

**Environmental Politics in a Polarized America:
Public Mood and Policy Consequences**

by
Parrish Bergquist

Submitted to the Department of Urban Studies & Planning,
Department of Political Science
in partial fulfillment of the requirements for the degree of
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Abstract

As the American political parties have polarized and nationalized, what are the implications for environmental policy? This question is particularly important at the state and local levels, where many environmental policy decisions are made and implemented, but about which scholars have drawn mixed conclusions. This dissertation enters the debate to expand understanding of the parties' role in state-level regulatory enforcement; describe and assess changing public attitudes about environmental protection; and deeply explore local perceptions of an important type of environmental disruption: energy infrastructure. I begin by exploring the public basis for environmental protection. In paper one, I estimate state-level public opinion about environmental protection from the late 1970s through 2016. I show that regional differences in public views about environmental protection have declined, whereas state publics have sorted more cleanly into partisan camps in every state. I also find that economic tradeoffs have increased in their importance for shaping Americans' environmental views. These data provide a crucial foundation for assessing the evolution of the state and national parties' positions about environmental protection, and exploring the elite rhetoric that may explain the shifting drivers of public environmental preferences. In the second paper, I ask how party control of state government institutions influences regulatory enforcement in the U.S. Despite growing evidence for the parties' influence across the slate of policy issues, scholars have drawn divergent conclusions regarding the parties' impact on state environmental policy. I apply a regression discontinuity design to assess whether party control of state houses and governors' mansions causes a meaningful change in Clean Air Act enforcement between 2000 and 2017. The findings suggest that narrowly elected Republican governors and legislative majorities reduce enforcement effort, and that the two branches' influence differs according to their distinct mechanisms of political control over the bureaucracy. Paper three moves beyond public attitudes about environmental topics in the abstract to assess local views of one particularly salient environmental topic: energy. Public views of energy technologies are critical to the United States' energy

future, but party and ideology do not contribute much explanatory power in explaining Americans' views of the energy system. I apply a framework rooted in social psychology to explain how sense of place shapes residents' interpretations and evaluations of large-scale energy transmission infrastructure as a threat or an opportunity.

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Chapter 1

Introduction

On August 7, 2017, David Graham of *The Atlantic* noted the stark contrast between the appearance of a dysfunctional administration under President Trump’s leadership and a “shadow government” that was making steady progress in enacting its policy agenda (Graham, 2017a). The week prior, Congress had failed to pass the Obamacare repeal, one of Trump’s highest legislative priorities; federal courts were blocking his “Muslim travel ban;” and Congress was showing little support for funding Trump’s proposed wall on the U.S. border with Mexico (Graham, 2017b). Yet, Graham wrote, “Even as the public government sputters, other elements of the Trump administration are quietly remaking the nation’s regulatory landscape, especially on the environment and criminal justice” (Graham, 2017a). Graham referred to the Trump administration’s progress in changing environmental rules, overhauling public-lands administration, appointing judges, approving infrastructure projects, and other actions that do not require congressional approval but that dramatically alter the policy landscape. Graham is not the only student of politics to highlight Trump’s progress in advancing his agenda outside the legislative arena (e.g., Popovich et al. (2017); Vinik (2017)).

While some of Trump’s positions do not reflect those of the modal Republican politician, his environmental agenda is typical of an increasingly anti-regulatory Republican party. Several recent governors stand out as exemplars. North Carolina’s Roy Cooper and his appointed environmental-agency director remade the state Department of Environmental Quality to promote a regulatory regime more favorable

to industry groups (Gabriel, 2014). After Michigan’s Democratic Governor Jennifer Granholm merged her state’s environmental agencies to centralize control and tighten enforcement, her Republican successor Rick Snyder split the agencies again to the ire of environmentalists (Jackman, 2017). Maine’s Republican Governor Paul LePage strutted into office in 2011 and pushed sweeping proposals to repeal many of the state’s environmental regulations (Woodard, 2014).

Data suggest that these anecdotes may indicate general trends. At the federal level, Republican legislators have become increasingly hostile to policies to protect the environment—including but not limited to policies that would address climate change (Kim and Urpelainen, 2017; Shipan and Lowry, 2001; League of Conservation Voters, 2012). Additionally, state leaders, like federal legislators, may “leapfrog” over constituency preferences to take more extreme positions than the majority of their constituents would prefer (Bafumi and Herron, 2010). The public has polarized in their views about environmental protection, but elite preferences are more extreme than the attitudes of the parties’ public bases (Skocpol, 2013; Lindaman and Haider-Markel, 2002). While Snyder, Cooper, and LePage’s actions are consistent with national trends, we lack the data to assess the generalizability of this fit to other states.

These examples and trends are also puzzling in light of several historical examples of environmental leadership by Republican Presidents. Theodore Roosevelt founded the Forest Service and set aside hundreds of millions of acres of public lands as conservation areas (National Park Service, 2017). Richard Nixon, under substantial public pressure and prodding by advisors, created the Environmental Protection Agency and signed the National Environmental Protection Act, Clean Air Act, and Endangered Species Act (Rinde, 2017).¹ George H.W. Bush helped to push through the Clean Air Act Amendments of 1990, a canonical use of market-based instruments to address pollution (Stavins, 1998). Bush also signed the Global Change Research Act, which requires the government to produce a National Climate Assessment every four years

¹Nixon’s environmental legacy is far from pristine. For example, he vetoed the Water Pollution Control Act Amendments in 1973, but Congress overrode his veto to establish the law that would become known as the Clean Water Act.

(Global Change Research Act, 1990). Even John McCain, until his 2008 Presidential run, advocated for federal policy to address climate change (Lizza, 2010).

How did we get from the Republican Party of Roosevelt, Nixon, Bush Sr., and McCain (prior to his presidential run) to the vehemently anti-regulatory Republican Party of 2018? What does this process imply about how the parties' leaders and public bases develop clear, coherent stances about political issues? Are the anecdotal examples of Republican governors' shifts towards anti-regulatory views illustrative of generalizable shifts within state parties? If so, do the policy implications of these shifts match their rhetorical force, and what can partisan influence over state environmental policy teach us about the parties' broader policy influence? How locally pervasive are the effects of the parties' increasingly divergent stances on environmental protection, and what explains policy views and outcomes when partisanship is not the driving force? These are the questions at the heart of this dissertation.

In Chapter One, "States Divided: Partisan Polarization and Environmental Protection," I explore public polarization about environmental protection at the state level. I compile hundreds of survey responses and adapt Caughey and Warshaw's (2015) Bayesian estimation method to measure changing public support for environmental protection among the state parties' public bases, from the late 1970s through 2016. The data set serves as a new and valid measure of public views about environmental protection at the state level and over time. Prior scholars have relied on proxy measures like interest group membership and broad measures of ideological liberalism. I use these data to assess the changing explanatory power of regional differences, partisanship, and economic considerations in driving public support for environmental protection. I show that regional differences in public views about environmental protection have declined, with the exception of the West, whereas economic tradeoffs have increased in their importance for shaping Americans' environmental views. This analysis is a crucial first step for understanding the evolution of the parties' positions in this issue area. In turn, the analysis can contribute to broader understanding of how the parties coalesce around consistent positions. There are three leading explanations for how issue positions evolve. In one explanation, party-position change

originates from state and local party leaders (Schickler, 2016). In the second explanation, national party leaders drive issue evolutions (Carmines and Stimson, 1986; Adams, 1997). In the third, parties adapt to maintain or expand their coalition of member groups (Karol, 2009). Leading explanations for the changing Republican party's position on environmental protection center around powerful donors from the oil and gas industry (e.g., (Davenport and Lipton, 2017)), but this explanation remains incomplete without state-level information about public and elite views.

In Chapter Two, "Controlling the Regulators: How Party Control of Government Shapes Environmental Regulation in the 21st Century," I assess the parties' influence over state-level regulatory enforcement. Despite party leaders' polarized (Poole and Rosenthal, 1984, 2001; McCarty et al., 2006; Clinton et al., 2004; Shipan and Lowry, 2001; Kim and Urpelainen, 2017) and nationalized (Hopkins, 2018) positions about environmental protection, scholars have returned mixed conclusions regarding the implications of partisan politics for environmental policy (Ringquist, 1993a, 1994; Medler, 1989; Ka and Teske, 2002; Potoski and Woods, 2002; Yi and Feiock, 2014; Nicholson-Crotty and Carley, 2018; Ka and Teske, 2002; Daley and Garand, 2005; Bromley-Trujillo et al., 2016; Konisky and Woods, 2012). More generally, most knowledge about the parties' influence on state policy comes from studies of legislative outputs (Caughey et al., 2017; Kousser, 2002; Chen, 2007; Yates and Fording, 2005; Reed, 2006). These make up only a fraction of the work of government and leave out policy implementation, enforcement, and enactments emitted by the bureaucracy rather than the legislature. A great deal of environmental policy occurs outside of the legislature and at the state level, and the analysis assesses how partisan politics influences this administrative realm. I apply a regression discontinuity design to assess whether Republican control of state houses and governors' mansions causes a change in the number of enforcement actions state agencies report between 2000 and 2017. I find that narrowly elected Republican governors and state legislative majorities reduce regulatory enforcement, but that influence from the executive and legislative branches differs according to their distinct mechanisms of political influence. The analysis shows that elections have consequences for regulatory enforcement. Because

of the importance of enforcement for promoting compliance with the Clean Air Act and improving environmental performance (Shimshack, 2014; Gray and Shimshack, 2011; Gray and Shadbegian, 2007), this means elections have consequences for environmental quality and public health in the U.S.

In Chapter Three, “Backyard Voices: How Sense of Place Shapes Views of Large-Scale Energy Transmission Infrastructure,” I move beyond public attitudes about environmental topics in the abstract to assess local views of specific environmental disruptions. Local political questions are often described as more “technical” than ideological (Trounstine, 2010, p. 416),² and some work shows that partisanship does not contribute much explanatory power to Americans’ views of the energy system (Ansolabehere and Konisky, 2014). This raises questions about the ideas, identities, and meanings that shape local political discourses. Energy scholars have found that perceived socioeconomic impacts shape public discourse around energy siting decisions (Slattery et al., 2012; Bidwell, 2013; Brannstrom et al., 2011; Larson and Kranich, 2016; Abbott, 2010; Walker et al., 2014; Songsore and Buzzelli, 2015). There is wide variation in how individuals and coalitions portray and interpret these impacts though, and the survey-based literature does not illuminate the forces shaping these perceptions. Thus, I focus on perceptions of socioeconomic impacts to explain distinctions between supporters’ and opponents’ perceptions and portrayals of project impacts. I conduct semi-structured interviews with residents and stakeholders along the routes of two large-scale transmission projects in the American Midwest. Applying a framework rooted in social psychology (Devine-Wright, 2009), I show how place sentiments shape interpretations and evaluations of the infrastructure proposed for two case sites. The geographic scale of place attachments informs the definitions of values and principles residents use to evaluate proposed disruptions. Additionally, the symbolic meanings people associate with their communities—particularly those associated with economic identities and aesthetic qualities—shape views of direct and second-order economic impacts.

²Though see de Benedictis-Kessner and Warshaw (2016) for evidence of partisan effects on municipal policy

Taken together, these papers advance understanding of the implications of partisan politics for environmental policy, and of the extra-partisan drivers of local environmental policy. Chapter One builds from the widely acknowledged polarization of Americans' political attitudes to describe state-level environmental attitudes, examine the relationship between environmental attitudes and ideology, and explore how the drivers of environmental attitudes have changed over time. Chapter Two extends the growing consensus that party control of government institutions causes meaningful shifts in states' legislative programs. I develop theoretical predictions for how the executive and legislative branches of government influence bureaucratic behavior. I test these predictions and provide evidence for partisan influence over administrative policy, and for the differential mechanisms of control available to the two branches. Chapter Three builds from survey research showing that perceived socioeconomic impacts shape Americans' willingness to accept energy infrastructure, and that place sentiments shape interpretations and evaluations of community disruptions. I apply the sense-of-place framework in the transmission infrastructure context, focusing on how the scale and content of place attachment interact to shape perceptions. The application contributes to conceptual and empirical explanations of public attitudes about the U.S. energy system, by illuminating the sources of public perceptions of proposed projects *prior* to their approval and construction.

Chapter 2

States Divided: Partisan Polarization and Environmental Protection

2.1 Introduction

Scholars have provided tremendous insights concerning the nature of public attitudes about environmental issues, highlighting the increasingly strong role that partisanship plays in shaping public opinion about the environment (McCright and Dunlap, 2011; Egan and Mullin, 2012; McCright et al., 2014; Baldassarri and Gelman, 2008; Guber, 2013; Carmichael and Brulle, 2017; Lindaman and Haider-Markel, 2002). Legislators—partially due to the influence of activists, industry groups, and think tanks—have also become more divergent in their views about environmental protection (Oreskes and Conway, 2011; Layzer, 2012; Jacques et al., 2008; Skocpol, 2013; Shipan and Lowry, 2001; Kim and Urpelainen, 2017), and these increasingly polarized elite cues have contributed to public polarization (Brulle et al., 2012; Carmichael and Brulle, 2017). What scholars have not assessed, however, is the degree to which these dynamics extend to the state level. This question is particularly important due to the strong role that states play in environmental policy making and scholars' increasing focus on cities and states for leadership in climate policy (Rabe, 2004, 2006; Betsill and Bulkeley, 2006; Betsill and Rabe, 2009; Bulkeley and Betsill, 2013).

A direct measure of state-level support for environmental protection would open

at least three research avenues in environmental politics and political science more broadly. First, scholars investigating the drivers of environmental and energy policy have used a variety of proxies for state-level environmental concern, due to a lack of direct measures. These proxies include broad measures of ideology (Berry et al., 1998), rates of membership in interest groups like the Sierra Club (e.g., Bromley-Trujillo et al. (2016); List and Sturm (2006)), or voting-based measures of legislator support for environmental protection (e.g., Lyon and Yin (2010); Ringquist (1993a); Cragg et al. (2013)). These measures are conceptually invalid: the link between ideology and environmental concerns may vary over time, group membership reflects the presence of issue publics rather than median opinion, and legislative scorecards reflect elite—not public—views. Scholars of state environmental policy need a valid measure of state-level public support for environmental protection.

Second, scholars have argued that regional and economic characteristics define public and elite views and environmental policy choices, rather than (or in addition to) partisan considerations (Layzer, 2011; Shipan and Lowry, 2001; Woods and Baranowski, 2006). This contradicts recent work on the parties' nationalization, wherein scholars have observed that neither state- nor local-level concerns distinguish state parties from each other (Hopkins, 2018). If this is true of party positions about environmental protection, and if state parties influence state policy (Caughey et al., 2017; Kousser, 2002; Chen, 2007; Yates and Fording, 2005; Reed, 2006; Besley and Case, 2003), then expectations about state experimentation with climate and environmental policy should be tempered. A state-level measure of environmental concern would help scholars adjudicate between these substantively important claims and better assess political representaton in the environmental policy arena. Third, the environmental policy arena makes a felicitous case for assessing the drivers of mass and elite partisan position change, particularly due to the regional differentiation that has characterized views on this topic. Adjudicating between competing theories of issue evolution (e.g., Schickler (2016); Carmines and Stimson (1986); Karol (2009)) necessitates measures of issue-specific public (and elite) opinion.

This study begins to address these gaps by describing and assessing the evolu-

tion of public views toward environmental protection at the state and state-party level. I compile a large dataset of survey responses gauging environmental concern and support for policies to protect the environment. I adapt the modeling framework developed by Caughey and Warshaw (2015) to estimate median opinion among state and state-party publics, from 1976 through 2016. The data show that environmental polarization has been ubiquitous around the country, but that states follow two broad patterns of polarization: divergent and parallel trends. National trends are generally consistent with broad measures of ideology, although the two trends do diverge at certain points. I next assess the changing influence of economic factors, geographic variation, and partisanship in predicting environmental concern around the country. I find that public environmental attitudes have declined in their geographic differentiability, with the exception of the Western region. There, public environmentalism has increased over time and is robust to controlling for partisanship. I also find that economic performance has increased in its importance for shaping public environmental attitudes. The descriptive data provide the foundation for studying the relationship between public views and state party positions, the role of state parties in shaping environmental policy agendas and outcomes, and the process by which state parties and state publics may have contributed or responded to changes in the national elite discourse.

2.2 Background: Public opinion and environmental protection

In light of the strong role that partisanship plays in shaping Americans' opinions about policy and politics (Lenz, 2013; Gerber and Huber, 2009; Zaller, 1992; Green et al., 2004), why is it worthwhile to measure subnational public opinion about environmental protection? Despite the growing use of ideological scales to measure citizens' opinions and politicians' responsiveness to them, this choice may inaccurately capture public attitudes and is inappropriate for some analyses. The debate about how

to measure public opinion grew out of Converse’s (1964) observation that individuals’ political views are poorly constrained by any underlying ideological coherence. Subsequent scholarship suggests that individuals’ opinions may be relatively stable but subject to stochastic variation. Imperfect survey instruments or anomalies of the political moment within which a survey is administered may explain this variation (Achen, 1975; Page and Shapiro, 1992). Aggregating across individuals and conceptualizing public opinion as a distribution can smooth this error (Page and Shapiro, 1992; Erikson et al., 2002; Stimson, 2004). Furthermore, as the parties have begun to send stronger and more coherent cues about policy preferences, public opinion has become more structured (Baldassarri and Gelman, 2008). The upshot of the debate is that a growing group of scholars argues that public opinion can be accurately estimated using only one dimension (Stimson, 2004; Erikson et al., 2002; Jessee, 2009; Caughey and Warshaw, 2017; Tausanovitch and Warshaw, 2013; Enns and Koch, 2013). According to this view, knowing an individual’s “ideology” would allow a researcher to know her preferences on a range of policy issues.

Other work shows that members of the public are ideologically mixed, and that collapsing public opinion to a single dimension can lead to erroneous conclusions (Broockman, 2016). For example, scholars using single-dimensional scales of public opinion have raised alarms about poor representation in legislatures, due to the apparent observation that legislators’ decisions reflect more extreme views than those of their constituents (Fiorina and Abrams, 2009; Caughey and Warshaw, 2016; Bafumi and Herron, 2010; Ansolabehere et al., 2001; Levendusky, 2009; Fowler and Hall, 2015; Clinton, 2006). Comparing constituents’ and legislators’ views about specific issues leads to a different conclusion about representation, however. Legislators taking “extreme” positions (when viewed on a single-dimensional scale) may be voting in alignment with the majority of their constituents across the slate of issues, if constituents are ideologically “mixed” rather than “moderate” (Ahler and Broockman, 2018). The difference between these conclusions stems from the choice of using single-dimensional ideological scales or issue-specific measures of public opinion. The divergent conclusions—and theoretical work suggesting differential representation

across issues—suggest the need for more research, at least some of which should be built around issue-specific measures of public opinion.

Moreover, at least four important questions about politics are best answered with issue-specific measures of public opinion. The first, easy, example is research into the drivers of opinion or policy in a particular substantive area, such as the environment (e.g., (Mildenberger and Leiserowitz, 2017; Kim and Urpelainen, 2017, 2018; Ringquist, 1993a; Konisky et al., 2008)). Here, most scholarship has used cross-sectional (e.g. Howe et al. (2013)), nationally aggregated (e.g. Carmichael and Brulle (2017)), or geographically undifferentiated (e.g. McCright et al. (2014); Guber (2013); Lindaman and Haider-Markel (2002)) measures of environmental concern, or proxies such as membership in interest groups like the Sierra Club (e.g. List and Sturm (2006); Bromley-Trujillo et al. (2016)). A time series of subnational issue-specific public opinion would better suit these analyses. Second, and of broader interest to political scientists, theory suggests that candidates for office cater their campaigns to certain issues, to attract voters in places that care about these issues (List and Sturm, 2006). Assessing this claim demands issue-specific measures of constituency opinion. Third, scholars have found evidence for variation in responsiveness to public opinion on different issues (Erikson, 1978; Miller and Stokes, 1963; Page and Shapiro, 1983; Canes-Wrone et al., 2011) or in different institutional or temporal contexts (Lax and Phillips, 2012, 2009). Developing a complete understanding of variation in responsiveness across time, space, and issues requires issue-specific measures of public opinion and legislator positions. Fourth, understanding the process by which the parties develop their strong and coherent stances on different issues necessitates the use of issue-specific measures of public and elite views. Current theory and evidence cluster around just a few issues (e.g., abortion and civil rights) (Adams, 1997; Carmines and Stimson, 1986; Schickler, 2016), leading to a partial picture of the evolution of political issues. Explaining substantive policy outcomes, assessing the use of different issues in campaigns, characterizing variation in responsiveness and accountability across issues, and developing the theory of issue evolution necessitates issue-specific measures of public opinion.

Existing measures of issue-specific public opinion fall short in their utility for these areas of inquiry. Some measures are subnational but cross-sectional, while most existing time series of opinion are nationally aggregated. Some studies measure national policy mood on particular issues across a long time span (e.g., Brulle et al. (2012); Carmichael and Brulle (2017); Nicholson-Crotty et al. (2009)). Legislators respond to public opinion in their states or districts; nationally aggregated measures therefore cannot be used to assess legislative accountability or responsiveness. Nationally aggregated measures also do not facilitate assessment of the sub-national drivers or responses to party-position change. Scholars often study representation and accountability by gauging views towards specific legislative proposals. These measures are cross-sectional by definition (Lax and Phillips, 2009; Levendusky, 2009; Abramowitz, 2010; Layman et al., 2010). This limits their utility for studying processes that unfold over many years, or incorporating temporal variation into assessments of these processes. Also, since most Americans pay little attention to politics, it may be unrealistic to expect them to have meaningful preferences about policy proposals in the legislature (Converse, 1964; Bartels, 2003; Zaller and Feldman, 1992). Moreover, individual survey items are subject to error generated from question order and wording (Achen, 1975; Ansolabehere et al., 2008) or other stochastic “considerations” that influence responses (Zaller, 1992). These observations about the nature of survey responses provoke caution in relying on overly specific survey questions, or even relying on individual-level survey data at all.

The approach presented here addresses both these shortcomings by pooling responses to many survey items and estimating public opinion at the state level and over a long time period. While it may be unreasonable to expect most citizens to have real preferences for very specific policy proposals (Berinsky, 2017), individuals have meaningful general orientations toward different issues (Zaller, 1992; Bartels, 2003). Of particular relevance to the present study, scholarship suggests that the same latent “common cause” structures individuals’ views of environmental protection (Guber, 2013, p. 101). Moreover, scholars have shown that, on aggregate, public opinion sends a meaningful signal and responds to politics in rational ways

(Page and Shapiro, 1992; Stimson, 2004). Aggregation allows researchers to capture a meaningful signal of public orientation towards politics. If public attitudes may not be accurately captured by ideological scales Broockman (2016), and if public opinion is most accurately described in aggregates, then public views may be most accurately estimated using aggregated measures of issue-specific views. I present such a set of estimates in this paper.

The estimates reflect state publics' general orientation towards government effort to prioritize environmental protection, under the assumption that this orientation drives public support or opposition for a range of specific policies. I estimate this construct from the late 1970s to 2016. In section 2.5 I present figures describing public attitudes about environmental concern. I also present the results of predictive models describing the changing drivers of environmental attitudes. The data open new opportunities for studying processes including issue evolution and polarization, and for incorporating institutions, economic change, and other temporally or geographically varying dynamics into studies of representation and accountability.

2.3 Methods: Dynamic, group-level item-response theory model of environmental concern

Measuring state-level environmental concern over time presents two main measurement challenges. First, few surveys have asked the same question about environmental protection over a long time period. This poses a challenge for measuring public opinion over time. Second, large-sample national surveys are not designed to draw representative samples from each state. This poses a challenge for estimating state-level public opinion. I address these challenges by adapting the dynamic, hierarchical group-level item-response theory (DGIRT) model developed by Caughey and Warshaw (2015). First, I gather a large and comprehensive dataset of publicly available survey questions gauging Americans' attitudes about environmental protection. Next, I use these data to estimate the median level of environmental concern for each state

in each year. I also estimate median attitudes among state partisans in each year.

Whereas scholars such as Levendusky (2009) and Lax and Phillips (2009) have studied issue-specific opinion using survey data about very specific policies, this analysis instead conceptualizes issue attitudes as a latent construct that underlies individuals' views of issues and policy proposals. This conceptualization comports theoretically with an important branch of research stemming from Converse's (1964) pessimistic view of ideological constraint among the mass public. Individuals' opinions may be relatively stable but subject to stochastic variation (Achen, 1975; Page and Shapiro, 1992). Scholars can smooth out error due to survey instruments by using a battery of related questions, rather than a single survey item (Ansolabehere et al., 2008). This insight underpins scaled measures of ideology and opinion. Respondent-level stochasticity can be smoothed by aggregating across individuals and conceptualizing public opinion as a distribution, since the public as a whole moves in rational ways (Page and Shapiro, 1992; Erikson et al., 2002; Stimson, 2004). The model I deploy in this study incorporates both of these insights.

The modeling approach builds upon item-response theory (IRT), multilevel regression and post-stratification (MRP), and dynamic linear modeling (DLM) to generate annual estimates of environmental-policy preferences in each state-party-year (Caughey and Warshaw, 2015). IRT combines responses to different survey questions into a single measure of latent policy views. Aggregating questions smooths survey-specific error, by pooling responses to as many high-quality survey questions as available (Ansolabehere et al., 2008; Tausanovitch and Warshaw, 2013). In an individual-level IRT model, question responses are jointly determined by respondents' score on some unobserved trait—in this case, their level of support for environmental-protection measures—and by the characteristics of the survey question. Typically, the latent trait is modeled using responses to several questions, but the model I use does not require each individual to answer more than one question. Instead, I model group-level opinion, assuming that individuals' opinion within each group is distributed normally around the group mean.

MRP leverages the predictive power of groups and models the relationship be-

tween demographic and geographic covariates and survey responses. In the MRP framework, researchers estimate a multilevel model that predicts opinion based on geographic and demographic covariates, and use that information to predict public opinion for all combinations of demographic covariates in each geographic subunit—in this case, the state and the state-party (Park et al., 2004). Median opinion for each geographic subunit is a weighted average: the sum of opinion within each demographic stratum, weighted by the proportion of the stratum in the subunit. The model borrows information from similar demographic groups and similar places to improve the accuracy of group means in each place.

The choice to incorporate grouping variables into the model implies a tradeoff between bias and variance. Using groups reduces variance: leveraging the predictive power of groups can improve estimates in states with small samples, by incorporating information about those groups in other states. Using groups can also bias estimates for states with few respondents, by pulling the estimates towards other similar states. In the Appendix I present results from a variety of specifications using race,¹ party, and state of residence as hierarchical predictors,² and without using hierarchical predictors. The main results are estimated with only state intercepts. These estimates appear to perform best, based on comparisons (included in the Appendix) with other existing measures of ideology and environmental concern.

In addition to pooling information between states using demographic predictors, researchers also often estimate state-specific intercepts based on economic, political, or demographic covariates at the state level. Using state-level predictors further pools information between states with similar economic structures, demographic populations, or other characteristics. In general, since multilevel modeling reduces variance, it is more appropriate for estimates designed for use as independent variables. This is because measurement error in the independent variable produces attenuation bias

¹I define race as black non-hispanic (where specified) and non-black, which includes white and other race categories. I define race this way because many early surveys did not include hispanic, Asian, American Indian or Alaskan native, or other race groups as response options. Thus, this is the finest-grained definition that allows for the inclusion of all respondents in the data.

² Future iterations of the model may also incorporate education and gender as demographic predictors.

in regression coefficients, whereas measurement error in the dependent variable is less worrisome (Angrist and Pischke, 2014). I use state-level intercepts in the models presented here, but I do not use state-level predictors. In Appendix A.2, I discuss a number of other decisions I make about data and model specifications, including the tradeoffs associated with each.

The model is dynamic, which enables me to estimate issue-specific opinion over time. As MRP borrows strength within groups and between places to improve estimates, DLMS allow the model to borrow strength across time (Martin and Quinn, 2002; Jackman, 2005; Linzer, 2013). The model treats each demographic and geographic hierarchical parameter's value in one period as the prior for its value in the next period, using DLM to model changes in the parameters (Caughey and Warshaw, 2015). While the group and state parameters' values change over time, I hold the parameter for each survey item constant. This enables overtime comparison of public attitudes. Holding item parameters constant implies that the latent-variable measure has the same meaning each year.

In sum, I estimate the opinion of groups defined by states, parties, and race, using MRP and DLM to estimate parameters for each group in each year and IRT to produce a scaled response from many survey items. Then I estimate average latent opinion in each state and state-party as the weighted sum of group-level opinion in that state and state-party. Modeling public opinion about environmental protection as a latent construct allows me to improve the reliability of estimates because they are produced from a battery of questions rather than from a single survey item that may produce biased responses (Ansolabehere et al., 2008). Additionally, the model allows me to measure public opinion at the state level, over time. By estimating public opinion along a single dimension though, I lose the ability to distinguish between attitudes about different environmental issues. For example, I pool questions about pollution and conservation, under the assumption that responses to both are related to the same latent dimension. One exception is climate change, an issue for which thick enough survey data exist to enable estimation of a standalone measure of attitudes about climate change (Bergquist and Warshaw, 2018). I do not include questions

about climate change in my dataset, for two reasons. First, I assess whether public concern about environmental topics, broadly defined, has become as polarized as public concern about climate change. This assessment requires separate measures of climate concern and environmental concern. Second, I use the climate concern model (along with Democratic presidential vote share and Caughey and Warshaw’s (2017) measure of ideological liberalism) to assess the face validity of the estimates developed here.

2.4 Data: Compiling survey evidence for environmental concern

To estimate state-level support for environmental protection, I sought to collect all publicly available survey questions gauging Americans’ support for environmental protection and concern about environmental problems, from the 1970s to the present. I collected the bulk of the data from the Roper Center for Public Opinion Research at Cornell University, which aggregates public opinion data from a variety of sources including news outlets (e.g., *New York Times*, ABC News) and think tanks (e.g., Pew, Public Religion Research Institute). I also obtained data directly from the Cooperative Congressional Election Study, Annenberg National Election Survey, American National Election Studies, General Social Survey, and Gallup Poll Social Series.

The estimation approach requires that the individual-level data include respondents’ state of residence, race, party identification, and a measure of environmental concern. In total, I identified 170 surveys which met these prerequisites and were fielded between 1973 and 2016. The dataset includes 79 distinct question series, which are grouped into several categories as shown in Table 2.1. Appendix B paraphrases the wording for each question included in the model, the surveys from which responses are included for each question, and the years in which each question was asked.

Table 2.1: Question Categories Included in the Estimates of Environmental Concern

Category	Description
spending	Should the government spend more, less, or the same amount to protect the environment?
policy	Do you support government policy to protect the environment?
worry	How much do you worry about environmental problems?
tradeoffs: energy	Should we prioritize energy production or environmental protection?
tradeoffs: economy	Should we prioritize economic development or environmental protection?
voting	How important is the environment to your vote?

The table shows the categories of questions included in the model, and a general description of questions included in each group. Appendix B shows a full list of survey items and sources, and reflects the differences in wording and response options between surveys.

The full dataset includes over 450,000 survey respondents, and Table 2.2 shows the samples in each year for which I estimate environmental concern. The dataset includes many questions that were asked for several years, and some that were asked in only one year. These single-year questions introduce some variation into the model that is difficult to model. Thus, I estimate models with and without them. In the Appendix, I present estimates from models that incorporate single-year questions, but the results in Section 2.5 include only those items that are asked in more than one year. Table 2.2 shows the sample sizes for models that include and exclude single-year items.

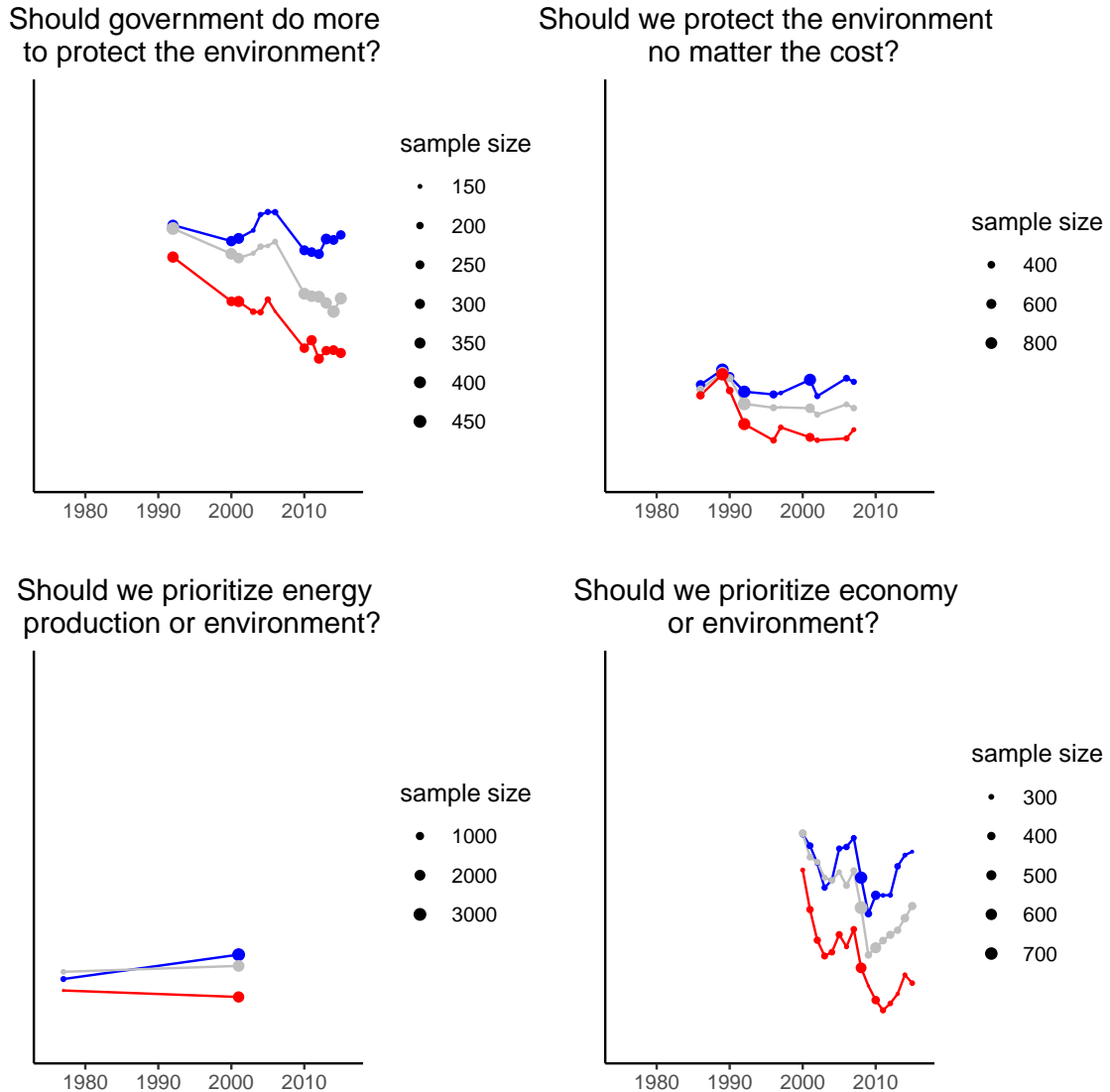
Table 2.2: Annual Samples Used to Estimate Environmental Concern

Year	Samples	
	2-year item filter	All items
1973		5555
1977	2903	5748
1980	3688	9435
1985	4956	8360
1990	3544	6584
1991	1865	2589
1992	7052	8705
1993	2508	4141
1994	3033	4515
1996	3010	6142
1997	1769	3685
1998	2867	6210
2000	28404	29224
2001	10394	10417
2002	3250	5788
2003	2468	4941
2004	9095	9095
2005	970	970
2006	39442	46262
2007	15253	15254
2008	41263	67824
2009	5149	6562
2010	60440	64117
2011	1747	1747
2012	53398	54363
2013	970	5085
2014	2928	55505
2015	3374	3374
2016	1058	2440

This table shows the annual samples for each year included in the model. Column 2 shows samples for the model estimated with items asked in two or more years. Column 3 shows samples for the model estimated using all items. Missing years for the early part of the time period reflect years for which samples were small enough to necessitate combining several years of data.

The dynamic nature of the model is facilitated by “bridge” questions which are asked in multiple years. These bridge series overlap with each other in the span of time across which they are asked, but no bridge question spans the full time series included in the model. They form the glue that allows me to estimate public opinion across the full time span covered in the data, and to estimate item parameters for discrete questions asked in a given year. Figure 2-1 illustrates the importance of bridge questions for estimating the model. The figure shows the annual average responses to four questions. None of the series covers the full time span included in the model, but they do follow similar trends for the spans of time when they overlap. Each question provides a bridge between a) the questions asked during different parts of the time spans they cover and b) discrete questions and the estimated latent variable.

Figure 2-1: Bridge questions allow for estimation of time-series measures of public opinion

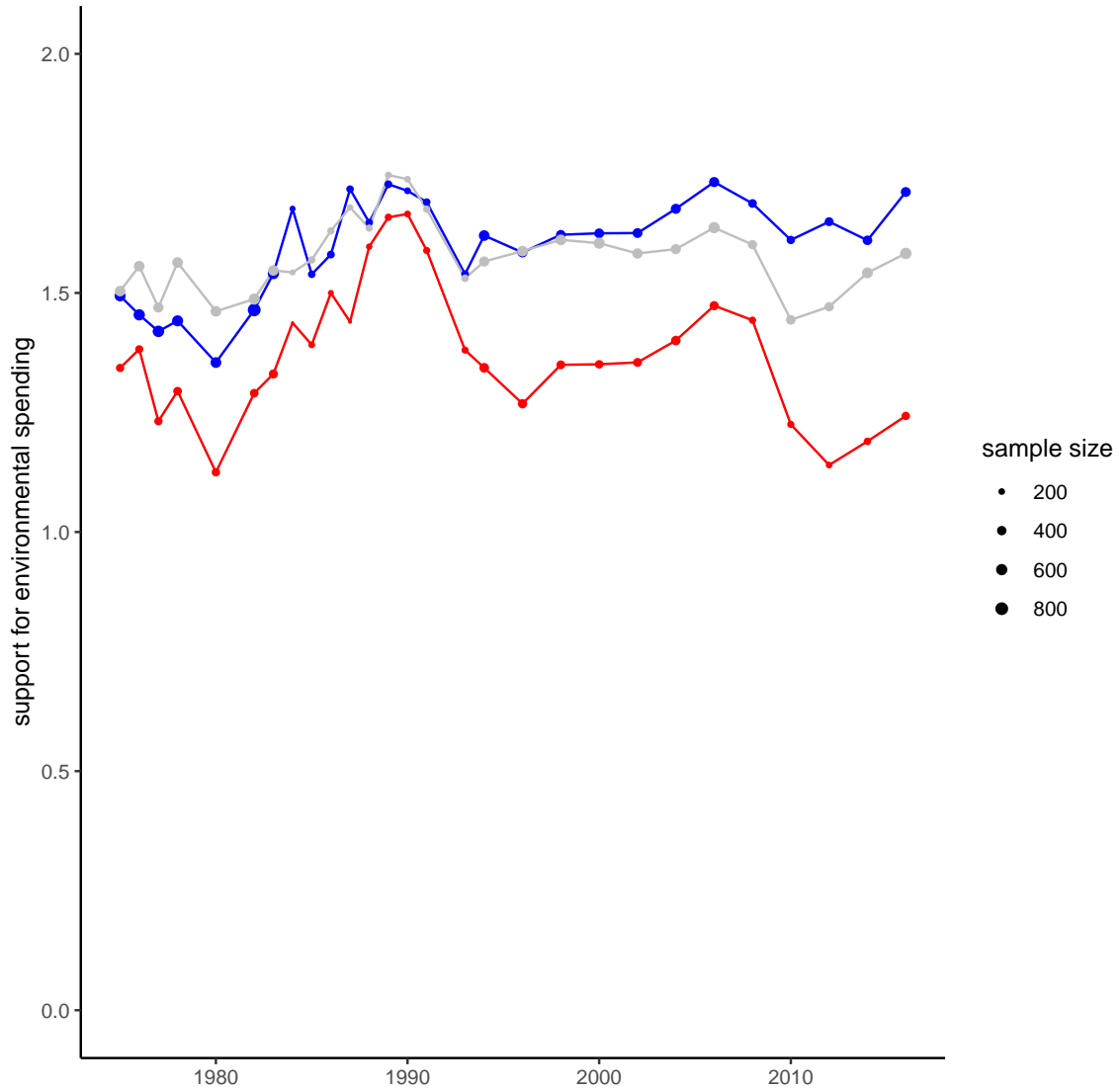


The figure shows average responses among Republicans (red), Democrats (blue), and Independents (gray) for four of the questions asked over many years in the data. High levels on the y axis indicate higher levels of support for environmental protection, but the scales for the four questions are different due to variation in response options for each. The points reflect the size of the national sample of party-identifying respondents answering each question in each year. The figure illustrates that trends tend to correlate strongly across question series, but that no series covers the full time span of the analysis. These bridging series form the glue that allow me to estimate the latent construct for the entire panel of state-years.

The precise question wording and response options offered to respondents vary across surveys. I preserved the multinomial or bivariate structure of response options from the original surveys, rather than collapsing multinomial responses into binary bins. Where necessary, I re-ordered the original response options, such that higher responses always indicate higher levels of support for environmental protection. For all items, zero represents the lowest level of environmental concern or support for environmental protection. I coded questions with exactly the same wording and response options as the same item, and I used annual cross-tabs from each survey to verify the validity of this coding scheme. Conversely, I coded questions with distinct wording and response options as distinct items. I also coded as distinct items any question asking whether the government should adjust its spending on environmental protection. This is because the meaning of responses to spending questions varies annually, according to the federal budget. The decision to maintain these items as discrete is a substantial departure from prior work gauging state-level attitudes about environmental protection (Kim and Urpelainen, 2018).³ As shown in Figure 2-2, trends in attitudes about spending and other questions in the data set correlate strongly. Nonetheless, I do not use the spending question as a bridging question since it is conceptually distinct.

³This choice is one feature that differentiates the estimates presented here from those presented in Kim and Urpelainen (2018). Their estimates are derived from MRP analysis of the General Social Survey's (GSS) question about environmental spending. The estimates presented here smooth out sampling error using item-response theory, do not assume independence over time in state opinion, incorporate many more respondents than the GSS offers, and are more suitable for overtime comparison because they are not tied to the federal budget.

Figure 2-2: Attitudes about environmental spending over time



This figure shows changing preferences for whether the government should increase, decrease, or maintain the current level of environmental spending in each year (National Opinion Research Corporation, 2017). I do not use this series as a bridging question in the model, since its meaning changes each year with the federal budget.

Consistent with most MRP applications, U.S. Census and American Community Survey data form the basis by which I estimate the proportion of each demographic group in each state-year. Since the U.S. Census Bureau does not collect individuals' party identification, I must combine the Census strata with another dataset to estimate public opinion by party. I use the estimated proportion of each stratum that is composed of Democrats, Independents, and Republicans, based on the "supersurvey" collected by Caughey and Warshaw (2017).⁴ These estimated proportions are quite precise due to the enormous sample of responses included in Caughey and Warshaw's (2017) estimates of mass liberalism.

2.5 Results

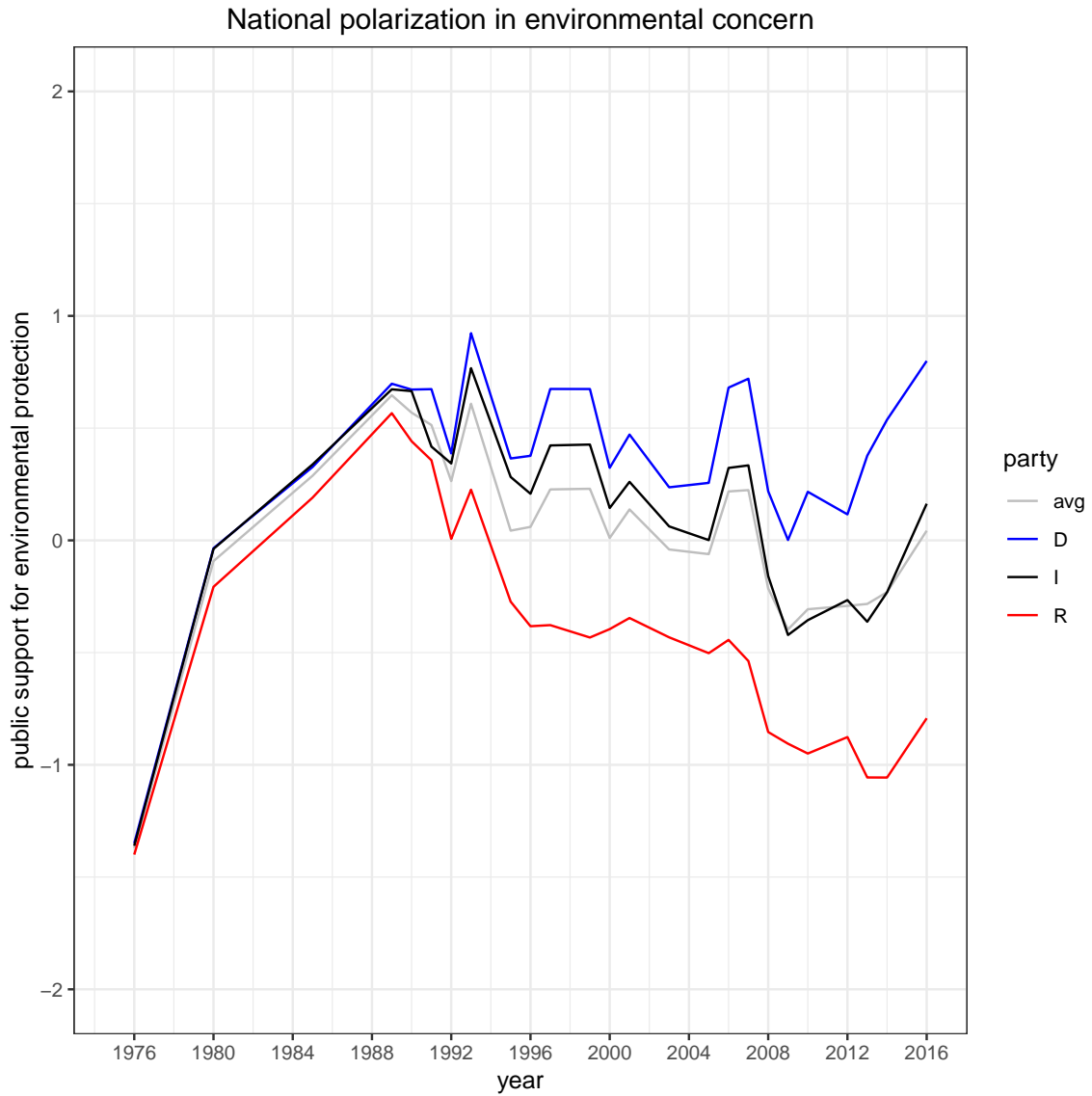
2.5.1 National trends in environmental concern

Figure 2-3 shows national trends in public concern about environmental protection since 1976, among Democrats, Republicans, and Independents.⁵ The figure shows that the two parties have diverged dramatically in their levels of support for environmental protection. These trends are not particularly novel, since prior work shows that public opinion about climate change has become quite polarized at the national level (McCright et al., 2014; McCright and Dunlap, 2011; Guber, 2013; Baldassarri and Gelman, 2008; Lindaman and Haider-Markel, 2002), and that national party leaders have diverged in their support for environmental protection (Kim and Urpelainen, 2017; Shipan and Lowry, 2001). Instead, the novelty of the data lie in their level of aggregation. The data allow for time-series analysis of the drivers and consequences of environmental concern, at a sub-national level of aggregation.

⁴Thanks to Chris Warshaw and Devin Caughey for making these data available.

⁵Figure 2-3 shows results estimated with only those items asked in two or more years.

Figure 2-3: Increasing polarization about environmental protection



This figure shows trends in environmental concern among Democrats (blue), Republicans (red), and Independents (black), between 1976 and 2016. The estimates show that the parties have diverged sharply in their levels of support for environmental protection, after a bipartisan peak in concern in 1990.

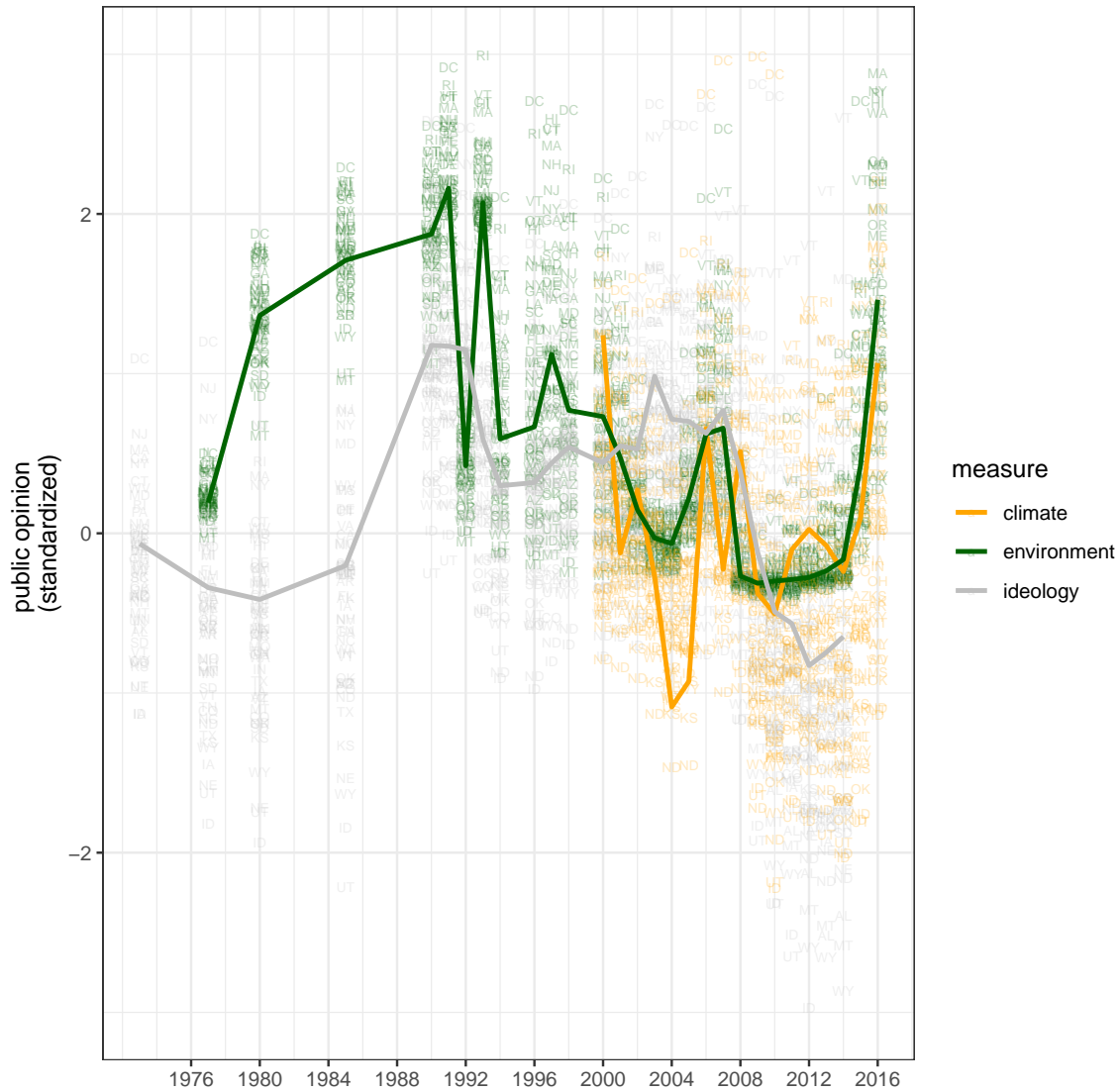
Next I compare national trends in liberalism and environmental concern, to assess whether the issue-specific measure of environmental concern tells us anything that a single-dimensional measure of ideology does not.⁶ Figure 2-4 shows trends in nationally aggregated public ideological liberalism (Caughey and Warshaw, 2017), climate concern (Bergquist and Warshaw, 2018), and environmental concern between the late 1970s and 2016.

The figure shows that environmental concern (shown in green) rose steadily throughout the 1980s and reached a peak in 1991. Environmental concern then declined throughout the 1990s and early 2000s, rose in the mid-2000s, and declined again beginning in 2008. Concern hovered until 2010, when it began to tick up again. Broadly, environmental concern and climate concern reveal similar trends, although climate concern dips to a more extreme low in 2004.⁷

⁶To assess the face validity of the estimates of environmental concern, I also present the cross-sectional correlations between these estimates in Appendix A.2.

⁷When measured with all items, instead of filtering out items that are only included in a single year, the environmental concern estimates dip to more extreme levels in the mid-2000s. Figure A.2-5 shows this trend.

Figure 2-4: National trends in environmental concern, ideology, and climate concern



The figure shows trends in environmental concern, climate concern (Bergquist and Warshaw, 2018), and mass ideology (Caughey and Warshaw, 2017), between the late 1970s and 2016. The national-level estimates are post-stratified from a model estimated without race or party group effects, and all three sets of estimates are standardized within simulation iterations, so that they are comparable across time and across measures.

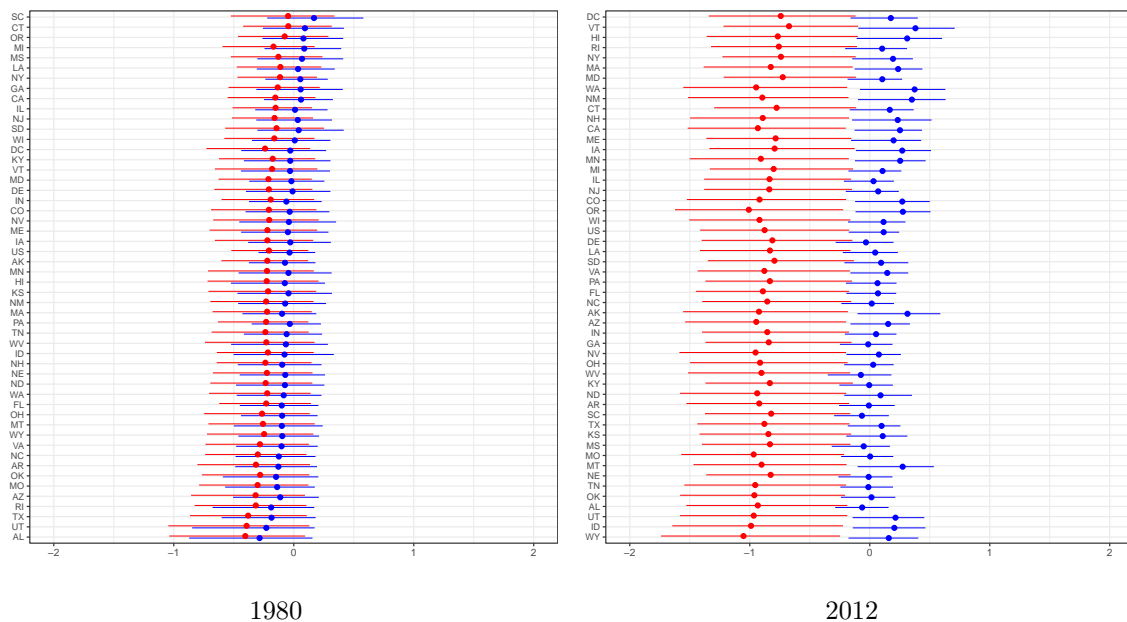
Both climate concern and environmental concern generally follow ideological liberalism with a few notable exceptions. First, environmental concern dips in 1992, whereas ideological liberalism appears flat between 1991 and 1992. Incidentally, this is the same year as the Rio Earth Summit, where the Kyoto Protocol originated and the Convention on Biological Diversity was opened for signatures. Second, between 2000 and 2004, the environmental measures decline even as the public expresses more liberal policy preferences overall. Both trends then reverse course (in opposite directions) between 2004 and 2006 (the year Al Gore released *An Inconvenient Truth*, a documentary about climate change). Third, an uptick in environmental concern and policy liberalism appear slightly off-sync in the last years of the time series. Environmental concern begins to uptick in 2010, whereas policy liberalism continues to decline through 2012. These differences suggest some value in measuring issue-specific public opinion, since the public appears to respond in distinctive ways to changes in the political and social environment. Future research should investigate the causes and consequences of these moments when the national ideological mood and environmental moods are out of sync.

2.5.2 State-level environmental concern and partisan polarization

I next describe the state-level dynamics of partisan polarization concerning environmental protection. Figure 2-5 shows polarization around the country about environmental protection, and suggests that by the year 2012, all state publics had sorted and diverged such that mass partisans' views are cleanly differentiated. This finding is novel, since some scholars and the media have argued that that, at least in some political moments, regional differences have mattered as much or more than party in shaping views about climate policy (Layzer, 2011; Bowlin and Brown, 2017). Figure 2-5 shows that environmental protection was not always but is now a polarized issue in every state around the country. The conservationist wing of the Republican Party appears to have disappeared everywhere.

Moreover, both figures show that polarization at the state level is largely driven by Republicans' movement away from support for environmental protection, rather than Democrats becoming more enthusiastic in their environmentalism. This finding departs from a recent MRP-based analysis of state-level environmental concern (Kim and Urpelainen, 2018), which found greater movement among Democrats. These divergent findings raise opportunities for further inquiry into the drivers of opinion change within both parties.

Figure 2-5: Increasing polarization in the states

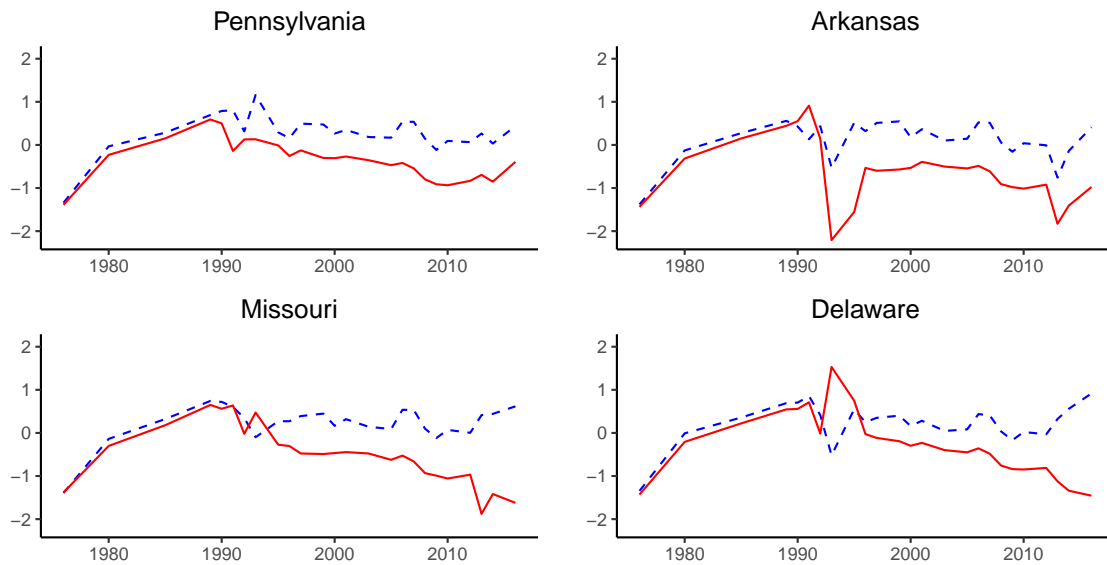


The figure shows point estimates and 95% credible intervals for environmental concern among Democrats (shown in blue) and Republicans (shown in red) in each state. The x axis represents the latent-variable measure of environmental concern, standardized for comparability over time. The figure shows that while there is some variation between state-level polarization, overall this issue has become highly polarized in every state.

In general, states follow two patterns of polarization, as illustrated in Figure 2-6. In some states, exemplified by Pennsylvania and Arkansas, mass partisans' views are differentiated but appear to move in parallel. In other places, exemplified by Missouri and Delaware, mass partisans' views have been steadily diverging. Other states that follow a divergent pattern include Colorado, Arizona, Indiana, Idaho, Michigan, Maryland, Kentucky, Louisiana, Mississippi, New Jersey, Oregon, Rhode

Island, Ohio, Wyoming, West Virginia, Wisconsin, and Utah. These different patterns provide one plausible entry to exploring the process of state-level polarization on this issue. What elements of state political context drive public attitudes about environmental protection, and how do party identifiers react differently to events that trigger public debate about environmental protection?

Figure 2-6: Two patterns of changing public opinion



The figure shows four states that illustrate two patterns of polarization in the states. Pennsylvania and Arkansas show a pattern of parallel trends, where Democrats and Republicans appear to respond to annual shocks in similar ways within the same state. Delaware and Missouri exemplify a pattern of divergence, where the public is differentiated along party lines, growing increasingly divergent, and mass partisans appear to respond to annual shocks in different ways.

2.5.3 The changing drivers of environmental concern

This four-decade panel of state-level environmental concern estimates provides new analytical leverage in assessing the drivers of public support for environmental protection. In addition to providing increased statistical power, the state level of aggregation allows me to incorporate sub-national variation (e.g., economic growth), and the panel structure of the data allows me to assess changes over time in the drivers of concern. The IRT-based model also smooths out survey-specific error, while still allowing for a plausible level of analysis. Thus, I next use panel regression to assess

the changing importance of geography, economic factors, and partisanship as drivers of environmental concern.

I build on individual-level cross-sectional analyses and national-level time-series analyses that have assessed the drivers of environmental concern. National-level analyses (Brulle et al., 2012; Carmichael and Brulle, 2017; Kahn and Kotchen, 2010) and some individual-level studies (Hamilton and Keim, 2009; Scruggs and Benegal, 2012; Shum, 2012) suggest that support for environmental protection is conditional on economic prosperity. A recent causally identified individual-level study does not find evidence that economic recession influences environmental concern (Mildenberger and Leiserowitz, 2017). This failure to detect an individual-level effect is unsurprising in light of uneven findings that the American public incorporates economic performance into its voting decisions (Kramer, 1971; Fiorina, 1978; MacKuen et al., 1992; Green et al., 1998; Achen and Bartels, 2016). One insightful finding from the economic voting literature is that media cues and campaign messages are critical if the public is to incorporate economic information into voting decisions or political views (Page and Shapiro, 1992; Lenz, 2013, 2009). Some work suggests this is true of environmental concern also (Carmichael and Brulle, 2017). Thus, it is possible that uneven findings about the relevance of economic fluctuation to environmental attitudes is due to unevenness in political or media messaging about the supposed economy-environment tradeoff. I offer a rough test of this hypothesis by assessing whether the importance of economic drivers has changed over time. Future research should assess the mechanism underlying the changing salience of the economy in predicting environmental concern. For example, exploring the influence of party position-taking about this tradeoff could provide a fruitful line of inquiry.

I also assess whether geographic variation has declined in its importance for predicting environmental attitudes. Some prior work suggests that environmental concern is differentiated regionally rather than along partisan lines (Shipan and Lowry, 2001; Layzer, 2011). But a number of scholars have shown the increasing importance of partisanship in predicting environmental attitudes (McCright et al., 2014; McCright and Dunlap, 2011; Guber, 2013; Lindaman and Haider-Markel, 2002; Kim

and Urpelainen, 2018). Alongside the broad observation that today’s political environment is increasingly nationalized (Hopkins, 2018), we might expect regional differentiation in environmental attitudes to have declined to zero and partisanship to have increased in its predictive power. I assess whether any regional variation remains, after controlling for the rising importance of partisanship in predicting environmental concern.

I use the estimates produced without race or party groups to assess the extent to which economic factors, partisanship, and regional differences have changed in their importance for shaping environmental views. To assess change over time, I use a panel model with interaction terms between decade and each of the three independent concepts of interest: partisanship, economic health, and geography. I use state and year fixed effects to control for time-invariant state-level confounding and for over-time changes that might influence environmental concern around the country. I cluster standard errors by state to account for serial correlation in state-level opinion. I operationalize partisanship using the Democratic candidates’ vote share in the most recent presidential election (MIT Election Data and Science Lab, 2017). I use state-level seasonally adjusted unemployment rates (Bureau of Labor Statistics, 2017) as the measure of economic health, and I use the four census regions (United States Census Bureau, 2018) to test for the effect of geography.

I estimate the model shown in Equation 2.1:

$$Y_{st} = \beta_1 U_{st-1} * D_{st} + \beta_2 R_{st} * D_{st} + \beta_3 V_{st} * D_{st} + U_{st-1} + R_{st} + D_{st} + \alpha_s + \gamma_t + \epsilon_{st} \quad (2.1)$$

where s and t index states and years, respectively, U refers to the seasonally-adjusted unemployment rate, V is the Democratic vote share in the most recent presidential election, D is an indicator for each decade in the data set, R is an indicator for each of the four census regions,⁸ α and γ are state and time-specific intercepts, and ϵ is an error term. Table 2.3 shows the results from this analysis.

⁸The four census regions are Northeast, Midwest, South, and West.

Table 2.3

	<i>Dependent variable:</i>
Vote share (proportion)	-0.086** (0.039)
Unemployment (%)	0.015 (0.019)
1990s: Midwest	-0.384*** (0.074)
1990s: South	-0.290*** (0.072)
1990s: West	-0.258*** (0.076)
2000s: Midwest	-0.162*** (0.059)
2000s: South	-0.122** (0.052)
2000s: West	0.125* (0.069)
2010s: Midwest	-0.105 (0.080)
2010s: South	-0.082 (0.082)
2010s: West	0.279** (0.108)
1990s: vote share	0.169*** (0.026)
2000s: vote share	0.074* (0.039)
2010s: vote share	0.142*** (0.055)
1990s: unemployment	-0.010 (0.027)
2000s: unemployment	-0.081** (0.035)
2010s: unemployment	-0.102*** (0.033)

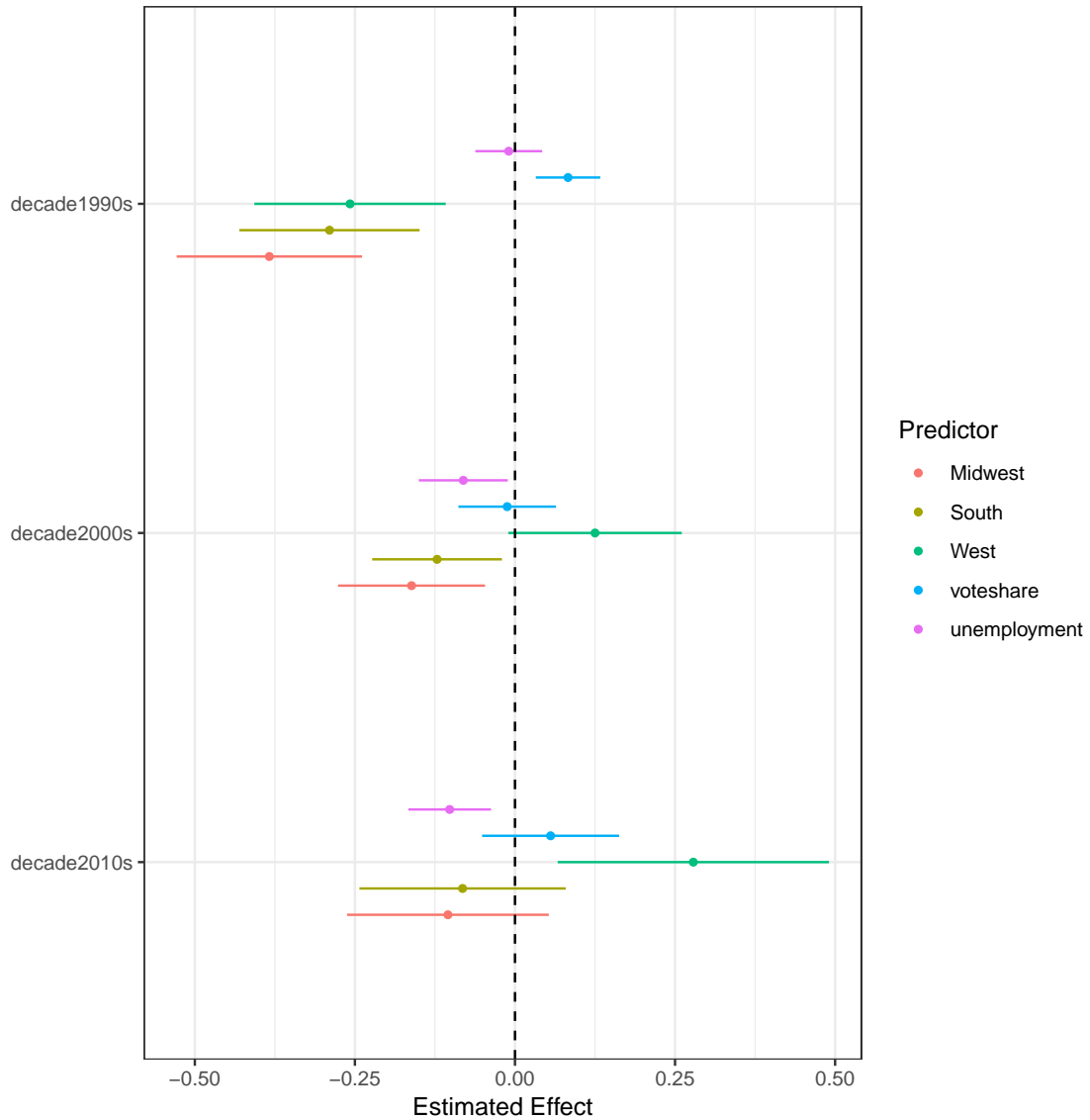
Note: *p<0.1; **p<0.05; ***p<0.01

This table shows results from a two-way fixed effect regression of environmental concern on Democratic presidential vote share, region, and unemployment. The table shows the declining influence of region and increasing power of Democratic vote share and economic performance in predicting environmental concern. The estimates of environmental concern are estimated without race or party as grouping variables. The omitted categories are the Northeast region and the 1970s-80s decade.

Several surprising findings surface. The base term for vote share is statistically significant and negative. This indicates that during the 1970s and 80s, states that tended to vote Republican also tended to be more environmentally conscious. As expected, in subsequent decades the influence of Democratic presidential vote share reversed direction and became more substantively meaningful. The exception is between 2000 and 2010, when the magnitude of vote share as a predictor is smaller than during the 1990s or the 2010s. This may reflect partisan bias in the public's evaluation of government policy. Republicans might have been more willing to accept government action to protect the environment when their co-partisan (President George W. Bush) was in office. However, under this logic, we might also expect to see an attenuation of the effect of vote share following the 2008 election when Democratic President Barack Obama was elected. Future research should probe the rhetorical foundations of this break in the power of partisanship to predict environmental attitudes. Second, the influence of unemployment has increased over time as a driver of environmental attitudes. A rise in unemployment causes environmental concern to fall in the 2000s and 2010s, but not in the 70s, 80s, or 90s. Third, even after controlling for partisanship, states in the western U.S. have become more environmentally concerned over time.

Figure 2-7 visualizes these changes. The Figure shows the marginal effects of each predictor during each decade, and illustrates the decreasing predictive power of geography (with the exception of the Western region), the consistent power of partisanship since the 1990s, and the rising influence of unemployment after 2000.

Figure 2-7: Drivers of Environmental Concern Across Three Decades



The figure shows the changing predictive power of a one standard-deviation increase in Democratic vote share and state-level unemployment rates over time, and the predictive power of each census region over time. Coefficients have been standardized, and reflect the results from a model with state and year fixed effects and state-clustered standard errors. The coefficients for vote share incorporate the effect for the base term, which is statistically significant.

2.6 Conclusion

In this paper, I have compiled hundreds of responses from 170 nationally representative public opinion surveys, to estimate state-level public concern about environmental protection across 40 years. The method smooths out error from individual survey instruments and captures the public's underlying orientation towards environmental protection, the economy-environment tradeoff, and the expenditure of government resources to protect the environment. The data are also an advance over nationally aggregated measures of public environmental concern, which are useful for some purposes but provide limited leverage for assessing the drivers and consequences of public opinion.

The descriptive results I present raise several opportunities for further inquiry. The data show that every state public has become polarized along partisan lines, but states seem to follow two different patterns of polarization. Some states' partisan publics follow parallel trends and others diverge over time in their levels of support for environmental protection. Future research should explore this variation in the processes of polarization.

Additionally, the data open opportunities for comparing ideological polarization with environmental polarization. I have incorporated ideological polarization as a robustness check for the estimates I present, but theory and evidence for polarization might be improved by comparing the extent and patterns of polarization on specific topics. The data I present allow for this type of comparison, on a common scale. As a starting point, I show that even during the time period when ideology and environmental concern are highly correlated, national trends in these two measures diverge from each other at certain moments. This suggests that there is some utility to measuring issue-specific opinion. The public responds to political and social events in ways that may not be reflected in broad-based single-dimensional measures of ideology. The state-level data presented here open new opportunities for comparing polarization on the environment with polarization about other political issues.

The predictive regression model I present also raises opportunities for further in-

quiry. I find that region has decreased in its predictive power over environmental concern, with the exception of the western region. In the west, the public has become more supportive of environmental protection even after controlling for partisanship. I also find that unemployment has increased in its relevance for environmental concern. Future work should probe the discursive roots of these changes, deepen understanding of how the economy affects environmental concern, and explore the intersection of party and economic change in shaping environmental concern. Ideological polarization has been tied to increases in income inequality (McCarty et al., 2006), and anecdotal evidence suggests the presence of a discourse that pulls both ends of the income distribution (ie, business interests and workers) away from support from environmental protection. How have partisan and media cues changed since the late 1970s to account for the increasing and interactive importance of partisanship and unemployment?

The data presented here also provide a foundation for studying two processes that are of central concern to political scientists: political representation and issue evolution. Some theory suggests that candidates for office use issues strategically in their campaigns, to attract voters in places that care about these issues (List and Sturm, 2006). On the other hand, as the parties become more nationalized, they are becoming less adaptive to state-specific policy concerns (Hopkins, 2018). The environment makes a substantively important and theoretically relevant case for studying the consequences of partisan nationalization. Other work suggests that accountability and responsiveness vary according to institutional differences and issue-specific features like salience (Erikson, 1978; Miller and Stokes, 1963; Page and Shapiro, 1983; Canes-Wrone et al., 2011; Lax and Phillips, 2012, 2009). Testing these predictions necessitates issue-specific measures of public opinion, one of which I provide in this paper. Overall, the data open possibilities for assessing state officials' responsiveness to changing public opinion about the environment, the factors that mediate responsiveness, and how party positions shape state legislative agendas.

The data presented here can also contribute to theory development about the evolution of the parties' positions about political issues. For thirty years, the leading the-

ory of issue evolution posited that the mass public follows nationally recognized elite partisans in adopting issue positions that re-orient the parties (Carmines and Stimson, 1986). Recent research presents evidence for a competing theory: party-position change begins at the local and state levels and is driven by changes in constituencies and constituent attitudes (Schickler, 2016). A third theory suggests that the parties' issue stances evolve in response to the need to maintain or expand the coalitions of interest groups that compose them (Karol, 2009). These theories provide competing hypothetical mechanisms to explain nationalization. The theories may not be mutually exclusive; instead, the process of issue evolution may vary between political issues. This dataset of state-level public opinion about the environment provides a starting point for assessing the role of the state-parties' elite and mass bases in the evolution of the national parties' stances on environmental protection.

Several Republicans stand out as enthusiastic (e.g., Teddy Roosevelt, George H.W. Bush) or at least tepid (e.g., Richard Nixon) environmentalists. This paper shows that today's Republican party has moved away from support for environmental protection measures all over the country, with the exception of the American West. Leading explanations center on elite leadership or campaign finance (Jacques et al., 2008; Davenport and Lipton, 2017), but the state-level roots or consequences of these changes are poorly understood. This gap is conspicuous since recent developments in the theory and evidence of issue evolution suggest that the parties' positions evolve in response to state-level changes in elite and public attitudes. The environment is a felicitous case for studying this process as a generalizable phenomenon, because cleavages in environmental concern have historically been described as more regional than partisan. Any explanation of how the party got to where it is today should thus incorporate the spatial dynamics of changing public attitudes and relate these changes to the evolution of elite views. This paper provides the starting point for such analysis.

Chapter 3

Controlling the Regulators: How Party Control of Government Shapes Environmental Regulation in the 21st Century

3.1 Introduction

In February 2014, Duke Energy spilled 39,000 tons of coal ash—a toxic waste produced at coal-burning power plants—into the Dan River in Eden, North Carolina. The accident polluted the river for 70 miles downstream and, for many, drew attention to a deal that Duke had come to with the North Carolina Department of Environment and Natural Resources (DENR) several months prior. The company had been under fire from environmental groups for several years because of poor management of coal ash at sites around the state. Probably to preempt a lawsuit from the Southern Environmental Law Center, the DENR finally took action against the company for violating the federal Clean Water Act (Semuels, 2017). The resulting settlement imposed a small fine on Duke and did not require the company to remove coal ash from leaky and unlined disposal ponds. Many argue that the accident could have been

prevented if DENR had imposed stronger requirements for the company to clean up its coal ash management practices (Editorial Board, 2015). Reinforcing this view, scholars have found that strong regulatory enforcement improves compliance with environmental regulations and deters future violations (Gray and Shimshack, 2011; Shimshack, 2014).

For many, the accident also typified a broader culture of regulatory laxity, capitulation to industry interests, and abuse of the discretion that states are afforded in enforcing the federal pollution control laws. Between 2011 and 2014 the DENR cut staff by two-thirds due to budget cuts imposed by the legislature. The governor increased from 24 to 179 the number of staff at the agency that were exempt from civil service protections. This increased by a factor of seven the number of staff at the agency who served at the discretion of the governor or of his appointed agency director. And that director made a number of other changes that loosened the regulatory enforcement regime, including directing agency staff to issue toothless warning letters to potential violators, rather than more meaningful notices of violation (Gabriel, 2014). These changes illustrate that state environmental agencies have discretion in implementing the federal pollution control laws and that agency choices are subject to political influence. They may also indicate that enforcement has become partisan, since a Republican governor and a Republican-controlled state legislature oversaw the changes.

Political science theory predicts that the parties might influence regulatory enforcement in a direction that is consistent with the North Carolina example, but evidence to support this claim is thin. Scholars have returned mixed conclusions regarding the implications of partisanship or ideology for environmental policy (Ringquist, 1993a, 1994; Medler, 1989; Ka and Teske, 2002; Potoski and Woods, 2002; Yi and Feiock, 2014; Nicholson-Crotty and Carley, 2018; Ka and Teske, 2002; Daley and Garand, 2005; Bromley-Trujillo et al., 2016; Konisky and Woods, 2012). More generally, most knowledge about the parties' influence on state policy comes from studies of legislative outputs (e.g., Caughey et al. (2017); Kousser (2002); Chen (2007); Yates and Fording (2005); Reed (2006)), but these make up only a fraction of the work of

government. At the federal level, scholars have assessed political influence over bureaucratic activities (eg, Wood (1991); Ackerman and Hassler (1981); Layzer (2012); Cook and Polsky (2005)), but there is no consensus about how governors and state legislatures influence policy implementation, enforcement, and enactments emitted by administrative agencies rather than legislatures. This gap is particularly notable in the environmental policy area, where states have a great deal of leeway within a national regulatory framework. The present study addresses these gaps by asking whether party control of governors' offices and state legislatures influences regulatory enforcement. The results elucidate whether the changes that occurred in North Carolina are symptomatic of broader differences in regulatory enforcement under Republican and Democratic-controlled state governments.

I use the case of the Clean Air Act (CAA), which regulates stationary and mobile sources of air pollution, to assess political influence over regulatory enforcement. I apply a regression discontinuity (RD) design to assess whether electing a Democratic or a Republican governor or state-legislative majority causes a change in the stringency with which state environmental agencies enforce the CAA. I also assess whether political influence varies according to the two branches' mechanisms of political control. The results suggest that both gubernatorial and state-legislative elections have consequences for environmental enforcement, and that influence from the executive and legislative branches differs according to their distinct mechanisms of political influence.

The paper proceeds in six sections. I first summarize empirical findings and highlight unanswered questions concerning the link between party control of government and state policy (Section 3.2). Next, I develop theoretical expectations for how the elected branches of state government influence administrative policy, and why we might expect to observe a partisan direction of influence (Section 3.3). I then introduce the case, methods, and data I use in the analysis (Section 3.4). I present and interpret results (Section 3.5) from the RD analyses and conclude (Section 3.6) with a discussion of the implications of these findings and the questions they raise for future research.

3.2 Background: State policy responsiveness and administrative policy

There is a growing body of evidence that partisanship affects elected officials' voting decisions, and that partisan control of government institutions has meaningful consequences for policy. Some studies conclude that there is no link (e.g., Hofferbert (1966); Konisky (2007)), an ambiguous link (e.g., Alt and Lowry (1994)), or, counter-intuitively, a negative relationship (e.g., Erikson et al. (1989); Lax and Phillips (2012); Erikson et al. (1993); Fredriksson et al. (2011)) between Democratic control of government and the liberalism of state policies. Increasingly, scholars have identified a link between party control of government and policy outputs (Caughey et al., 2017; Kousser, 2002; Chen, 2007; Yates and Fording, 2005; Reed, 2006), although this link is contingent on the policy area investigated, state institutional features (Besley and Case, 2003), and whether the parties split control of the governorship and legislature (Alt and Lowry, 2000). Findings of a robust link between Democratic (Republican) control of elected institutions and the liberalism (conservatism) of state policies are consistent with theoretical expectations (Bawn et al., 2012; Layman et al., 2010) and empirical evidence of increasingly divergent partisan position-taking by legislators (Fowler and Hall, 2015; Fowler et al., 2016; Poole and Rosenthal, 1984, 2001; McCarty et al., 2006; Clinton, 2006; Shor and McCarty, 2011). Nonetheless, even if we accept recent findings that party control of government institutions influences policy outputs, the bulk of political science scholarship on the topic draws its conclusions from studies of legislative enactments. This body of evidence does not illuminate how the elected branches of government affect policy implementation, enforcement, or policy enactments that do not emit from the legislature.

3.3 Theoretical framework: Polarization, nationalization, and political influence over agency activities

3.3.1 Partisan Influence Over Regulatory Enforcement

Why and how do elected officials influence administrative policy, and why might the direction of influence differ between the two major American political parties? I define administrative policy as policy implementation, enforcement, or other policy actions that do not emit from the legislature but instead from administrative agencies. A theory of political influence over administrative policy in general, and regulatory enforcement in particular, begins with the observation that today's polarized, nationalized parties exhibit stronger and more consistent influence on state policy than they did in the early- and mid-twentieth century. A clear and growing gap has emerged between the preferences and attitudes of Democratic and Republican party leaders (Poole and Rosenthal, 1984, 2001; McCarty et al., 2006; Clinton et al., 2004) and mass partisans (Levendusky, 2009; Abramowitz, 2010; Fiorina and Abrams, 2008), including at the state level (Shor and McCarty, 2011; Caughey and Warshaw, 2017). Likewise, the state parties have become increasingly consistent with the national parties in their policy views (Hopkins, 2018) and distinct from each other in their policy programs (Caughey et al., 2017). Overall, whereas historically the state parties might have responded to local and state-level concerns in distinctive (within the party) or similar (across the parties) ways, today's nationalized and polarized parties are likely to promote similar (within the party) but divergent (across the parties) policy programs around the country.

The second component of the theory concerns variation in the extent to which the parties seek to influence administrative policy, according to the organization of conflict around an issue. Political influence over bureaucratic behavior becomes a greater concern under conditions of higher conflict between political principals and between agents and principals (Waterman et al., 2004; Huber and Shipan, 2002). Thus, if

the parties' positions diverge on an issue, and if one of the parties' policy position diverges from the relevant administrative agency's mandate, political principals are likely to seek to influence agency actions. Nationalization and polarization imply a high degree of goal conflict between the parties about environmental regulation (Shipan and Lowry, 2001; Kim and Urpelainen, 2017), and between the increasingly anti-regulatory Republican party and the regulatory mandates of environmental management agencies. This conflict leads to the expectation that Republicans would seek to reduce enforcement activity, whereas Democrats would seek to increase it. I test this expectation by assessing whether, in states that narrowly elect Republican governors or state legislative majorities, regulatory enforcement action decreases relative to states that narrowly elect Democratic governors and state legislative majorities.

3.3.2 Mechanisms of Political Influence

While nationalization and polarization lead to the expectation of partisan conflict over regulatory enforcement, a satisfying theory of political control requires an understanding of the mechanisms that would enable partisan influence. Administrative policy occurs in the executive branch of government, and the governor does not suffer from collective action problems to the extent that the legislature does. Thus, the executive's institutional position and structure suggest that governors are likely to exert stronger influence than legislatures. Still, both the executive and the legislature enjoy mechanisms of political influence over the bureaucracy. Thus, the third component of the theory addresses how partisan political principals from the different branches of government influence agency behavior.

The legislative and executive branches influence the bureaucracy through different channels. The executive primarily influences agency behavior through staffing. Either through their appointment powers or by rearranging an agency's personnel, executives influence the bureaucracy by deciding who works there (Moe, 1985; Lewis, 2010; Howell and Lewis, 2002). Thus, in a context of polarized, nationalized parties, governors might influence regulatory agency behavior by nominating co-partisans to agency director positions, oversight boards, or other appointed staff offices.

The party in control of the legislature might affect agency activities through oversight, low-profile policy challenges, or the state budget. The budget represents the most direct avenue of influence. Legislatures use appropriations both to send signals to an agency and to hamstring or expand its capacity to pursue long-running cases or investigations (McCubbins et al., 1989). Additionally, the budget mechanism provides the legislature a means by which to send signals and adjust resources available to the attorney general, who is partially or wholly responsible for bringing enforcement actions in many states.

The executive and legislature negotiate to set the budget though. Some evidence suggests that governors effectively use the budgetary process to advance their policy agendas (Kousser and Phillips, 2012), but executive influence in budgeting appears limited to reducing—rather than increasing—agency budgets relative to the legislature’s desired appropriation (Kiewiet and McCubbins, 1988; Wilson, 1989). Also, the evidence for governors’ success in budget negotiations is drawn from high-profile agenda items mentioned in governors’ state of the state addresses (Kousser and Phillips, 2012). It is unclear how these conclusions translate to policy changes that both branches are likely to avoid publicizing.

Legislatures might also influence administrative policy through direct and indirect oversight from legislative committees with jurisdiction over a particular agency. Direct oversight mechanisms include “police patrol” activities like agency rule review, ad hoc studies or reports, field observations, hearings, and legislative sanctions (McCubbins and Schwartz, 1984). These mechanisms are costly and therefore likely to occur more often as the relative political consequences of an agency’s work increase. But more often, legislatures use indirect, “fire alarm” oversight mechanisms (McCubbins and Schwartz, 1984; Wilson, 1989; Potoski and Woods, 2001). These include procedures, analysis requirements, and rules that are embedded into agencies’ operations. Some requirements enable citizens and groups to challenge agency actions or raise infractions to the relevant legislative committee’s attention (McCubbins and Schwartz, 1984; McCubbins et al., 1987). Others define the evidence and frameworks agencies must use to make decisions. They thereby speed, slow, or change the di-

rection of agency policy-making without the direct interference of the legislature in specific decisions (Potoski and Woods, 2001; McCubbins et al., 1989). Of course, the consistency and direction of partisan influence on regulatory enforcement depends on the interests of the constituencies that an oversight committee's work affects and the extent to which interested constituencies are sorted between the parties. Polarization and nationalization suggest consistent partisan preferences and, thus, consistency in the direction of partisan influence on regulatory enforcement through committee oversight.

While oversight mechanisms are embedded into agency structures through enabling statutes (McCubbins et al., 1989; Huber and Shipan, 2002), the legislature can use low-profile tactics such as riders on must-pass bills to redirect agency policy-making or change the rules and procedures that serve as oversight mechanisms (Layzer, 2012, p. 21). In an example relevant to the case explored in this paper, Congress used appropriations riders to blunt the Reagan administration's efforts to roll back Clean Air Act implementation throughout the 1980s (Bryner, 1995). Low-profile tactics influence policy without attracting the attention of other political principals or groups empowered to raise fire alarms. This is an important feature for environmental regulatory enforcement, since many groups are empowered to raise fire alarms and the states operate within a federally enforceable framework. Overall, legislatures can influence agency activities by adjusting resources through the budget, using existing oversight mechanisms, or changing the rules and procedures that serve as oversight mechanisms for the legislature.

Based on this framework, the elections of Democratic and Republican governors and state-legislative majorities can have consequences for administrative policy through distinct mechanisms. State legislatures can expand, retract, or redirect resources available to agencies and to other state offices including the attorney general. Administrative activities vary in the resources they require, and this mechanism is most effective for influencing resource-intensive activities. State legislatures can also influence administrative policy through committee oversight and procedural changes that speed, slow, or change the direction of agency policy-making. These mecha-

nisms are most likely to influence formalized enforcement activities that are subject to process constraints. Governors influence agency operations primarily through appointing friendly managers, re-organizing agency staffs, and adjusting agency priorities through their relationships with agency leadership. These theoretical predictions lead to the expectation that governors may exert strong direct influence on agency actions through their appointment powers, but they are constrained in their influence over resource-intensive activities or those subject to legislative oversight. I test this prediction by assessing heterogeneity in the effect that governors and state legislatures can achieve over different types of enforcement activities.

Prior research lends plausibility to this theory, but gaps remain in scholars' assessments of partisan influence over environmental policy in general and regulatory enforcement in particular. In one body of work, scholars have examined the mechanisms included in the theory presented here. Evidence suggests that appointment powers afford influence over regulatory decisions to governors (Wood and Waterman, 1994; Koski, 2007; Woods, 2004), and that appointed agency leaders have polarized along with the political parties at the national level (Devins and Lewis, 2008). These studies lend credence to the theorized mechanism of gubernatorial influence: staffing. Evidence also suggests that indirect oversight mechanisms afford influence to the legislative committees that oversee an agency (Potoski and Woods, 2001; Woods, 2013, 2004). Much of this work relies on perceptual measures of influence rather than indicators of policy outputs. This suggests that some political influence is achieved through bureaucrats' anticipation of principals' reactions to agency decisions. But the survey-based evidence does not tell us whether political principals influence administrative policy outputs, or whether the direction of influence differs between the parties.

More broadly, state-level studies that assess partisan effects on environmental policy return mixed results. When scholars have included partisan control of government or "government ideology" (Berry et al., 1998) in predictive models, many have found that these influence environmental policy outputs (Yi and Feiock, 2014; Lyon and Yin, 2010; Huang et al., 2007; Carley and Miller, 2012; Yi and Feiock, 2012; Chandler,

2009; Stoutenborough and Beverlin, 2008; Vachon and Menz, 2006; Nicholson-Crotty and Carley, 2018). Others find null (Fisher, 2006; Carley and Miller, 2012; Ringquist, 1993b; Daley and Garand, 2005) or inconsistent (Ringquist, 1994; Medler, 1989; Ka and Teske, 2002; Bromley-Trujillo et al., 2016) effects. Some of these studies operationalize partisan control as a dichotomous indicator of unified government (Huang et al., 2007; Bromley-Trujillo et al., 2016), but the theory developed here suggests that detecting the influence of partisan control merits a design that disaggregates control of the legislature and governor's office. Other studies rely on data from a time period preceding the rise in political polarization, when the direction of partisan influence may not have been consistent across the states (Ringquist, 1993a, 1994; Konisky, 2007; Medler, 1989; Ka and Teske, 2002). Some studies have applied causal designs to identify partisan differences in environmental spending (Fredriksson et al., 2011) or environmental outcomes (Beland and Boucher, 2015). These results are suggestive, but leave the mechanisms of influence ambiguous. Overall, this research provides suggestive evidence that partisan politics influences environmental policy, but it would stretch these findings to conclude that election outcomes cause a change in environmental policy outputs that is distinct from the enduring features of states' political, economic, and cultural contexts. This is a substantively important question. States play a crucial role in enforcing the federal pollution-control laws, and enforcement is critical to promoting compliance and strong environmental performance (Gray and Shadbegian, 2007; Gray and Shimshack, 2011; Shimshack, 2014).

To bring clarity to this debate, the present study asks whether Republican or Democratic control of state government causes systematic changes in environmental regulation in the American states. More precisely, how does the election of a Republican governor or legislative majority affect enforcement compared with the counterfactual election of Democrats to the same institution in the same state? I also assess heterogeneity in the effect of the legislative and executive branches of government on enforcement activities, according to the resources and formal procedures associated with the activities that agencies undertake.

3.4 Case, design, and data for assessing political influence over regulatory enforcement

3.4.1 Case: The Clean Air Act

To examine political influence over regulatory enforcement, I examine state agencies' enforcement of the Clean Air Act (CAA). The CAA, passed in 1970, regulates the emissions of air pollutants from mobile and stationary sources. The law sets up a framework wherein states take primary responsibility for achieving national pollution-control standards established by the Environmental Protection (EPA). Specifically, states must develop State Implementation Plans (SIPs), which include air quality standards that meet or exceed federally established criteria. If states do not submit regulatory programs that are consistent with the national standards, or if EPA deems a state's implementation efforts inadequate, EPA enforces the standards directly. Thus, within a nationally established framework, states have discretion in implementing and enforcing federal pollution-control standards. Cross-state comparability in policy outputs makes the CAA an ideal empirical setting for examining political influence over state bureaucracies.

The CAA also provides a theoretically relevant case because of the centrality of goal conflict to theories of political influence over the bureaucracy (Waterman et al., 2004; Huber and Shipan, 2002). For some issues, such as education, states also enjoy broad policy leeway. But it is difficult to theoretically derive the direction of influence that the parties would exert or to operationalize policy indicators that are both comparable between states and more substantively meaningful than spending measures. Environmental regulation, by contrast, has become a hallmark of ideological conflict between the parties at the national level. Theoretically deriving the expected direction of partisan influence is straightforward, based on the observation that elite and mass partisans hold divergent preferences about environmental problems and policies (Kim and Urpelainen, 2018; McCright et al., 2014), and that Republicans have trended away from support for environmental protection policies (Shipan and Lowry,

2001; Kim and Urpelainen, 2017). The study tests whether goal conflict between Republican political principals (governors and legislative majorities) and environmental regulatory agencies influences regulatory policy enforcement in the states.

I focus in particular on stationary sources regulated under the Title V permitting program. Title V was included in the 1990 CAA amendments to improve reporting, enforcement, and compliance with the law. Under the program, large sources of air pollution and some smaller sources are required to obtain permits that establish facility-level pollution control requirements. State and local agencies issue most Title V permits, assume responsibility for monitoring compliance and taking action against violators, and are required to report their enforcement actions to the EPA. Actions states might take include informal warnings, notices of violation that do not impose penalties but instead provide guidance and request action from the facility, administrative orders that may impose compliance orders or fines, and civil or criminal prosecutions. EPA groups these actions into “informal” and “formal” categories (United States Environmental Protection Agency, 2017). Informal actions include warning letters and notices of violation, whereas formal actions include administrative orders and civil or criminal judicial proceedings. Two theoretically relevant features distinguish these kinds of actions: the resources they require and the actors involved in carrying them out. Environmental agencies can issue warning letters and notices of violation independently. In contrast, administrative orders and judicial proceedings require the involvement of lawyers, often from the Attorney General’s office. Likewise, formal actions often unfold over several years and require tremendous financial resources. Warning letters and notices of violation can emerge from some amount of dialogue between a facility and enforcers during the monitoring process, but they are relatively quick to issue and require a lower investment of time and money.

Since the theory predicts that legislatures and governors influence administrative policy through different channels, their influence should be observed through different outputs. Specifically, the legislature’s use of the budget and oversight mechanisms—including low-profile changes that alter the rules for administrative proceedings—are more likely to affect resource-intensive formal enforcement activities. This is due to

the resources required, involvement of the attorney general (also subject to resource constraints controlled by the legislature), and oversight mechanisms associated with formal enforcement. The governor, on the other hand, is most likely to influence informal enforcement activities where the agency enjoys more discretion.

3.4.2 Design: Regression discontinuity and randomization inference

I use a regression-discontinuity (RD) approach to elucidate whether electing a Democratic or a Republican governor or state-legislative majority causes a change in enforcement activity in a state. The RD design allows researchers to identify a causal effect by focusing analysis within a narrow bandwidth spanning a treatment-assignment threshold (Lee and Lemieux, 2010). In many political-science applications—including the present study—treatment is defined by electoral margins (the “running variable”) and assigned according to the 50% vote share required for the Democratic or Republican candidate to win (Lee, 2008). By focusing analysis on narrowly decided elections in states that are otherwise similar, the RD design allows the researcher to assess the causal effects of a party’s electoral victory.

The approach rests on an assumption of continuity of potential outcomes at the treatment-assignment threshold (De la Cuesta and Imai, 2016). If potential outcomes are continuous between units spanning the threshold, the RD design supports a claim that any discontinuity observed between units assigned to treatment and control is caused by the treatment. The continuity assumption is valid if there is no discontinuity in pretreatment covariates or placebo outcomes at the treatment-assignment threshold, within the bandwidth specified for the analysis. I use a series of robustness checks to test the validity of the continuity assumption underlying these analyses.¹ I

¹I test for discontinuities using local linear regression, applying larger weights to observations near the treatment-assignment threshold (De la Cuesta and Imai, 2016). I examine the effect of the lagged running variable (e.g., the previous election’s vote margin in the gubernatorial RD) on the outcome variable; the current running variable on the lagged outcome variable; and the running variable on the lagged treatment (party of the governor or legislative majority) and running variables, the current running variable and treatment for the opposite branch of government, and public support for environmental protection. I derive estimates of public environmental concern using

find no significant discontinuities, which suggests that the continuity assumption is valid.²

For the analysis of gubernatorial control, I use a standard RD: treatment is defined as a Bernoulli random variable and assigned by electoral margins in gubernatorial elections. For the analysis of legislative control, I use the multidimensional RD approach developed by Feigenbaum et al. (2017). The main challenge for applying RD in a legislative context is that treatment-party control of the legislature is determined not by one election but by many. Multidimensional RD combines these elections into a single running variable that measures the distance between a vector of district-level election outcomes and the electoral results that would deliver majority-party status. I construct the running variable by first determining the number of seats (m) the minority party lacks to achieve majority status. Second, I determine the distance to majority status in the minority's m closest elections.³ Since treatment is defined as Republican victory, this distance is multiplied by -1 if the Republicans are in the minority. Once this variable has been constructed, the analysis proceeds as with simple RD, where treatment is assigned according to the 50% threshold.

A shortcoming of the regression discontinuity approach is that the design restricts analysis to the subset of the data that are concentrated near the treatment-assignment threshold. This restriction raises concern about applying large-sample statistical procedures in some applications (Cattaneo et al., 2015). Since gubernatorial elections only occur every four years, my analysis includes a small number of elections and an even smaller number of close elections. As a robustness check for the analysis of gubernatorial control, I complement the RD with randomization inference, a statistical technique designed for hypothesis testing with small samples.

In the randomization-inference framework, the researcher tests the sharp null hypothesis that there is no treatment effect for any unit. Under this sharp null, the

an adaptation of the dynamic group-level item response theory model developed in Caughey and Warshaw (2015). To test for lasting effects of party control of government, I also examine the effect of the lagged running variable and lagged treatment assignment on the outcome variable.

²The results of all placebo tests are included in Appendix Section B.0.1.

³Following Feigenbaum et al. (2017), I use Euclidean distance, such that distance to majority status is determined by summing the squares of the margins of loss in the m closest elections.

potential outcomes for all units are known, since the potential outcome for each unit is the same under the observed randomization of treatment and any counterfactual treatment assignment. Since all potential outcomes are known under the null hypothesis, the researcher can derive the distribution of any test statistic and determine the p-value and confidence interval for an observed test statistic based on this distribution. The distribution of test statistics thus provides a reference distribution through which to determine the probability of observing the effect that was actually observed (Rosenbaum, 2010, Ch. 2), and rejecting or failing to reject the null hypothesis. I test the sharp null hypothesis that there is no effect on enforcement following the election of a Republican governor. I provide additional details about randomization inference, including support for the identifying assumption of local randomization of treatment, in the Appendix.

3.4.3 Data: Measuring regulatory enforcement and party control of government

The treatment-assignment variables are derived from election returns. For the gubernatorial RD, I use election returns from 2000 to 2016 (CQ Press, 2018) and define the running variable as Republican vote margin. State-years are assigned into treatment if the Republican candidate receives more than 50% of the two-party vote share. For the state-legislative RD, I use state legislative election returns from 2000 to 2016 (Klarner, 2018). The running variable for the legislative analysis is the Euclidean distance between a vector of district-level election results and the results that would be required for the Republican party to win majority status (Feigenbaum et al., 2017). Consistent with prior applications of the multidimensional RD (e.g., Caughey et al. (2017)), I only examine the effect of electing a Republican majority to the lower legislative chamber since many state senators are not up for re-election every term. I do not include elections in multimember districts or Nebraska, since multimember districts pose design complications and the Nebraska legislature is nonpartisan.

The outcome variables reflect states' enforcement actions taken against major

and synthetic minor facilities permitted under the CAA’s Title V Program, between the years 2000 and 2017. I focus on this subset of enforcement actions to maximize consistency in reporting over time and between states. States are required to report enforcement actions taken against Title V-permitted major and synthetic minor emitters.⁴ Also, the introduction of the Enforcement Compliance History Online (ECHO) database in 2002 substantially improved the consistency with which states reported their enforcement activities.⁵ EPA modernized its CAA data collection system during the time period under study, and I use data from the modernized dataset, the Integrated Compliance Information System (ICIS-Air) (United States Environmental Protection Agency, 2017).

I aggregate facility-level enforcement data from ECHO to produce state-level, annual counts of formal, informal, and total enforcement actions taken by state and, where authorized, local environmental agencies. To control for differences in states’ enforcement populations and annual shocks that affect enforcement in all states, I use the residualizing approach recommended by Lee and Lemieux (2010). I regress the logged count of actions on state and year fixed effects, and use the change in the residuals from this regression as the primary dependent variable.⁶

⁴While states are required to report enforcement actions taken against major and synthetic minor sources, federal reporting has been the source of contentious debate and some inconsistencies. In the present analysis, some caution is merited in interpreting the data: the absence of actions in the EPA database indicates at least that these actions were not reported to EPA and at most that they did not occur. By extension, it could be argued that any effect observed might reflect either state-level regulatory changes or symbolic opposition to federal overreach in reporting requirements. While either of these effects is interesting, it seems unlikely that states would under-report their enforcement actions on principle and risk the EPA entering to impose stricter enforcement. Nonetheless, replicating the analysis with data collected directly from the states would bolster confidence in the interpretation.

⁵Thanks to Mike Barrett, ECHO manager at EPA, for his insights about managing and interpreting data obtained through ECHO.

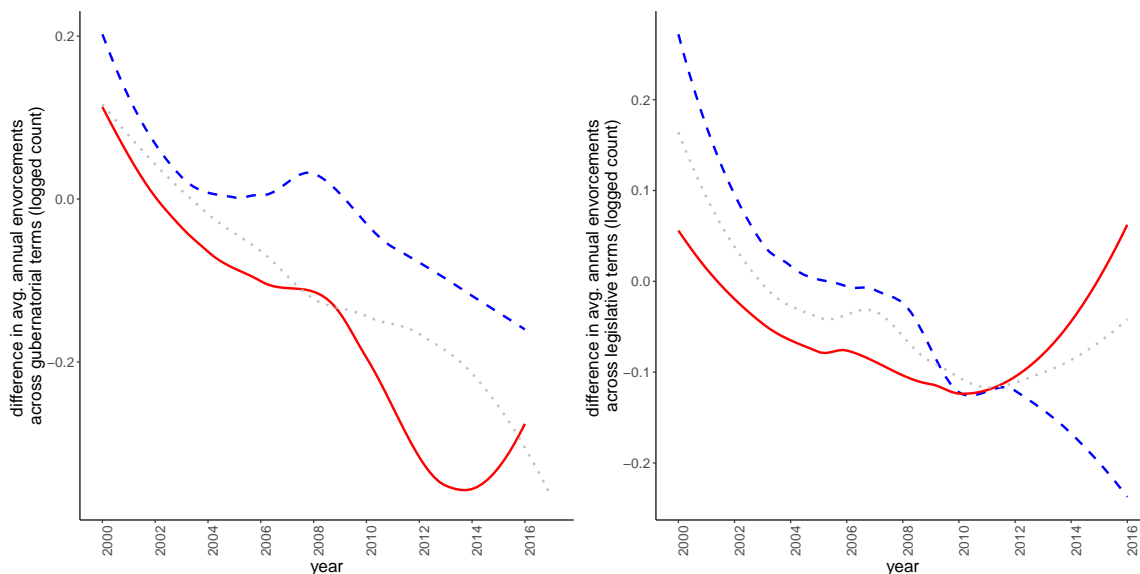
⁶I also run the models using simple logged counts of actions and the ratio of actions to manufacturing facilities. The results are substantively and statistically similar for the results estimated with the first-differenced counts, ratios, and the residualized, first-differenced counts. Robustness checks suggest better balance between treated and control groups for the results using the residualized, first-differenced variable. Thus, I use the residualized variables due to stronger support for the continuity assumption. I include results using first-differenced logged counts in Appendix Table B.0-14.

3.5 Results: Regulatory enforcement under Democratic and Republican administrations

3.5.1 National trends in CAA enforcement

Figure 3-1 shows national-level trends in states' enforcement efforts taken under the CAA since 2000, in states controlled by Democratic and Republican governors and state legislatures. The figure suggests two patterns of political influence. First, states controlled by Republican governors appear to conduct fewer enforcement actions than their Democratic counterparts, after accounting for between-state differences in the enforcement population. Second, the relationship between party control of government and changes in regulatory enforcement appears stronger for governors than for state legislatures. This is consistent with theoretical expectations that the executive is more easily able to influence administrative policy since it occurs in the executive branch. Nonetheless, this correlation does not provide evidence that the election of a Republican or a Democratic governor makes a meaningful difference in enforcement, all else equal. I turn to the regression discontinuity analysis to adjudicate this question.

Figure 3-1: National Trends in CAA Enforcement



The figure shows enforcement activity in states headed by Democratic (dashed blue line) and Republican (solid red line) governors and state legislatures. The trends reflect the change in the natural log of annual actions taken during a gubernatorial or legislative term, compared with the election year.

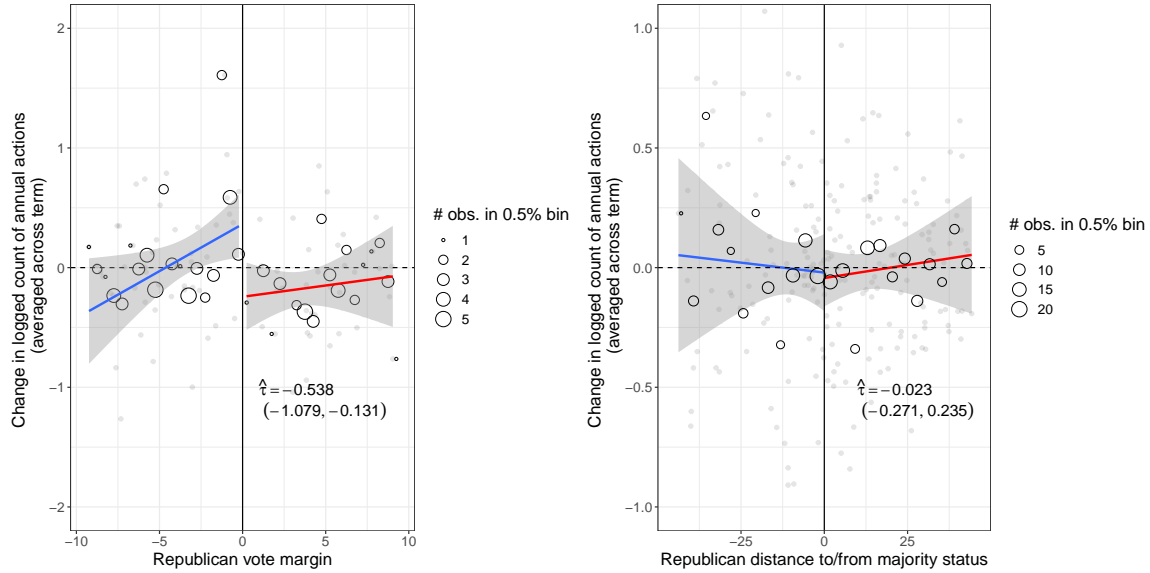
3.5.2 Political Influence Over CAA Enforcement

I first assess the extent to which party control of governors' offices and state legislatures affects regulatory enforcement overall, by assessing discontinuities in total enforcement actions taken by narrowly elected Democratic and Republican governors and state legislatures. Figure 3-2 shows the effect of Republican control of governors' mansions and statehouses on enforcement actions taken by state agencies. I find evidence that the party of the governor has a strong influence on total enforcement, whereas the effect of state legislatures is statistically indistinguishable from zero. This comports with prior research finding that appointment powers afford governors influence over the direction of agency policy (Wood and Waterman, 1994; Koski, 2007; Woods, 2004). The analysis provides new evidence of a partisan difference in governors' influence: narrowly elected Republican governors reduce regulatory enforcement as compared with their Democratic counterparts. In contrast, the analysis suggests that legislatures, due to the challenges associated with collective action, are not as nimble as the executive in influencing policy.

Due to the small sample included in the bandwidth for the analysis of gubernatorial control, I use randomization inference to check the robustness of the large-sample result.⁷ The results derived using randomization inference are broadly consistent with the large-sample RD results. While the point estimates are smaller for the difference in means test deployed using randomization inference, results from both models are substantively meaningful. A narrow Republican victory causes a 14%-42% reduction in enforcement, estimated using randomization inference and local linear regression-based RD, respectively. This amounts to between 6 and 18 fewer actions in the median state.

⁷Appendix Figure B.0-6 shows the results of the randomization-based test and the large-sample RD.

Figure 3-2: Political Influence Over CAA Enforcement



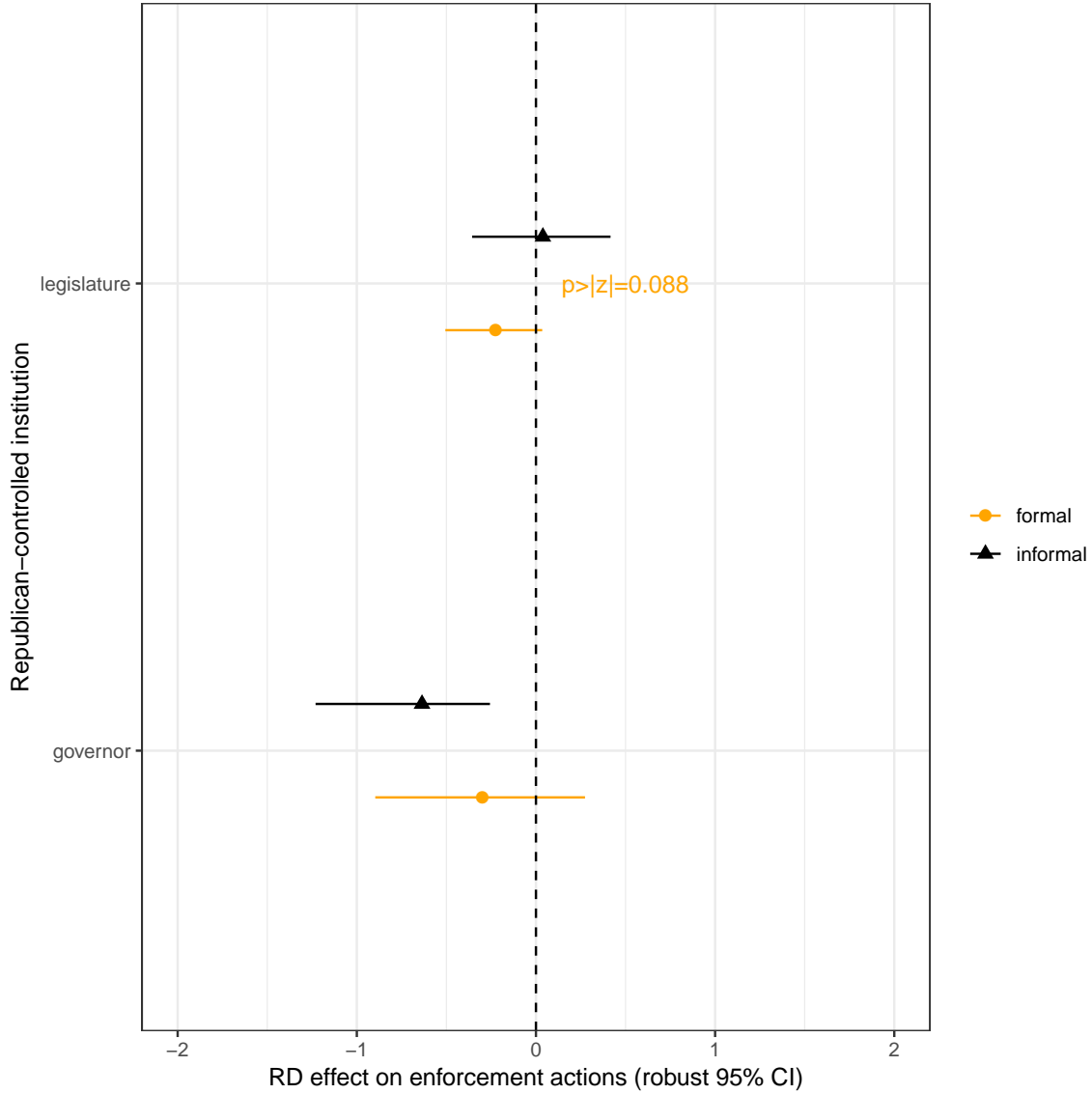
The figure shows the RD effect that narrowly elected Republican governors (left panel) and state legislative majorities (right panel) have on annual enforcement actions taken during each year of their terms, as compared with the year of their election. The effect was estimated with the `rdrobust` (Calonico et al., 2015) R package, using a triangular-kernel local linear estimator, MSE-optimal bandwidth, and bias-corrected robust confidence intervals. The hollow points reflect local averages for each bin in the data, and they are sized to reflect the number of state-year observations in each bin. The dependent variable is the change in the residuals from a linear regression of the natural log of annual enforcement actions, averaged across the years of gubernatorial or legislative terms, on state and year fixed effects.

3.5.3 Heterogeneous Effects on Enforcement

These average effects may mask heterogeneity in the effects that legislatures and governors are able to exert through their differential mechanisms of political influence. Thus, I next assess whether governors and legislatures influence different types of agency activities. Figure 3-3 shows the results from RD models assessing the effect of governors and state legislatures on formal and informal enforcement actions.⁸

⁸Results from all models are included in the Appendix. The figures and tables in the Appendix reflect results for each year of a term, in addition to the effect presented here, estimated using the average annual change in actions taken during gubernatorial terms and legislative sessions.

Figure 3-3: Governors' and Legislatures' Effects on Enforcement



The plot shows the effect of Republican gubernatorial victories and state legislative majorities on formal and informal enforcement activities. The effects were estimated with the `rdr` (Calonico et al., 2015) R package, using a triangular-kernel local linear estimator, MSE-optimal bandwidth, and bias-corrected robust confidence intervals. The dependent variable is the change in the residuals from a linear regression of the natural log of annual enforcement actions, averaged across the years of gubernatorial or legislative terms, on state and year fixed effects.

The results shown in Figure 3-3 suggest that the lack of an overall effect for state legislatures masks an effect that the legislature is able to achieve over formal enforcement activities. This result is significant at the 90% confidence level, but not the 95% confidence level. It is substantively meaningful in the context of total cross-sectional and over-time variation in enforcement. The effect is approximately one-third of a standard deviation in the dependent variable, and implies a 20% reduction in formal actions taken. The median state would bring three fewer judicial cases or administrative orders under a narrowly elected Republican-controlled state legislature.

The results also suggest that Republican governors exert stronger influence than legislatures, but that governors' influence is most readily observed in informal warning letters and notices of violation. The effect of a Republican gubernatorial victory on formal punitive actions is statistically indistinguishable from zero, whereas the effect on informal actions is robust across the governor's term with the exception of year three.⁹ While these differences in effects are not statistically significant, they are suggestive of heterogeneous effects.

Together, these results provide support for the theory that the legislature and governor affect enforcement through distinct channels. Governors exert the strongest influence on regulatory enforcement in terms of substantive magnitude. Their influence is primarily observed in the frequency with which agencies issue warning letters and notices of violation rather than administrative and civil judicial actions. This provides support for the theory that governors influence enforcement by appointing politically friendly agency managers who may adjust agency priorities and the frequency with which the agency takes relatively low-cost signaling actions against polluters. But governors are hamstrung in their ability to influence resource-intensive activities. Instead, through its oversight powers and appropriations authority, the party in control of the state legislature can constrain the resources at an agency's disposal for bringing lawsuits and adjust the rules and procedures that govern formal administrative actions. Notably, the budget mechanism also allows the legislature to

⁹Appendix Figure B.0-5 shows the results for all years of governors' terms. Appendix Figure B.0-3 shows the results estimated using various bandwidths.

change the resources available to the attorney general’s office, which is partly or fully responsible for bringing formal enforcement actions. The involvement of the attorney general in these cases may introduce a political check on the governor’s power, particularly if the attorney general is of the opposite party.

3.6 Conclusion: Implications and future research

I have used a regression discontinuity setup to examine whether state legislatures and governors influence enforcement of the Clean Air Act, one of the nation’s landmark pollution-control laws. I also develop a theory to explain political influence over state administrative policy, which could be further developed through testing in other issue areas or temporal settings. The findings advance knowledge of state policy responsiveness by identifying the direction and magnitude of the consequences of partisan electoral victories for administrative—rather than legislative—policy outputs. I also find suggestive evidence that governors and state legislatures influence enforcement through different channels. Governors—through their appointment powers and relationships with agency directors—can substantially redirect agency enforcement effort, but their effect is primarily seen in the frequency with which agencies send informal warning letters and notices of violation to Title V-permitted facilities. State legislatures—through their control of the resources available to agencies and attorneys general, committee oversight, and low-profile policy changes—influence the frequency with which agencies level administrative penalties and bring judicial cases.

The results from the analysis of gubernatorial influence suggest that enforcement may be one policy mechanism behind Beland and Boucher’s (2015) finding that pollution decreases under narrowly elected Democratic governors. Informal actions generally precede administrative orders and judicial actions and make up the majority of enforcement actions taken by state agencies. Thus, even if governors’ influence is primarily felt in informal activity, a shift in informal enforcement under a new governor represents meaningful changes in states’ enforcement regimes. Furthermore, although warning letters and notices of violation require relatively minimal response

from the recipient, they send a meaningful signal that can promote compliance and deter future violations at the recipient facility and surrounding facilities (Gray and Shimshack, 2011). These results show that elections have consequences for enforcement. Because of the importance of enforcement for promoting compliance and improving environmental performance, elections have consequences for environmental quality.

The analysis also provides evidence that state legislatures influence formal enforcement activity, which is consistent with theoretical and empirical work finding that legislatures influence the bureaucracy through budgeting (Ansolabehere and Snyder, 2006; McCubbins et al., 1989; Bryner, 1995), oversight (Potoski and Woods, 2001; Woods, 2013, 2004), or low-profile policy-change tactics (Hacker, 2004; Layzer, 2012). Extending the time frame to include more elections in the relatively narrow bandwidth supporting the continuity assumption would strengthen the claim that state legislative elections affect formal enforcement activity. Extending the time frame and sample for this analysis would require collecting data directly from state agencies, as the states reported their actions to EPA less consistently prior to the year 2000.

This analysis opens at least three opportunities for further inquiry into political influence over administrative policy, where theoretical development has been rich but empirical evidence is somewhat thin. First, theory suggests that political influence over the bureaucracy varies across policy areas, according to dimensions such as the level of conflict between principals and agents (Waterman et al., 2004; Huber and Shipan, 2002), distributive concerns (Ringquist, 1994), and information asymmetry (Waterman et al., 2004; Ringquist, 1994). This analysis provides evidence for political influence when there is high conflict between political principals of different parties, and between partisan principals and their bureaucratic agents. Future research should compare political influence over bureaucratic behavior across policy areas that vary in goal conflict and other relevant dimensions. Second, future research should investigate how these effects shrink, grow, counteract, or cumulate in eras with differing degrees of partisan polarization. Third, while these results are consistent with the theorized mechanisms of influence available to governors and state legislatures,

qualitative process tracing in a sample of typical cases could further elucidate these mechanisms.

Chapter 4

Backyard Voices: How Sense of Place Shapes Views of Large-Scale Energy Transmission Infrastructure

4.1 Introduction

The U.S. energy grid is undergoing dramatic growth and reconfiguration. On average, the U.S. has seen the construction of 12,000 miles of natural gas pipelines each year since 1950 (Dooley et al., 2009), accumulating to over 2.5 million miles of transmission pipeline today (US DOT Pipeline and Hazardous Materials Safety Administration, 2018). This trend shows no signs of slowing. Declining natural gas prices and technological advancement have opened huge extraction opportunities, and many argue that inadequate transmission infrastructure is the limiting factor in getting this gas to market. Infrastructure development to meet this need is already underway. For example, five pipelines connecting to the Marcellus and Utica shales were scheduled for completion in 2017, with another five to open in 2018 (DiSavino, Scott, 2017). Meanwhile, the U.S. has 640,000 miles of high-voltage electric transmission lines, and the electricity transmission infrastructure is projected to grow by 6% by 2030 (US Department of Energy, 2015). Building a lower-carbon electricity system would neces-

sitate further infrastructure expansion. For example, meaningful adoption of carbon capture and sequestration technology would require the construction of 11,000-22,000 miles of pipeline to transport CO_2 by 2030. (Dooley et al., 2009). Large-scale deployment of wind and solar-generated electricity requires either major advances in storage technology or an overhaul of the transmission system (MacDonald et al., 2016).

Reconfiguring or expanding the nation's transmission infrastructure will require the engagement and guidance of the American public, since communities will be asked repeatedly to accept new transmission infrastructure. It is thus critical to understand public perceptions of energy transmission infrastructure, and how these perceptions are shaped by arguments from government, companies, and advocates. Scholarly attention to public views of transmission infrastructure has been limited though. Instead, scholars have focused on attitudes towards electricity generation facilities such as wind farms and power plants.

In this paper, we expand on work assessing the drivers of public attitudes toward electricity generation facilities to explore perceptions of energy transmission infrastructure. We draw on in-depth interviews with public officials, residents, landowners, and stakeholders in communities along the routes of two proposed energy transmission projects to understand how community members view the projects. Our study contributes to scholarly assessments of public attitudes about energy facilities in four important ways. First, whereas most prior work has assessed attitudes towards electricity generation facilities, we focus on transmission infrastructure. Generation and transmission facilities differ in their aesthetic qualities, the costs they may impose on communities, and the benefits they may deliver. Our study enables comparison of public attitudes towards these components of the energy system, which impact communities in different ways. Second, the study complements survey-based studies of attitudes about energy infrastructure. We focus on socioeconomic considerations, a category of perceived impacts that survey researchers have identified as important drivers of public attitudes. Our analysis elucidates the sources of these perceptions. Third, we gauge attitudes about proposed projects before they have been approved or constructed. This allows us to assess public expectations for the projects before res-

idents have become acquainted with facilities' impacts or adapted to their presence. Fourth, we study two proposals that vary in their aesthetic qualities and the source of the energy they are designed to transmit. This allows us to determine whether attitudes vary according to these factors.

We apply a framework rooted in social psychology to explain local attitudes about energy transmission infrastructure. The framework draws from social representation theory (Moscovici, 2001; Batel and Devine-Wright, 2015) and is centered around the concept of sense of place, which is composed of attachment, symbolic meanings, and satisfaction associated with a place (Stedman, 2002). We show how the scale of place attachments (Devine-Wright and Batel, 2017) and the symbolic meanings underlying place attachments (Devine-Wright, 2009; Devine-Wright and Howes, 2010; Bailey et al., 2016) help shape residents' interpretations and evaluations of proposed projects as a threat or an opportunity. Whereas this framework has been applied to attitudes towards wind energy siting proposals, we build upon it and carry it into a new context: transmission infrastructure. We show how evaluations of the projects stem from contradictions and complementarities between sense of place and interpretations of transmission projects' socioeconomic impacts. Place attachments at the local, state, and national scales help define the values through which respondents evaluate the projects. Likewise, symbolic meanings associated with aesthetic characterizations and economic identities inform interpretation of project impacts and evaluations of the projects as threats or opportunities.

The paper proceeds in four sections. First, we review prior work assessing attitudes about energy infrastructure and present our conceptual framework to assess the role of sense of place in shaping residents' perceptions of energy transmission infrastructure (Section 4.2). Next, we describe our case sites and research methods (Section 4.3). In Section 4.4, we apply the framework in our cases. We describe patterns in the symbolic meanings and scale of attachments that comprise sense of place among our respondents. We show how respondents interpret project impacts through the lens of place sentiments, how these interpretations are rooted in familiar experiences, and how evaluations of the projects stem from the relationship between sense of place and

interpretations of project impacts. We conclude in Section 4.5 with a discussion of the theoretical and practical implications of our findings.

4.2 Background and Conceptual Framework

4.2.1 NIMBY attitudes towards Infrastructure Siting

A large literature in planning and public policy assesses NIMBY—“not in my backyard”—attitudes towards infrastructure siting proposals. The NIMBY concept refers to attitudes of opposition to facilities such as power plants, industrial facilities, mental health facilities, or affordable housing projects in close proximity to one’s home, despite generalized support for these types of facilities (Schively, 2007). This phenomenon has received some attention in the context of energy infrastructure siting, with a particular focus on electricity generation facilities (Ansolabehere and Konisky, 2009; Wolsink, 2000, 2007; Devine-Wright, 2005; Swofford and Slattery, 2010; Rygg, 2012; Slattery et al., 2012; Carlisle et al., 2015; Greenberg, 2009; Greenberg and Truelove, 2011), nuclear waste disposal (Jenkins-Smith et al., 2011; Sherman, 2012; Slovic et al., 1991), and oil and gas extraction sites (Michaud et al., 2008; Smith, 2001; Boudet et al., 2014; Jacquet, 2012; Paydar et al., 2016; Davis and Fisk, 2014). Only recently have scholars begun to examine the NIMBY phenomenon in the context of transmission infrastructure (Gravelle and Lachapelle, 2015). Moreover, scholars have returned mixed findings concerning whether proximity to infrastructure facilities is an important predictor of support (Gravelle and Lachapelle, 2015; Greenberg, 2009; Jenkins-Smith et al., 2011; Michaud et al., 2008; Johansson and Laike, 2007; Krause et al., 2014; Swofford and Slattery, 2010; Boudet et al., 2014; Carlisle et al., 2015).

These varied results may stem from differences in research designs, political and social contexts, or the types of infrastructure examined in each study. Moreover, few of these studies have directly assessed NIMBYism in its strict sense, defined as general support for infrastructure of a particular type but opposition when a project is proposed near one’s home. A recent study finds little support for strict NIMBYism

in the energy infrastructure context. Instead, other considerations shape individuals' views of infrastructure proposed for their communities. Relevant considerations include trust in energy companies, perceptions of economic costs and benefits associated with proposed projects, and individuals' sense of local environmental quality (Konisky et al., 2018). These results comport with prior work arguing that the NIMBY concept is too simplistic, and that probing nuanced, complex motivations could provide useful insights into the drivers of residents' behavior (Wolsink, 2007; Devine-Wright, 2005, 2009; Batel and Devine-Wright, 2015; Pellizzone et al., 2015; Aaen et al., 2016; Rand and Hoen, 2017).

4.2.2 Socioeconomic considerations shape attitudes towards energy infrastructure

To this end, scholars have coalesced around several key factors that tend to drive public support, opposition, and overall views of large-scale energy infrastructure projects. These include concerns about socioeconomics, aesthetics, environmental impacts, health risks, planning and siting processes, and proximity to the infrastructure (Rand and Hoen, 2017). Socioeconomic considerations appear particularly pertinent in the scholarly and public discourse, especially in the wind-energy infrastructure context. For example, scholars have identified a strong perception that wind-energy development brings jobs to communities, and expected economic development has been linked with support for wind-energy development (Slattery et al., 2012; Bidwell, 2013; Brannstrom et al., 2011; Larson and Krannich, 2016). Likewise, perceived or expected property-value impacts are a major concern for residents living near proposed energy projects (Abbott, 2010; Walker et al., 2014), even though studies suggest this infrastructure has minimal or null effects on property values (Heintzelman and Tuttle, 2012; Fast and Mabee, 2015; Hoen et al., 2015; Lang et al., 2014). Advocates and opponents also tend to focus on economic concerns in their efforts to influence the outcomes of siting decisions (Brannstrom et al., 2011; Songsore and Buzzelli, 2015).

Due to the attention paid to them in scholarly and public discourse, we focus

our analysis on perceptions of socioeconomic impacts.¹ There is wide variation in how individuals and coalitions portray and interpret these impacts though. In public discourse, supporters and opponents focus on different sets of economic concerns in shaping their arguments for and against the infrastructure (Songsore and Buzzelli, 2015). Scholars have also found variation in the impacts that tend to drive support or opposition. Some scholars have found that compensation to landowners drives support for wind-farm developments (Mulvaney et al., 2013; Walker et al., 2014) and gas drilling (Jacquet, 2015, 2012). But individual-level compensation can also lead to conflict within communities, due to concerns about fairness in the distribution of these benefits (Fast et al., 2016; Baxter et al., 2013; Walker et al., 2014; Brannstrom et al., 2011; Songsore and Buzzelli, 2015). Some work has shown that European residents prefer public to private forms of compensation (García et al., 2016) and ownership (Toke et al., 2008) to address fairness concerns, but it is not clear that concerns about fairness in compensation predict attitudes about projects in North America (Baxter et al., 2013; Walker et al., 2014). Nonetheless, concerns about public compensation including tax revenues do tend to structure debates about siting (Brannstrom et al., 2011).

In sum, scholars have found that socioeconomic considerations tend to drive views of electricity-generation facilities, and project developers, opponents, and supporters often focus on these aspects in public discourse. Building from this work, we focus on perceptions of socioeconomic impacts to explain distinctions between supporters' and opponents' perceptions and portrayals of project impacts. We address two important gaps in the literature. First, while most prior work has focused on electricity generation facilities, we examine views of transmission infrastructure. Our study can help to illuminate whether the real and perceived distribution of costs and benefits differs between generation and transmission facilities, and how these differences help to explain public views towards different components of the energy system. Second, the survey-based literature has focused on perceived socioeconomic impacts, but ques-

¹We do not argue, of course, that these are the *only* project attributes that matter to community members.

tions remain about what shapes these perceptions. This question forms the core of our analysis.

4.2.3 Sense of place shapes perceptions, representations, and responses to disruptions

Sense of place—a concept developed in social psychology—informs how residents interpret, evaluate, and portray potential disruptions such as, in our cases, energy transmission infrastructure. Sense of place is composed of three related concepts: (1) symbolic meanings form the bases for (2) attachment, and both of these contribute to some level of (3) satisfaction associated with a “spatial setting” (Stedman, 2002, p. 563). Symbolic meanings are “descriptive statements, rooted in symbols about ‘what kind of place this is’ (Stedman, 2002, p. 564). Meanings are symbolic in the sense that they are expressed in terms of physical attributes of locations. Some have conceptualized meanings as cognitive constructs (Stedman, 2002), while others argue that meanings are comprised of both cognition and emotion (Devine-Wright, 2009). We adopt the latter definition: the meanings associated with place are imbued with both thinking and feeling and expressed through symbols. All settings hold multiple meanings, and symbolic meanings associated with a place vary across individuals.

Symbolic meanings form the basis for place attachment and place satisfaction. Place attachment is a “bond between people and their environment” (Moore and Graefe, 1994; Williams et al., 1992; Stedman, 2002). Symbolic meanings are the “building blocks” of attachment (Bem, 1970): people become attached to places through attributing meaning to them. Attachment is also a form of identity since people begin to define themselves in terms of a place, through interacting with the place and imbuing it with meaning. One intuitive way to distinguish between symbolic meanings and place attachment is to think of symbolic meanings as expressions of what a place means to a person, whereas attachment is a measure of how much it means (Bem, 1970; Stedman, 2002). Place satisfaction is an overall attitude, analogous to a feeling thermometer, and it also stems from symbolic meanings. Satisfaction

is a “multidimensional summary judgment of the perceived quality of a setting” (Stedman, 2002, p. 564)(Ladewig and McCann, 1980; Mesch and Manor, 1998). Together, symbolic meanings, place attachment, and place satisfaction comprise sense of place. Table 4.1 summarizes these concepts, along with the concepts from social representations theory that help to link sense of place with interpretation and evaluation of community disruptions.

Table 4.1: Definitions: Sense of Place and Social Representations of Community Disruptions

Concept	Definition
Sense of Place	
Symbolic meanings	descriptive statements about a place, rooted in physical attributes; what a place means to a person; building blocks for attachment
Place attachment	bond between people and their environment; how much a place means to a person
Place satisfaction	overall positive, negative, or neutral attitude about a place
Social Representation of Community Disruptions	
Anchoring	linking new information to familiar knowledge through naming or comparison
Objectification	making abstract concepts, values, or principles concrete

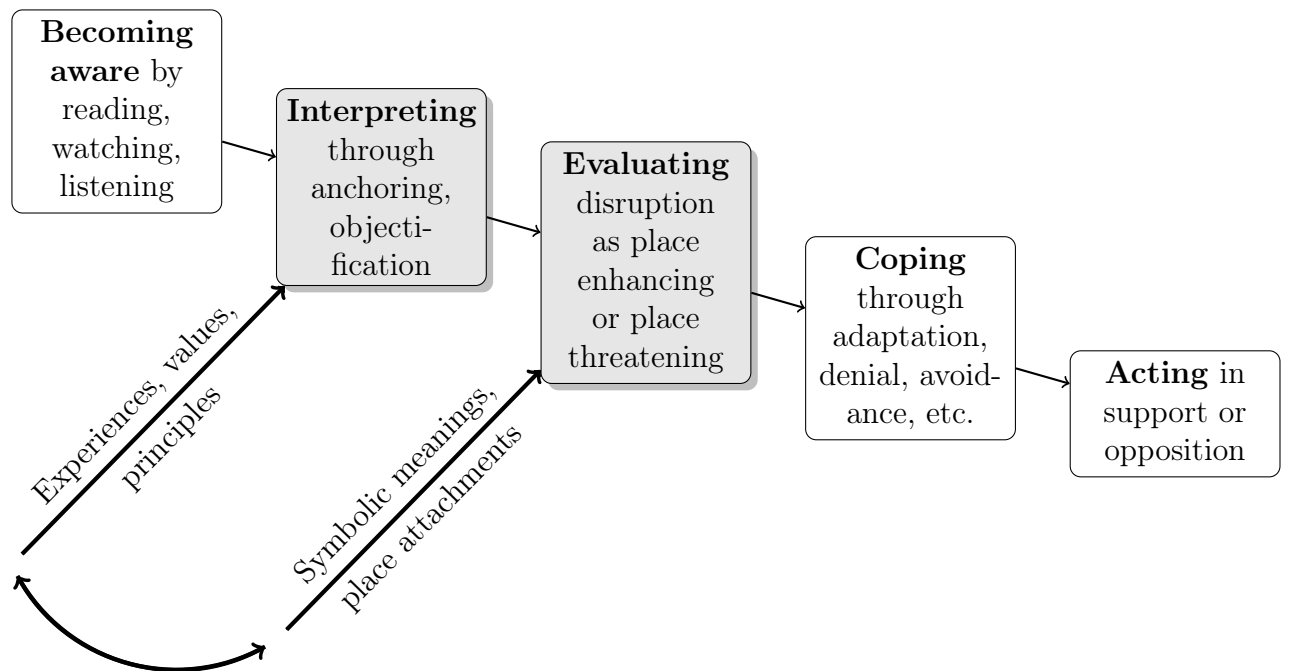
The table provides definitions for the central concepts applied in the analysis, in which we explore how sense of place shapes community-level interpretations of proposed energy transmission infrastructure projects.

Devine-Wright (2009) combines sense of place with elements of social representations theory (Moscovici, 2001), in a framework that explains how sense of place shapes residents’ interpretations, evaluations, portrayals, and actions towards proposed changes in their communities. The framework, depicted in Figure 4-1, assumes a disruption, which is a proposed or actual change to a place. Individual and social responses to the disruption unfold in four stages: awareness, interpretation, evaluation, and coping (Devine-Wright, 2009). In the first phase, community members become aware of the proposed disruption. This information-gathering process is mediated by communication with trusted individuals, the media, project developers, and other

interested stakeholders. Second, individuals interpret the change; they try to make sense of its implications for their world. People interpret the change through the processes of anchoring and objectification. Anchoring is the process by which people link new information to familiar knowledge. Objectification is the process by which people make abstract concepts concrete (Moscovici, 2001). We explain both concepts more fully in Section 4.3. The links that people make between the unfamiliar and the familiar are indelibly shaped by the composition of the familiar. Thus, in Devine-Wright's (2009) framework for assessing responses to place disruptions, the symbols and symbolic meanings that comprise sense of place provide the source material from which individuals draw in anchoring and objectifying disruptions. For example, someone who feels attachment to a farm community may develop expectations about an unfamiliar disruption by analogy to elements of her experiences as a farmer.

In the third phase, people draw on their interpretations of proposed changes to evaluate them as threats or opportunities. To continue our example, the farmer will evaluate the disruption in light of its implications for farming. If people interpret a change as place-enhancing, they will evaluate the change positively. Interpretations of a change as place-threatening correspond to negative evaluations, whereas interpretations of the change as place-enhancing correspond to positive evaluations. These evaluations depend on the fit between interpretations of project impacts and the symbolic meanings associated with the place itself. Finally, in the coping and acting phases, individuals may respond with actions of resistance to or support for the change. The decision to act and the direction of action depend on evaluation of the change as a threat or opportunity in light of an individual's sense of place.

Figure 4-1: Framework: Sense of place shapes responses to disruptions



This figure, adapted from Devine-Wright (2009), depicts how sense of place shapes social responses to community disruptions. The figure depicts five stages: knowing, interpreting, evaluating, coping, and acting. The present analysis focuses on stages two and three: interpretation and evaluation.

4.2.4 Sense of place shapes perceptions of energy infrastructure projects

Scholars have studied these concepts in the context of electricity generation infrastructure, in three main ways. First, without explicitly invoking the framework articulated here, energy scholars have noted that place-related values, identities, attachments, and meanings help explain responses to energy facility siting proposals (Pasqualetti, 2011; Ferguson-Martin and Hill, 2011; Bidwell, 2013; Hirsh and Sovacool, 2013; Phadke, 2013; Petrova, 2013). Second, scholars have explicitly used elements from Devine-Wright's (2009) framework to show how social representation, symbolic meanings, and place attachments shape responses to facility siting proposals. These studies first gauge the meanings that survey respondents assign to their communities. Examples of meanings include environmental health, economic decline, tourism, wilderness, or friendliness (Jacquet and Stedman, 2013; Devine-Wright and Howes, 2010; Bailey et al., 2016). Then, scholars show how residents interpret proposals (through anchoring and objectification) and evaluate them in light of their place attachments. For example, community members may anchor a proposed wind farm by comparing turbines' height to an industrial tower. These individuals would interpret the wind farm as "industrializing." Residents who view their community as touristic—a symbolic meaning—are likely to evaluate this industrializing interpretation as a threat. Conversely, those who view their place as economically struggling might evaluate the industrializing wind farm as an opportunity (Devine-Wright and Howes, 2010). Opposition (support) hinge on contradictions (complementarities) between symbolic representations of a place and perceptions of project impacts, as interpreted through anchoring and objectification (Devine-Wright and Howes, 2010; Bailey et al., 2016; Devine-Wright, 2009).

Third, scholars have assessed whether the scale of place attachment shapes acceptance of energy infrastructure. In these studies place attachment is generally operationalized separately from symbolic meanings. Scholars ask respondents to what extent they feel a sense of connection or belonging to their communities (Jacquet and

Stedman, 2013), the nation, or the world (Devine-Wright and Batel, 2017). They then assess whether feelings of attachment to place drive attitudes about infrastructure developments. Findings are mixed, perhaps because the concept of place attachment is imprecise and abstract as a survey item when it is separated from the symbolic meanings underlying it. We argue that the *content* of symbolic meaning is an important component in the link between place attachment and views of disruptions. In our case sites, almost all respondents expressed place attachment, but their perceptions of project impacts and their overall attitudes toward the proposals varied widely. Assessing the content of place attachments—and not simply gauging their existence or their geographic scale—helps explain these differing perceptions.

4.3 Methods and Data

We apply this framework to assess how sense of place shapes perceptions of two proposed long-haul energy transmission projects in the American Midwest. We chose our case sites according to two criteria. First, we paid particular attention to the timing of our data collection and selected projects that were still in the planning stages. Neither project had been approved when we conducted our interviews. This timing distinguishes our study from prior work gauging public views after project completion. We explore anticipatory interpretations and expectations, rather than perceptions that are shaped by the end product or have had time to weaken in intensity. Second, the cases differ in the type of infrastructure proposed. We study one natural gas pipeline and one high-voltage transmission line intended to transmit wind-generated electricity. This variation allows us to compare perceptions of projects which differ in their physical attributes and in the source of the energy they are designed to carry. Third, both projects are designed primarily for transmission through, rather than distribution within, the communities they will cross. This feature distinguishes the localized impacts of transmission projects and distribution facilities, which have been the main focus of prior assessments of energy infrastructure siting processes. Our study extends knowledge of public attitudes about the U.S. energy system by

illuminating perceptions of transmission—rather than distribution—facilities.

Our data consist of semi-structured interviews with county government officials; stakeholders such as representatives of unions, farm bureaus, businesses, and environmental groups; and community residents whose properties the projects would or would not cross. We focused our interviews around two broad questions that we introduced in Section 4.2 as queries of interest to scholars and practitioners. How do community members and stakeholders evaluate the socioeconomic aspects of large-scale energy infrastructure projects, and how do perceptions of siting processes shape their evaluations? We used a semi-structured interview approach (Weiss, 1994). This means we used an interview guide to ensure that we covered a core set of topics with each respondent, but we allowed flexibility in the conversation so that respondents could raise concerns and perspectives we may not have asked about. We adapted a template interview guide for each respondent, and this template is included in the Appendix. One of the authors conducted the interviews, and all interviews were conducted in person or over the phone.²

We used a snowball sampling technique to identify interview respondents in each case site. We identified initial contacts through media reports, the websites of relevant stakeholder groups, and county government websites. We then arranged additional interviews with individuals recommended by these initial contacts. In total, we interviewed 31 individuals across the two project sites. Table 4.2 shows the roles of our interview respondents across the two cases.

²Only one interview was conducted over the phone, because the respondent was not available in person during the days we visited his community. All other interviews were conducted in person.

Table 4.2: Interview Respondents Across our Case Sites

Description	Project	# of Respondents
Local official (elected)	Pipeline	4
	Power Line	7
Local official (unelected)	Pipeline	2
	Power Line	2
Stakeholder	Pipeline	3
	Power Line	2
Resident	Pipeline	3
	Power Line	7
Developer	Pipeline	0
	Power Line	1

We subjected our interview data to several rounds of qualitative coding, to understand how respondents interpreted and evaluated the proposed projects. In the initial coding we categorized and organized responses based on the structure of our interview protocol and initial research questions. This round of coding helped us to identify commonalities and differences in respondents’ perceptions of project attributes on a variety of dimensions, the implications of these attributes as individual- or community-level costs or benefits, and overall evaluations of the projects.

Through the first round of coding, it became clear that individuals were using elements of their social and individual experiences to interpret, assess, and ultimately evaluate these proposed disruptions to their communities. To systematically assess how social and individual experience informs respondents’ perspectives, we developed a second coding protocol around sense of place and social representations. Table 4.3 summarizes the concepts that we used to organize the second round of coding.

Table 4.3: Coding for Social Representations and Sense of Place

Concept	Operationalization	Example
Anchoring	Naming	Project is a “land grab”
	Comparison	Developer is not a utility
Objectification	Value or principle, concretely defined	“need” as demonstrable local shortage of electricity
Symbolic meaning	descriptive statement rooted in physical attributes	existing utility infrastructure is used to characterize a place as industrial
Place attachment	geographic scale of expressed meanings	state as an oil producer

We code the interviews according to the operational definitions of anchoring and objectification identified by Moscovici (2001). First, respondents categorize by *naming* the project or some aspect of it. For example, they might call it a “land grab” (naming the project itself), or they might name crop damage as a concerning characteristic. Second, they *compare* the project to a familiar prototype. For example, many respondents compare the power line to pipelines, and this comparison informs their expectations regarding disruption to farmland. We extend Moscovici’s (2001) definition of prototypical comparisons to include metaphor as well.³ We identify instances of objectification by coding for values that respondents invoke in evaluating the projects, and noting the concrete evidence they use to argue that the project is (in)consistent with each value.

We also coded the interviews for evidence of sense of place: symbolic meanings and place attachments. These reveal themselves both through respondents’ general portrayals of their communities and through their depictions of the relationship be-

³The distinction between metaphor and prototypical comparisons is subtle, as they are both forms of comparison. We classify a comparison as a metaphor if a person uses the comparison to illustrate an aspect of the project without claiming that the analog is a prototypical example of a class. For example, a respondent might compare the height of a transmission tower to the height of a football stadium, but this is not a claim that the tower *is* a stadium. By contrast, a prototypical comparison makes a classification claim. For example, many respondents compare the merchant developer that proposed the transmission line to traditional utilities. Respondents then argue that these entities do or do not belong in the same class, and by extension that they should or should not be subject to the same permitting procedures.

tween the projects and their communities. Following Stedman's (2002) argument that symbolic meanings form the basis for place attachments, we coded segments of the interviews wherein respondents invoked some concrete symbol, its meaning, and the time- and/or geographic scale of place attachment associated with the symbolic meaning. For example, one respondent depicts his community's landscape this way:

We have power lines all over the place and I've been raised with that and we have a substation where I was raised. My parents' house was less than 350 feet from a substation....The school bus route came along there from when I was in grade school and we'd walk from the house across a railroad track bed to the school bus stop at the substation. I can tell you today if I drove by that road every day I'm not for sure I could tell you whether the gate was open on that fenced-in substation or not, or if there was any wires to it. I don't see it anymore because I've seen it every day. You may have rooms in your house that you don't know....You see them so many times. You see them every day unless somebody drastically moves a cabinet or something, you probably don't see that cabinet any more. It's there and you see it but it doesn't click.

The symbols invoked here include power lines, a substation, and (through analogical reasoning) rooms in a home. The symbolic meaning they convey is that of a rural-industrial landscape, and this meaning contributes to and reflects place attachment at the local scale.

We use this coding process to extract the symbolic meanings expressed by the residents we talked with, describe the interpretations and evaluations they present when discussing the projects, and show how these two sets of concepts are related.

4.4 Analysis: Sense of place informs the interpretation and evaluation of energy transmission infrastructure

Our primary question is how symbolic meanings and place attachments shape interpretations and evaluations of transmission infrastructure projects proposed for our case communities. To answer, we assess patterns of place attachments, symbolic meanings, and the links between them among supporters and opponents of both projects.⁴ Several patterns emerge in the frequency with which supporters and opponents of the projects express symbolic meanings and place attachments. First, all of our interview respondents convey local place attachments. This provides support for the argument that understanding multi-scalar place attachments is critical to explaining the relationship between sense of place and evaluation of community disruptions (Devine-Wright and Batel, 2017). To this end, project supporters, compared with opponents, more commonly invoke higher-level (state or national) place attachments. It is too simplistic to argue that those who feel a sense of place attachment are the most likely to oppose infrastructure proposals. Instead, the geographic scale of place attachments interacts with symbolic meanings to inform interpretation of particular project impacts.

A second pattern concerns the aesthetic characterizations that respondents apply to their communities. Opponents more often express place sentiments relating to nature, home, and respite. In contrast, supporters commonly view their communities as rural-industrial landscapes and convey pride in their communities' achievement of progress or modernization.

⁴Appendix Tables B.0-21 and B.0-22 show the number of respondents that invoked each scale of place attachment and symbolic meaning, and the number of times we used each code. We created a code for each symbolic meaning expressed by an interview respondent, and coded all instances of that meaning expressed by any respondent. Table B.0-21 shows the percentage of supporters and opponents that communicate the meanings expressed most frequently. Table B.0-22 shows the frequency with which we applied these codes across transcripts and thus provides a sense for the intensity with which respondents express each meaning. Note that Table B.0-22 includes some meanings that are not included in Table B.0-21, because they are expressed with low intensity or by only one respondent.

Third, while there are some similarities in the economic identities that supportive and opposing respondents express, they vary in the specific production-related place meanings they express. Economic identities include vulnerability or poverty along with production-related meanings, such as farming, commerce and industry, or energy production. Respondents in both groups express a sense of community vulnerability. This pattern comports with findings that local economic quality is not a significant independent predictor of support or opposition to infrastructure projects (Konisky et al., 2018). Instead, sentiments of community vulnerability interact with other symbolic meanings underlying productive identities to shape perceptions and evaluations of project impacts. Both supportive and opposing respondents identify with their places as agricultural producers.⁵ Opponents more often focus on agricultural production to the exclusion of other productive activities like energy or manufacturing.⁶ In contrast, supporters often highlight commercial and industrial productivity or energy production. We next assess how these patterns of symbolic meanings and place attachments inform interpretations and evaluations of project impacts.

Scale of place attachments help define the values and principles by which respondents evaluate the projects

Place attachments help respondents evaluate the projects. Specifically, the geographic scale of place attachments informs how respondents objectify the principles of need, progress, service, and security, through which they evaluate the projects. Table 4.4 shows the links between place attachment, particular interpretations of values and principles, and evaluations of the projects.

⁵This frequency appears slightly lower among power line supporters, in part because two project supporters were stakeholders associated with labor and environmental groups, and not local to the communities where the projects were proposed.

⁶The prevalence of farm-related place sentiments appears lower among pipeline opponents, but it is important to note that all pipeline opponents who express production-related place sentiments express sentiments associated with farming. We talked with a few pipeline opponents from suburban communities, whose place sentiments were not related to production at all but instead to aesthetic characteristics. This is an example of how the objective differences between places constrain the possibilities for interpretation of impacts through the lens of sense of place (Van der Horst, 2007)

Table 4.4: Scale of place attachments, values, and evaluations of projects

Place attachment	Value or principle	Definition	Evaluation
National, local	need, progress	national and local electricity needs	opportunity
National, local	need, service	community contribution to national electricity needs	opportunity
National, state, local	security, progress	American energy independence, local oil and gas extraction	opportunity
Local	need	no unmet local electricity needs	threat

The table shows the links between the geographic scale of place attachments and the meanings respondents apply to ambiguous values and principles. Place attachments inform how respondents define the values they use to evaluate the projects.

In both cases, only supporters express national-scale place attachments, and they often justify their support for the project in terms of these higher-level place attachments. A county commissioner on the power line route couches his support based on the need for national infrastructure improvements. He explains, “We’re all three [county commissioners] of the opinion that the infrastructure of the electric transmission in the United States is ancient and needs to be upgraded....Infrastructure is important if the nation is going to grow.” This respondent assigns meaning to national electricity needs and sees the project as an opportunity to better meet those needs. He also links national and even global place attachment back to his community. He continues:

I just saw on television one of the politicians talking, that the reason people are poor in other parts of the world is because they don’t have electricity. Electricity has been the finest gift to the humans that you can imagine. As a little boy I grew up without electricity and...To me, why would anybody protest? There’s electric lines going across my, it was at the time my great-grandfather’s property and he *gave* the right of way he was so happy to have electricity in the area. Now we’re griping about not getting enough money.

This respondent links his own experience from childhood with national and even global electricity needs. He also expresses a value of progress defined in a geographically nested way, and evaluates the project as an opportunity to advance national and local progress.

Other power line supporters justify their support for the project by invoking, as a component of community identity, local service towards the national good. One respondent expresses the sentiment this way:

I think it's almost a little patriotic for me to be able to provide to people that we're not only providing their food, we're not only able to provide them quality product for them to eat, but we're also able to help them to have electricity, to have energy, that that's something that we are able to provide here in rural [America] that they can't do in the cities because it's just not feasible.

This definition of service reveals geographically nested place attachments: this respondent values both local service and national needs. Several other respondents invoke similar definitions of service in explaining their support for the power line and in describing their community's role in the project. Geographically nested place attachments are central to these objectifications of service, progress, and need. In turn, these values—so defined—provide a basis for viewing the project as an opportunity for the community, region, or nation.

Similarly, respondents along the pipeline route invoke the value of national security to explain their view of the pipeline as an opportunity. One respondent explains, “I am a firm believer that we need to be independent of foreign oil. What do we fight these wars over at the end of the day? It is generally oil and to do that, I think it [domestic oil and gas extraction] is going to save our nation, it really is.” He continues by arguing that pipelines are the safest, most reliable technology for facilitating the extraction of oil and gas from the Marcellus and Utica shales. He also links national security with regional and local impacts, musing, “I wish I was 20 years younger so I could see the impact on this region in the next 20 years as we become truly independent of

foreign oil and the economic activity that is going to be ongoing with the Utica and the Marcellus.” The respondent’s exposure to the energy industry shapes his sense of place: he draws meaning from the local oil and gas industry. The pipeline presents an opportunity to expand gas extraction, enhancing both this source of local meaning and national security. Thus, his sense of place tied to energy production contribute to the view of the project as an opportunity for both the nation and the region.

Conversely, the exclusively local place attachments expressed by many opponents grounds the criteria they use to evaluate the projects. This is particularly evident in the power line case, where respondents evaluate the project in terms of geographically defined (local) need. Opponents contrast the project with existing power lines, railroads, and highways, arguing that the critical distinction with these other types of infrastructure is that they all serve a local need. One opponent declares, “This RTO was not ... Doesn’t need the energy [from the transmission line]. We have plenty of cheap abundant electricity as it is and we’re also utilizing wind energy right here...that we make here.” Another compares the proposal to a recently constructed transmission line: “Well, it was moving electricity in [my state] from one spot to another spot in [my state]. I assumed they needed it. Ameren is an electric company....They’re serving the people of [my state].” These respondents do not view the project as an opportunity to meet a need, because they define need in an exclusively local way. Thus, place attachment informs their particular definition of need, through which they evaluate the project. ⁷

The values of need, security, and service are ambiguous, in that they are subject to interpretation and can thus take on different meanings for different individuals. Place attachments inform the particular meanings that respondents apply to these values in our cases, and, thus, their evaluations of the projects as threats or opportunities.

⁷Supporters are also aware of this distinction, but they often invoke a more abstract definition of “public good,” or they express place attachments encompassing the state, region, nation, or future. This layered place attachment informs their conception of “need” as extending beyond the immediate needs of their community or even state.

Symbolic meanings associated with economic identities inform interpretation of project impacts

In combination with the geographic scale of place attachments, the meanings underlying production-related place attachments shape the way in which respondents interpret and evaluate the projects' economic impacts. Table 4.5 summarizes these links between symbolic meanings and geographically scaled place attachments, interpretation of impacts, and evaluations of the projects.⁸

Table 4.5: Links between productive identities, scale of place attachments, interpretation, and evaluation of project impacts

Economic Identity	Scale of Place Attachment	Interpretation of project impact	Evaluation
Energy, agriculture	local, state, national	benefit: independence from foreign oil and gas	opportunity
		benefit: expanded energy development	
		benefit: pipeline construction jobs	
Modernity	local, national	benefit: upgrade grid	opportunity
Agriculture	local	(non) benefit: local electricity	threat
		cost: inconvenience to farmers, farmland devaluation	
		(non) benefit: non-local, temporary jobs	

This table shows the links between symbolic meanings associated with economic identities, scale of place attachments, interpretation of project impacts in light of place sentiments, and the resulting evaluations of the projects. The table shows that evaluations stem from the perceived complementarity or contradiction between sense of place and perceived project impacts.

In general, supporters and opponents differ in whether farming features as the *only* source of economic identity. A respondent in the power line case exemplifies a dualistic sense of place infused with a narrative of arrested decline. She expresses

⁸Table B.0-20 provides a complete summary of the links between sense of place, anchors people use to interpret the proposals, the values they use to evaluate them, and interpretations and evaluations of the projects.

nostalgia for her town's identity as an industrial producer:

If you were to look at us 30 years ago, we had a manufacturing plant here for GE, for General Electric...There was a Simco and they did a lot of welding, and they did a lot of production of I'm not sure exactly what specifically they produced, but had a lot of welding, they had a lot of trades jobs....We've lost so many manufacturing jobs that there's really, unless you are attached to the local government or the school or you're doing something that supports the agriculture industry here, there aren't many jobs.

She also draws meaning from her community's identity as an agricultural producer, and expresses a similar narrative of decline. She recalls farmers' struggles during the 1980s farm crisis and, informed by this memory, sees farmers teetering again: "Profit margins and row crop production are razor thin right now. For instance, last year we wouldn't have had any income over being able to make the payments...Some of the stuff is kind of starting to snowball the same way they did in the early '80s to lead to the crash like in the mid-'80s." Other respondents also invoke symbols suggesting a narrative of decline, including job loss, out-migration, school district budget shortfalls, and dwindling county budgets.

When viewed within a context of industrial and agricultural decline, the project represents an opportunity for community recovery and individual hedging. Most respondents recognize that jobs associated with the power line would be temporary and may not go to local workers. Even so, when viewed through the lens of industrial decline, the project represents an opportunity to revitalize the community's manufacturing identity:

They [jobs] are not going to affect us here in the county because that would be probably close to an hour and 20 minute drive every day for someone...But no, that's not really a concern to me that they would be temporary because hopefully this industry continues to build and transmission continues to improve and expand and they're able to continue

building up, those temporary jobs become permanent and they're able to get more jobs.

This expectation of future growth complements the narrative of community decline and recovery. Likewise, compensation to farmers represents an opportunity for hedging by those whose properties are directly impacted by the line. Additionally, individual compensation has a multiplier effect:

Having that additional revenue [compensation from the power line] is really big. One of the things that's really neat about farmers and agriculturists, is when we have extra money in our pockets it's most likely going to stay local. We're going to buy more cows, it means we need to buy more feed, so that keeps the individuals employed at the feed mill. It's really a trickle down system to where, maybe we'll buy another tractor or we may upgrade equipment.

In this view, transmission infrastructure represents an opportunity for land to multi-task in its productive capacity, as both grazing land and a rent generator. Her sense of place is rooted in manufacturing decline, farmers' vulnerability, and memories of agricultural decline and feeble recovery. The project complements these meanings; she views it as an opportunity to hedge against crop and land price fluctuations and bring back local manufacturing. For this respondent and others, a narrative of community decline supports evaluation of the project as an opportunity to ensure the continuation of local services, replenish county coffers, and support local service-industry or construction businesses.

Pipeline supporters also commonly evaluate the project as an opportunity in light of dualistic place sentiments rooted in agriculture and energy production. Pipeline respondents who express energy-related place sentiments are optimistic about future employment growth associated with pipeline construction. One respondent recalls:

One day I went up to see one of their guys up on the rigs, and it was Jimmy from Louisiana. We got to talking and he goes, "You know what? As soon as I train somebody to run this rig, I am going back to Louisiana.

Nothing against Ohio, but I am an offshore driller guy,” He said. That was the problem we had initially, they had to bring the people in from the outside because they knew how to ... They were trained to do the work. Then we, it took us about two to three years to get caught up and start a well site training center that was developed right here downtown, just down the street, to train workers, to teach welding and to teach everything that needed to be to run these rigs....Our biggest challenge in the next 10, 20 years is going to be workforce, having a workforce that is trained, can pass a drug test and wants to come to work everyday. That is going to be the biggest challenge because the jobs are going to be there....I tell people, “Look, you want Junior to have a job in the next 20 years, we have got to seize the opportunity here.”

This respondent’s hopeful attitude mirrors the hope for a manufacturing rebound in the power line case. Like power line respondents, he recognizes that developers have imported workers, but expresses hope that the growing industry will support local workforce development. His prior experience with the oil and gas industry informs this hopeful interpretation for employment growth. It also shapes his sense that energy production is an important source of meaning. In turn, the importance of oil and gas development as a symbolic meaning contributing to his sense of place implies that the pipeline’s potential to expand shale-gas extraction is place-enhancing.

Production-related identities also interact with the scale of respondents’ place attachments to inform their views of the projects’ potential as economic opportunities. One power line supporter describes employment opportunity in the wind-energy industry in terms of opportunities for his state:

Wind by its very nature creates jobs in Missouri because Missouri is a manufacturing center that’s all about bending metal. We make airplanes. We make cars. So if you go to the AWEA [American Wind Energy Association] website or any website that shows you the wind energy supply chain, you’re going to see lots of stuff in Missouri. And so wind being built

anywhere in the country, is creating jobs in Missouri...Whereas there's no coal mined in Missouri at all for Missouri electricity production.

Similarly, respondents in the pipeline case describe the pipeline as essential to re-opening capped shale gas wells in Ohio, and this evaluation is deeply rooted in the state's identity as an energy producer. One respondent describes his upbringing:

Where I come from in southeastern Ohio, drilling and oil and gas production is literally part of our collective consciousness, because we've been involved with it in agriculture for literally decades and over a century....You see it come in cycles, but now with Marcellus and Utica shale development that you're seeing over there...It's not new strata or new discoveries, because we've always known the oil and gas is there. It's basically having the technology to be able to harvest it efficiently and effectively.

This respondent and others view pipeline construction as an essential component to unleashing the state's energy production potential and as the safest, most efficient technology for doing so. For those to whom oil and gas development is an important source of place meaning, the project is place-enhancing.

Respondents who express purely local, farm-based production identities interpret quite differently the potential for employment or economic development associated with the projects. A county commissioner on the power line route states:

This county is one of the larger counties in the state. You can guess that most of [the land] is agricultural, not all of it, but a great chunk of it is agricultural. We feel very strongly that without agriculture this county would have nothing....The farm community is the biggest producer of money in the county.

Many also link this meaning with a sense of vulnerability: "It's not a great time to be a farmer and rancher right now anyways," and "It takes generations and generations of building anything to make a living off of." Respondents in this group focus on disruption to farming and decline in property value that the project could impose,

rather than the opportunity to “bring back” lost manufacturing jobs or hedge against risk. They discredit claims about employment opportunities:

What they do is they have like a circus and they get, they hire workers and they all start at a beginning location, you know, in whatever state it is. And then they take their little traveling circus, and they go from the beginning all the way to the end....The vast majority of the pipeline workers were from out of state and....It’s not people that live in the community for the most part.

This quote illustrates that respondents whose place attachments are not rooted in local or statewide manufacturing are not inclined to see the project as an economic opportunity. Instead, they dismiss employment opportunities as immaterial and focus their evaluations on disruption to agriculture and the inadequacy of compensation the developer pays to farmers. A project opponent in Illinois observes:

There are power lines that go, they don’t go parallel with the boundary; they go at an angle across a big, nice field. Oh, that hurts that field....Every time they’re out there doing tillage work, you’ve got to go around it some way. You’ve got to watch for it. You’ve got to watch for it or you’ll hit one of those poles, that big pole. We’re talking about a piece of land that’s worth millions of dollars, and then you have that obstacle.

Respondents for whom agriculture represents the only source of economic identity focus on disruption to farming when evaluating the project. They dismiss manufacturing employment or service-industry business as either unlikely to transpire or irrelevant to their local place attachments rooted in agricultural production. The project represents a threat of loss rather than an opportunity to recover or hedge against possible losses.

4.4.1 Aesthetic characterizations shape interpretations and evaluations

Symbolic meanings associated with aesthetic qualities also provide a basis for interpreting and evaluating project impacts. Opponents and supporters convey aesthetic descriptions of their communities, and Table 4.6 summarizes the links between aesthetic meanings, interpretation of project impacts, and evaluations.

Table 4.6: Aesthetic meanings, scale of place attachment, interpretation, and evaluation of project impacts

Aesthetic Meaning	Scale of Place Attachment	Interpretation, Value	Evaluation
Suburbs, nature, home	local	cost: damaged natural areas	threat
		community cost: tax revenues decline	
		individual cost: property values decline	
Rural- industrial	local	(non) cost: no decline in property values	opportunity
		benefit: tax revenues increase	
		benefit: cut property tax rates	

The table shows the two broad patterns of aesthetic meanings that community members use to describe their communities, the interpretations of project impacts commonly associated with each characterization, and the resulting evaluation of the project as a threat or opportunity.

Aesthetic place sentiments conveyed by opponents include portrayals of the community as suburban, depictions of natural landscapes, and affinities for home. One pipeline opponent evokes all three of these, in describing the view from his home:

This is probably one of the more pristine tributaries to the river because it doesn't have a lot of building around it. It doesn't go through really any villages or anything. It's just out in the country. More so it's being built up more and more because this guy over here wants to develop it. But anyway...I can go on and on. This river is very, very important to me. This whole swamp is. This is a floodplain. In the spring this totally becomes a lake. I call it Lake [his wife's name].

Later, he describes the developer's plans for boring beneath his swamp: "They pump the water across where the water is ponded on the upside, put the pipe in, fill it back up, 'restore' it." Scoffing incredulously, he adds, "My battle with anybody was you don't restore wetlands. You destroy it and then wait for it to come back 50, 75 years later." These quotes illustrate a contradiction between the pipeline and the aesthetic characteristics that provide meaning to a place and thus build place attachment. This view exemplifies the symbolic meanings espoused by many project opponents who view their communities as rural respites, natural landscapes, or who express strong feelings of a place as home.

In contrast, many supporters—particularly in the pipeline case—describe landscapes as rural-industrial, a depiction that does not produce the same sense of threat. They note the existence of power lines, electricity generation facilities, highways, pipelines, and other infrastructure and argue that none of these interferes with the productive or aesthetic value of the land. One respondent expresses this in colorful terms:

Do we like pipeline or energy infrastructure? Well I'll tell you this. Our farm in [a different] County: We have three pipeline systems, an AT&T transmission cable, American Electric Power, a 725 kilowatt transmission line goes across the corner of it. Pennsylvania Railroad and yeah there's a cellular tower on the farm across the road.

A power line supporter says, "In this locale you can't see very far anyway. You can't see very far without seeing cell phone towers, you can't see very far without seeing other utility poles." In this view, people are so accustomed to seeing utility infrastructure that they no longer notice it, farmers have gotten used to farming over pipelines and around power poles, and consequently the project does not pose a threat. These respondents do not view a new proposal for industrial infrastructure as a threat to the landscape, since it is already industrialized.⁹

⁹Notably, in the power line case some opponents also depict the landscape as rural-industrial, but they draw a different meaning from the existence of utility infrastructure on many farms. Farmers have done enough and should not have to accept more infrastructure on their properties. In their more generalized depictions of the landscape, opponents portray the community as a rural respite and highlight the negative impact of new infrastructure on view sheds and natural areas. These aesthetic depictions correspond with views of the project as a threat.

Different aesthetic characterizations also shape expectations for the projects' economic impacts. For instance, opponents whose sense of place is rooted in a natural-landscape aesthetic downplay the project's revenue generating potential. They argue that the new infrastructure would cause a decline in property taxes. Landowners would petition for a reduction in the assessed value of their homes based on the aesthetic disruption caused by the new infrastructure. In contrast, supporters who view their community as a rural-industrial landscape are not particularly worried about property devaluation. They cite examples of instances in which power lines, pipelines, or other aesthetic nuisances have failed to cause a reduction in home-sale values. Moreover, an assessor along the power line route points out that the tax revenues from a pipeline that crosses the county generates 35% more revenue than all of the farm land in the county. Another supporter points out that nine of the top ten taxpayers in the county are utilities. Other supporters recall situations wherein other counties lowered individual property-tax rates after pipelines produced a wind-fall for local school districts. Respondents who anchor to these experiences view the power line as an opportunity to add to local revenues and/or reduce local property taxes. These conflicting evaluations are informed by the symbolic meanings respondents associate with their communities. For those who view the landscape as already industrialized, one more project does not pose a threat to a landscape already criss-crossed by them. But those who cherish their communities as pastoral respites are more likely to worry about property devaluation caused by visible infrastructure, since this is an interruption to the landscape as they perceive it.

4.5 Implications and Conclusion

In this paper, we have explored the relationship between sense of place, perceptions of community impacts, and evaluations of community disruptions in the form of energy transmission infrastructure proposals. We build from scholarship that finds little evidence for a NIMBY explanation for community opposition to energy infrastructure, positing instead that public perceptions are more nuanced than the NIMBY label sug-

gests. Survey researchers have used perceptual measures to identify socioeconomic considerations as important drivers of public attitudes, and our analysis helps to elucidate the sources of these perceptions. We deeply explore the place sentiments that help to shape community perceptions of socioeconomic impacts including landowner compensation, jobs, tax revenues, manufacturing activity, electricity provision, and impact to property values and farming operations. We show how the geographic scale of place attachments and the symbolic meanings that compose sense of place inform respondents' interpretation and evaluation of project impacts.

We show that the scale of place attachments informs individuals' definitions of the values and principles they use to evaluate proposed disruptions. Those who view the projects as an opportunity are more likely to hold state and national-scale place attachments. Opponents, in contrast, are more likely to express exclusively local place attachments. These differences inform the values—particularly need, service, progress, and security—through which respondents evaluate project impacts.

We also show that the symbolic meanings people associate with their communities—particularly those associated with economic identities and aesthetic qualities—shape views of direct and second-order economic impacts. Opponents are more likely to feel connected to their community's identity as an agricultural producer, whereas supporters in both sites draw meaning from their communities' history of manufacturing or energy production. The scale of place attachments and symbolic meanings that underly them also interact to shape interpretations and evaluations of the proposed disruptions. For example, respondents who hold state-scale place attachments and value the state's role in U.S. manufacturing view the project as an opportunity even if it will not create jobs in their own town or county.

The study contributes to conceptual and empirical explanations of public attitudes about the U.S. energy system, by applying the sense-of-place framework in the transmission infrastructure context. Conceptually, we advance the sense-of-place framework by focusing on how the scale and content of place attachment interact to shape perceptions. Exploring the symbolic meanings underlying place attachments adds nuance to understanding of the relationship between place attachment

and attitudes toward community disruptions. As our analysis shows, the content of multi-scalar and local place attachments can vary widely with important implications for interpretations and evaluations of disruptions. Our study also provides an empirical advance, because we carry the sense-of-place framework into the transmission infrastructure context. Wind-farm development has been the primary context for developing the framework, and we highlight concerns that are prevalent in responding to transmission infrastructure proposals.

The timing of our interviews also distinguishes the analysis, since much prior work focuses on perceptions of projects once they have been installed. We draw our inferences from interviews conducted during the planning and permitting process. Our findings can help scholars and practitioners better understand and address the concerns of community members who will be asked repeatedly to accept infrastructure like the projects we study here.

The interpretation of proposed disruptions is not an atomistic process. Instead, through political and social discourse, interested actors try to shape interpretations in light of pre-existing attachments, and they may even shape those attachments themselves (Moloney and Walker, 2007; Devine-Wright and Howes, 2010). Our study captures discourses at a single moment in time, such that we cannot trace the social processes that shape our respondents' place attachments. Instead, future research could trace how social constructions shape individuals' place attachments and thereby inform their interpretations and evaluations of place disruptions.

The political and social discourses that inform interpretations of disruptions raise important considerations for equity and justice for at least two reasons. First, the power to shape discourse is unequally distributed. Second, places differ in their objective characteristics, which raises perilous implications for communities that already host infrastructure. Variation in communities' environmental, aesthetic, and economic qualities shapes the available symbols from which individuals draw place-related meanings. This variation thus constrains the possibilities for interpreting impacts through the lens of sense of place (Van der Horst, 2007). To the extent that developers site infrastructure by anticipating conflicts between sense of place

and proposed projects or adapt compensation accordingly, the nation's infrastructure future could perpetuate an unjust distribution of costs and benefits accruing from infrastructure siting. Even if community members hold perceptions of their communities as "industrial" and therefore do not view disruptions as place-threatening, it does not necessarily follow that new infrastructure should be sited there. Nor does it follow that communities whose characteristics imply that residents are likely to view a project as a threat should not accept some share of the nation's infrastructure capacity expansion.

Chapter 5

Conclusion

Taken together, these papers advance understanding of the drivers of environmental politics in a polarized American political context, and they provide a foundation for future research of relevance to political science and environmental policy. Chapter One provides empirical evidence that the polarization of Americans' views of environmental policy runs deep and is ubiquitous around the country. The conservationist wing of the Republican Party has largely disappeared, and Americans' views of environmental protection are now differentiated by region more than by party. The exception is the American West, where views are distinct from those of the rest of the nation even after accounting for partisanship. The study raises opportunities for future research into the causes and consequences of this lingering geographic differentiation within an otherwise nationalized partisan split. The analysis also raises questions about the rhetorical roots of the changing drivers of environmental concern, most notably the increased salience of economic concerns in shaping Americans' views. Additionally, the opinion data provide a crucial ingredient for explaining the parties' changing postures towards environmental protection.

Chapter Two provides evidence that elections have consequences for regulatory enforcement, and for administrative policy more broadly. The analysis also provides evidence of heterogeneity in the influence that governors and legislatures can exert over state agencies. This heterogeneity is consistent with theoretical predictions concerning the differential mechanisms of political control available to governors and state

legislatures, but future research should more deeply explore the process of political influence. Moreover, while the study provides evidence for political influence over one type of administrative policy (regulatory enforcement), future research should explore heterogeneity in political influence in other policy areas (e.g., healthcare, education, financial regulations, or welfare).

Chapter Three extends the sense-of-place framework to the energy transmission infrastructure context. The study deepens the conceptual framework itself. I show how the meanings underlying place attachments inform the values that individuals use to evaluate community disruptions, and I highlight the place-related identities that shape community responses to disruption in the American Midwest. Place meanings are socially constructed, though, and future research should trace the power-laden discursive processes that shape individuals' place attachments which, in turn, inform interpretations and evaluations of place disruptions.

Appendix A

States Divided: Partisan Polarization and Environmental Protection

A.1 Survey Questions Included in the Estimates of Environmental Concern

Table A.1-1: Survey Questions Included in the Estimates of Environmental Concern

Question Category	Years	Question	Sources
policy	2001	When it comes to protecting the environment; do you think government too often gives in to business interests or don't you think so?	Time Magazine and CNN 2001
policy	2000; 2001; 2004; 2006; 2011; 2013; 2015	1992; 2003; 2005; 2010; 2012; 2014;	Do you think the U.S. government is doing too much; too little; or about the right amount in terms of protecting the environment? Gallup 2000a, 1992, 2001, 2003a, 2004b, 2005, 2006, 2010a, 2011, 2012, 2013, 2014, 2015

Survey Questions A.1-1 Continued from previous page

Question Category	Years	Question	Sources
policy	2001; 2002; 2003; 2005; 2008	2002; 2004; 2007; With which do you agree: Life on earth will continue without major environmental disruptions only if we take additional; immediate; and drastic action concerning the environment; We should take some additional actions concerning the environment; We should take just the same actions we have been taking on the environment?	Gallup 2001, 2002a, 2003a, 2004b, 2005, 2007, 2008b
policy	1990; 1991	With which do you agree: Life on earth will continue without major environmental disruptions only if we take additional; immediate; and drastic action concerning the environment; We should take some additional actions concerning the environment; We should take just the same actions we have been taking on the environment?	Gallup 1990, 1991
policy	2001; 2003; 2007; 2014	2002; 2006; 2012; Do you favor or oppose more strongly enforcing federal environmental regulations?	Gallup 2001, 2002a, 2003a, 2006, 2007, 2012, 2014
policy	2014	Do you think government enforcement efforts of the Clean Air Act are adequate?	Cooperative Congressional Election Study 2014
policy	1990; 1985	Do you think government enforcement efforts of environmental regulations are adequate; too strict; or not strict enough?	Time Magazine and CNN 1990; Time Magazine 1985
policy	2010; 1995; 1990; 1985	2002; 2001; Are the existing environmental laws and regulations adequate; should go further; or have gone too far?	CNN 2010b; Time Magazine and CNN 2002, 1995, 2001, 1990; Time Magazine 1985
policy	1996	With which do you agree: current environmental laws need to be made tougher. They are tough enough but need better enforcement. Both laws and enforcement are at the right levels; or current environmental laws are too tough and should be loosened up?	Belden and Russonello 1996
policy	1992; 2001; 1990	1995; Would it be better to go slow in spending money to clean up the environment; or do you think we should go full-speed ahead?	Time Magazine and CNN 1992b,c, 1995, 2001, 1990
policy	1997	How high a priority should the environment be for Congress and the President in the next year?	Gallup 1997a

Survey Questions A.1-1 Continued from previous page

Question Category	Years	Question	Sources
policy	1990	How high a priority should cleaning up the environment be for the country?	Washington Post 1990
policy	1997	How high a foreign-policy priority should the environment be?	Pew 1997
policy	2000; 2004	Should the federal government spend more to protect the environment?	National Annenberg Election Survey 2000a,b,c,d,e, 2004, 2000f
policy	2009; 2004; 2003; 2002	How important is it that the president and Congress deal with the environment in the next year?	CNN 2009; Gallup 2004d, 2003b, 2002b
policy	1998	How high a priority should providing tax credits to reduce pollution be for using the surplus?	Gallup 1998b
policy	1989; 1986; 2001; 1992; 1997; 2006	Do you agree or disagree that protecting the environment is so important that requirements and standards cannot be too high; and continuing environmental improvements must be made regardless of cost?	CBS 1989, 2007, 1986, 2002, 2001a, 1990, 2001e, 1992b, 1996, 1997, 1992c, 2006; New York Times 1989
policy	1998	Do you agree or disagree that protecting the environment is so important that requirements and standards cannot be too high; and continuing environmental improvements must be made regardless of cost?	American National Election Studies 1998
policy	1979; 1982; 1983	Do you think environmental protection laws and regulations have gone too far; or not far enough; or have struck about the right balance?	Roper 1979, 1982, 1983
policy	2008; 2007	Do you think environmental regulations in this country are: excessively strong; too strong but not excessive; about right; need to be somewhat stronger; or need to be a lot stronger?	Knowledge Networks, American Clean Skies Foundation 2008; Knowledge Networks, MIT 2007
policy	2002	Do you think environmental regulations in this country are: excessively strong; too strong but not excessive; about right; need to be somewhat stronger; or need to be a lot stronger? (with prelude)	Knowledge Networks, MIT 2002
policy	2010	Do you think that America is doing more than enough; about the right amount; or too little to protect the world's environment?	General Social Survey 2010
policy	1992; 1990	Would you be willing to pay 200 dollar more in taxes to clean up the environment if you knew the money was going to be used for environmental cleanup purposes only?	Time Magazine and CNN 1992c, 1990

Survey Questions A.1-1 Continued from previous page

Question Category	Years	Question	Sources
policy	1992; 1990	Would you be willing to pay 500 dollars more in taxes to clean up the environment if you knew the money was going to be used for environmental cleanup purposes only?	Time Magazine and CNN 1992c, 1990
policy	1985	In order to do more to clean up toxic wastes; would you be willing to pay higher federal income taxes to fund cleanup programs across the nation?	Time Magazine 1985
policy	1990	Would you be willing to pay an extra 25 cents per gallon of gas to reduce pollution and global warming?	Time Magazine and CNN 1990
policy	1990	Would you be willing to pay an extra 50 cents per gallon of gas to reduce pollution and global warming?	Time Magazine and CNN 1990
policy	1993; 1994; 2000; 2010	How willing would you be to pay much higher prices in order to protect the environment?	General Social Survey 1993, 1994, 2000, 2010
policy	1985	In order to do more to clean up toxic wastes; would you be willing to pay higher state and local taxes to fund cleanup programs in your area?	Time Magazine 1985
policy	1993; 1994; 2000; 2010	How willing would you be to accept cuts in your standard of living in order to protect the environment?	General Social Survey 1993, 1994, 2000, 2010
policy	1993; 1994; 2000; 2010	How willing would you be to pay much higher taxes in order to protect the environment?	General Social Survey 1993, 1994, 2000, 2010
spending	2005	Should spending for environment and natural resources increase; decrease; or stay the same?	Knowledge Networks, The Chicago Council on Foreign Relations 2005
spending	2000	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 2000
spending	2002	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 2002
spending	2006	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 2006
spending	2008	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 2008

Survey Questions A.1-1 Continued from previous page

Question Category	Years	Question	Sources
spending	2010	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 2010
spending	2012	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 2012
spending	2014	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 2014
spending	2016	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 2016
spending	1973	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1973
spending	1974	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1974
spending	1975	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1975
spending	1976	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1976
spending	1977	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1977
spending	1978	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1978
spending	1980	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1980
spending	1982	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1982
spending	1983	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1983

Survey Questions A.1-1 Continued from previous page

Question Category	Years	Question	Sources
spending	1984	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1984
spending	1985	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1985
spending	1986	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1986
spending	1987	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1987
spending	1988	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1988
spending	1989	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1989
spending	1990	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1990
spending	1991	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1991
spending	1993	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1993
spending	1994	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1994
spending	1996	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1996
spending	1998	Are we spending too much; too little; or about the right amount of money on improving and protecting the environment?	General Social Survey 1998

Survey Questions A.1-1 Continued from previous page

Question Category	Years	Question	Sources	
tradeoffs: economy	2008; 2010; 2000; 2002; 2004; 2006; 2009; 2012; 2014; 2015	2010; 2001; 2003; 2005; 2007; 2011; 2013; 2015	With which statement do you agree: Protection of the environment should be given priority; even at the risk of curbing economic growth or economic growth should be given priority; even if the environment suffers to some extent?	CNN 2008, 2010b; Gallup 2000a, 2001, 2002a, 2003a, 2004b, 2005, 2006, 2007, 2008b, 2009, 2010a, 2011, 2012, 2013, 2014, 2015
tradeoffs: economy	2003	With which statement do you agree: The highest priority should be given to protecting the environment. Both the environment and the economy are important but the environment should be given priority; both the environment and the economy are important but the economy should be given priority; the highest priority should be given to economic considerations?	Knowledge Networks, MIT 2003	
tradeoffs: economy	1990; 1995; 1999; 1997; 1992	1991; 1998; 2000;	With which statement do you agree: Protection of the environment should be given priority; even if it means a loss of jobs in some industries; or the availability of jobs should be given priority; even if the environment suffers.	Gallup 1990, 1991, 1995, 1998a, 1999a, 2000b, 1997b, 1992, 1999b
tradeoffs: economy	1992	Do you think the federal government's current regulations protecting the environment will weaken; strengthen; or have no effect on the economy?	Time Magazine and CNN 1992a	
tradeoffs: economy	2009	With which statement do you agree: Protection of the environment should be given priority; even at the risk of curbing economic growth or economic growth should be given priority; even if the environment suffers to some extent? (extra answer choice)	Public Agenda Foundation 2009	
tradeoffs: economy	1992	Is it more important for the government to push ahead with laws that protect the environment even though some workers might lose their jobs as a result; or protect some workers' jobs even though the environment might be harmed as a result?	Time Magazine and CNN 1992a	

Survey Questions A.1-1 Continued from previous page

Question Category	Years	Question	Sources	
tradeoffs: economy	2006	With which statement do you agree: Stricter environmental laws and regulations cost too many jobs and hurt the economy or stricter environmental laws and regulations are worth the cost.	Pew 2006a	
tradeoffs: economy	1992	Would you favor or oppose stricter air pollution laws even if some factories might have to close?	CBS 1992b	
tradeoffs: economy	2001	Do you agree or disagree that we must protect the environment even if it means paying higher prices for electricity and gasoline?	CBS 2001a,c,b	
tradeoffs: economy	2000; 1993; 1997; 1992	2000; 1990; 1996; 1997; 1992	Do you agree or disagree that we must protect the environment even if it means jobs are lost in your community?	CBS 2000, 1990, 1993, 1996, 1997, 1992a; New York Times 1996
tradeoffs: economy	2006; 2008; 2012	2007; 2010;	Should we protect the environment even if it costs some jobs or reduces our standard of living or is protecting the environment not as important as maintaining jobs and our standard of living?	Cooperative Congressional Election Study 2006, 2007, 2008, 2010, 2012
tradeoffs: economy	1993	Would you favor stronger federal government measures to protect the environment; even if some American workers might lose their jobs.	Time Magazine and CNN 1993	
tradeoffs: economy	2013	Do you favor or oppose tougher laws and regulations to protect the environment even if it raises prices or costs jobs?	Public Religion Research Institute 2013	
tradeoffs: economy	1990	Do you agree or disagree that we must protect the environment even if it means paying higher prices for electricity and gasoline? (different answer choices)	NBC 1990	
tradeoffs: economy	2008	With which do you agree: Protecting the environment should be a top priority even if it means higher consumer prices. Protecting the environment is important; but it is more important to keep the economy growing.	National Annenberg Election Survey 2008	
tradeoffs: economy	2009	Do you agree or disagree that protecting the environment should be given priority; even if it causes slower economic growth and some job losses?	Pew 2009	
tradeoffs: economy	1990	Do you agree or disagree that we must protect the environment even if it means increased government spending or higher taxes?	CBS 1990	

Survey Questions A.1-1 Continued from previous page

Question Category	Years	Question	Sources
tradeoffs: economy	2007; 1992; 2009; 2015	Which is more important to you—stimulating the economy or protecting the environment?	CBS 2007, 2009b,c,a, 1992b, 2015
tradeoffs: energy	2001; 1977	Which do you think is more important—producing energy; or protecting the environment?	CBS 2001d,j,i, 1977, 2001g,a,e,c,b,h
tradeoffs: energy	2008; 2006	Which should be a more important priority for this country: protecting the environment or developing new sources of energy?	Pew 2008a,b, 2006b
tradeoffs: energy	2008; 2006	Which should be a more important priority for this country: protecting the environment or developing new sources of energy?	Pew 2008a,b, 2006b
tradeoffs: energy	2007; 2010; 2011	Which should be a more important priority for the government: protecting the environment or developing new sources of energy?	CBS 2007, 2010, 2011
tradeoffs: energy	2010	Which of the following should be the more important priority for U.S. energy policy: deepening energy prices low or protecting the environment?	Pew 2010
tradeoffs: energy	2007; 2001	Which should be a higher priority for the government – increasing the production of petroleum; coal and natural gas; or encouraging people to conserve energy?	CBS 2007, 2001f,g,a,c,b,h
tradeoffs: energy	2008	Which is more important—finding new energy sources; or improving energy conservation?	ABC News 2008
tradeoffs: energy	2009; 2008; 2006	Which should be the more important priority for US energy policy?...Expanding exploration; mining and drilling and the construction of new power plants; or more energy conservation and regulation on energy use and prices	Public Agenda Foundation 2009; Pew 2008a,b, 2006b, 2008c
tradeoffs: energy	2001	Do you agree or disagree: we need to place fewer regulations on the oil and gas companies to make it easier for them to increase energy production?	CBS 2001a,b
tradeoffs: energy	1979; 1982	There is increasing talk about an energy crisis...Are you more on the side of adequate energy or more on the side of protecting the environment?	Roper 1979, 1982

Survey Questions A.1-1 Continued from previous page

Question Category	Years	Question	Sources	
tradeoffs: energy	2001; 2002; 2003; 2005; 2007; 2009; 2011; 2013; 2015	2002; 2004; 2006; 2008; 2010; 2012; 2014;	With which statement do you agree: Protection of the environment should be given priority; even at the risk of limiting the amount of energy supplies – such as oil; gas and coal – which the United States produces or development of U.S. energy supplies – such as oil; gas and coal – should be given priority; even if the environment suffers to some extent?	Gallup 2001, 2002a, 2003a, 2004b, 2005, 2006, 2007, 2008b, 2009, 2010a, 2011, 2012, 2013, 2014, 2015
voting	2010		How important will the environment be to your vote for Congress?	CNN 2010a; Gallup 2010b
voting	2010		How important will the environment and global warming be to your vote for Congress?	Gallup 2010c
voting	2004; 2008; 2003	2000;	How important are the candidate's positions on the environment in influencing your vote for President?	Gallup 2004a, 2000c, 2004c, 2008a, 2003c
voting	2008		How important will the environment and global warming be to your vote for President?	Gallup 2008c
voting	2016; 2004	2015;	How important will the environment be to your vote for President? (subset registered voters)	Pew 2016, 2015; Princeton Survey Research Associates, International 2004
voting	2000		How important will the environment be to your vote for President? (additional answer choice)	Gallup 2000b
voting	2003		Will the environment be the single most important issue to your vote for President?	ABC News 2003
voting	2003		How important will the environment be to your vote for President?	Princeton Survey Research Associates, International 2003
voting	2012; 2007; 2008	2004;	How important will the environment be in deciding who to vote for this fall?	Pew 2012, 2004a, 2007b, 2004b, 2007a, 2008d
worry	2007		How would you characterize your overall level of concern about the environment?	Cooperative Congressional Election Study 2007
worry	1990		Do you think the world currently is facing an environmental crisis?	Washington Post 1990
worry	2000; 2010		Do you agree or disagree: Many of the claims about environmental threats are exaggerated.	General Social Survey 2000, 2010
worry	1990		Do you think your health is currently being hurt by a lack of environmental quality?	Time Magazine and CNN 1990
worry	1993; 2010	2000;	Do you agree or disagree: There are more important things to do in life than protect the environment.	General Social Survey 1993, 2000, 2010

Survey Questions A.1-1 Continued from previous page

Question Category	Years	Question	Sources	
worry	2006; 2007	How important to you is protecting the environment?	Cooperative Congressional Election Study 2006, 2007	
worry	1992	How serious a problem is pollution in the area where you live?	CBS 1992b	
worry	1992	Is pollution a serious problem that is getting worse in the country?	CBS 1992b	
worry	2000	How serious a problem is the environment?	Gallup 2000a	
worry	1995; 1990	Is protecting the environment one of the most important problems facing the country?	Time Magazine and CNN 1995, 1990	
worry	1992	How serious a problem is the risk that American workers might lose their jobs when environmental regulations are enforced?	Time Magazine and CNN 1992a	
worry	1994	Has pollution of the air and water gotten better; worse; or stayed the same?	Time Magazine and CNN 1994	
worry	2001; 2002; 2004; 2006; 2008; 2011; 2013; 2015	2005; 2007; 2010; 2012; 2014;	How much do you worry about the quality of the environment	Gallup 2001, 2002a, 2004b, 2005, 2006, 2007, 2008b, 2010a, 2011, 2012, 2013, 2014, 2015
worry	1984	How important are threats to the environment?	Gallup 1984	
worry	1991; 1992; 1996	How much do you worry that pollution and other environmental problems will get worse?	ABC News 1991, 1992; Washington Post 1996	
worry	1993; 1994; 2000; 2010	How much do you agree that we worry too much about the future of the environment; and not enough about prices and jobs today?	General Social Survey 1993, 1994, 2000, 2010	
worry	1990; 2006	How serious a problem is pollution where you live?	CBS 1990; Pew 2006a	
worry	1990	How serious a problem is pollution in the country as a whole?	CBS 1990	
worry	1993; 1994; 2000; 2010	How much do you agree or disagree that people worry too much about human progress harming the environment?	General Social Survey 1993, 1994, 2000, 2010	
worry	1990	How serious a national security threat are environmental problems like air pollution and water contamination in the next 5 years?	Market Strategies, Inc. Americans Talk Security Project 1990	

A.2 Validation and Comparing Models

To assess the face validity of the estimates, I investigate their cross-sectional correlations with the measures shown in Figure 2-4 and with a third metric that should correlate strongly with public concern about the environment: vote share in presidential elections. Even if the estimates trend separately overall, the ordering of states in the data should be strongly correlated between environmental concern and ideology, climate concern, and presidential vote share, particularly in the latter part of the time period when environmental regulation had become a highly polarized issue between the two American political parties (Kim and Urpelainen, 2018; McCright et al., 2014; Shipan and Lowry, 2001; Kim and Urpelainen, 2017; Lindaman and Haider-Markel, 2002). Table A.2-2 and Figures A.2-3 and A.2-2 show the cross-sectional correlations between the state-year estimates of environmental concern presented in Section 2.5, climate concern, ideology, and presidential vote share. The estimates are correlated quite strongly with all three existing metrics, and the correlation with presidential vote share and ideology increases substantially over time. This is consistent with the finding that the parties have become more cleanly sorted ideologically over time. Across the slate of political issues, the public is now better sorted into partisan camps than it was prior to the mid-1990s.

One choice that the researcher must make in developing time-series model is whether to include items that are only asked in a single year. Including these items increases the sample used to estimate opinion, but it is difficult to estimate parameters for these items. Including them seems to skew the estimated posterior distribution of opinion for the years in which they are included. For this reason, Section 2.5 shows results estimated without single-year items. Here I present cross-sectional correlations between models estimated with (Section A.2.2) and without (Section A.2.1) these items.

A second choice the researcher must make is which demographic predictors to include in the hierarchical model. I estimate models with only state-level intercepts; with state-level intercepts and party as a grouping variable; and with state-level

intercepts, party, and race as grouping variables. This Appendix includes tables and figures showing the correlations between various versions of the model and ideology, climate concern, and vote share. Table A.2-3 and Figure A.2-6 show that the model estimated with party and race as grouping variables performs slightly worse in its correlations with existing measures of public concern. For this reason, I focus on the models without party and race as grouping variables in the panel models presented in Section 2.5.3. I also present state-level estimates of party polarization for years with relatively large sample sizes in Figure 2-5, to maximize accuracy and precision in the figure and, thus, the reliability of conclusions drawn from it.

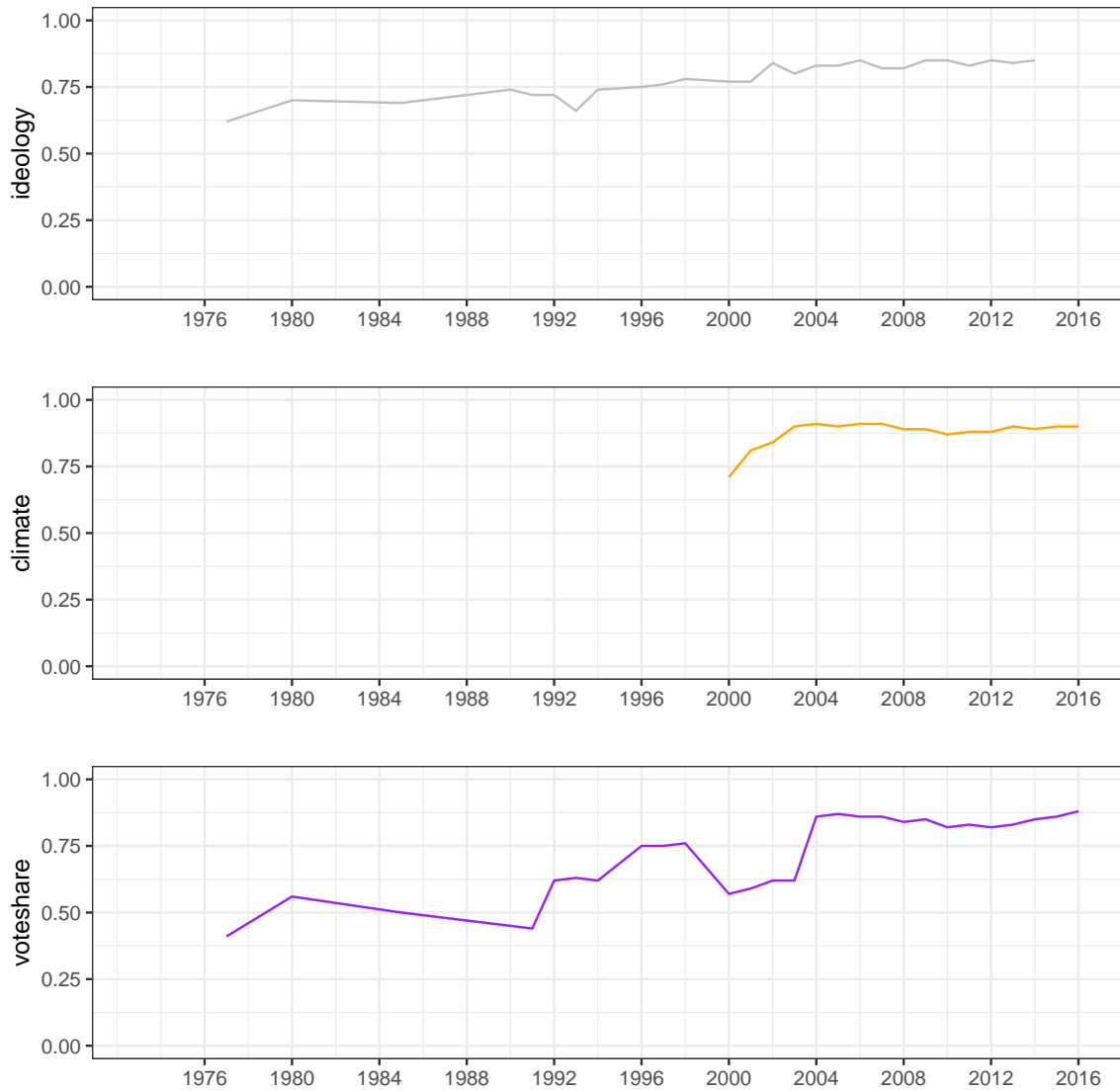
A.2.1 Models with a 2-year Time Filter for Item Inclusion

Table A.2-2: Cross-sectional correlation between state-level environmental concern and three existing measures of public opinion (no groups, 2-year time filter for item inclusion)

year	correlations		
	ideology	climate	voteshare
1973	-0.06		
1977	0.62		0.41
1980	0.70		0.56
1985	0.69		0.50
1990	0.74		0.45
1991	0.72		0.44
1992	0.72		0.62
1993	0.66		0.63
1994	0.74		0.62
1996	0.75		0.75
1997	0.76		0.75
1998	0.78		0.76
2000	0.77	0.71	0.57
2001	0.77	0.81	0.59
2002	0.84	0.84	0.62
2003	0.80	0.90	0.62
2004	0.83	0.91	0.86
2005	0.83	0.90	0.87
2006	0.85	0.91	0.86
2007	0.82	0.91	0.86
2008	0.82	0.89	0.84
2009	0.85	0.89	0.85
2010	0.85	0.87	0.82
2011	0.83	0.88	0.83
2012	0.85	0.88	0.82
2013	0.84	0.90	0.83
2014	0.85	0.89	0.85
2015		0.90	0.86
2016		0.90	0.88

This table shows correlations between environmental concern and ideology, climate concern, and vote share. The model is estimated with state-specific intercepts but no pooling based on demographic predictors. Items only used in a single year are dropped from the estimates.

Figure A.2-1: Cross-sectional correlation between state-level environmental concern and three existing measures of public opinion (no groups, 2-year item filter)



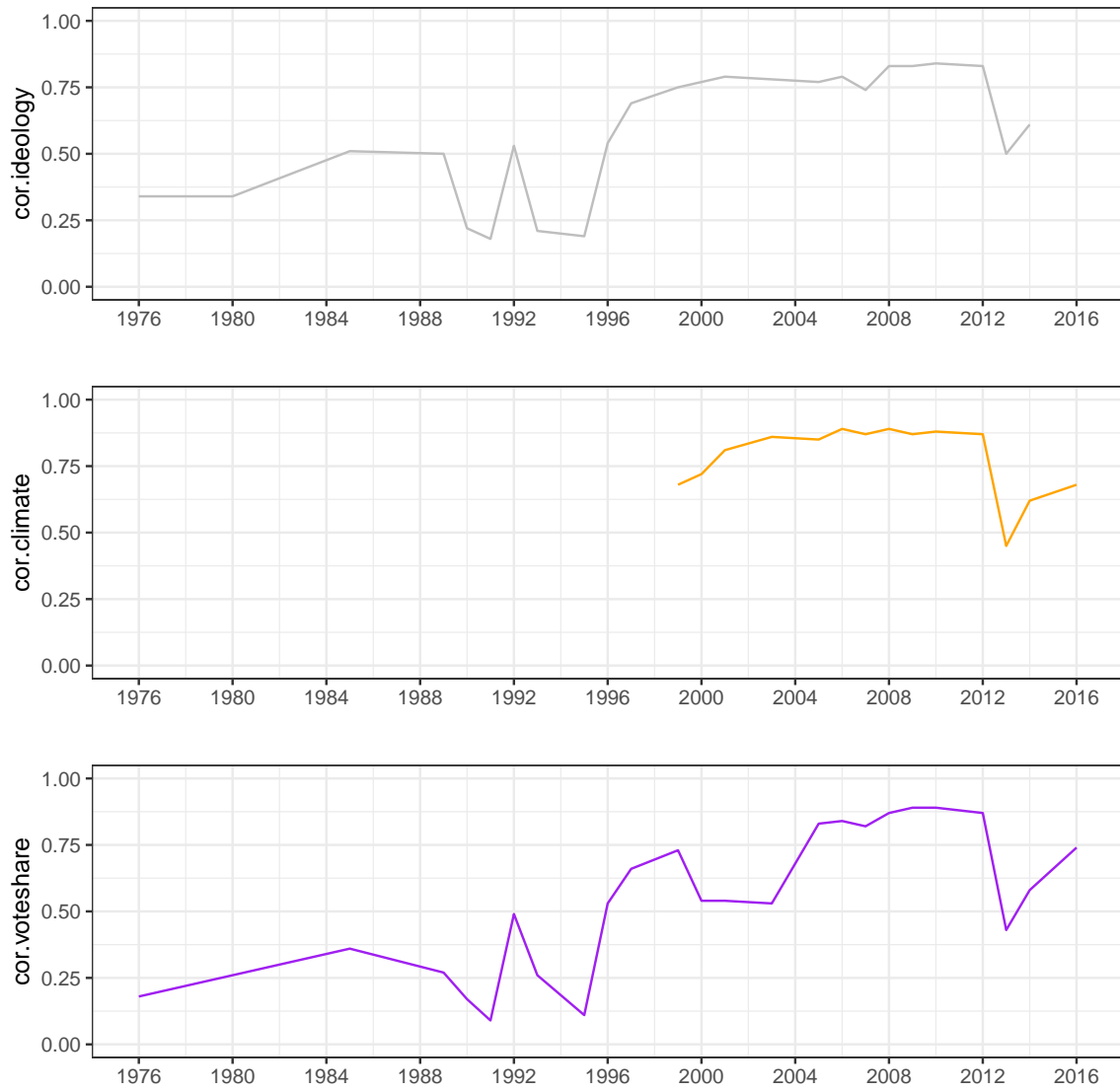
This table shows correlations between environmental concern and ideology, climate concern, and vote share. The model is estimated with state-specific intercepts but no pooling based on demographic predictors. Items only used in a single year are dropped from the estimates.

Table A.2-3: Cross-sectional correlation between state-level environmental concern and three existing measures of public opinion (estimated with race and party groups, and 2-year item filter)

year	Correlations		
	ideology	climate	voteshare
1973	-0.12		
1977	0.57		0.30
1980	0.50		0.49
1985	0.32		0.13
1990	0.26		0.14
1991	0.33		0.26
1992	0.57		0.57
1993	0.14		0.20
1994	0.17		0.24
1996	0.77		0.81
1997	0.80		0.81
1998	0.72		0.82
2000	0.76	0.67	0.55
2001	0.71	0.70	0.48
2002	0.38	0.40	0.41
2003	0.35	0.37	0.24
2004	0.74	0.75	0.70
2005	0.47	0.37	0.43
2006	0.82	0.87	0.86
2007	0.73	0.84	0.81
2008	0.86	0.89	0.84
2009	0.81	0.80	0.81
2010	0.86	0.88	0.86
2011	0.42	0.44	0.42
2012	0.82	0.86	0.85
2013	0.44	0.38	0.33
2014	0.54	0.58	0.50
2015		0.58	0.60
2016		0.73	0.79

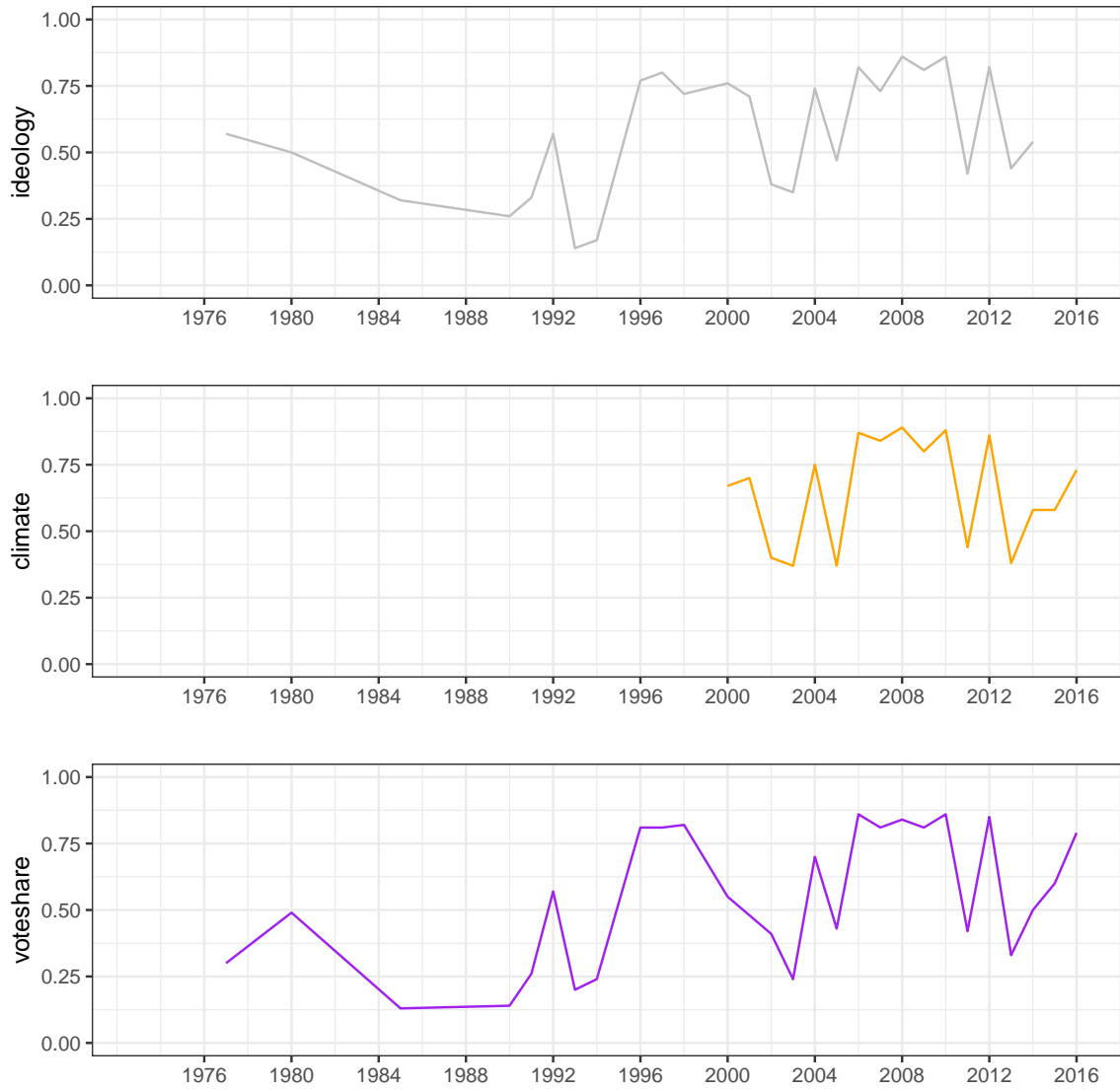
The table shows the cross-sectional correlations between annual levels of environmental concern and ideology, climate concern, and Democratic presidential vote share. The model was estimated with state, race, and party as individual-level grouping variables and post-stratified to the state-year level for comparison with the other measures.

Figure A.2-2: Cross-sectional correlation between state-level environmental concern and three existing measures of public opinion (model estimated with race and party groups and 2-year time filter)



Model estimated with 2-year time filter and pooling by race and party.

Figure A.2-3: Cross-sectional correlation between state-level environmental concern and three existing measures of public opinion (estimated with parties but no race groups, 2-year time filter)

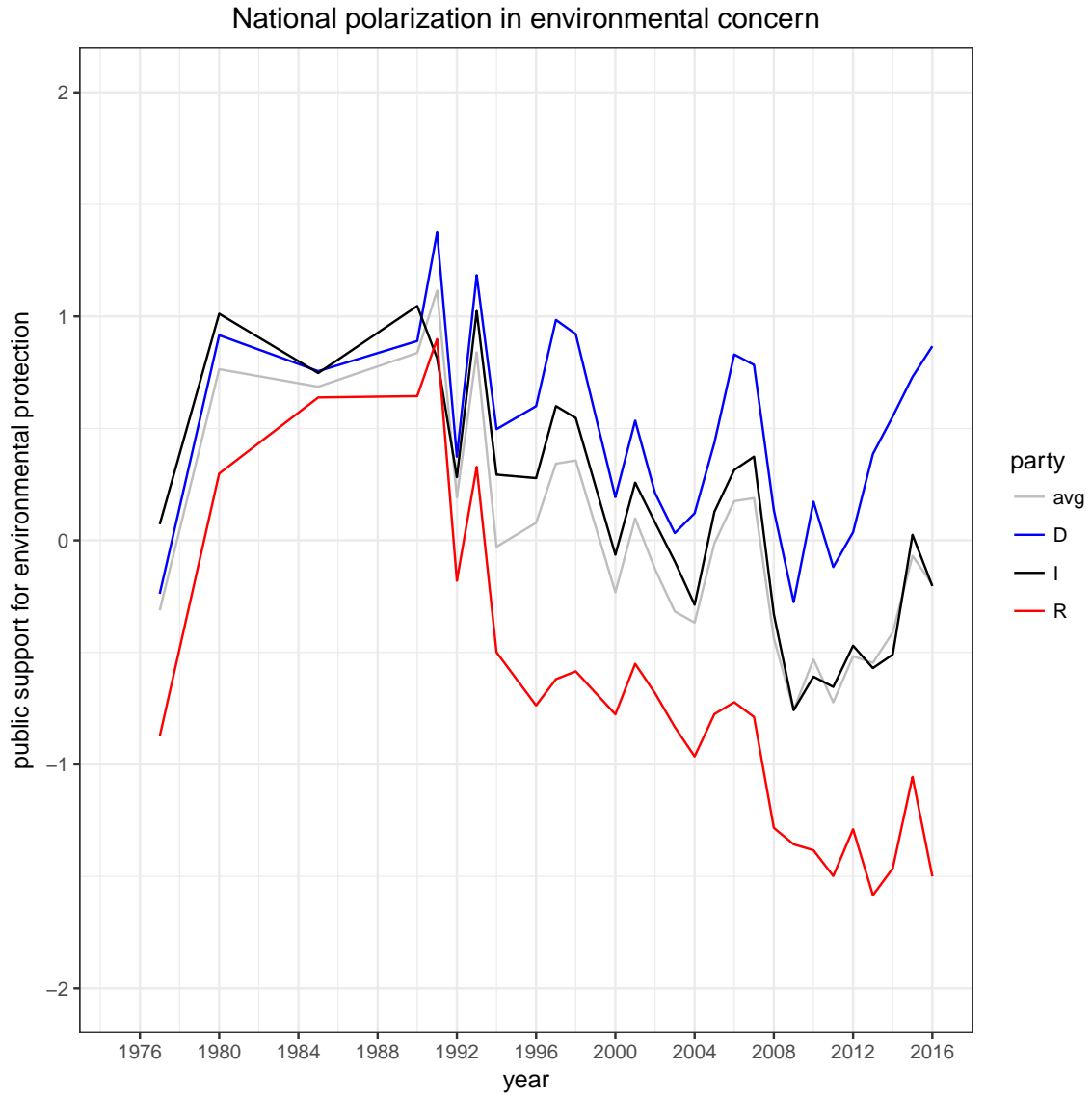


Model estimated with 2-year time filter and pooling by party but without race.

A.2.2 Models Without a Time Filter For Items' Inclusion

Figure A.2-4 shows national-level polarization, estimated with a model that includes single-year items and without race as a grouping variable. Overall, the results are consistent with the filtered model, with one notable difference. The parties appear more polarized in the early part of the time period for the model estimated with all items. This is likely due to the greater precision of these estimates during the early part of the time period, which stems from the larger samples used (Table 2.2).

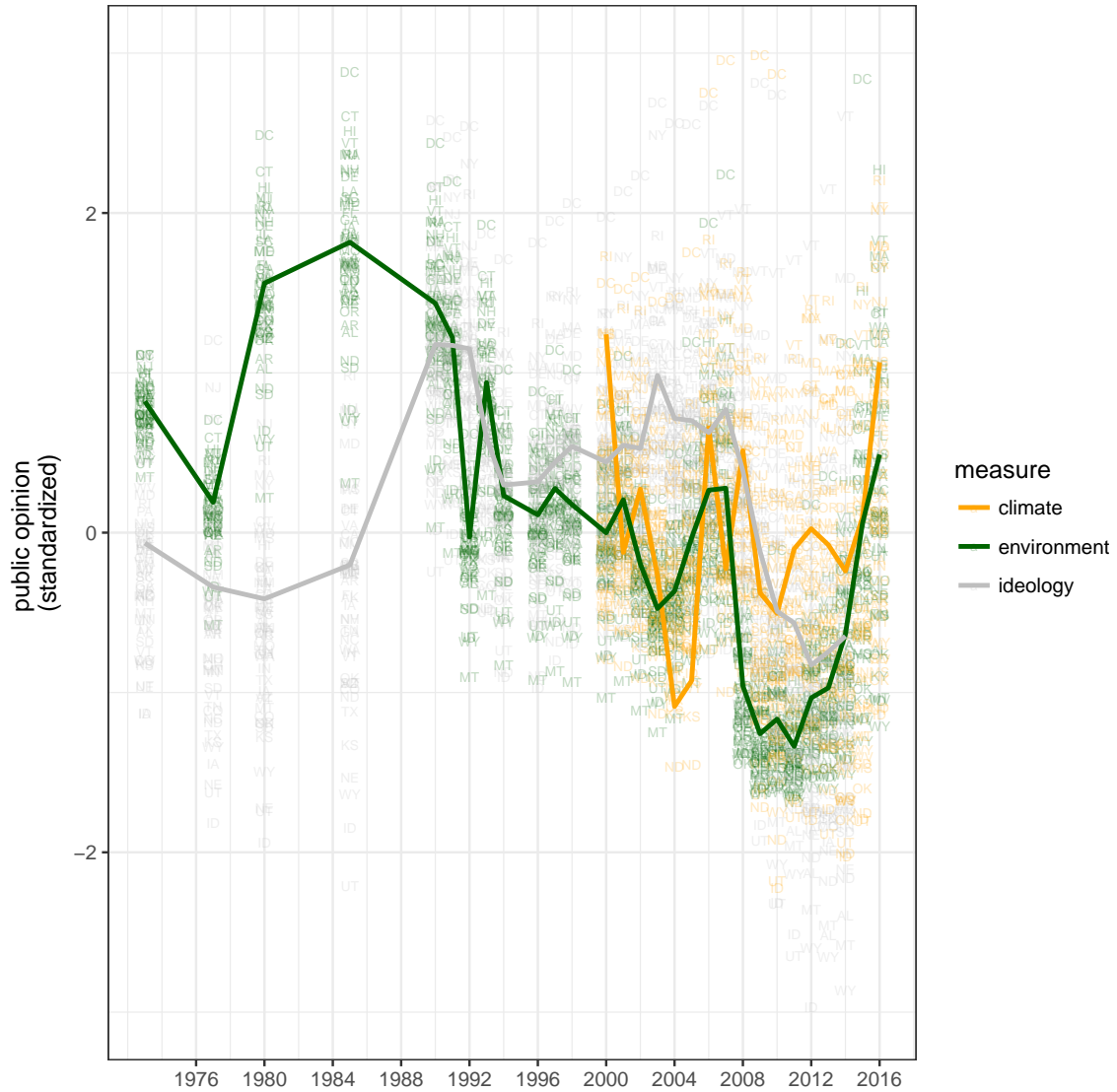
Figure A.2-4: Increasing polarization about environmental protection



The figure shows nationally aggregated environmental concern among Democrats, Republicans, and Independents, since the late 1970s. These estimates reflect a model that incorporates single-year items, in addition to those spanning two or more years as shown in Figure A.2-4.

Figure A.2-5 shows trends in environmental concern, based on estimates that include all items in the data rather than only those items asked in two or more years. Figure A.2-5 is analogous to Figure 2-4 in Section 2.5, with the distinction that Figure A.2-5 is based on estimates that include single-year items. While the trends are broadly similar, the figure shows that the environmental concern index dips to a more extreme low in the late-2000s, when estimated using all items. The environmental concern index also diverges from ideology from the early 1990s through 2006 when estimated with all items. This divergence covers a shorter time span for the estimates based on time-filtered items.

Figure A.2-5: Trends in environmental concern, climate concern, and policy liberalism



The figure shows trends in environmental concern, mass liberalism (Caughey et al., 2017), and climate concern (Bergquist and Warshaw, 2018). These estimates reflect a model that incorporates single-year items, in addition to those spanning two or more years as shown in Figure 2-4.

Tables A.2-4 and A.2-5 and Figure A.2-6 show the correlations between a model estimated without a time filter for items' inclusion, and the three existing measures of liberalism and environmental concern. The results for the state model (estimated without parties) are quite similar in their variance with and without single-year items. The results from the state-party model are more variable when estimated without a time filter for items' inclusion.

Table A.2-4: Correlations between environmental concern and 3 measures of public opinion for a model estimated without race or party as groups, and without filtering items based on years of availability

correlations				
year	ideology	climate	vote share	sample size
1973	0.67			5555
1977	0.66		0.43	5748
1980	0.74		0.56	9435
1985	0.74		0.56	8360
1990	0.77		0.48	6584
1991	0.74		0.48	2589
1992	0.74		0.63	8705
1993	0.75		0.63	4141
1994	0.77		0.63	4515
1996	0.79		0.76	6142
1997	0.79		0.76	3685
1998	0.80		0.76	6210
2000	0.81	0.70	0.64	29224
2001	0.80	0.76	0.64	10417
2002	0.85	0.81	0.65	5788
2003	0.81	0.84	0.65	4941
2004	0.88	0.87	0.85	9095
2005	0.86	0.87	0.88	970
2006	0.88	0.91	0.89	46262
2007	0.84	0.92	0.89	15254
2008	0.82	0.90	0.90	67824
2009	0.83	0.89	0.91	6562
2010	0.84	0.91	0.91	64117
2011	0.84	0.90	0.92	1747
2012	0.85	0.93	0.90	54363
2013	0.85	0.93	0.91	5085
2014	0.85	0.93	0.90	55505
2015		0.93	0.90	3374
2016		0.93	0.94	2440

This table shows the annual samples and correlations between a model estimated without any demographic grouping variables, and using all items in the data rather than restricting the model to using items that appear in at least two years. The table shows that the model performs quite well when using all of the data.

Figure A.2-6: Cross-sectional correlation between state-level environmental concern and three existing measures of public opinion

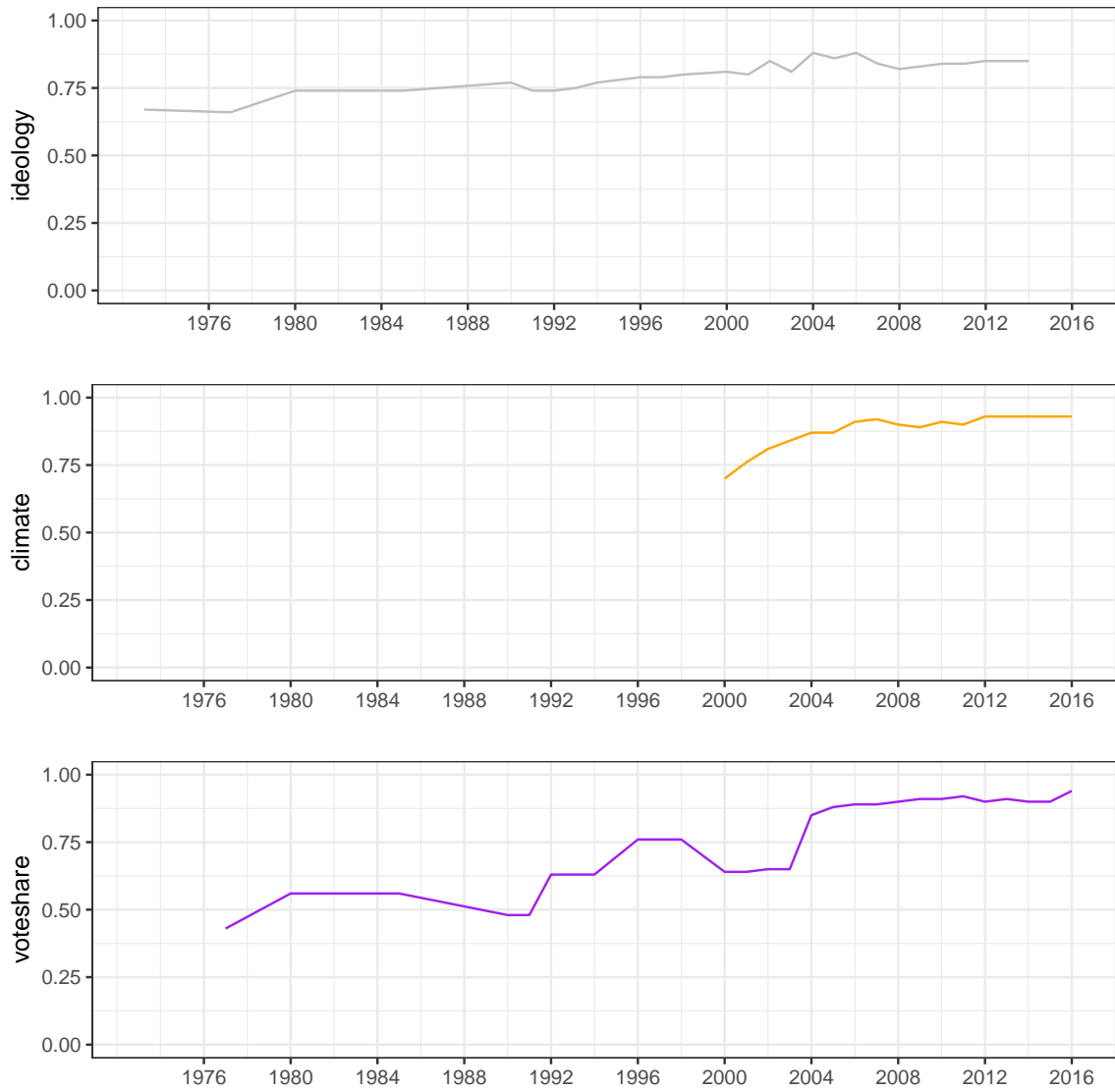


Table A.2-5: Correlations between environmental concern and 3 measures of public opinion for a model estimated with race and party as groups and without filtering items based on years of availability.

year	correlations			sample size
	ideology	climate	voteshare	
1973	0.56			5555
1977	0.65		0.66	5748
1980	0.60		0.53	9435
1985	0.38		0.14	8360
1990	0.27		0.37	6584
1991	-0.07		-0.08	2589
1992	0.52		0.48	8705
1993	0.13		0.07	4141
1994	0.06		0.06	4515
1996	0.64		0.58	6142
1997	0.76		0.66	3685
1998	0.48		0.56	6210
2000	0.74	0.62	0.52	29224
2001	0.68	0.68	0.48	10417
2002	0.43	0.42	0.44	5788
2003	0.47	0.47	0.25	4941
2004	0.70	0.71	0.63	9095
2005	0.38	0.30	0.36	970
2006	0.80	0.86	0.83	46262
2007	0.52	0.72	0.63	15254
2008	0.80	0.85	0.83	67824
2009	0.73	0.72	0.72	6562
2010	0.82	0.85	0.85	64117
2011	0.38	0.39	0.41	1747
2012	0.78	0.84	0.85	54363
2013	0.52	0.50	0.49	5085
2014	0.80	0.89	0.85	55505
2015		0.52	0.55	3374
2016		0.65	0.63	2440

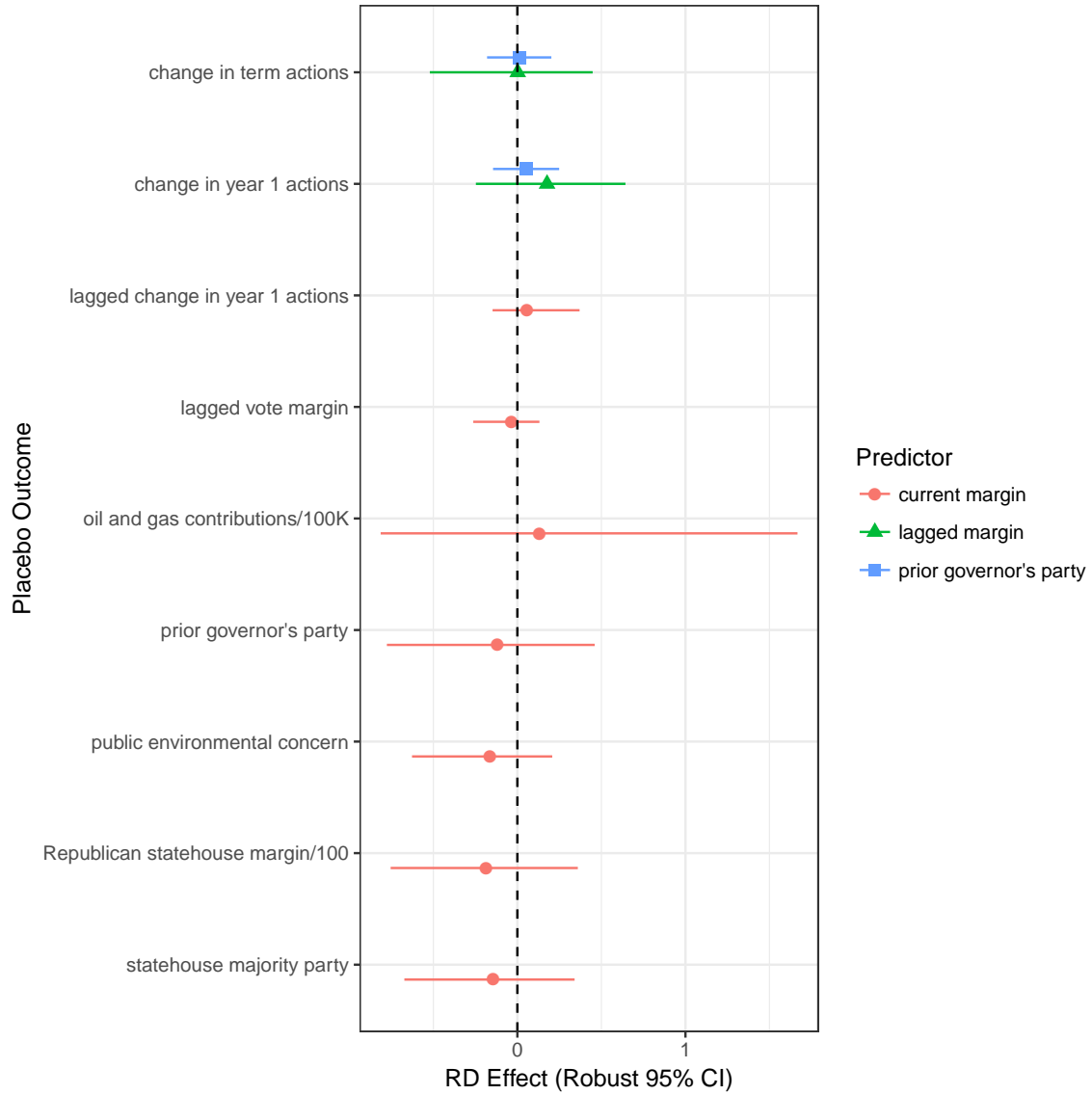
This table shows the annual samples and correlations between a model estimated with race and party as demographic grouping variables, and using all items in the data rather than restricting the model to using items that appear in at least two years. The table shows that the model's annual variance is higher when using all of the data.

Appendix B

Controlling the Regulators: How Party Control of Government Shapes Environmental Regulation in the 21st Century

B.0.1 Robustness Checks for the Continuity Assumption: Large- sample RDD for Gubernatorial Elections

Figure B.0-1: Robustness Checks for the Continuity Assumption: RD for Gubernatorial Elections



The plot shows 95% confidence intervals for placebo tests of several predictors on placebo outcomes. The estimates reveal no significant discontinuities in placebo outcomes at the treatment-assignment threshold.

Table B.0-1: Effect of current running variable on change in informal actions lagged by one, two, and three years

Lag (years)	Estimate	Pr $> z $	Eff. N	BW
1	0.056 (-0.148, 0.37)	0.399	77	0.089
2	0.043 (-0.455, 0.467)	0.98	88	0.112
3	0.264 (-0.363, 0.82)	0.449	66	0.107

The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The outcome variable is the change in the residuals from a two-way fixed effect regression of the natural log of annual actions on state and year fixed effects.

Table B.0-2: Effect of lagged running variable on informal actions (first year and averaged across term)

Years since election	Estimate	Pr $> z $	Eff. N	BW
Avg. (1-4)	0.002 (-0.521, 0.448)	0.883	80	0.13
Year 1	0.177 (-0.247, 0.643)	0.383	83	0.138

The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The outcome variable is the change in the residuals from a two-way fixed effect regression of the natural log of annual actions on state and year fixed effects.

Table B.0-3: Effect of lagged treatment (Republican victory) on informal actions (first year and averaged across gubernatorial term)

	<i>Years since election:</i>	
	Avg. (1-4)	1
Lagged treatment	0.011 (0.097)	0.052 (0.100)
Constant	0.004 (0.066)	-0.022 (0.068)
Observations	149	147
R ²	0.0001	0.002
Adjusted R ²	-0.007	-0.005
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

The effects were estimated using OLS regression.

Table B.0-4: Effect of current running variable on lagged running variable and lagged treatment

Outcome variable	Estimate	Pr > z	Eff. N	BW
Lagged vote margin	-0.036 (-0.263, 0.131)	0.514	70	0.11
Lagged Republican victory	-0.119 (-0.776, 0.46)	0.616	69	0.105

The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The outcome variables are the lagged running variable and lagged treatment.

Table B.0-5: RD estimates of effect of current vote margin on legislative vote margin or statehouse party majority

Outcome variable	Estimate	Pr $> z $	Eff. N	BW
Legislative vote margin (euclidean distance)	-18.639 (-75.409, 35.973)	0.488	101	0.123
Republican statehouse majority	-0.144 (-0.672, 0.34)	0.521	105	0.126

The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The outcome variables are the running variable that assigns treatment and the treatment variable for the state legislative analysis.

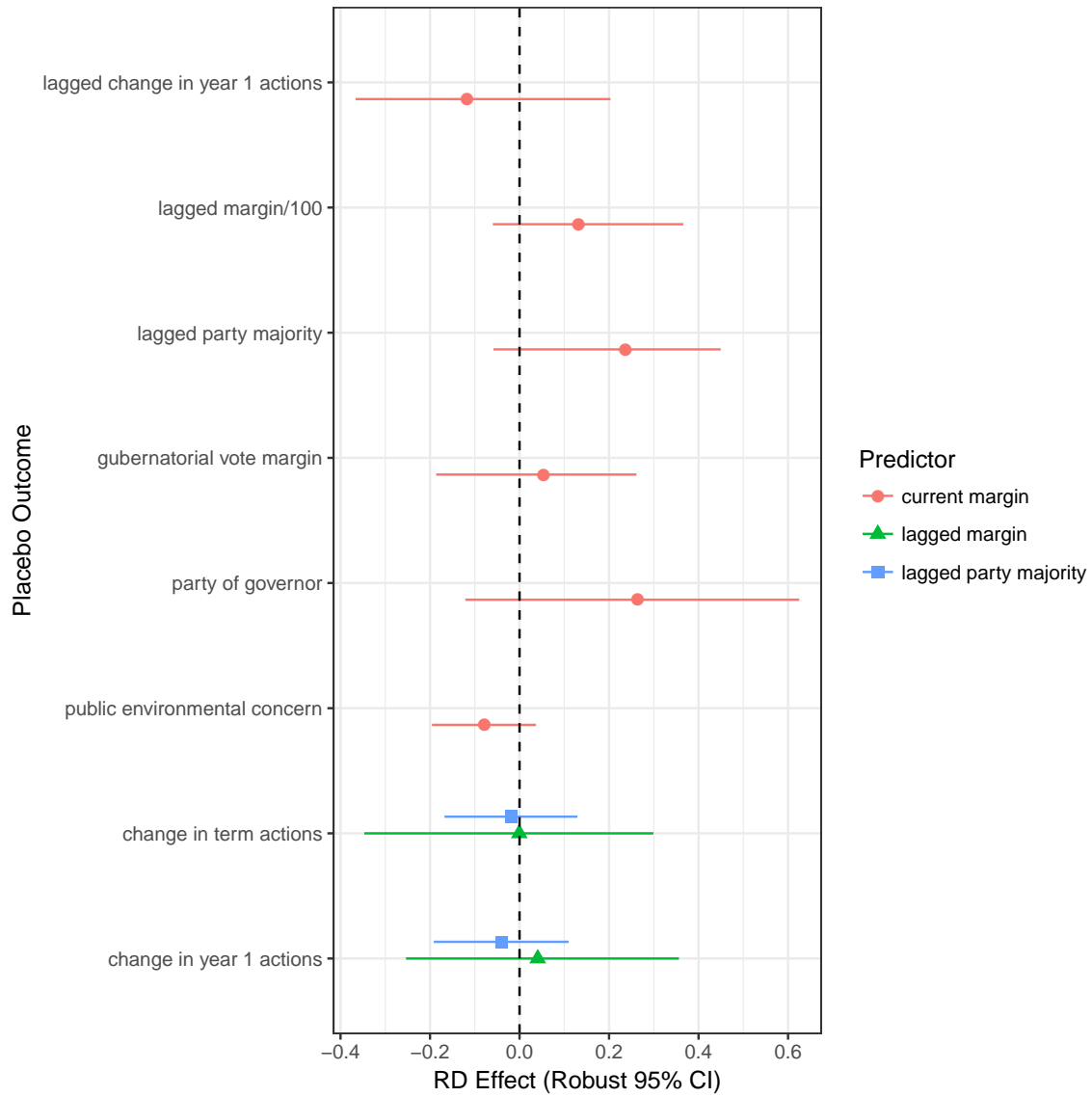
Table B.0-6: RD estimate of effect of gubernatorial vote margin on public environmental concern

Outcome variable	Estimate	Pr $> z $	Eff. N	BW
Public environmental concern	-0.164 (-0.627, 0.207)	0.324	111	0.126

The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The outcome variable is state-level environmental concern, estimated using an adaptation of the dynamic group-level item-response theory model developed by Caughey and Warshaw (2015).

B.0.2 Robustness Checks for the Continuity Assumption: Legislative Elections

Figure B.0-2: Robustness Checks for the Continuity Assumption: RD for Legislative Elections



The plot shows 95% confidence intervals for placebo tests of several predictors on placebo outcomes. The estimates reveal no significant discontinuities in placebo outcomes at the treatment-assignment threshold.

Table B.0-7: Effect of current running variable on lagged outcome

Lag (years)	Estimate	Pr > z	Eff. N	BW
1	-0.117 (-0.366, 0.203)	0.574	196	54.481
2	0.051 (-0.308, 0.43)	0.745	212	65.324
3	0.061 (-0.313, 0.487)	0.67	177	60.398

The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The outcome variable is the change in the residuals from a two-way fixed effect regression of the natural log of annual actions on state and year fixed effects.

Table B.0-8: Effect of lagged running variable on current outcome variable (first year and averaged across term)

Outcome variable	Estimate	Pr > z	Eff. N	BW
Avg. (1-2 or 1-4)	-0.001 (-0.347, 0.299)	0.885	181	43.619
Year 1	0.041 (-0.254, 0.356)	0.742	213	66.942

The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The outcome variable is the change in the residuals from a two-way fixed effect regression of the natural log of annual actions on state and year fixed effects.

Table B.0-9: OLS Effect of lagged treatment (Republican majority/minority status) on current outcome variable (first year and averaged across gubernatorial term)

	<i>Years since election</i>	
	Avg.	1
Lagged Republican majority status	-0.019 (0.075)	-0.041 (0.077)
Constant	0.006 (0.055)	0.016 (0.056)
Observations	288	286
R ²	0.0002	0.001
Adjusted R ²	-0.003	-0.003
<i>Note:</i>	*p<0.1; **p<0.05; ***p<0.01	

The effects were estimated using OLS regression.

Table B.0-10: RD estimates of effect of current running variable on lagged running variable and lagged treatment

Outcome variable	Estimate	Pr > z	Eff. N	BW
Lagged distance to majority	13.161 (-5.972, 36.586)	0.159	171	40.403
Lagged Republican majority status	0.237 (-0.058, 0.449)	0.131	198	54.248

The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The outcome variables are the lagged running variable and lagged treatment.

Table B.0-11: RD estimates of effect of current vote margin on gubernatorial vote margin or party of governor

Outcome variable	Estimate	Pr $> z $	Eff. N	BW
Gubernatorial vote margin	0.053 (-0.186, 0.261)	0.743	122	65.893
Party of governor	0.264 (-0.121, 0.625)	0.186	117	60.286

The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The outcome variables are the vote margin and the treatment variable for the gubernatorial analysis.

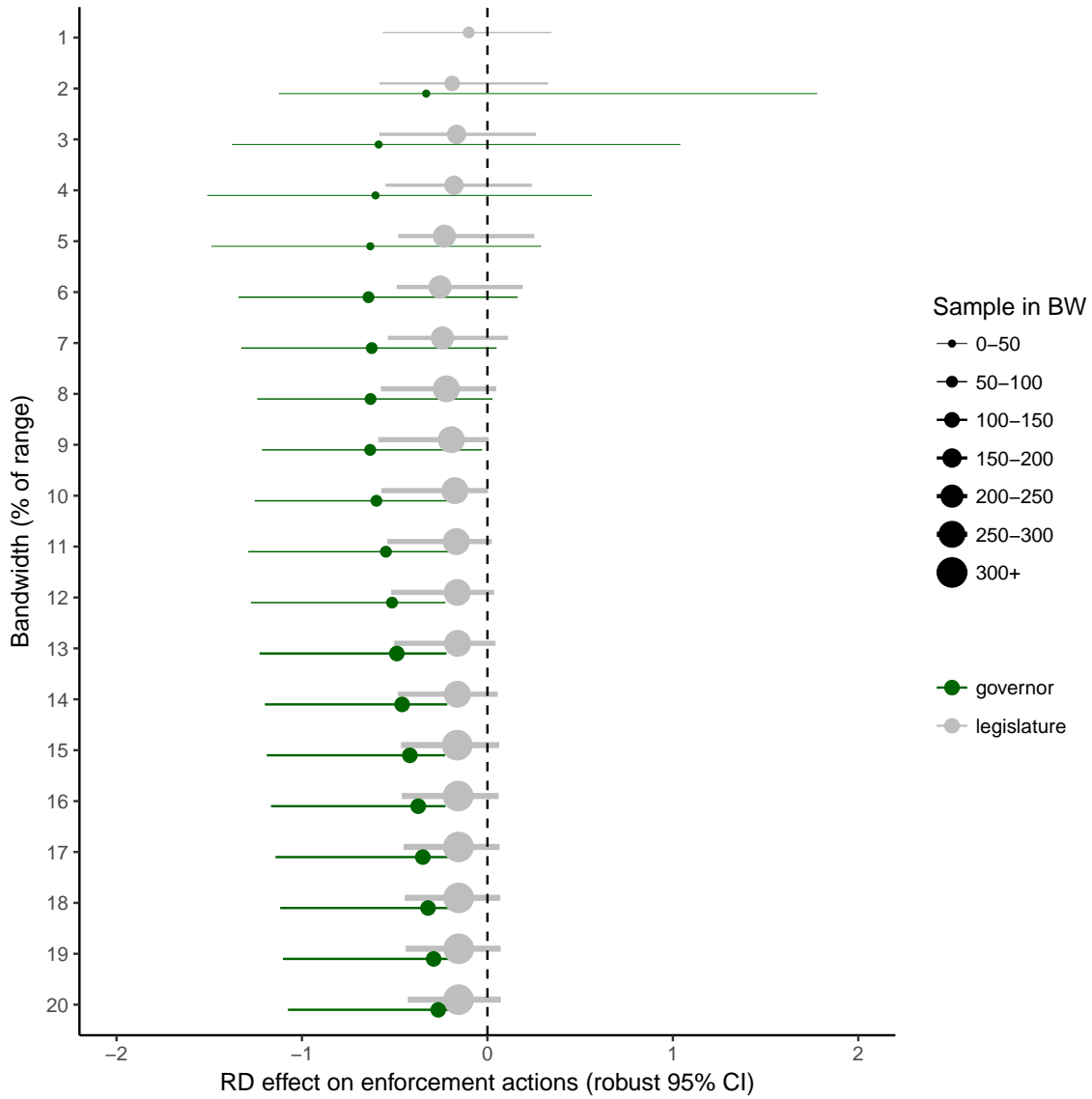
Table B.0-12: RD estimates of effect of running variable on public environmental concern

Outcome variable	Estimate	Pr $> z $	Eff. N	BW
Environmental concern	-0.078 (-0.196, 0.037)	0.18	253	72.306

The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The outcome variable is state-level environmental concern, estimated using an adaptation of the dynamic group-level item-response theory model developed by Caughey and Warshaw (2015).

B.0.3 Results

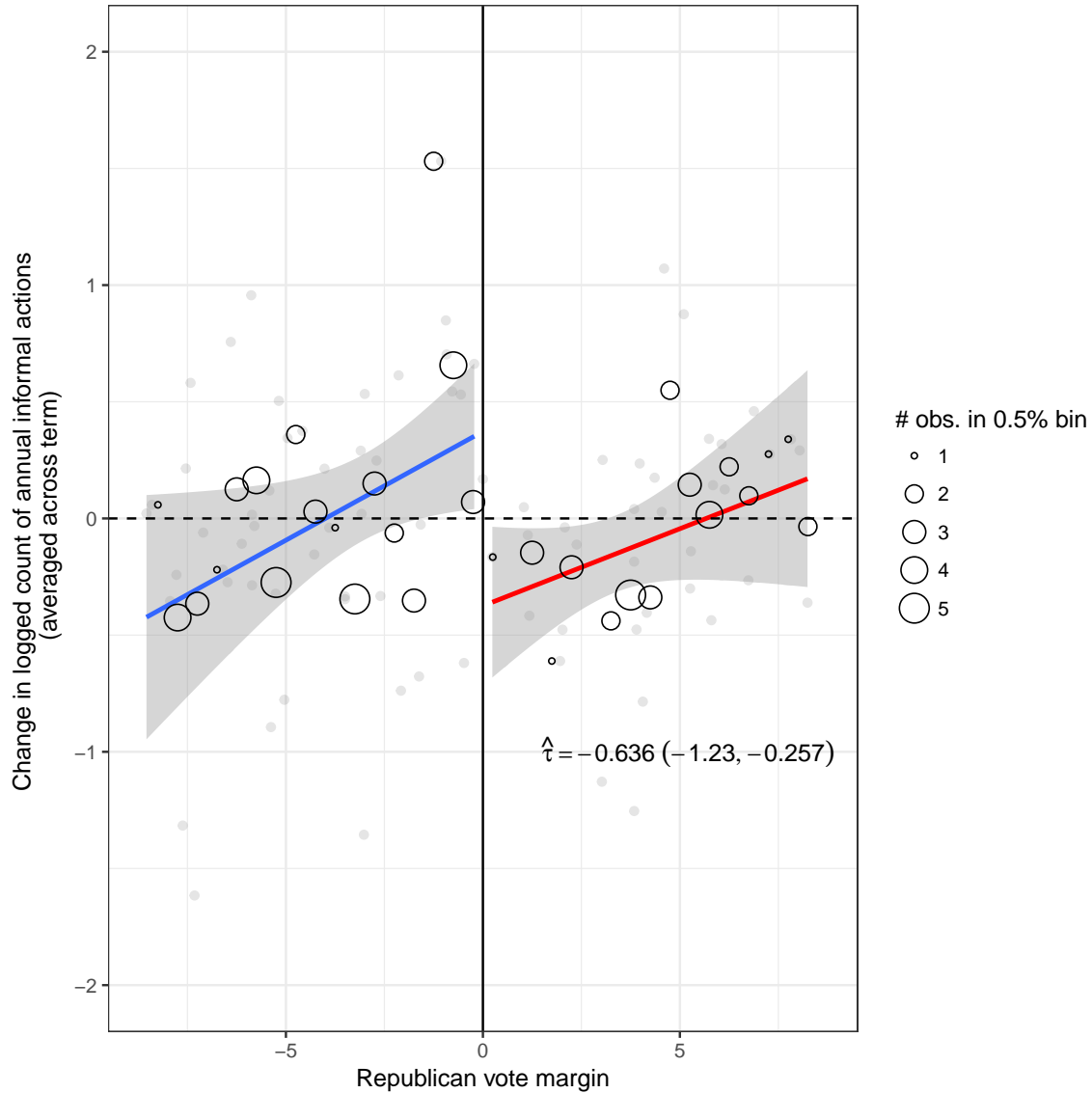
Figure B.0-3: Point estimates and confidence intervals at various bandwidths



The figure shows the point estimates and bias-corrected robust 95% confidence intervals for the large-sample RD estimates of the influence of Republican governors and state legislatures on informal and formal enforcement actions, respectively.

B.0.4 Results: Governors

Figure B.0-4: Governors' Influence Over Informal Enforcement



The figure shows the RD effect that narrowly elected Republican governors have on the change in annual informal enforcement actions taken during each year of their term, as compared with the year of their election. The effect was estimated with the `rdrbust` (Calonico et al., 2015) R package, using a triangular-kernel local linear estimator, MSE-optimal bandwidth, and bias-corrected robust confidence intervals. The hollow points reflect local averages for each bin in the data, and they are sized to reflect the number of state-year observations in each bin. The dependent variables are the residuals from two-way fixed-effects regressions of the logged change in annual enforcement actions taken one, two, three, and four years after an election, and averaged across gubernatorial terms, on state and year fixed effects.

Table B.0-13: Results Derived from Residualized, Logged Count

Years After Election	Estimate	Pr > z	Eff. N	BW
Total Actions				
1	-0.566 (-1.131, -0.164)	0.009	87	0.094
2	-0.439 (-1.028, 0.045)	0.072	85	0.092
3	-0.458 (-1.091, 0.066)	0.083	83	0.098
4	-0.659 (-1.403, -0.123)	0.019	85	0.107
Avg.	-0.538 (-1.079, -0.131)	0.012	87	0.094
Informal Actions				
1	-0.747 (-1.475, -0.267)	0.005	80	0.087
2	-0.468 (-1.037, -0.045)	0.032	89	0.101
3	-0.302 (-1.032, 0.244)	0.226	86	0.113
4	-0.863 (-1.733, -0.334)	0.004	72	0.088
Avg.	-0.636 (-1.23, -0.257)	0.003	81	0.087
Formal Actions				
1	-0.162 (-0.756, 0.392)	0.535	107	0.141
2	-0.086 (-0.748, 0.639)	0.879	93	0.123
3	-0.486 (-1.285, 0.219)	0.165	85	0.118
4	-0.315 (-1.174, 0.705)	0.624	84	0.125
Avg.	-0.3 (-0.897, 0.274)	0.297	101	0.129

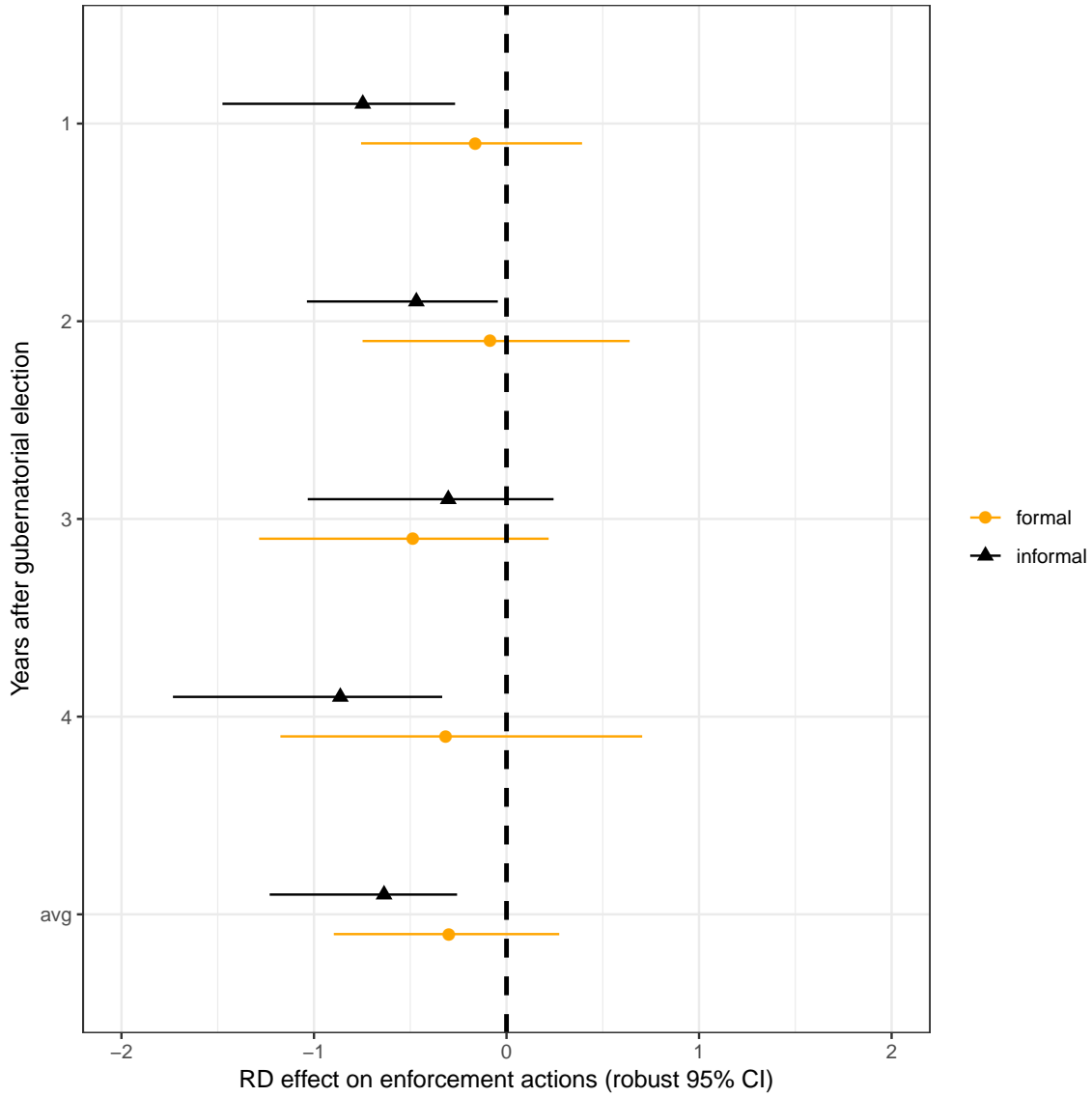
Effect of Republican victory on annual enforcement actions, from 1-4 years after an election. The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The dependent variable is the change in residuals from a fixed effects regression with state and year fixed effects on the natural log of annual enforcement actions.

Table B.0-14: Results Derived from Change in Logged Count of Enforcement Actions

Years After Election	Estimate	Pr > z	Eff. N	BW
Total Actions				
1	-0.575 (-1.128, -0.181)	0.007	91	0.096
2	-0.365 (-0.978, 0.189)	0.185	99	0.111
3	-0.328 (-1.295, 0.58)	0.455	102	0.119
4	-0.76 (-2.037, 0.201)	0.108	109	0.13
Avg.	-0.653 (-1.183, -0.243)	0.003	96	0.1
Informal Actions				
1	-0.715 (-1.419, -0.243)	0.006	81	0.088
2	-0.279 (-0.84, 0.185)	0.21	97	0.114
3	-0.106 (-1.113, 0.752)	0.705	107	0.136
4	-0.816 (-2.155, 0.184)	0.099	106	0.132
Avg.	-0.698 (-1.302, -0.3)	0.002	89	0.094
Formal Actions				
1	-0.195 (-0.798, 0.36)	0.459	104	0.132
2	-0.03 (-0.663, 0.699)	0.959	97	0.127
3	-0.223 (-1.269, 0.872)	0.717	92	0.122
4	-0.325 (-1.619, 0.975)	0.627	103	0.144
Avg.	-0.367 (-0.996, 0.177)	0.171	107	0.139

Effect of Republican victory on the change in annual informal enforcement actions, from 1-4 years after an election. The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The dependent variable is the change in the natural log of annual actions.

Figure B.0-5: RD Effect of Republican Control of Governorships on CAA Enforcement Actions



The plot shows 95% confidence intervals for the effect of Republican gubernatorial election victory on enforcement activity. The models were estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidth, and robust confidence intervals. The dependent variable is the change in the natural log of annual enforcement actions, averaged across gubernatorial terms. The dependent variables are the residuals from two-way fixed-effects regressions of the logged change in annual enforcement actions taken one, two, three, and four years after an election, and averaged across gubernatorial terms, on state and year fixed effects.

Table B.0-15: Point estimates and confidence intervals at various bandwidths

Estimate	Pr $> z $	Eff. N	BW
-0.23 (-4.369, 0.96)	0.21	8	0.01
-0.33 (-1.124, 1.778)	0.659	15	0.02
-0.587 (-1.378, 1.04)	0.784	22	0.03
-0.603 (-1.511, 0.564)	0.371	36	0.04
-0.631 (-1.488, 0.29)	0.186	45	0.05
-0.641 (-1.342, 0.163)	0.125	60	0.06
-0.624 (-1.327, 0.05)	0.069	68	0.07
-0.63 (-1.241, 0.027)	0.061	77	0.08
-0.632 (-1.215, -0.028)	0.04	84	0.09
-0.598 (-1.255, -0.131)	0.016	90	0.1
-0.547 (-1.29, -0.21)	0.007	95	0.11
-0.514 (-1.275, -0.226)	0.005	98	0.12
-0.488 (-1.229, -0.221)	0.005	106	0.13
-0.46 (-1.2, -0.216)	0.005	110	0.14
-0.418 (-1.19, -0.228)	0.004	118	0.15
-0.373 (-1.167, -0.226)	0.004	125	0.16
-0.348 (-1.143, -0.207)	0.005	127	0.17
-0.32 (-1.118, -0.195)	0.005	134	0.18
-0.29 (-1.103, -0.189)	0.006	139	0.19
-0.265 (-1.076, -0.176)	0.006	145	0.2

The table shows RD estimates for the effect of Republican gubernatorial victories on informal enforcement, estimated using bandwidths from 0 to 0.2 of proportional vote margin. The dependent variable is the change in logged count of annual actions taken during each year of a governor's term.

B.0.5 Randomization-Based Analysis of Gubernatorial Influence

Since gubernatorial elections only occur every four years, my analysis includes a small number of elections and an even smaller number of close elections. As a robustness check for the analysis of gubernatorial control, I complement the RD with randomization inference, a statistical technique designed for hypothesis testing with small samples.

In the randomization-inference framework, the researcher tests the sharp null hypothesis that there is no treatment effect for any unit. Under this sharp null, the potential outcomes for all units are known, since the potential outcome for each unit is the same under the observed randomization of treatment and any counterfactual treatment assignment. Since all potential outcomes are known under the null hypothesis, the researcher can derive the distribution of any test statistic and determine the p-value and confidence interval for an observed test statistic based on this distribution. The distribution of test statistics thus provides a reference distribution through which to determine the probability of observing the effect that was actually observed (Rosenbaum, 2010, Ch. 2), and rejecting or failing to reject the null hypothesis.

To derive the distribution of the test statistic (in this, case, a t-test of difference of means) and test the hypothesis, the researcher simulates all possible random assignments of treatment and determines the probability of observing the observed test statistic, if the null hypothesis is true. Under the additional local stable unit treatment value assumption, the test can be inverted to derive a confidence interval for the size of the effect (Ho and Imai, 2006; Cattaneo et al., 2015; Rosenbaum, 2010). I follow the approach developed by Cattaneo et al. (2015) for applying randomization inference to calculate a p-value and confidence interval in a regression discontinuity setup. I test the sharp null hypothesis that there is no effect on enforcement following the election of a Republican governor. Table B.0-16 and Figure B.0-8 reflect the results and confidence intervals for this difference in means test, estimated using the residualized and first-differenced dependent variable. Figure B.0-6 compares the

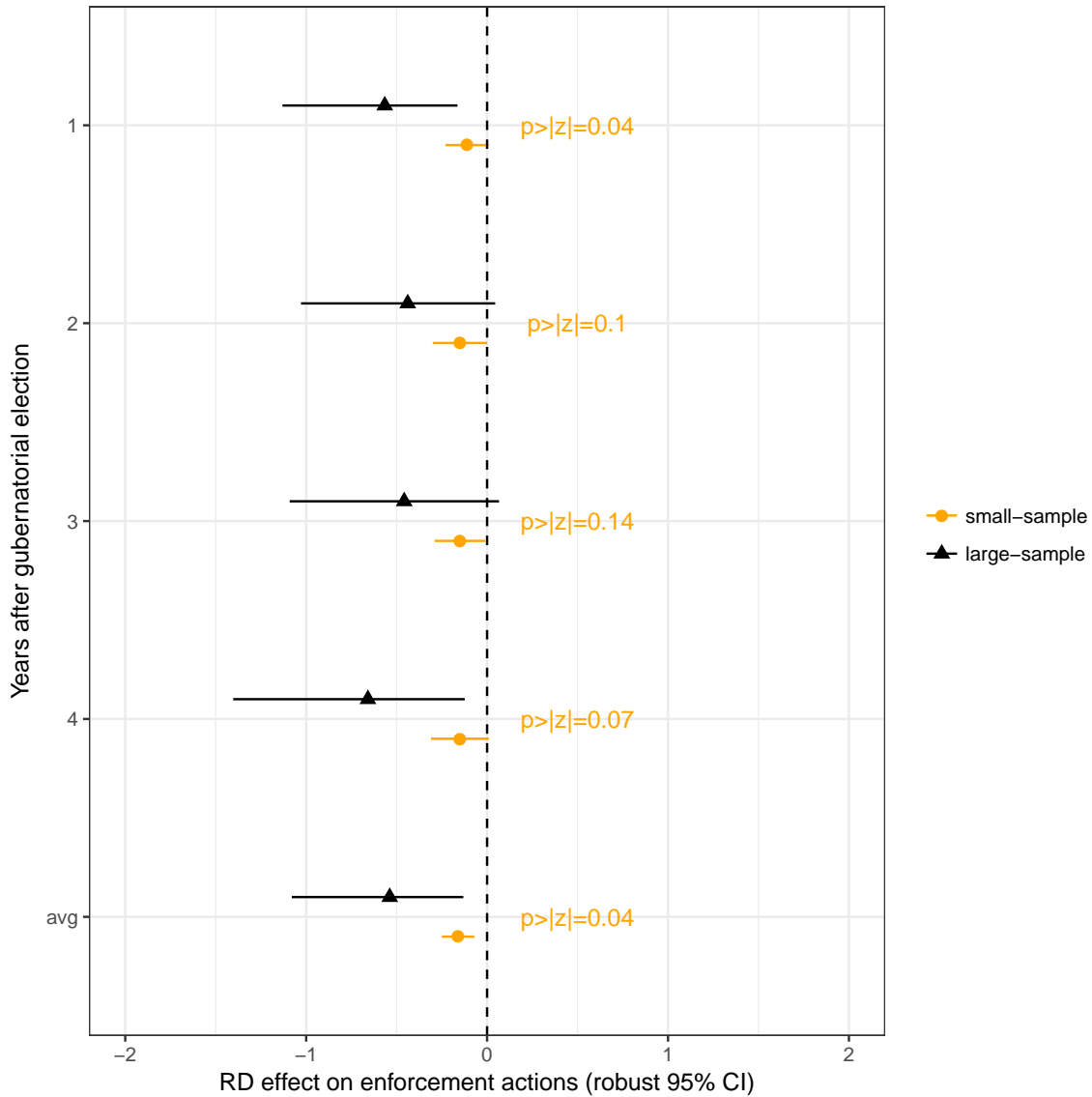
estimates derived using randomization inference and the conventional large-sample RD design. The stricter identification assumption required to apply randomization inference narrows the bandwidth within which the analysis is conducted. This increases the efficiency of the estimates, but also reduces their substantive magnitude. Still, overall the results from randomization inference support the conclusions drawn using the conventional RD.

Table B.0-16: P-values for Fisher’s Exact Test of Effect of Republican Gubernatorial Control on CAA Enforcement

Outcome Variable	Year 1	Year 2	Year 3	Year 4	Average
Total actions (residualized, logged count)	0.0427	0.0977	0.1365	0.0706	0.0373
Total actions (logged count)	0.0421	0.1597	0.3923	0.19	0.0135

This table shows p-values for a difference of means test in a test of the sharp null hypothesis that there is no difference in mean outcomes between Republican and Democratic-led environmental agencies.

Figure B.0-6: Randomization Inference and Large-Sample RD Estimates of Effect of Republican Control of Governorships on CAA Enforcement Actions



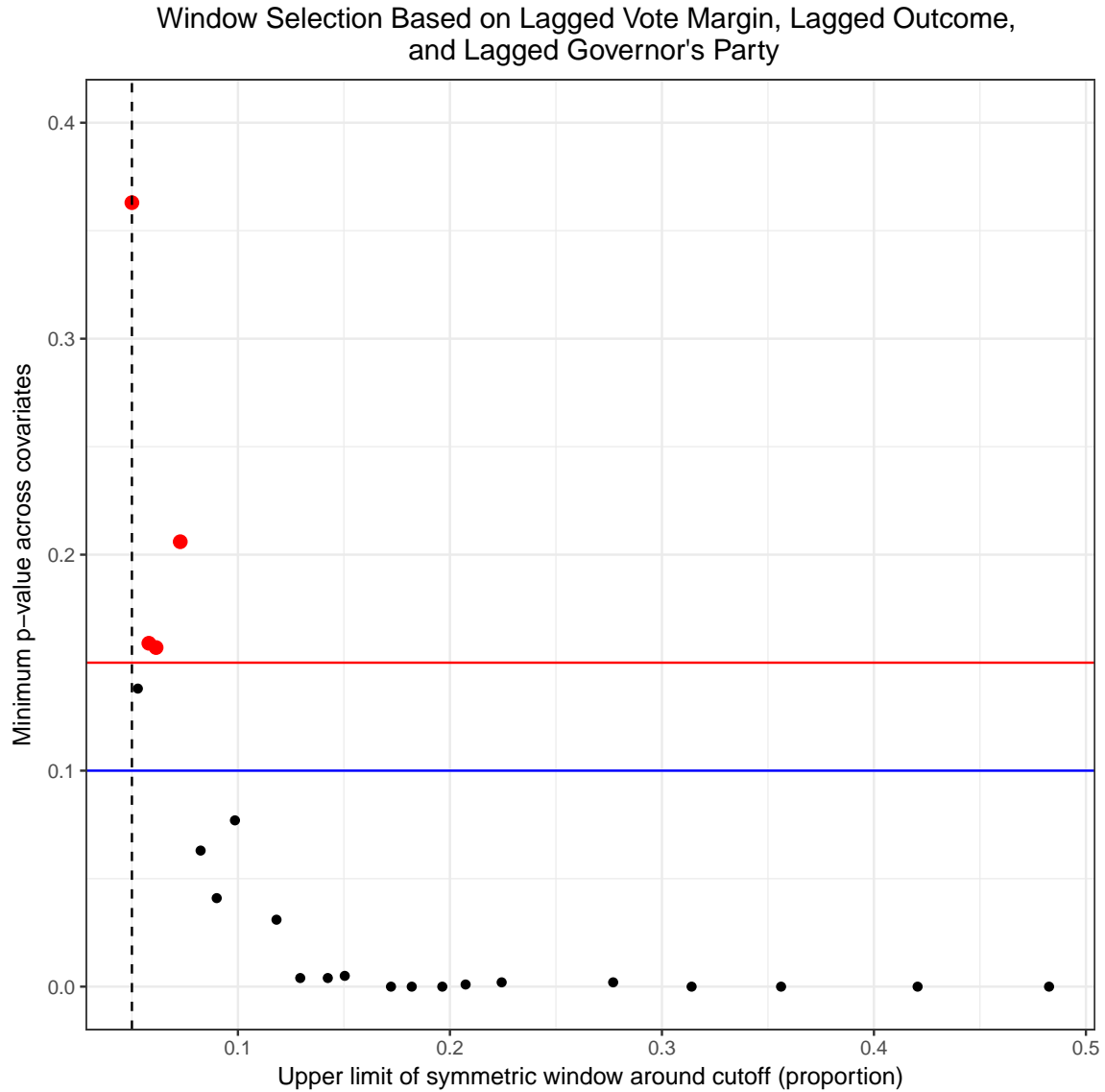
The plot shows the effect of Republican gubernatorial victories on CAA enforcement. The effect was estimated with the `rdlocrand` (Cattaneo et al., 2018) (small sample) and `rdrobust` (Calonico et al., 2015) (large sample) R packages. The large-sample model was estimated using a triangular-kernel local linear estimator, MSE-optimal bandwidth, and robust confidence intervals. The small-sample confidence intervals correspond to a difference-in-means test. The dependent variable is the change in the residuals from a linear regression of the natural log of annual enforcement actions, averaged across the years of a governor's term, on state and year fixed effects and an intercept term.

Applying randomization inference in an RD design rests on the assumption of local randomization of treatment, which is more stringent than the continuity assumption (De la Cuesta and Imai, 2016). When elections are very close, assignment into treatment (Republican victory) and control (Democratic victory) is quasi-random. Quasi-random election outcomes approximates random assignment to treatment in an experimental setting. Random assignment ensures that the distribution of potential outcomes is the same in treated and control groups. This balance assures the researcher that the difference in average outcomes between the two groups is caused by the treatment rather than systematic differences in background variables between the two groups.

To test this assumption and select the bandwidth for the randomization-based RD analysis, I use a procedure that is similar to the robustness checks used to examine the validity of the continuity assumption in large-sample RDs. I test for balance in the same pre-treatment covariates and placebo outcomes used to test the continuity assumption in the large-sample RD models. I then select the largest window within which I cannot reject the null hypothesis of no difference in means in pretreatment covariates and placebo outcomes between treatment and control groups. I use a confidence level of 85% for this test, under the logic that the greater danger is in committing Type II error in bandwidth selection (Cattaneo et al., 2015). Failure to reject the null hypothesis provides evidence that the local randomization assumption holds within a given window around the treatment-assignment threshold. To avoid mistakenly conducting the analysis within a bandwidth where there is imbalance across pretreatment covariates, I set a significance level that makes it more difficult to fail to reject the null hypothesis (Cattaneo et al., 2015). Figure B.0-7 shows the p-values associated with a series of difference-of-means tests for windows of varying widths across the treatment-assignment thresholds, along with the bandwidths used for the randomization-based RD. I use the widest bandwidth within which I can reasonably rule out imbalance on all of the pretreatment covariates and placebo outcomes, with $\alpha = 0.15$.

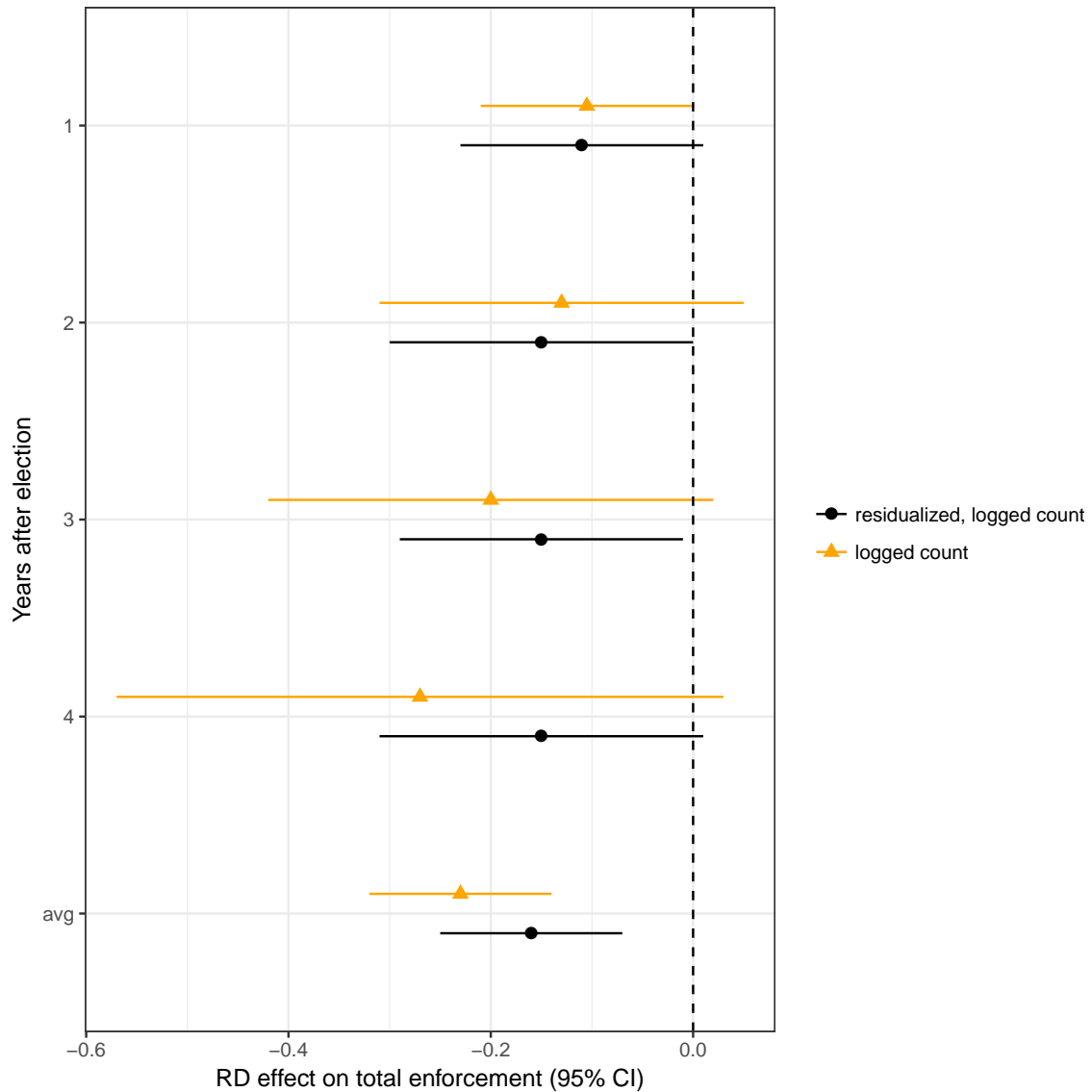
B.0.6 Bandwidth Selection for Randomization Inference

Figure B.0-7: Bandwidth Selection for Randomization Inference-based RD Analysis of Effect of Republican Gubernatorial Control on CAA Enforcement



The plot shows the minimum p-value for difference of means tests used to verify the local-randomization assumption and choose a bandwidth for RD analysis using randomization inference. The groups are defined by the treatment-assignment threshold (50% vote share), and each point reflects the minimum p-value for a difference in means test between treated and control groups on the same covariates used to test the validity of local randomization in the large-sample RD. These are the previous election's margin, the outcome variable lagged by one year, and the prior governor's party.

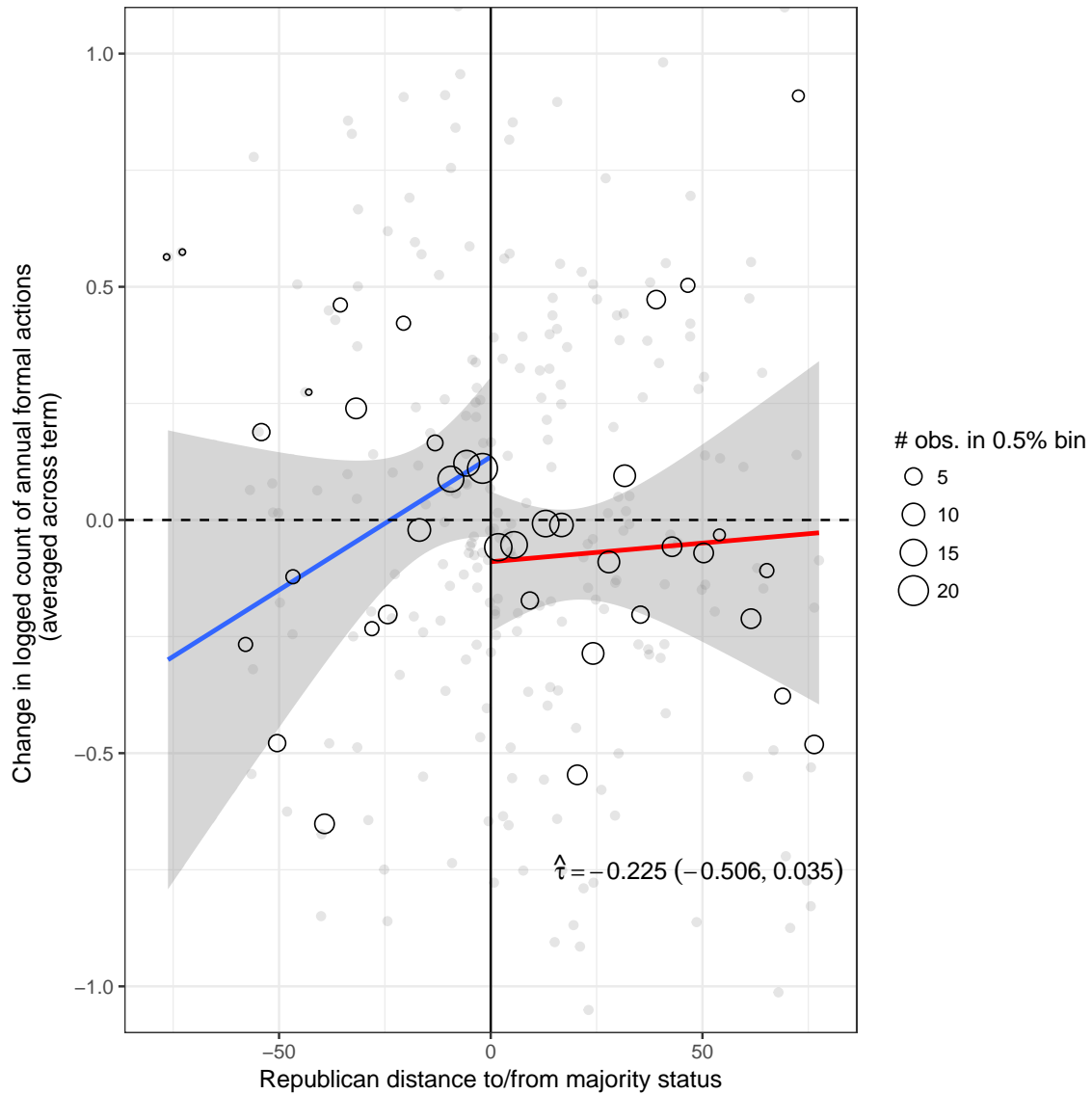
Figure B.0-8: Randomization Inference: Effect of Republican Control of Governorships on CAA Enforcement Actions



The plot shows 95% confidence intervals for the difference of means in enforcement activity between Republican and Democratic governors elected with +/- 5% vote margins. The confidence intervals were calculated using the rdlocrand package (Cattaneo et al., 2018). The dependent variable is the change in annual enforcement actions taken one, two, three, and four years after an election, and averaged across gubernatorial terms.

B.0.7 Results: State Legislatures

Figure B.0-9: Effect of Republican Control of Governorships on CAA Enforcement Actions



The plot shows the effect of Republican statehouse majorities on CAA enforcement. The effect was estimated with the `rdrubust` (Calonico et al., 2015) R package, using a triangular-kernel local linear estimator, MSE-optimal bandwidth, and robust confidence intervals. The estimate is significant at the 90% confidence level.

Table B.0-17: Results Derived from Residualized, Logged Count

Years after election	Estimate	Pr > z	Eff. N	BW
Total Actions				
1	-0.058 (-0.304, 0.167)	0.567	233	57.705
2	-0.088 (-0.391, 0.206) (-0.456, 0.26)	0.544	203	46.758
Avg.	-0.023 (-0.271, 0.235)	0.888	205	45.403
Informal Actions				
1	0.019 (-0.351, 0.381)	0.935	211	50.181
2	0.013 (-0.445, 0.45)	0.992	215	51.442
Avg.	0.039 (-0.356, 0.416)	0.879	208	48.425
Formal Actions				
1	-0.227 (-0.542, 0.051)	0.104	239	68.611
2	-0.224 (-0.543, 0.048)	0.101	226	60.731
Avg.	-0.225 (-0.506, 0.035)	0.088	253	78.636

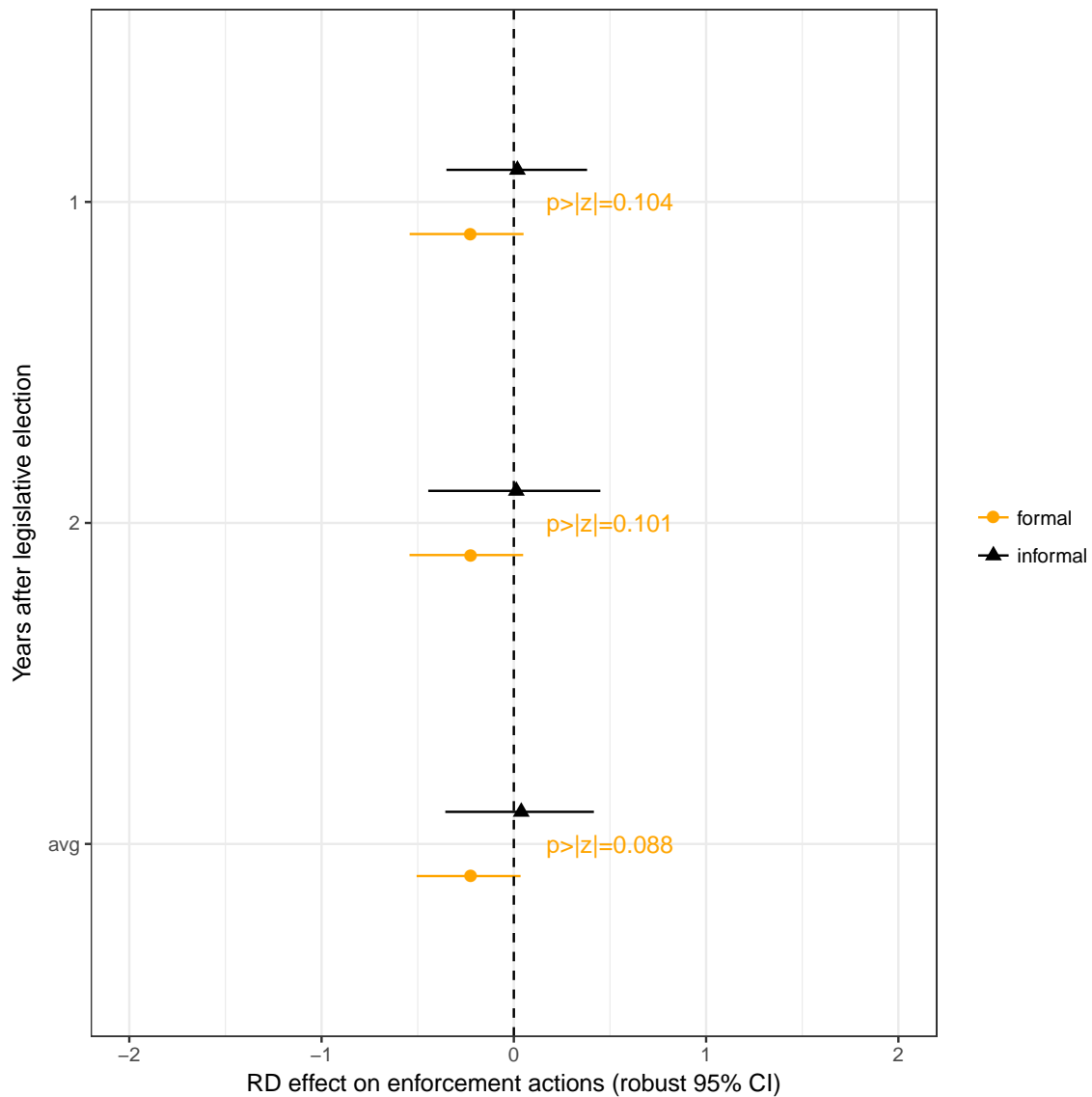
Effect of Republican victory on annual enforcement actions, from 1-2 years after an election, and averaged across legislative sessions. The effect was estimated using the `rdr` package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The dependent variable is the change in residuals from a fixed effects regression with state and year fixed effects on the natural log of annual enforcement actions.

Table B.0-18: Results Derived from Change in Logged Count of Enforcement Actions

Years after election	Estimate	Pr > z	Eff. N	BW
Total Actions				
1	-0.047 (-0.294, 0.177)	0.626	233	58.724
2	-0.08 (-0.469, 0.332)	0.738	229	56.326
Avg.	-0.012 (-0.257, 0.238)	0.94	211	48.243
Informal Actions				
1	0.037 (-0.313, 0.389)	0.832	217	53.998
2	0.089 (-0.379, 0.62)	0.637	219	53.217
Avg.	0.054 (-0.323, 0.429)	0.783	213	49.929
Formal Actions				
1	-0.222 (-0.54, 0.07)	0.131	245	74.521
2	-0.218 (-0.606, 0.157)	0.248	237	68.056
Avg.	-0.239 (-0.537, 0.033)	0.083	252	76.653

Effect of Republican statehouse majority status on the change in annual informal enforcement actions, from 1-2 years after an election and averaged across the legislative term. The effect was estimated using the rdrobust package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The dependent variable is the change in the natural log of annual actions.

Figure B.0-10: RD Effect of Republican Control of State Legislatures on CAA Punitive Actions, Large-Sample RD



Effect of Republican legislative victory on the change in annual enforcement actions, in the first two years years after an election. The effect was estimated using the `rdrobust` package (Calonico et al., 2015), using a triangular-kernel local linear estimator, MSE-optimal bandwidths, and robust confidence intervals. The dependent variable is the change in residuals from a two-way fixed effect regression of the natural log of annual actions on state and year fixed effects.

Table B.0-19: Point estimates and confidence intervals at various bandwidths

Estimate	Pr > z	Eff. N	BW
-0.101	0.636	75	10
(-0.565, 0.345)			
-0.19	0.583	124	20
(-0.582, 0.327)			
-0.166	0.457	158	30
(-0.583, 0.262)			
-0.18	0.442	189	40
(-0.549, 0.24)			
-0.232	0.543	213	50
(-0.481, 0.253)			
-0.255	0.39	230	60
(-0.49, 0.191)			
-0.243	0.198	243	70
(-0.537, 0.111)			
-0.222	0.097	255	80
(-0.574, 0.047)			
-0.194	0.054	267	90
(-0.589, 0.006)			
-0.175	0.053	278	100
(-0.572, 0.003)			
-0.168	0.072	286	110
(-0.539, 0.024)			
-0.163	0.088	291	120
(-0.519, 0.036)			
-0.161	0.1	294	130
(-0.503, 0.044)			
-0.162	0.12	299	140
(-0.482, 0.055)			
-0.163	0.137	303	150
(-0.466, 0.064)			
-0.158	0.131	305	160
(-0.462, 0.06)			
-0.156	0.144	307	170
(-0.452, 0.066)			
-0.155	0.153	308	180
(-0.446, 0.07)			
-0.155	0.157	309	190
(-0.44, 0.071)			
-0.155	0.164	313	200
(-0.429, 0.073)			

The table shows RD estimates for the effect of Republican state legislative majorities on formal enforcement, estimated using bandwidths from 0 to 20% of the range of the running variable. The dependent variable is the change in residualized, logged count of annual actions taken during each year of a legislative term.

Table B.0-20: Sense of Place, Interpretation of Impacts, and Evaluation of the Projects

Sense of Place / Scale of Place Attachment	Anchor	Perceived Impact and Objectified Value	Evaluation
Economic Identities			
Local, national, progress and	aging power lines	benefit: need: upgrade grid	opportunity
	local electrification		
	HVDC power lines in NY	safety: low safety risk	
Industry and commerce, trajectory of decline and recovery	manufacturing jobs	benefit: future jobs, manufacturing recovery	opportunity
Agriculture, trajectory of decline and recovery	land prices, crop prices, 1980s farm crisis	benefit: compensation payments as land "rents"	opportunity
National, agriculture	electricity provision, food provision	service: grid expansion	opportunity
Local, agriculture	local distribution lines	need: local electricity	threat
Agriculture, trajectory of hard-fought progress	"traveling circus" of construction jobs	(non) benefit: non-local, temporary jobs	threat
	power poles obstructing fields	cost, distributive justice: inconvenience to farmers, lost value of farmland	
Agriculture, energy	oil and gas extraction	benefit, need: expanded oil and gas development	opportunity
	oil and gas well site training programs	benefit: pipeline construction jobs	
	negotiation with developers	benefit: generous compensation to landowners	
Local, state, national, energy	oil and gas extraction	security: independence from foreign oil and gas	opportunity
Community aesthetics			
Suburbs, nature, home	pipeline construction process	cost: damaged natural areas	threat
	property devaluation	community cost: tax revenues decline	
		individual cost: property values decline	
Rural-industrial	power lines, substation, pipelines	(non) cost: no decline in property values	opportunity
		benefit: tax revenues increase	
		benefit: cut property tax rates	

This table shows the symbolic meanings and anchors through which respondents perceive project impacts and evaluate them as threats or opportunities.

Table B.0-21: Scale of Place Attachments and Symbolic Meanings: Respondent Frequencies

Code	Pipeline		Power Line	
	Oppose (%)	Support (%)	Oppose (%)	Support (%)
Geographic scale				
Global	0	40	0	11
Local	100	100	100	100
National	0	100	0	33
State/regional	25	100	50	67
Meaning				
Autonomous	NA	NA	25	0
History	33	80	25	56
Home	67	40	50	33
Nature	67	40	38	11
Producer	33	100	100	89
Agriculture	33	80	100	56
Commerce/industry	0	80	13	67
Energy	0	100	38	22
Progress/modernity	0	100	0	44
Resilient	NA	NA	25	11
Rural-industrial	0	80	25	33
Service	NA	NA	0	33
Suburban	67	20	NA	NA
Vulnerability	33	40	50	44
Poverty	33	40	25	11

This table shows the percentage of project supporters and opponents in each case site who express each symbolic meaning. Some meanings are not expressed by any respondents for one of the sites; these are reflected as “NA” values.

Table B.0-22: Scale of Place Attachments and Symbolic Meanings: Code Frequencies

Code	Pipeline		Power Line	
	Oppose (%)	Support (%)	Oppose (%)	Support (%)
Geographic scale				
National	0	21	0	22
Local	92	49	90	76
Global	0	4	0	4
State/regional	8	72	7	16
Meaning				
Progress/modernity	0	31	0	18
Capitalist	NA	NA	0	3
History	5	13	8	11
Home	27	5	18	5
Law and order	NA	NA	0	2
Nature	23	3	11	2
Outdated	NA	NA	0	3
Producer	14	69	66	52
Agriculture	14	19	55	34
Commerce/industry	0	10	3	20
Energy	0	58	8	3
Autonomous	NA	NA	8	0
Resilient	NA	NA	8	2
Rural-industrial	0	21	5	8
Suburban	36	2	NA	NA
Service	NA	NA	0	10
Steward	NA	NA	0	2
Underdog	NA	NA	3	0
Unified	NA	NA	5	0
Vulnerability	9	11	21	16
Poverty	9	8	5	2

This table shows the frequency with which we used each symbolic meaning code for each project, and thus provides a sense of the frequency and intensity with which respondents identify various meanings with their communities. Each cell reflects the percentage of total symbolic meaning code applications that were applied to each code. “NA” values indicate that no respondents express a particular geographic scale or symbolic meaning in the interviews.

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