are added to the red "Climate Deniers" category, further marked by striped lines" (Koronowski, 2014).

[7] Perhaps the most well-known exceptions, Arnold Schwartzenegger (Republican governor of California from November 17, 2003 to January 3, 2011) and Charlie Crist (Republican governor of Florida from January 2, 2007 to January 4, 2011) advocated for policies to address climate change. I conduct a robustness check in section 4.4 to investigate the stability of the results when I do not include individuals in California under Schwartenegger or in Florida under Crist. Observations from Florida in 2010 are not included in any of the analyses because Crist switched to Independent in early 2010. Crist later switched to the Democatic Party in 2012.

world, which increases the external validity of the study relative to a laboratory study. Gerber et al. (2011) conduct a field experiment in which the authors randomize the timing of televised political advertising campaigns and find strong but temporary effects on public opinion of the candidates. Gerber et al. (2009) use a field experiment before the 2005 Virginia gubernatorial election to test the effect of newspapers on political opinion and behavior and find some evidence that media exposure matters.

A growing and related literature utilizes quasi-experimental variation to identify the effects of media communication on public opinion and behavior. DellaVigna and Kaplan (2007) use the natural experiment of the entry of Fox News into media markets and find some evidence that Fox News persuaded a significant percentage of its viewers to vote Republican. Enikolopov et al. (2010) use a similar identification strategy in the context of Russia and also find evidence of persuasion. Chiang and Knight (2011) find that newspaper endorsements for president shift stated voting intentions. Gentzkow (2006) leverages historical data on the diffusion of television while Gentzkow et al. (2011) exploit newspaper entry and exit to identify the effects on voter behavior.

There is less evidence in the economics literature regarding the effect of communication on environmental beliefs and behavior more specifically. A prominent exception is Jacobsen (2011), who finds that the climate change documentary, *An Inconvenient Truth*, substantially increased carbon offset purchases. A set of working papers (Beattie, 2017a; Beattie, 2017b) focus on the effects of newspaper coverage on consumer behavior. Beattie (2017a) finds that consumers become more skeptical about climate change when the tone of newspaper coverage becomes more skeptical about the issue. Relatedly, Beattie (2017b) examines the effect of newspaper tone regarding climate change on consumer driving behavior; recent coverage with an environmental

tone causes households to be more environmentally friendly in their driving behavior while skeptical tone has no effect on behavior.

2.3 Evidence that Political Affiliation of Constituents Could Matter

An extensive literature spanning multiple fields investigates the determinants of climate change beliefs. It is beyond the scope of this paper to review all these studies, but several important themes emerge from this body of work.[8] First, political affiliation is an extremely important explanatory variable for predicting climate change beliefs. "Where measures of partisanship or political ideology are included in models of individual opinion, they typically dominate all other relationships" (Egan and Mullin, 2017). Moreover, political affiliation moderates the impact of information on climate change beliefs. Specifically, studies show that education and scientific knowledge positively correlate with belief in climate change for Democrats but have weak or even negative correlation for Republicans (Egan and Mullin, 2017; Malka et al., 2009; McCright and Dunlap, 2011; Guber, 2013; Kahan, 2015). The implication is that providing scientific information about climate change will have differential effects on Democrats and Republicans.[9]

Second, global warming beliefs have become increasingly polarized by political party over time (Egan and Mullin, 2017; Krosnick et al., 2000; McCright and Dunlap, 2011; Guber, 2013) and research indicates that this polarization matters for how the public understands messaging on global warming. Multiple studies find evidence of partisan contrasts in the effectiveness of communicating with different frames, with frames typically having larger impact for Republican

[8] Recent review articles on the topic include Egan and Mullin (2017) and Hornsey et al. (2016).
[9] Relatedly, providing other types of environmental information such as energy efficiency ratings can result in different reactions from those of different political ideologies. See Gromet et al. (2013) for an example.

opinion than for Democrat opinion (Egan and Mullin, 2017; Hardisty et al., 2009; Gromet et al., 2013).

Third, when confronted with a complex issue such as climate change, individuals tend to look for cues from the political elite of their party when forming their opinion.[10] Rugely and Gerlach (2012) argue that individuals adopt the climate change positions of their political party to mitigate informational costs of understanding complex scientific issues. Others argue that individuals want to conform their climate change beliefs to the predominant beliefs of their cultural group (Kahan et al., 2012). As summarized by Egan and Mullin (2017), "the complex scientific content on the climate change issue can make it difficult for individuals to form their own judgments about the accuracy of climate science or the potential impacts of climate policy, leading most to look to partisan elites for information about the quality of evidence and the likely effects of policy proposals."

Fourth, while Republican and Democrat political elite have displayed a substantial gap in environmental concern since at least the early 1970s, substantial public opinion differences on environmental issues did not manifest until the mid-1990s (Egan and Mullin, 2017). Thus, climate change beliefs of individuals have followed the polarized positions taken by the political elite, a phenomenon sometimes termed "issue evolution" (Lindaman and Haider-Market, 2002). Taken together, these four themes strongly suggest that the political affiliation of a constituent will matter when presented with communication concerning climate change. Specifically, prior evidence

[10] There is an entire literature devoted to theories and evidence concerning the impact of elite behavior on mass opinion. Some examples include Brody (1991), Carmines and Stimson (1989), Hetherington (2001), Kam (2005), Levendusky (2010), and Zaller (1992).

points to Republicans as being more susceptible to persuasion from their political elite on the issue of climate change.

3. Data

This study requires merging survey responses on global warming beliefs with gubernatorial election information. Consistent with Beland (2015), I obtain gubernatorial election results from Leip's Atlas of US Presidential Elections (2017). I include all elections from all 50 states where either a Democrat or a Republican won; elections with an Independent winner are not included. Apart from New Hampshire and Vermont[11], governors serve four-year terms. Gubernatorial elections typically take place in November with the winner taking office in January. Therefore, I link the election results from November of year *t* with global warming beliefs from individuals in that state from years *t+1* to *t+4*.[12] Governors sometimes leave office early for a variety of reasons. If their replacement takes power without an election and is of the same political party, I keep the corresponding observations in the sample. However, in the rare case that the replacement belongs to a different party, the corresponding observations are excluded from analysis. If there is a special election to determine the replacement, I use the results of the special election for the remainder of the term until the next election.

Data on individuals and their global warming beliefs come from multiple waves of the National Surveys on Energy and Environment (NSEE). The NSEE include twice per year national opinion surveys on issues related to energy, the environment, and climate change. The NSEE are a

[11] Governors serve two-year terms in these two states.
[12] t+1 to t+2 for New Hampshire and Vermont because of the two-year terms.

collaborative effort between the Muhlenberg Institute of Public Opinion at Muhlenberg College and the Center for Local, State, and Urban Policy (CLOSUP) at the University of Michigan's Gerald R. Ford School of Public Policy. Published in July 2017, Version 12 of the NSEE project covers the time period of 9/2/2008 to 9/24/2015 (Rabe and Borick, 2017).[13] Each of the 14 waves contain data on approximately 600-900 respondents. 87.5% of respondents provide an answer to the survey question about global warming beliefs and 90.6% of respondents provide an answer to the survey question about political affiliation. Counting only individuals who provide their global warming beliefs, have a Democratic or Republican governor, and report their individual political affiliation, there are 8,756 observations from all 50 states. A small number of individuals do not report race/ethnicity and are excluded from the main sample.[14] As such, the main sample for analysis contains 8,680 observations.

Table 1 provides summary statistics for the main sample, and for the United States population as a comparison. As seen in Table 1, all demographic groups are represented in the NSEE. However, the sample contains a relatively higher proportion of White/Caucasian respondents and relatively lower proportions of racial/ethnic minorities, as compared to the US population. As such, I control for race/ethnicity in all regressions of Section 3. Also, the NSEE sample is older and more highly educated than the US population at large; I therefore show specifications where I control for age and education in Section 4.4.

The exact wording of the global warming belief question is, "From what you've read and heard, is there solid evidence that the average temperature on earth has been getting warmer over the past

[13] Respondents were interviewed in English on landlines and cell phones (only landlines in 2008). Phone numbers were chosen randomly from United States numbers provided by a marketing company. Both landlines and cell phones were called up to 10 times to reach a representative sample of adult Americans (Rabe and Borick, 2017).
[14] I also report a robustness check where I include individuals who do not report race/ethnicity.

four decades?" (Rabe and Borick, 2017). Approximately 71% of the sample answers "yes" to this question. There is an apparent correlation between global warming belief and individual political affiliation. As shown in Table 1, over 85% of Democrats believe in global warming, around 71% of Independents believe in global warming, and 52% of Republicans believe in global warming.

4. Empirical Strategy and Results

This paper seeks to identify the impact of a governor's political party on the global warming beliefs of constituents. Gubernatorial election outcomes are potentially endogenous to global warming beliefs. There are many unobserved characteristics of gubernatorial candidates and states, correlated with election outcomes, that also affect constituent behavior and beliefs. Thus, I adopt a RDD identification strategy, which uses outcomes of close elections as a quasi-experiment. The use of the RDD for identification of the effects of election outcomes stems from Lee (2001, 2008). Beland (2015), Beland and Boucher (2015); Beland and Oloomi (2017) Beland and Unel (2018), and Leigh (2008) utilize the RDD specifically in the context of gubernatorial elections.

As suggested by de la Cuesta and Imai (2016), Gelman and Imbens (2017), and Skovron and Titiunik (2015), I utilize nonparametric local linear regressions with an optimal, data-driven bandwidth. Local linear regressions allow for an arbitrary relationship between the running variable (vote margin) and the outcome (belief in global warming) near the RD threshold. In contrast, point estimates and inference in the parametric approach to RDD assume that the functional form of the regression relationship is known. However, for robustness, I also present results from a parametric approach that cluster standard errors at the state level. Before presenting regression results, I first provide some graphical evidence of the discontinuity.

4.1 Graphical Evidence

Define the margin of victory as the difference between the election vote share received by the Republican and Democratic candidates. Then, a positive margin of victory signifies that the Republican candidate won the election and the RDD threshold is defined where the margin of victory for a Republican governor is 0 percent. Figures 1-6 show RD plots for the probability that a respondent believes in global warming. Each plotted point represents the proportion of individuals who believe in global warming within each margin of victory bin. RD plots in Figures 1-3 fit a quartic polynomial on both sides of the RD threshold using data from all elections. Figures 4-6 fit linear functions on both sides of the RD threshold using only data from elections within the Calonico et al. (2017a,b) optimal bandwidth. Figures 1-3 give a visual overview of the relationship between the political party of the governor and global warming beliefs across all elections whereas Figures 4-6 provide a better graphical representation of the local linear regressions reported in the next subsection, 3.2. Figures 1 and 4 include all respondents, Figures 2 and 5 include only self-identified Democratic respondents, and Figures 3 and 6 include only self-identified Republican respondents.

In Figures 1 and 4, there is a small discontinuity in the proportion of respondents believing in climate change when crossing the RD threshold. Visually, a Republican win decreases the probability of a respondent believing in global warming by approximately 2 percentage points for this overall sample. Figures 2 and 5 show that there is little change in the probability of a self-identified Democrat respondent believing in global warming when a Republican governor wins. Finally, Figures 3 and 6 indicate there is a larger drop in the probability of a self-identified Republican respondent believing in global warming when a Republican governor wins a close election. The magnitude of the discontinuity at the RD threshold is approximately 9 percentage

points for Figure 3 when including all elections and approximately 12 percentage points in Figure 6 when using the Calonico et al. (2017a,b) optimal bandwidth. While these plots of the raw data are informative, I next present estimates from local linear regressions that condition on several baseline covariates and facilitate inference on the RD treatment effects of interest.

4.2 Nonparametric Local Linear RDD

The RD treatment effect is the difference between the expected proportion of respondents believing in global warming given a Republican election win and the expected proportion of respondents believing in global warming given a Democratic election win at the RD threshold (vm_0). However, since there are no treatment or control observations exactly at vm_0, one must use observations close to vm_0 for estimation. The first step of local linear estimation is therefore to choose the bandwidth, *h*, for estimation; only observations within this bandwidth are used to fit linear regression functions on both sides of the threshold. As recommended in the literature, I use an optimal bandwidth that minimizes the MSE of the local linear estimator (Calonico et al., 2014; de la Cuesta and Imai, 2016; Imbens and Kalyanaraman, 2012; Skovron and Titiunik, 2015). As is standard, I primarily utilize a triangular kernel[15], which weights observations closer to the RD threshold more heavily. Because the local polynomial approach approximates an unknown functional form near the threshold, there is a bias that arises in the estimator.[16] A bias-correction procedure estimates the bias term and subtracts it from the RD point estimate. Calonico et al. (2014) provide methods to conduct inference on RD estimates that account for the bias term. Therefore, as recommended by de la Cuesta and Imai (2016), and Skovron and Titiunik (2015), I

[15] I also show results using a uniform kernel.
[16] In contrast, conventional parametric RD approaches would ignore the bias because one would simply assume that the underlying regression function is a polynomial of a certain order.

show results using the robust inference of Calonico et al. (2014a,b) for all local linear regressions.[17] For completeness and transparency, I also show conventional point estimates with conventional inference and bias-corrected point estimates with conventional inference.

Table 2 presents the baseline RD results. Each of these columns include several covariates to improve precision. The included covariates are race/ethnicity, gender, and survey year fixed effects. The first column shows results for the full sample using a triangular kernel. While the point estimates suggest that Republican governors decrease the probability of a respondent believing in global warming, the estimates are not significant at conventional levels. Results in Column 2 for the full sample and the uniform kernel are quite similar. I do not find statistical evidence of a Republican governor impacting the global warming beliefs of Democratic respondents in Columns 3 and 4. However, when limiting the sample to Republican respondents only in Columns 5 and 6, I find large and statistically significant effects. The preferred bias-corrected estimate in Column 5 indicates that a Republican governor decreases the probability of a Republican respondent believing in global warming by approximately 13.5 percentage points. Results from the uniform kernel in Column 6 suggest a slightly larger effect of around 16 percentage points.

4.3 Parametric Specifications

The RD literature increasingly recommends using nonparametric local polynomial methods with bias correction, so I view the estimates from the previous section as preferred. Nevertheless, I also present results from parametric specifications for several reasons. First, parametric specifications facilitate straightforward hypothesis testing for differences between groups. In the present context,

[17] Calonico et al. (2017a) expands the methods to allow for covariates. I use the rdrobust package (Calonico et al., 2017b) within Stata for all local linear regressions, incorporating the default MSE-optimal bandwidth.

one can easily test whether the discontinuity differs for Democrat versus Republican respondents. Second, parametric specifications facilitate the inclusion of additional baseline covariates such as state fixed effects; this can reduce the residual variance and produce more precise estimates. Lastly, several related papers (Beland, 2015; Beland and Boucher, 2015; Beland and Oloomi, 2017; Beland and Unel, 2018; Ferreira and Gyourko, 2009, 2012) primarily utilize parametric specifications so these specifications are most directly comparable.

Denote the vote margin in state *s* in year *t* as VM_{st}, where positive values indicate the election of a Republican governor and negative values indicate the election of a Democratic governor. The discontinuity therefore occurs at VM_{st}=0. The baseline RD specification is

$$GW_{ist} = \beta_0 + \beta_1 RG_{st} + \beta_2 RP_{ist} + \beta_3 RG_{st} * RP_{ist} + \beta_4 IP_{ist} + \beta_5 RG_{st} * IP_{ist} + \beta_6 X_{ist} + f(VM_{st}) + f(VM_{st}) * RP_{ist} + f(VM_{st}) * IP_{ist} + \psi_t + \zeta_s + \varepsilon_{ist}. \quad (1)$$

The outcome variable, GW_{ist}, is an indicator for belief in global warming. RG_{st} is an indicator for a Republican governor holding office in state *s* in year *t*, RP_{ist} is an indicator for an individual *i* residing in state *s* in year *t* who reports a Republican party affiliation, IP_{ist} is an indicator for an individual who self-reports as Independent in their party affiliation, X_{ist} includes individual characteristics such as race/ethnicity and gender, ψ_t are year fixed effects, and ζ_s are state fixed effects. The continuous relationship between vote margin and global warming belief is captured with $f(VM_{st})$, which is a parametric function of vote margin (allowed to take on different slopes on each side of the discontinuity). The parametric function of vote margin is also interacted with the individual-level political affiliation variables to allow for different trends based on self-identified political affiliation. β_1, β_3, and β_5 are the main parameters of interest, as they represent the differential effects of a republican governor on the global warming beliefs of individuals of

different party affiliations. Note that, because all individuals in the sample self-report a political affiliation of Democrat, Republican, or Independent, β_1 represents the impact of a Republican governor on the global warming beliefs of a Democratic individual. β_3 represents the differential effect of a Republican governor on the global warming beliefs of a Republican individual, relative to a Democratic individual. Likewise, β_5 represents the differential effect of a Republican governor on the global warming beliefs of an Independent individual, relative to a Democratic individual. Therefore, the overall effect of a Republican governor on the global warming beliefs of a Republican individual is $\beta_1 + \beta_3$ and the overall effect of a Republican governor on the global warming beliefs of an Independent individual is $\beta_1 + \beta_5$.

As a baseline, I use linear controls and the optimal bandwidth from the local linear specification 2 in Section 4.2, which corresponds to the optimal bandwidth for the uniform kernel on the full sample. I then widen the bandwidth to use more data further away from the discontinuity. Widening the bandwidth requires adding higher levels of polynomial controls to the RD specification to control for the smooth relationship between vote margin and global warming beliefs. However, there are an infinite combination of bandwidths and parametric controls that one could choose. It is best to avoid choosing bandwidth and order of the polynomial controls in an ad-hoc manner. I therefore show results for polynomial controls ranging from order 2 up to order 5, each time using the optimal-bandwidth calculation of Calonico et al. (2017a,b). I cluster standard errors at the state level in all parametric specifications.

Table 3 shows results for these specifications using optimal bandwidths and polynomial controls ranging from linear to order 5. I do not find any evidence across specifications that the election of a Republican governor affects the global warming beliefs of Democratic constituents. However, consistent with the nonparametric local linear results from Section 4.2, I do find

evidence that the election of a Republican governor has a differential effect on Republican constituents. The preferred specification (1) with linear controls indicates that the election of a Republican governor decreases the probability of a Republican constituent believing in global warming by approximately 9.5 percentage points. This is true both relative to Democratic constituents and in absolute magnitude since the estimated coefficient for Democratic constituents is essentially 0. Specifications (2-5) qualitatively agree with Specification (1), although the magnitude and statistical significance on the differential effect for Republican constituents vary.

While not the focus of this paper, I note that individuals reporting Republican or Independent political affiliation have a substantially lower baseline probability of believing in global warming relative to Democratic individuals. A Republican survey respondent is 30.3 percentage points less likely to believe in global warming and an Independent survey respondent is 14.5 percentage points less likely to believe in global warming, as compared to Democratic respondents. For reference, the unconditional probability of a Democratic individual in the sample believing in global warming is 0.853. Thus, the election of a Republican governor serves to further decrease the likelihood of global warming belief among a subgroup that already has a significantly lower baseline probability of believing.

4.4 Robustness Checks

Table 4 shows results for a variety of alternative parametric specifications to demonstrate the stability of the estimates.[18] The first alternative specification removes state and year fixed effects because they are not necessary to generate consistent parameter estimates in the RD design. I then

[18] Each of these specifications uses linear controls. Additional results using higher order polynomial controls are similar and available upon request.

show results with several narrower bandwidths in Column 2 (50% of optimal BW) and Column 3 (75% of optimal BW). Column 4 adds education and age as two additional individual-level controls. As seen in Table 4, the results for these alternative specifications are qualitatively unchanged from the baseline results in Table 3. I still find a negative and significant differential effect of a Republican governor on the climate change beliefs of Republican constituents. Relative to Democratic constituents, the election of a Republican governor causes an approximate 8 to 12 percentage point decrease in the probability of a Republican constituent believing in global warming.

In Column 5 of Table 4, I limit the sample to only include observations where the governor has been in power for at least a year. The rationale is that there is a potential delay between when the governor takes office and when the governor's policies and/or messaging are internalized by constituents. Although slightly less precise, the point estimate on the differential effect of a Republican governor on a Republican respondent in Column 5 of Table 4 is slightly larger than the corresponding baseline estimate in Column 1 of Table 3. Appendix Table A1 shows nonparametric local linear results when I limit the sample to observations where the governor has been in the position for at least a year. Point estimates are larger in absolute value when limiting the sample in this way than for the overall sample. For Republican respondents, the election of a Republican governor leads to a 16 to 20 percentage point decrease in the probability of believing global warming is real. Therefore, if anything, the effect of interest gets stronger when I limit the sample to exclude the first year that a governor is in power.

Another potential issue is that the main survey question of analysis only asks whether an individual believes average temperatures have been rising. As a policy concern, we may also be concerned with belief in anthropogenic climate change. By definition, we have a larger potential

influence on anthropogenic climate change as compared to naturally occurring climate change.[19] I therefore leverage the additional survey question, "Is the earth getting warmer because of human activity such as burning fossil fuels, or mostly because of natural patterns in the earth's environment?" (Rabe and Borick, 2017). I define a dichotomous dependent variable as: 1=human activity or combination of human activity and natural patterns, 0=natural patterns or doesn't believe in any global warming. Table 5 presents nonparametric local linear results; Columns 5 and 6 show that a Republican governor affects the anthropogenic global warming beliefs of a Republican individual much the same as found previously in Table 2 for general global warming beliefs. However, Table 5 also suggests that there may be a stronger effect of a Republican governor on Democratic individuals for anthropogenic global warming beliefs as compared to the effect in Table 2 for general global warming beliefs of Democratic individuals. Results for parametric specifications testing for differential effects on anthropomorphic global warming beliefs based on individual political ideology are shown in Table 6. The qualitative results are unchanged; the magnitude of the impact of a Republican governor on global warming beliefs is larger for Democratic individuals than for Republican individuals. However, the differential effect is not significant at conventional levels (p-value = 0.143 for linear controls in Column 1).

Lastly, I check for stability in the results with three alternative sample selection criteria. [20] First, recall that the main sample requires race/ethnicity to be reported. Column 1 of Table A2 shows local linear results for Republican individuals for the slightly larger sample that includes individuals who do not report their race/ethnicity. Next, recall that two Republican governors (Schwartzenegger and Crist) advocated for climate change policies in their respective states. In

[19] A policy to decrease naturally occurring global warming would require geoengineering solutions. Moreover, it is not clear that the public would support costly policies to address natural warming.
[20] I focus on the results for Republican individuals. As in the baseline results of Table 2, estimates here are never significant for the overall sample or for sample of only Democratic respondents.

column 2 of Table A2, I show local linear results for Republican individuals when I drop the observations corresponding to the states and time periods of these two governors. Furthermore, several other governors, at least at times, have stated positions on climate change that are at odds with the typical party platform. Column 3 of Table A2 presents local linear results for Republican individuals when excluding observations from the relevant states and years.[21] Results for these alternative samples are consistent with the main results already discussed.[22] Likewise, Table A3 provides parametric results for these alternative samples. The results remain unchanged; there is no effect of a Republican gubernatorial win on the climate change beliefs of Democratic constituents but a Republican gubernatorial win decreases the probability of a Republican constituent believing in climate change by approximately 9 to 11 percentage points.

4.5 Validity Checks and Falsification Tests

Several papers have called into question the appropriateness of the RDD in the context of close elections (Caughey and Sekhon, 2011; Grimmer et al., 2012; Snyder, 2005). However, another set of papers argue that the assumptions behind the RDD are likely met in most close election settings and provide recommendations for researchers applying the method (de la Cuesta and Imai, 2016; Eggers et al., 2015; Skovron and Titiunik, 2015). Here, I conduct the validity checks and falsification tests recommended by these papers.

[21] To the best of my ability, I identified the first time that a governor was on record with a contrarian stance on climate change. Excluded states (Republican governors) and years are as follows: Florida (Crist, 2008-2010), California (Schwartzenegger, 2008-2010), Ohio (Kasich, 2013-2015), Iowa (Branstad, 2011-2015), Michigan (Snyder, 2011-2015), Nevada (Sandoval, 2011-2015), New Jersey (Christie, 2010-2015), Utah (Huntsman Jr., 2008-2009), Maryland (Hogan, 2015), and Massachusetts (Baker, 2015). The one excluded Democratic state is West Virginia (Tomblin, 2012-2015) because Tomblin is labeled "red" by the 2014 report (Koronowski, 2014). Except for Crist and Schwartzenegger, these governors have mixed records on climate change statements and actions.
[22] The relevant estimates are less precise in Column 3 of Table A2. However, excluding all observations from potentially contrarian governors substantially cuts the sample size.

First, as suggested by de la Cuesta and Imai (2016), I estimate nonparametric local linear regressions where I replace the dependent variable of global warming belief with other baseline covariates that should not change discontinuously at the threshold. Table 7 reports these falsification tests for the baseline covariates of Republican affiliation (indicator for individual self-reports as a Republican), white/Caucasian, age 45 or older, male, and college educated. I use the optimal bandwidth calculation from Calonico et al. (2017a,b) for each falsification test, as recommended by Skovron and Titiunik (2015). In Table 7, I do not find any evidence of discontinuous changes in any of the pre-determined covariates at the threshold; this supports the validity of the RD design.

The null results on the local linear regressions reported in Table 7 show that there are no discontinuous changes in baseline covariates for the overall sample. However, the main result in this paper concerns differential effects for Republican versus Democratic individuals when a Republican Governor is elected. Therefore, I also conduct falsification tests using the parametric specification given in equation 1 (replacing global warming belief with the baseline covariates). As shown in Table 8, I do not find significant estimates for the coefficients on Republican Governor (β_1), Republican Governor X Republican Individual (β_3), or Republican Governor X Independent Individual (β_5).[23] There is no evidence that baseline covariates change differentially at the RD threshold based on individual political affiliation, again adding credibility to the RD design.

Next, I look for manipulation in the vote margin by examining the density near the threshold. There should not be a discontinuous change in the density of the forcing variable at the

[23] For each outcome in Table 8, I use the optimal bandwidth from Calonico et al. (a,b). I use linear controls, the uniform kernel, and year fixed effects as covariates for the bandwidth calculation.

threshold because this could be indicative of manipulation. If, for example, the Republican party could precisely forecast a close gubernatorial election outcome and divert enough resources to just move a potential loser over the threshold, there could be a violation of the continuity assumption of the RD design. However, I do not find any evidence of such manipulation. Figure 7 shows the density plot of vote margin from all state-year observations, along with 95% confidence intervals from the estimator proposed by Cattaneo et al. (2017a).[24]

Finally, I test for placebo effects of the Republican Governor treatment on the lagged outcome of global warming belief. Specifically, I estimate specifications where I use the global warming beliefs in the years prior to an election. For example, a gubernatorial election took place in Minnesota in 2010. Mark Dayton (Democrat) won the election and took office in January 2011. I pair this election result with the individual-level data on global warming beliefs in Minnesota during the four years prior to this election (2007-2010). The intuition is that the messaging from a governor taking office in 2011 should not affect the global warming beliefs of individuals in the years prior to the messaging. Table 9 shows nonparametric local linear results for the overall sample and Table 10 shows results for the parametric specification that tests for differential effects by individual political affiliation, as given by equation 1. I find no evidence that present election outcomes affect past global warming beliefs for the overall sample in Table 9. Furthermore, I find no evidence that present election outcomes differentially affect past global warming beliefs of individuals identifying with different political parties in Table 10. Overall, these validity and falsification tests lend credibility to the claim that I am identifying effects from an exogenous quasi-experiment.

[24] The robust manipulation test-statistic is 0.273 with a p-value of 0.785 when using the default options in the rddensity package (Cattaneo et al., 2017b).

5. Conclusion

In summary, this paper provides evidence that political leaders' messaging and policies can affect global warming beliefs of constituents, especially when constituents share a common partisan identity with the leader. I use survey data from all 50 U.S. states to establish the causal effect of the political party of a governor on the climate change beliefs of constituents. In the preferred nonparametric local linear RD specification, the election of a Republican governor decreases the absolute probability of a Republican constituent believing in global warming by approximately 14 percentage points. Additional parametric specifications find evidence that a Republican governor differentially affects the probability of global warming belief for individuals affiliated with different political parties; Republican individuals become approximately 9 percentage points less likely to state that global warming is real compared to Democratic individuals. These findings are robust to alternative specifications and sample selection criteria.

Previous literature provides reason to expect that the political party of the governor could differentially affect the global warming beliefs of Democratic and Republican constituents. Political affiliation has been shown to a be one of the most important predictors of climate change beliefs and political affiliation moderates the impact of scientific information on climate change beliefs. It is also established that experimentally manipulating the frame of how global warming information is conveyed to constituents typically has larger impacts on Republican individuals than on Democratic individuals. Additionally, research suggests that individuals look to their political leaders to develop opinions on complex issues such as climate change. Finally, there is evidence that the climate change skeptic position of the Republican elite preceded the mass opinion polarization on the issue.

While this previous research helps justify why we may expect to find differential impacts on Democratic and Republican individuals, the channel by which the political party of the governor affects global warming beliefs remains largely an open question. Evidence is growing that the media affects individuals' pro-environmental beliefs and behavior, and this is one potential avenue for future research. For example, does the election of a Republican governor affect the tone of local media coverage? Another possibility is that individuals simply look to their elected officials for cues on climate change beliefs and the direct communication from the elected official is what sways opinion. Regardless of the transmission mechanism, the policy implication is clear. It will likely remain difficult to convert climate change skeptics so long as their political leaders publicly exhibit skeptical positions. Previous research documents a growing polarization in climate change beliefs between Democrats and Republicans; this paper provides one explanation why this could happen even as the scientific consensus on the existence and impacts of climate change becomes stronger.

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Table 1. Descriptive Statistics

Variable	Sample Mean	US Population
Global Warming Belief	0.709	N/A
Race/Ethnicity		
White/Caucasian	0.814	0.769
African-American	0.0749	0.133
Asian	0.0262	0.057
Hispanic/Latino	0.0469	0.178
Mixed Race and Other	0.0381	0.039
Male	0.482	0.492
College Educated	0.485	0.303
Age 45 or Older	0.695	0.534
Governor Political Affiliation		
Democrat	0.47	N/A
Republican	0.53	N/A
Individual Political Affiliation		
Democrat	0.385	0.29
Republican	0.296	0.26
Independent	0.319	0.42
Global Warming Belief by Individual Political Affiliation		
Democrat	0.853	N/A
Republican	0.52	N/A
Independent	0.711	N/A

Table 2. Baseline Local Linear RD Results: Global Warming is Real

	Full Sample		Democrat Respondents		Republican Respondents	
	(1)	(2)	(3)	(4)	(5)	(6)
Conventional	-0.0264	-0.0274	-0.0243	-0.0304	-0.115**	-0.144**
	(0.0284)	(0.0264)	(0.0375)	(0.0395)	(0.0583)	(0.0636)
Bias-corrected	-0.0250	-0.0329	-0.0331	-0.0297	-0.135**	-0.160**
	(0.0284)	(0.0267)	(0.0375)	(0.0395)	(0.0583)	(0.0636)
Robust	-0.0250	-0.0329	-0.0331	-0.0297	-0.135**	-0.160**
	(0.0331)	(0.0301)	(0.0434)	(0.0458)	(0.0661)	(0.0713)
Observations	8,680	8,680	3,342	3,342	2,573	2,573
Kernel	Triangular	Uniform	Triangular	Uniform	Triangular	Uniform
BW	11.809	11.747	11.399	8.737	11.148	8.374

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All specifications include controls for race/ethnicity and gender, and year fixed effects.

Table 3. Baseline Parametric RD Results: Global Warming is Real

	(1)	(2)	(3)	(4)	(5)	(6)
Republican Governor (RG)	0.000327	-0.00633	0.0243	0.0331	0.102*	0.0313
	(0.0382)	(0.0362)	(0.0403)	(0.0484)	(0.0564)	(0.0410)
RG X Rep. Individual	-0.0909**	-0.0835	-0.113*	-0.182**	-0.215**	-0.187***
	(0.0442)	(0.0551)	(0.0649)	(0.0727)	(0.0814)	(0.0661)
RG X Ind. Individual	0.0210	0.0618	0.0695	0.0728	0.0853	0.0473
	(0.0498)	(0.0570)	(0.0794)	(0.0896)	(0.0920)	(0.0783)
Rep. Individual	-0.302***	-0.305***	-0.240***	-0.213***	-0.203***	-0.232***
	(0.0384)	(0.0441)	(0.0519)	(0.0495)	(0.0553)	(0.0506)
Ind. Individual	-0.146***	-0.158***	-0.127***	-0.132***	-0.146***	-0.117***
	(0.0312)	(0.0328)	(0.0377)	(0.0372)	(0.0342)	(0.0398)
Order Polynomial Controls	1	2	3	4	5	5
BW	11.747	18.825	20.321	29.947	36.571	All
Optimal BW	X	X	X	X	X	
Observations	3,801	6,265	6,624	7,748	8,125	8,680
# Clusters (States)	34	45	45	47	50	50

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All specifications include controls for race/ethnicity and gender, state fixed effects, and year fixed effects.

Table 4. Additional Parametric RD Results: Linear Controls

	(1)	(2)	(3)	(4)	(5)
Republican Governor (RG)	-0.00164	0.0501	0.0159	-0.00117	-0.0269
	(0.0398)	(0.0676)	(0.0400)	(0.0396)	(0.0490)
RG X Rep. Individual	-0.0795*	-0.119*	-0.121***	-0.0762*	-0.103*
	(0.0447)	(0.0691)	(0.0470)	(0.395)	(0.0559)
RG X Ind. Individual	0.0409	0.0514	0.0426	0.0106	0.0279
	(0.0520)	(0.0756)	(0.0629)	(0.0524)	(0.0721)
Rep. Individual	-0.307***	-0.264***	-0.269***	-0.306***	-0.280***
	(0.0388)	(0.0556)	(0.0412)	(0.0343)	(0.0360)
Ind. Individual	-0.154***	-0.125***	-0.123***	-0.141***	-0.119***
	(0.0297)	(0.0378)	(0.0367)	(0.0327)	(0.0350)
BW	11.747	5.874	8.81	11.747	10.160
Optimal BW	X	50%	75%	X	X
State FE		X	X	X	X
Year FE		X	X	X	X
Additional Controls				X	
At least 1 Year in Office					X
Observations	3,801	2,144	2,769	3,748	2,786
# Clusters (States)	34	27	31	34	34

Standard errors in parentheses are clustered at the state level.

*** p<0.01, ** p<0.05, * p<0.1

All specifications include controls for race/ethnicity and gender. All specifications include linear controls. Additional controls include an indicator for college educated and an indicator for age 45 or older.

Table 5. Additional Local Linear RD Results: Global Warming is Due to Humans

	Full Sample		Democrat Respondents		Republican Respondents	
	(1)	(2)	(3)	(4)	(5)	(6)
Conventional	-0.0455	-0.0227	-0.0862*	-0.0675	-0.116*	-0.105*
	(0.0322)	(0.0309)	(0.0514)	(0.0472)	(0.0601)	(0.0613)
Bias-corrected	-0.0518	-0.00972	-0.103**	-0.0755	-0.136**	-0.134**
	(0.0322)	(0.0309)	(0.0514)	(0.0472)	(0.0601)	(0.0613)
Robust	-0.0518	-0.00972	-0.103*	-0.0755	-0.136**	-0.124*
	(0.0380)	(0.0346)	(0.0604)	(0.0554)	(0.0689)	(0.0694)
Observations	8,680	8,680	3,342	3,342	2,573	2,573
Kernel	Triangular	Uniform	Triangular	Uniform	Triangular	Uniform
BW	10.096	9.609	8.435	8.317	9.781	8.119

Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

All specifications include controls for race/ethnicity and gender, and year fixed effects.

Table 6. Additional Parametric RD Results: Global Warming is Due to Humans

	(1)	(2)	(3)	(4)	(5)	(6)
Republican Governor (RG)	-0.0518	-0.00661	0.0113	0.0333	0.0961	0.0313
	(0.0531)	(0.0355)	(0.0381)	(0.0422)	(0.0589)	(0.0410)
RG X Rep. Individual	-0.0779	-0.0739	-0.138**	-0.196**	-0.194**	-0.187***
	(0.0519)	(0.0556)	(0.0642)	(0.0759)	(0.0821)	(0.0661)
RG X Ind. Individual	0.0375	0.0505	0.0974	0.0940	0.0972	0.0473
	(0.0592)	(0.0564)	(0.0801)	(0.0925)	(0.0999)	(0.0783)
Rep. Individual	-0.327***	-0.314***	-0.253***	-0.216***	-0.181***	-0.232***
	(0.0424)	(0.0439)	(0.0522)	(0.0548)	(0.0518)	(0.0506)
Ind. Individual	-0.146***	-0.147***	-0.138***	-0.140***	-0.146***	-0.117***
	(0.0420)	(0.0307)	(0.0368)	(0.0356)	(0.0346)	(0.0398)
Order Polynomial Controls	1	2	3	4	5	5
BW	9.609	19.063	20.989	26.249	33.119	All
Optimal BW	X	X	X	X	X	
Observations	3,271	6,365	7,017	7,297	8,066	8,680
# Clusters (States)	34	45	45	46	49	50

Standard errors in parentheses are clustered at the state level.

*** p<0.01, ** p<0.05, * p<0.1

All specifications include controls for race/ethnicity and gender, state fixed effects, and year fixed effects.

Table 7. Falsification Tests: Local Linear RD

Outcome	Rep. Ind.	White	Age 45 or older	Male	College
	(1)	(2)	(3)	(4)	(5)
Conventional	-0.0039	-0.0371	0.0139	-0.0353	0.0330
	(0.0344)	(0.0303)	(0.0304)	(0.0309)	(0.0320)
Bias-corrected	-0.0122	-0.0465	0.0222	-0.0450	0.0449
	(0.0344)	(0.0303)	(0.0304)	(0.0309)	(0.0320)
Robust	-0.0122	-0.0465	0.0222	-0.0450	0.0449
	(0.0395)	(0.0349)	(0.0334)	(0.0357)	(0.0348)
Kernel	Triangular	Triangular	Triangular	Triangular	Triangular
BW	7.587	6.557	9.214	11.542	10.513

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All specifications include controls for race/ethnicity and gender, and year fixed effects.
(specification 2 omits race/ethnicity controls and specification 4 omits gender controls)

Table 8. Falsification Tests: Parametric Specifications

Outcome	White	Age 45 or Older	Male	College
	(1)	(2)	(3)	(4)
Republican Governor (RG)	0.00650	-0.0502	-0.0585	0.0572
	(0.0859)	(0.0440)	(0.0416)	(0.0568)
RG X Rep. Individual	0.0520	0.0235	-0.0737	0.0889
	(0.0611)	(0.0591)	(0.0470)	(0.0808)
RG X Ind. Individual	-0.0164	0.0139	0.0739	0.0330
	(0.0656)	(0.0649)	(0.0722)	(0.0779)
Order Polynomial Controls	1	1	1	1
BW	7.225	12.877	9.547	8.673
Optimal BW	X	X	X	X
Observations	2,574	4,314	3,208	2,763
# Clusters (States)	28	36	33	31

Standard errors in parentheses are clustered at the state level.

*** p<0.01, ** p<0.05, * p<0.1

All specifications include controls for race/ethnicity and gender, state fixed effects, and year fixed effects.
(specification 1 omits race/ethnicity controls and specification 3 omits gender controls)

Table 9. Nonparametric Local Polynomial Falsification Test: Lagged Global Warming Beliefs

	(1)	(2)	(3)	(4)
Conventional	0.0181	0.0197	0.0169	-0.00944
	(0.0262)	(0.0259)	(0.0297)	(0.0418)
Bias-corrected	0.0181	0.0249	0.0124	-0.0157
	(0.0262)	(0.0259)	(0.0297)	(0.0418)
Robust	0.0181	0.0249	0.0124	-0.0157
	(0.0309)	(0.0295)	(0.0351)	(0.0452)
Kernel	Triangular	Uniform	Triangular	Triangular
BW	13.261	11.832	10.382	12.174
Optimal BW	X	X	X	X
Order Polynomial	1	1	1	2
Additional Covariates			X	

N=7575. Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 10. Parametric Falsification Test: Lagged Global Warming Beliefs

	(1)	(2)
Republican Governor (RG)	0.0159	0.0115
	(0.0620)	(0.0696)
RG X Rep. Individual	-0.00812	-0.00985
	(0.0840)	(0.0845)
RG X Ind. Individual	-0.0369	-0.0394
	(0.0454)	(0.0453)
Order Polynomial Controls	1	1
BW	11.832	11.832
Optimal BW	X	X
State FE	X	X
Year FE	X	X
Additional Covariates		X
Observations	3,926	3,872
# Clusters (States)	31	31

Standard errors in parentheses are clustered at the state level.
*** p<0.01, ** p<0.05, * p<0.1
All specifications include controls for race/ethnicity and gender
(specification 1 omits race/ethnicity controls and specification 3 omits gender controls)

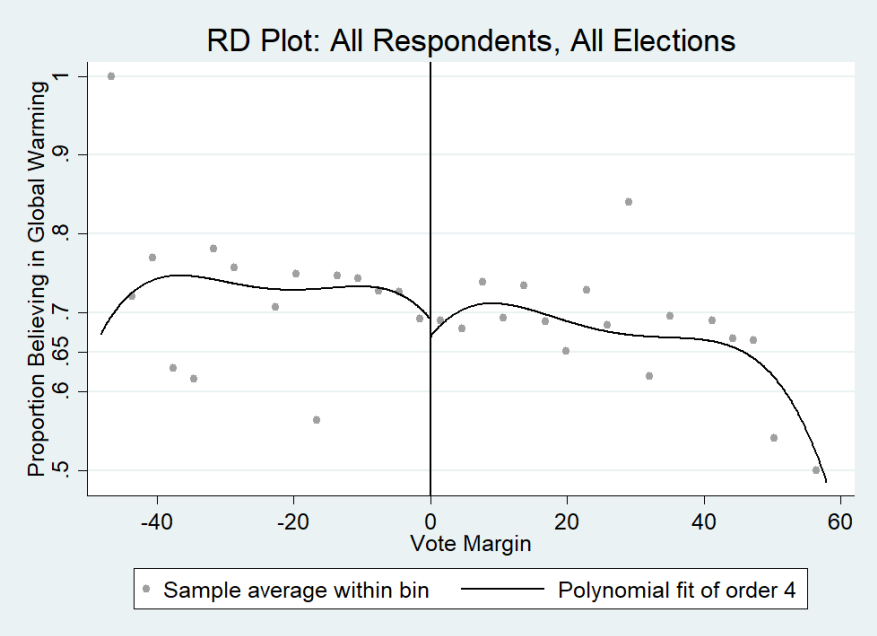

Figure 1. RD Plot of Vote Margin vs. Global Warming Beliefs: All Respondents, All Elections.
Notes: Positive vote margin indicates Republican governor. All respondents are included in this figure.

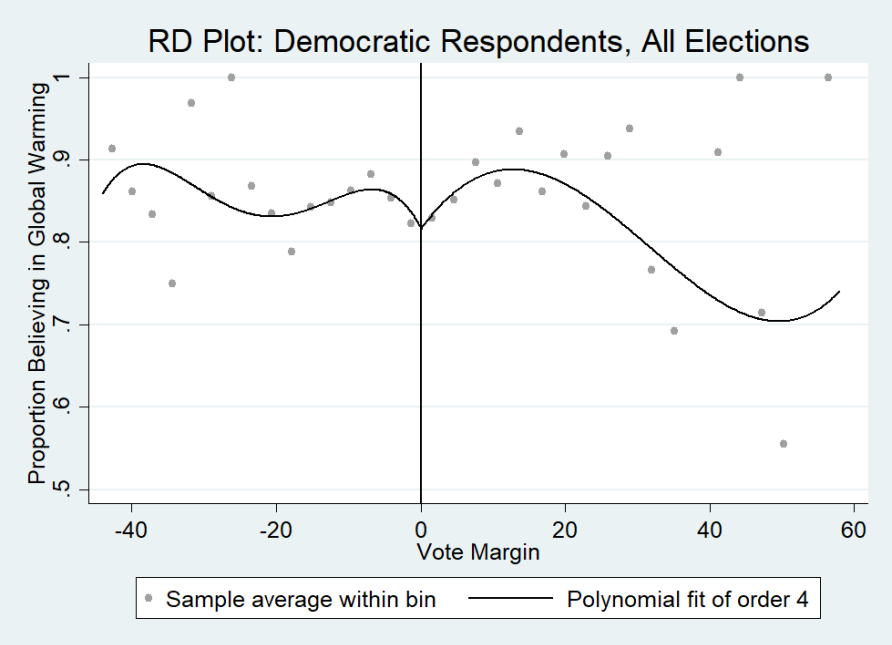

Figure 2. RD Plot of Vote Margin vs. Global Warming Beliefs: Democratic Respondents, All Elections.
Notes: Positive vote margin indicates Republican governor. Only Democratic respondents are included in this figure.

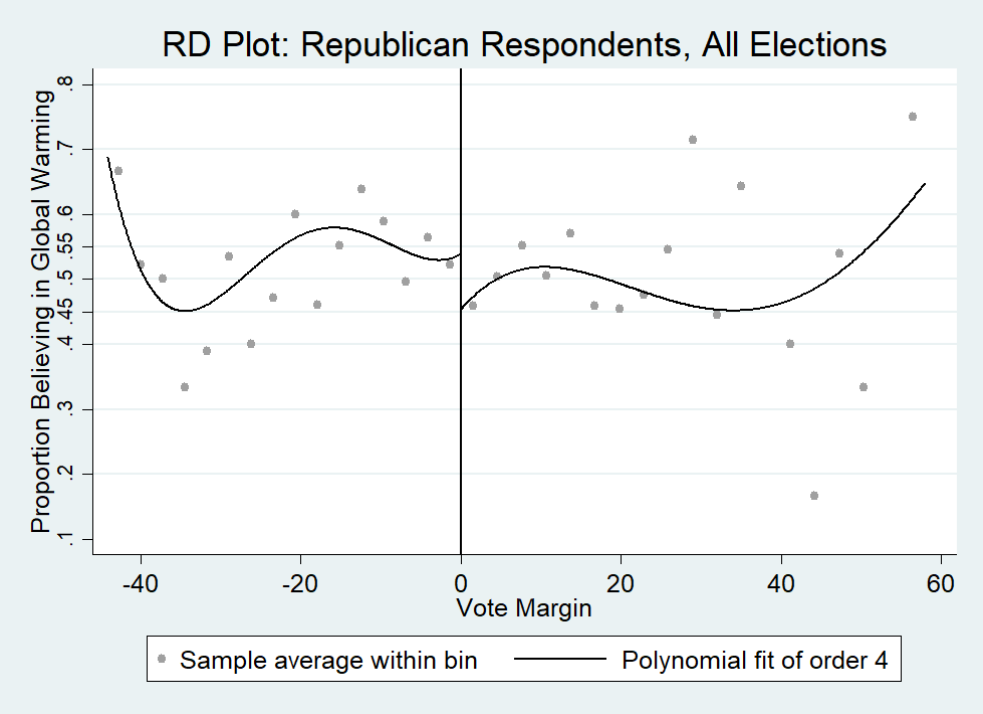

Figure 3. RD Plot of Vote Margin vs. Global Warming Beliefs: Republican Respondents, All Elections.
Notes: Positive vote margin indicates Republican governor. Only Republican respondents are included in this figure.

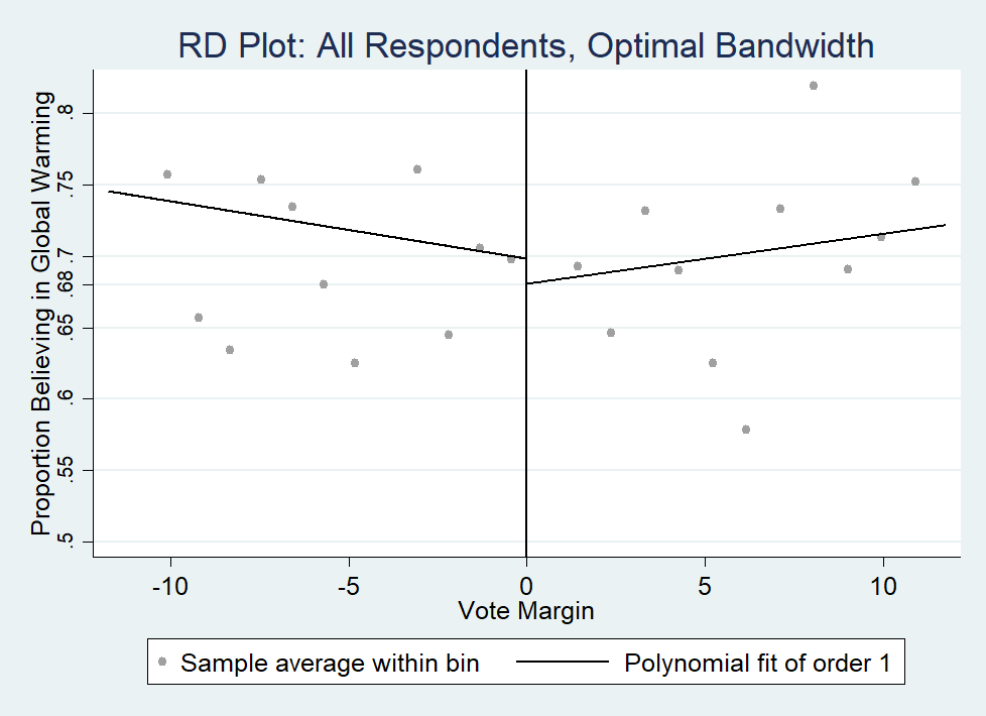

Figure 4. RD Plot of Vote Margin vs. Global Warming Beliefs: All Respondents, Optimal Bandwidth.
Notes: Positive vote margin indicates Republican governor. All respondents from elections within the optimal bandwidth are included in this figure.

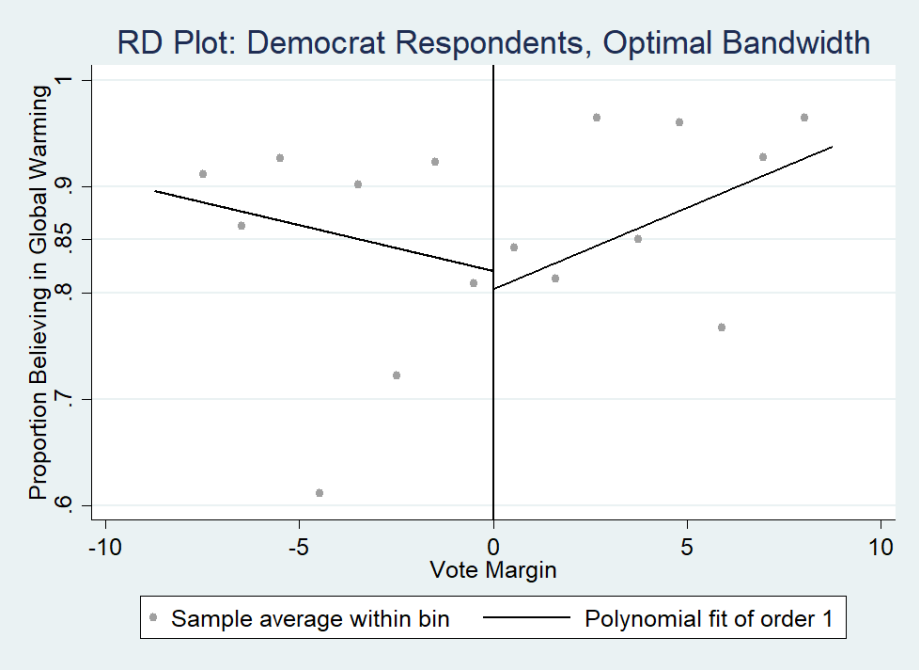

Figure 5. RD Plot of Vote Margin vs. Global Warming Beliefs: Democratic Respondents, Optimal Bandwidth.
Notes: Positive vote margin indicates Republican governor. Only Democratic respondents from elections within the optimal bandwidth are included in this figure.

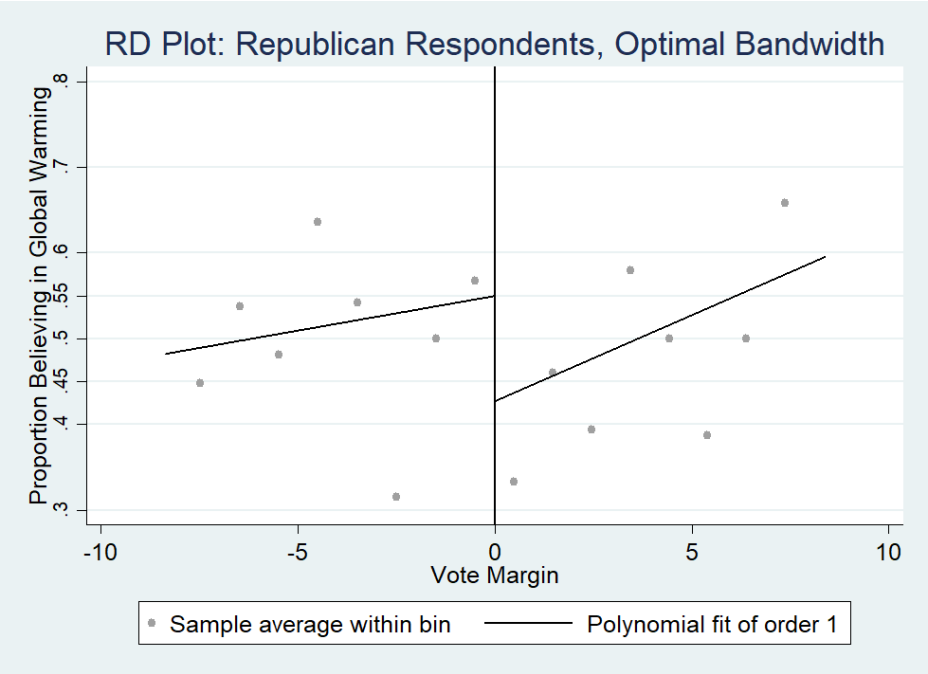

Figure 6. RD Plot of Vote Margin vs. Global Warming Beliefs: Republican Respondents, Optimal Bandwidth.
Notes: Positive vote margin indicates Republican governor. Only Democratic respondents from elections within the optimal bandwidth are included in this figure.

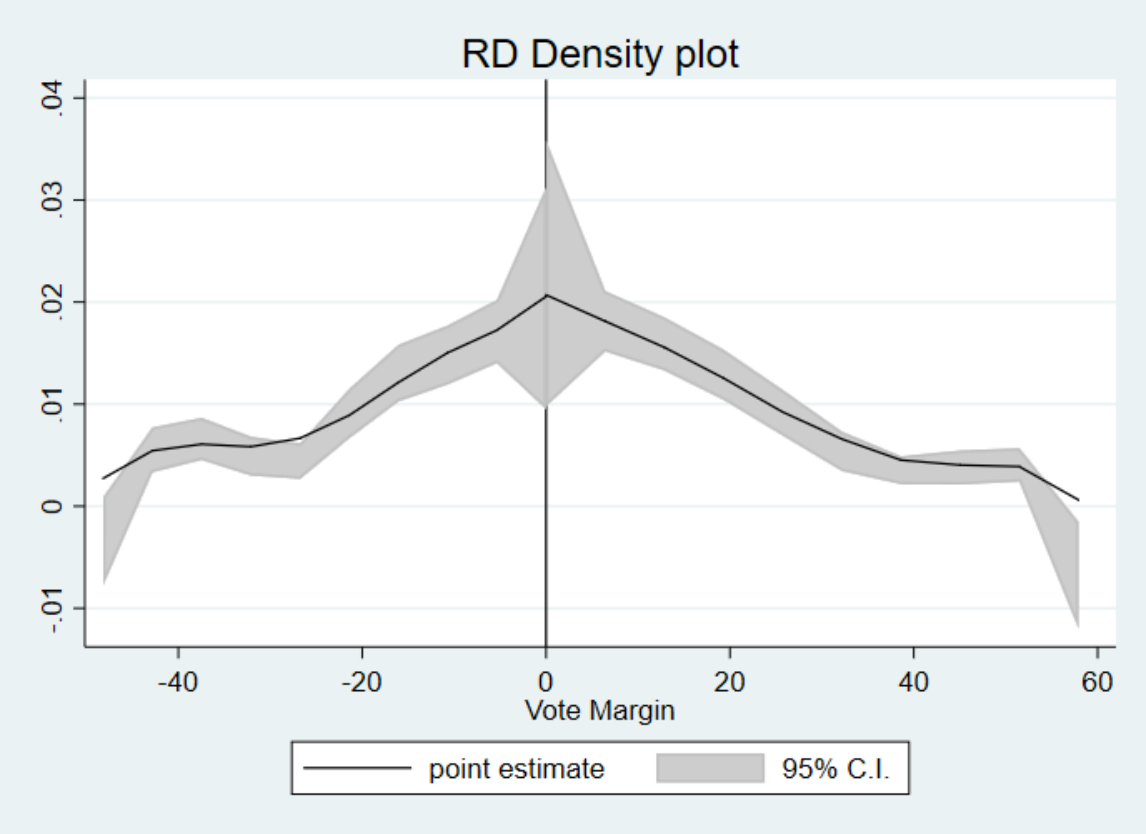

Figure 7: RD Density Plot of Vote Margin. Figure shows the RD density plot of state-year election outcomes. It is produced using the default options in the rddensity package (Cattaneo et al., 2017b).

Table A1. Local Linear RD Results: Global Warming is Real, Governor in Power ≥ 1 Year

	Full Sample		Democrat Respondents		Republican Respondents	
	(1)	(2)	(3)	(4)	(5)	(6)
Conventional	-0.0461	-0.0421	-0.0349	-0.0325	-0.138**	-0.178**
	(0.0316)	(0.0317)	(0.0370)	(0.0408)	(0.0651)	(0.0704)
Bias-corrected	-0.0441	-0.0332	-0.0409	-0.0421	-0.158**	-0.199***
	(0.0316)	(0.0317)	(0.0370)	(0.0408)	(0.0651)	(0.0704)
Robust	-0.0441	-0.0332	-0.0409	-0.0421	-0.158**	-0.199**
	(0.361)	(0.0361)	(0.0423)	(0.0450)	(0.0740)	(0.0816)
Observations	7,268	7,268	2,816	2,816	2,155	2,155
Kernel	Triangular	Uniform	Triangular	Uniform	Triangular	Uniform
BW	12.269	10.160	14.354	9.742	11.747	8.033

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All specifications include controls for race/ethnicity and gender, and year fixed effects.

Table A2. Additional Local Linear RD Results: Global Warming is Real, Alternative Samples

	Include Respondents Not Reporting Race/Ethnicity	No Crist or Schwartzenegger	No Party Contrarians
	(1)	(2)	(3)
Conventional	-0.110*	-0.110*	-0.0822
	(0.0587)	(0.0573)	(0.0605)
Bias-corrected	-0.131**	-0.129**	-0.101*
	(0.0587)	(0.0573)	(0.0605)
Robust	-0.131*	-0.129**	-0.101
	(0.0674)	(0.0635)	(0.0676)
Observations	2,594	2,484	2,239
Kernel	Triangular	Triangular	Triangular
BW	11.020	11.840	11.976

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

All specifications include controls for race/ethnicity and gender, and year fixed effects.

Table A3. Additional Parametric RD Results: Global Warming is Real, Alternative Samples

	Include Respondents Not Reporting Race/Ethnicity	No Crist or Schwartzenegger	No Party Contrarians
	(1)	(2)	(3)
Republican Governor (RG)	-0.000602	-0.0186	0.00684
	(0.0375)	(0.0371)	(0.0295)
RG X Rep. Individual	-0.0947**	-0.0907**	-0.113**
	(0.0406)	(0.0442)	(0.0421)
RG X Ind. Individual	0.0224	0.0213	-0.00409
	(0.0505)	(0.0497)	(0.0439)
Observations	3,826	3,722	3,311
# Clusters (States)	34	34	33

Standard errors in parentheses are clustered at the state level.

*** p<0.01, ** p<0.05, * p<0.1

All specifications include controls for race/ethnicity and gender, state fixed effects, and year fixed effects.