Out of Sight, Out of Mind? Exploring the Effect of Distancing of Climate Change in Support for Green Policies with A Survey Experiment

By

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Abstract

How can exposure to different geographical scales of possible implications of climate change affect people's support for environmental policies? This study seeks to answer this question by employing an experimental research design. The first survey experiment (N=2038) was conducted in the US, it included exposure to the textual frames, which mimicked the snippets of speech by members of Congress. As the initial survey failed to identify any significant treatment effect, a second survey (N=1241) with a modified questionnaire was conducted in the US as well. The treatment condition included an open-ended question, which asked the respondents to outline the environmental problems on three levels – global, national, and local. Findings reveal that viewing climate policy as the primary prerogative of local governments corresponds with stronger opposition to climate policies.

Acknowledgments and Dedications

I dedicate this thesis to my family. Both to my birth family at home and my found family all around the world.

The last two years have been extremely eventful, tragic, and painful both for the world as a whole and my home country specifically. Just so it happened that it also coincided with me getting a Master's degree at the same time. Not going to lie, it has been quite a journey, with a lot of ups and downs, but I am endlessly thankful for all of the support that I have received from the CEU community as a whole and my closest friends specifically, you know who you are. I am really happy that I ended up where I am right now.

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The Puzzle

Rapidly worsening environmental conditions all around the world are the sad reality that we are living in. The changing climate dramatically threatens the stability of ecosystems, infrastructure, and overall human well-being. Intergovernmental Panel on Climate Change calls for decisive societal action in response to climate change, as more than a decade ago it has been proven that the scientific community is univocal on the issue of global warming: it is happening (IPCC 2007).

However, in public discourse climate change is still a very partisan topic. While most of the public acknowledges that the climate is changing and they are witnessing it in their own day-to-day life (for instance, in weather conditions), the opinions on the nature of this change, and whether anything on the state-level should be done about it remains divided (Fairbrother, Johansson Sevä, and Kulin 2019; Lachapelle, Borick, and Rabe 2014; McCright, Dunlap, and Marquart-Pyatt 2016). The gap between scientific knowledge and public awareness on the issue is one of the biggest challenges for the field of climate change communication, as it diminishes the discussion on potential climate action policies. An extensive body of scholarly work has been dedicated to this issue (Barr, Gilg, and Shaw 2011; Dovers 1995; Lorenzoni, Nicholson-Cole, and Whitmarsh 2007; Sharples 2010).

Some explain the differences among perceptions on the climate issue by analyzing the socio-demographic factors. It has been shown that in the countries all around the world those who support climate policies tend to be more left-wing, younger, and living in urban areas (McCright and Dunlap 2011a; Schumacher 2014). While this knowledge is substantial, it does not provide us an understanding of how can we take urgent action towards the mitigation of climate change in an effective way with the means of democratic institutions. The fact that the issue of climate change is extremely multi-layered does not make the task easier – the complexity is getting broken down to heuristics and cues, which voters rely on, although this simplification leads to

the growing level of politicization and polarization on the issue of climate policies (Guber 2017).

Is there any way to communicate the climate crisis more effectively? Are there any specific topics and dimensions within the environmental crisis issue that might seem more appealing to voters?

Introduction

The issue of climate change has become an important political matter. As the possible ramifications of changing the global environment are very much likely to be immediate, devastating, and irreversible, it is crucially important to work out the ways of productively communicating to citizens the message of urgent mitigation of the ecological crisis. One of the most effective ways of doing it is working out an effective strategy of communication of climate policy, so it can inform people's voting decisions.

Existing research focused on the psychological effects of framing climate change, using the attitudes and changes in everyday behavior, such as consumer choice or whether people recycle or not as an outcome variable. However, this evidence does not provide an empirical explanation for the mechanisms behind the climate policies' support. One of the key determinants of the preference for climate policy outlined in the existing literature is the persistent effect of the left-right ideology, where the consensus is that more left-leaning individuals indicate a strong preference for climate policies and right-leaning individuals oppose it (Harring and Sohlberg 2017; McCright, Dunlap, and Marquart-Pyatt 2016). The key division in those preferences lies within the attitudes toward the economy and overall preference for a "smaller government", which does not pose additional restrictions, coming from the conservative side of the political spectrum.

It would be natural to expect a high level of salience of environmental issues in recent years, as the UN is issuing and promoting scientific reports, which highlight the urgency of the problem (United Nations 2021). Numerous countries worldwide experience the direct negative effects of changing climate – from deadly devastating floods in Germany in the summer of 2021 to worsening with each year forest fires on the West Coast of the US to destructive floods in India causing loss of lives, livestock, and infrastructure. However, amid the COVID crisis and

unfolding negative economy-related implications from it, climate change seems to appear an issue of very little concern, as is indicated by the polls (Gallup Poll 2020).

However, it is no surprise that the issue of weight and salience is affecting the change in people's attitudes and their readiness to support candidates, parties, and policies. So, it is only natural to expect that a more pressing issue causes people to adjust their beliefs and behaviors. An important question that arises here is how salient is the climate issue in the eye of the public? And because the environmental conditions are objectively worsening all around the world – how threatening does climate change have to become so people are willing to support climate policies?

Some of the existing studies demonstrate that people living in the regions that have witnessed climate extremes, tend to demonstrate a higher level of support for Green parties, however, this relationship is moderated by income level (Hoffmann et al. 2022). In other words, having a first-hand experience of climate change leads to increased support for climate action, but only given favorable economic conditions.

In my study, I plan to break down this issue further. Using the experimental research design, I examine whether highlighting the scope of climate change with framing – be it a local problem or a global-scale catastrophe affects support for climate policies on three dimensions – support for renewable energy, taxation for pollution, and policy implementation timespan. The study fielded a large online survey experiment, which was implemented in the US in December of 2021. The respondents were asked to read short snippets of speeches of Democratic politicians talking about climate change. In the first treatment group, the speech highlighted local consequences of climate change (on a state level – the snippet included the name of the respondent's state of residence as indicated earlier in the questionnaire). In the second treatment group, climate change was described as a global problem. Unfortunately, this type of research setup did not yield the expected results. For that reason, the second survey which included a

collection of descriptive type of data was conducted. It asked respondents to think of the most important climate change implications for the respondents from the US on the state, national and global levels. Collection and analysis of that type of data helped me to evaluate where did my initial theoretical expectations go wrong.

This thesis will be structured as follows. The first chapter contains a review of existing literature on the topic. It contains three main categories – a review of the literature on support for environmental policies, research on framing climate change, and an overview of the body of work on the causal mechanism of framing. Then, I describe the research design of the two surveys that were fielded as a part of the presented study. Afterward, I discuss the results of both surveys. In conclusion, I summarize the implications and possible limitations of my research.

1. Overview of Existing Research

1.1. Explaining Support for Environmental Policies

Like any other policy, support for climate action can be explained through various approaches to voting behavior. In this section, I will discuss how the sociological approach, socio-psychological approach, and retrospective voting can help us understand the support for climate policies. I will try to draw the strengths and limitations of each approach as well as empirical evidence. Additionally, I will discuss the international modes of climate policy regulations and the public support for them.

One of the existing mainstream frameworks that explain voting behavior is the sociological approach, which originated from Columbia school and got initially conceptualized by Lazarsfeld and Berelson. The main idea behind this approach is that voting behavior can be explained by social identification and political predispositions. Therefore, to understand the voting patterns and intentions from that standpoint we just have to identify the main existing groups and cleavages within a society and that will allow us to make predictions about voting preferences.

The sociological approach is prevalent in explaining green voting. It provides a pretty straightforward explanation for environmental policies support – people vote for respectful policies and candidates because there are growing sociological and demographic groups that tend to support them. For instance, it has been widely shown that the Green electorate consists mainly of young people with a high level of education (Franz, Fratzscher, and Kritikos 2019; Schumacher 2014), who tend to live in the urban areas and who are less tied to the Christian church (Dolezal 2010). The reverse trend has also been proved by the empirical research by establishing a "white male effect" when it comes to climate attitudes. Survey data analysis shows that white conservative males are more likely to be strong climate denialists than all of the other demographic groups (McCright and Dunlap 2011a).

An alternative to the sociological approach is a socio-psychological view of voting behavior, also known as the Michigan school. It posits that most of the core political attitudes are formed in adolescence and they tend to be mostly stable. In that sense, voting for a certain party, candidate or policy is not merely the act of voting, but also a big part of one's identity. So, in that approach, if we know with which party a citizen identifies, then we can predict candidate evaluations, policy issue preference, and vote choice. When it comes to climate-oriented voting behavior, it has been shown that the Green vote is very much an "inherited" one – if parents voted for the Greens, their children are very likely to vote in the same manner. What also matters is the prevalence of altruistic behaviors in a community, with co-workers, and within the neighborhood (Videras et al. 2012).

While the sociological approach can help us to understand which groups of the population are more susceptible to environmental messaging, socio-psychological focused research allows us to outline important individual-level predictors of engagement with the topic. That, in turn, can help to raise awareness more effectively. In line with that mission, the meta-analysis of international surveys shows that a psychological construct – consideration of future consequences – predicts the climate attitudes better than most traditional determinants of pro-climate sympathies such as income and education (Beiser-McGrath and Huber 2018).

However, an explanation of environmental policy support purely through psychological factors and values might seem too simplistic and reduce the whole problem to the individual level. In line with that critique, political science offers to view the climate action problem through the lens of collective action. The empirical analysis in that vein has demonstrated that people's support for pro-climate policy instruments (specifically, taxation) is strongly dependent on their level of political trust (trust in politicians and existing institutions) and their trust in other citizens (Harring and Jagers 2013). A natural implication of these findings is that

we have to build stronger local communities and ensure people's high level of both political and interpersonal trust if we want to build a more sustainable world.

Additionally, viewing the problem of climate change through collective action problem can help us see the respective policies in a more complex way. For instance, a study by Stokes points out a peculiar feature of climate policy preferences – they are very much spatially distributed (2016). Analyzing the implementation of the Green Energy Act aimed at the development of wind energy infrastructure in Ontario, Canada, she discovers that citizens retrospectively punish governments for policies with concentrated local costs and diffuse public benefits. The natural experiment shows that while the large majority quietly supports the implementation of climate policies, a vocal minority of mobilized local opponents is punishing the incumbent government for the wind projects. This minority can even force the incumbent to abandon the policy in the area altogether and move it to the communities with a lower level of wealth and social capital.

Climate policies usually lead to shared public benefit, whereas the cost of the policy falls on the shoulders of the non-exempt. Bernauer and McGrath analyzed the implementation of the "odd-even" rule in Delhi, India (2016). The goal of that regulation is to reduce individual car usage in big cities and incentivize people to use public transport and other more environmentally friendly ways of transportation. According to that rule, private cars with odd numbers are allowed on the road three days a week, and for those with even numbers – the other three days, no rules applied on Sundays. Women and people who are using two-wheeled transport were exempted from the rule. Therefore, the private cost was on male car owners, which lead to wide public benefit – clean air. That policy set allowed to test what exactly drives policy support and opposition for the non-exempt. Their findings showed that support for the policy was surprisingly high and robust among non-exempt. However, the support went down when they were told about the exemptions, but there was no erosion based on the information

that exemption reduces policy effectiveness. The authors conclude that policy efficacy is not as important to non-exempt as the perception of fairness is the main driver behind the policy support.

One of the most promising policy solutions to growing CO_2 emissions is the taxation of carbon. The logic of it is quite simple – it requires emitters to pay the tax on a progressive scale in line with the amount of pollution that they produce (Center for Climate and Energy Solutions 2022). Despite its simplicity and effectiveness, politicians are hesitant to implement or even discuss it, since it is natural to expect citizens to be strongly opposed to the introduction of an increase in taxes. To move past this contradiction, policymakers have shifted the taxation from increased taxation to increased revenue, which, in turn, can be used to benefit citizens. That mechanism of bringing the revenue from taxation back into society has coined the term revenue recycling. A cross-national comparative survey of the US and Germany has shown that citizens of both countries are in favor of revenue recycling, but that indication of support is conditional on whether other industrialized countries are ready to adopt similar taxation schemes (Beiser-McGrath and Bernauer 2019b). The highlighted mechanism within the study shows an interesting dynamic of how people's willingness to pay corresponds with their perception of what policies are being implemented in other countries.

Since the perception of what other countries are doing in their attempts to fight climate change is important for citizens in shaping their attitudes on domestic environmental policies it is important to consider the international realm of the problem, when unpacking the issue of respective policy support. The first big international treaty to mitigate the effects of climate change was the 1997 Kyoto Protocol. It used the approach of traditional international diplomacy by enforcing legally binding commitments on the principles of a fair share of costs and burdens. Despite being an international treaty, the nature of the Kyoto protocol and the backlash to it has shaped a big share of public attitudes towards the climate. For instance, the majority of

conservative climate change denialist rhetoric as well as hard sponsorship of think tanks that produced reports proving that global warming is a hoax was due to the Protocol. The vocal conservative backlash was one of the main reasons why the US never signed the treaty, and the initial public debate around it has shaped the way the discussion around it exists in the public sphere to this day (McCright and Dunlap 2003).

The later 2015 Paris Agreement offered a completely different operational framework, as it operates based on internationally coordinated and monitored unilateralism, meaning that states act predominantly without regarding the interests of the other players (Bernauer et al. 2016, 153). Bernauer et al. fielded a survey in China – the world's biggest greenhouse gas emitter – in an attempt to access how the public perceives the changes in international regulations (2016). Their findings demonstrate that the public expresses strong and almost univocal support for the Paris-style unilateral way of management of climate policies, which means that the present global regime of regulations of climate policies aligns with people's preferences.

Additionally, it has been shown that exposure to the information on the other countries' failure to achieve climate goals does not lower the support for the climate agenda (Beiser-McGrath and Bernauer 2019a). Overall, even though it seems slightly counterintuitive, the public seems to support the unilateral approach to global environmental policies. McGrath and Bernauer are also explaining a causal mechanism behind this particular type of support. They claim that when it comes to climate, people tend to be driven by a range of existing personal predispositions and considerations of possible costs, which brings us back to the psychological approach to the understanding of green voting preferences (McGrath and Bernauer 2017).

In this section, I have tried to unpack the main approaches to understanding pro-climate policy preferences. While sociological and psycho-sociological approaches are prevalent, they tend to reduce the argument to the characteristics of particular parts of the demographic or to the individual level. An analysis from the rational choice perspective reveals puzzling patterns

of voting and supporting climate policies worldwide. That includes retrospective voting (for punishing the local incumbents for costly climate policies), prioritization not effectiveness, but the fairness of a certain policy, as well as the importance of political and interpersonal trust in shaping the support for climate action. Speaking of the global realm, the existing unilateral approach to global climate regulation introduced by the 2015 Paris Agreement seems to align with the public's preferences. In the next section, I will talk about how the framing of specific environmental policies and campaigns shapes the public's attitudes towards them.

1.2. Framing Climate Change: Existing Research

The issue of climate change has become increasingly salient in the past several years. Generally, it has been pointed out that the use of media frames that make people less supportive of climate change is on a steady decline and the frames that promote public engagement on the ecological issues are used more and more often (Nabi, Gustafson, and Jensen 2018). One tactic of engaging people with the issue is the use of alarmist language, which mostly focuses on emphasizing danger and fear (Stecula and Merkley 2019). Another way of doing it – and we can see it being employed extensively in the media around the world – is to build the discussion around scientific observations and appeal to "hard evidence". However, the general public finds scientific information unavailable and sometimes even incomprehensive – that is why media plays an important role in shaping public perception of climate change (Sharples 2010).

When environmental issues become an inseparable part of the media landscape, they get intertwined with other salient issues on the agenda, i.e. it competes with other topics on the agenda for the issue space. First of all, climate change competes with the other issues in political and media discussion. Therefore, if the issue space is limited, there might be no place for the environment (Brulle, Carmichael, and Jenkins 2012). Climate change is also often placed at the center of the current political discussion. In that context, it is usually contrasted with the economic perspective (i.e. "How are we going to pay for the sustainable policies?") and, in turn,

partisan affiliations (Shehata and Hopmann 2012). A great example of this is American Green New Deal, which sparked wide discussions not only about the climate but the economy as well and led to distinct party polarization on the issue (Gustafson et al. 2019).

A deeper look into how polarization within the climate agenda operates reveals that one of the key forces seems to be moral predispositions. A Series of experiments shows that liberals did not change their beliefs regardless of the moral framing of climate change, whereas the conservatives responded very positively when the value of protecting the environment was framed as a moral problem, relating to the respect for the authority (Wolsko, Ariceaga, and Seiden 2016).

The media landscape, in turn, is shaping the public attitudes by emphasizing certain repercussions of climate change and activating certain emotions. Sentiment analysis of the major American newspapers reveals that different papers appeal to different emotions, but the top-3 are trust, anticipation, and fear. The author concludes that the episodic framing of climate change, amplified by the media's tendency to personify and dramatize the events, prevents the news outlets from reporting the larger context behind the climate crisis (Patronella 2021).

However, the importance of solely media coverage of an issue might be overstated. An extensive study of Americans' public opinion towards climate change shows that media coverage of the issue, by and large, has a positive effect on the perceived public importance of the issue. Though, media coverage, in that case, is a function of elite cues and economic factors. Therefore, what plays a principal role in raising the public concern about the environment is the partisan clash and direct political communication employed by the elites (Brulle, Carmichael, and Jenkins 2012). Additionally, a cross-national analysis of media coverage of different global governance forums shows that the discussion of the event in the press is going to be limited or completely absent if top politicians of the state are not attending the meeting

(Karlsson-Vinkhuyzen, Friberg, and Saccenti 2017). Therefore, political elites play an important role in shaping public perception of climate change.

As I have discussed at length in the previous section, the climate crisis is a very complex problem and solutions to it always create a situation where the cost of policy implementation falls on particular groups within a society. That is why it is important to explore the effects of framing climate change in terms of gain or loss (i.e., what opportunities the fight against environmental crisis opens versus what damaging consequences it brings) and how it shapes the perception of the problem. It is shown that the gain frame has a strong positive impact on the perceptivity of climate issues. Another pair of frames that the authors controlled for – and which is especially relevant for this study – is the variance in how distant the problem is presented to be. Authors conclude that focusing on the distant consequences of climate change emphasizes the importance of the mitigation of the issue, but in that case, it is hard for the people to attribute the personal benefits which might come from the environmentally-friendly actions in that case (Spence and Pidgeon 2010).

The study by Spence and Pidgeon is extremely relevant for my research, as they are testing the relevant hypotheses in their work. While our studies have a lot in common in terms of research design – they are also testing the effects of framing of climate change on people's attitudes towards it, they are also used textual frames in the experimental setting and their study was also conducted on an online platform, there are still several differences. First of all, the number of participants that they recruited was relatively small (N=161) and it was in a way a convenience sample – they were recruited among undergraduate psychology students. One of the other disadvantages of their sample is that it was very much skewed gender-wise (22 men and 139 women take part in their study), and it has been shown that gender imbalances can affect the observations of environmental attitudes (Boeve-de Pauw, Jacobs, and Van Petegem 2014), as women tend to express slightly greater concern for the environment than men

(McCright and Xiao 2014). So, while the study by Spencer and Pidgeon is an important theoretical stepping stone for my research, I find it important to advance the framework with a sounder research design and methodological approach.

Apart from individual-level values and social psychology, it is worth considering the foreign policy dimension and its perception when researching climate attitudes. An unexpected and strong predictor in shaping public preference for carbon taxation – an important and contested climate-related cost-benefit problem – is the international dimension. It has been shown that the exposure to the choices of other countries regarding carbon taxation shapes both the support for it and preferences for a particular type of design (Beiser-McGrath et al. 2021).

In the context of perception of climate change rather in terms of gain or loss, a lot of experimental research has been done examining the relationship between general attitudes towards the economy and political institutions and preference for pro-environmental policy. Fairbrother et al. conducted a survey experiment in four culturally diverse countries – Sweden, Spain, South Korea, and China – focusing on how trust towards political institutions shapes attitudes toward future-oriented policies, such as climate-related ones. Their findings reveal that a high level of political trust shapes people's confidence in policy effectiveness and general willingness to sacrifice for others (Fairbrother et al. 2021).

Additionally, a survey experiment aimed at studying the relationship between economic perceptions and views on climate change, established that respondents do not dramatically change their beliefs about climate change when they are first faced with both either negative or positive evaluations of the economy of their country. But negative framing of the economy affects the prioritization of taking urgent action to address climate change (Kenny 2018). The overall takeaway from this study is that economic evaluations do matter, but an emphasis on economic distress before discussing the environmental issues seems to steal the spotlight, as the economy seems to have a bigger issue weight.

However, there is no consistent agreement on whether people tend to prioritize climate change when they are exposed to local or the bigger consequences of the issue, as there is a myriad of ways of operationalizing and measuring those dimensions. One of them is looking at people's physical exposure and proximity to the consequences of changing climate. Cross-national analysis shows that people who live in the countries that are affected by the changing climate emphasize the ecological problems way stronger than people from other countries (Inglehart 1995). Although, people can feel the changes in the climate even in the smallest bits and that, in turn, might shape their attitudes. For instance, there seems to be a correlation between the changes in the weather and public perception of climate change (Egan and Mullin 2012). Although this effect seems to be very small, it is very unlikely that it alone might lead to a public consensus on climate change (Bergquist and Warshaw 2019). However, while the impact of the weather on public opinion seems contested, there is some strong evidence that it affects lawmakers. It has been shown that members of Congress, whose home states experience extreme weather, are much more likely to support pro-climate policy proposals (Herrnstadt and Muehlegger 2014).

The study by Konisky et al. employed cross-sectional survey data to analyze the variation in climate attitudes and how the level of political trust affects it across the geographical scale (global, national, local) and type of the environmental problem (pollution, resources) (Konisky, Milyo, and Richardson 2008). The most relevant of their findings is that the public desires more government action when it comes to local and national pollution issues, interestingly less government intervention when it comes to global natural resources problems. While in its conceptual approach this study is also similar to my research, they are using cross-sectional data (from the 2007 CCES survey) and different dimensions of climate issues

What is crucial in climate communication is a choice of effective strategies that affect not only people's attitudes but behavior as well. Changes in the environment are caused by human

activity, and reshaping everyday practices is an important step in climate change mitigation. For instance, if people have pro-environmental attitudes, they are more likely to consume energy (when it comes to electricity and heating) more consciously by trying to save it or trying to use renewable alternatives (Jakučionytė-Skodienė, Dagiliūtė, and Liobikienė 2020). In a broader sense, it is shown that there is an association between pro-environmental attitudes and behavior, meaning that the attitudes are crucial for the action, however, the former are insufficient by themselves to change the behavior (Casaló and Escario 2018).

In this section, I have tried to touch upon the main aspects of framing climate change literature. I have talked about the framing of scientific information and its perception, issue weight, polarization, and elite cues, emphasizing gains of losses when it comes to mitigation of climate change, the impact of political trust on the perception of environmental problems, as well as international dimension and exposure to direct consequences of changing climate. In the existing body of literature two studies - Konisky, Milyo, and Richardson 2008 and Spence and Pidgeon 2010 – are very similar in their conceptual apparatus and research design to the present study. However, both of them have certain methodological shortcomings, which were discussed at length above. The point of this review was to highlight an existing gap in the literature that the presented project aims to fill – there is no body of research that would highlight the role of the geographical scope of climate change on policy preference. Obtaining this knowledge is crucial, as it is a key step in developing comprehensive climate communication strategies.

1.3. Framing: Causal Mechanism and Implementation in Survey Experimental Research

In this section, I will define framing and explain the mechanism of affecting an individual's preferences and behaviors behind it. I will also discuss how framing is different from priming

and how their effects differ. The practice and challenges of implementation of framing type of treatment in survey experiment design will also be outlined.

In communication, scholarship framing is defined as the following: "To frame is to select some aspect of perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described" (Entman 1993, 391). To put it simply framing operates by highlighting a certain aspect of the presented concept or product to raise the salience of the concept/product in question. Naturally, it is widely employed in marketing, politics, and any sphere that engages in any form of public communication. An example of an issue frame is provided in Table 1 below:

Table 1. (Spence and Pidgeon 2010, 664)

Frame	*Information extracts*
Gain	The mitigation of climate change will prevent further significant warming, which is projected to be greater in the winter in the north and greater in the summer in south and central Europe.
Loss	Without mitigation of climate change, further significant warming will occur; this will be greater in the winter in the north and greater in the summer in south and central Europe.
Local	The warming trend and spatially variable changes in rainfall have affected people all over Britain.
Distant	The warming trend and spatially variable changes in rainfall have affected people all over Europe.

Being at the center of communication scholarship – which encompasses psychology, neurobiology, linguistics, and political science – this concept seems extremely hard to break down and study. More specifically, a deeper analysis of underlying psychological mechanisms behind the decision-making has revealed that even when we talking about very complex choice-making situations – be it voting in an election or evaluating taxation policies, the decisions are usually dependent on 'here-and-now' perspectives, which are very temporal and are subjective to constant change (Tversky and Kahneman 1985). Some researchers even go as far as to claim

that voters usually make decisions relying on very superficial cues – such as the faces and appearance of politicians (Todorov et al. 2005). All of those claims add up to a wider discussion within the field of study of voting behavior. However, we cannot deny the fact that most voters rely on certain cues, which are usually made up of tiny pieces of information – be it just a party logo or a slogan, the appearance of the leader, or a more complex emotional appeal of the campaign. For that reason, framing matters, as it is one of the mechanisms behind the generation of those cues.

The other mechanisms tapping into the provision of information to citizens, which are employed by media outlets, political campaigns, and other means of mass communication, are agenda setting and priming. Agenda setting is characterized by not shaping the attitudes per se, but by making certain events, aspects, and narratives more salient (McCombs and Shaw 1972). In the context of policy preferences, the example of agenda-setting focused research would be an analysis of what policies are predominantly discussed in the media, and which are not, without much connection to the content of that discussion. And this is the core difference between the concept of agenda-setting and priming – the latter is focused on highlighting a certain substantive aspect, while the former is about putting certain issues in the spotlight.

In contrast, the priming hypothesis would read as follows: "[T]he more attention campaigns and the media pay to a particular aspect of political life, the more citizens will rely on that consideration in their political evaluations" (Tesler 2015, 806). A real-life example of priming is a spike in approval of same-sex marriage among the American public after then-President Barack Obama had just made a public announcement in the same vein.

As I have tried to show in this section, agenda-setting, framing, and priming are always mixed, plus, they all take place in very specific and sophisticated political contexts. Studying the effects of framing with a survey experiment is very useful when complex phenomena are at the center of the puzzle. These include the effect of economic downturns on public support for

redistribution (Marx and Schumacher 2016), to what extent does policy design and framing influence public support for renewable energy (Stokes and Warshaw 2017), and how framing can change attitudes to a very complicated and polarizing issue of fracking (Bayer and Ovodenko 2019).

2. Hypotheses

As it has been shown above, a lot of existing research about the effects of framing climate change has used either people's attitude towards the environment or change in behavior as an outcome variable. This implies that most psychological implications of the framing effects have been considered. The present study is focused on how the framing of climate policies can affect policy support.

The main theoretic assumption for this causal relationship arises from existing framing studies that point out that frames can affect public perception by changing what the individuals take into consideration when they are evaluating a policy (Chong and Druckman 2007). In simple terms, if we had single-issue candidates and single-issue voters who are trying to make the decision, we would expect to see a straightforward effect from framing on the votes. In those conditions, the intended influence of frames on public opinion would reflect in people's issue preferences and therefore in voting behavior. However, even in this simplistic setting, we have to consider that apart from the preferences, voters also consider the importance of the given issue in the evaluation of the candidate – otherwise it can be referred to as issue weight.

Climate change is an extremely complex issue, that encompasses the fields of meteorology and natural science, economics, public policy, political trust, and psychology. So, it can be broken down into dozens of aspects and their possible implications. For that reason, I employ multi-dimensional measurement of the outcome of framing, which touches upon some of the most relevant dimensions of climate policies. That will allow me to see and contrast what specific aspects of changing climate appear to be more salient for voters than the others.

My theoretical expectation is that framing climate change as a local problem will increase people's support for more urgent pro-environmental policies. This allows me to draw my first hypothesis:

H1: *Exposure to the local treatment will lead to a higher level of support for more immediate climate policies.*

Additionally, it has been established that if voters have been directly exposed to the consequences of changing climate (extreme weather, droughts, floods, etc.) their support for climate policies and candidates increases (Hoffmann et al. 2022). However, the picture gets more complicated when we consider not candidate or policy preferences, but preferences for environmental taxation. First of all, it has been shown that the preference of American citizens for taxation is not reflective of their general policy preferences (Bartels 2005). Why is that the reason – is a topic of a separate Master's thesis, as there are a lot of underlying factors at play and it is still a debate within political science, which has started with the publication of a beforementioned article by Bartels. Although, when it comes to environmental taxation, it seems that political trust is a strong predictor that shapes preferences for carbon taxation (Fairbrother et al. 2021).

That being said, I have to acknowledge that it is very difficult to measure the preference for climate-related taxation with a couple of survey items. That is why I am most interested in a specific dimension of taxation: my two taxation-related questions are reverse-coded items, which reflect either preference for household-level tax or corporation tax (see Appendix B for exact formulations of the questions). That, in turn, also corresponds with the local and global framing employed in this survey. Because I expect the local treatment to increase the perceived urgency of the problem, I also expect the same treatment to cause changes in people's perception of taxation.

H2: *Exposure to the local treatment will drive up the support for the taxation of corporations.*

The third dimension of my outcome variable is renewable energy. Overall, the American public seems to support renewable energy. According to the Pew Research poll on the topic,

around 89% of Americans generally favor the expansion of solar and wind power (Pew Research Center 2016). So, expecting to see a great variation in attitudes towards renewable energy after being exposed to the treatment would be a naïve assumption. That is why in my outcome variable option I contrast the implementation of renewable energy infrastructure with its cost. And my first and final hypothesis postulates the following:

H3: *Exposure to the local treatment will lead to a willingness to support renewable energy, even if it costs more.*

3. Research Design

This section outlines the contents of the surveys for the research. The first survey is conducted as a battery within a bigger online academic survey in the US. The study is conducted using the online platform Lucid - an online survey panel that collects nationally representative samples for social science research using advanced screening for gender, race, age, and region (Coppock and McClellan 2019), which has recently been widely used in social science research (Ackerman 2019; Simonovits, McCoy, and Littvay 2022; Twenge and Joiner 2020). Both surveys were built and fielded through Lucid's respondent discovery tool Theorem. As the first survey has led me to conclude that the posed hypotheses were not grounded in evidence, I have conducted a second survey, which produced more descriptive data. Unlike the initial survey experiment, the second survey included open-ended questions which tested what events come to respondents' minds when they think about the environmental problems on a local, national and global level. Both surveys were conducted as a battery of a bigger survey, however, the completion length did not exceed 10-15 minutes in both cases to prevent the attrition bias.

Practically, both surveys employ a between-subjects type of research design, meaning that the subjects are randomly assigned to treatment conditions and the subject is experiencing only one of those conditions. Therefore, the difference between the treatment groups is of primary interest for the sake of this research. We can test for the effect of the treatment under the assumption that all other differences between groups are held equal due to random assignment.

However, it is important to point out that while the sampling provided by Lucid is one of the best in terms of quality of sampling among other available online survey platforms, it still carries on all of the problematic sides of that type of data collection. The biggest one is that the fraction of the population that is willing to fill in surveys for modest rewards is not entirely representative of the whole population of the US. The way Lucid is tackling this problem and what makes it different from similar survey companies is that they multisource the suppliers of

respondents, and each of the suppliers has its approach to recruiting and engaging with respondents (Sagoo-Sbrighi 2020). That helps to partially mitigate the self-selection bias that usually entails online surveys.

That being said, I still acknowledge that online sampling and fielding of the survey are far from being perfect and it is very much likely to produce a lot of bias, which in turn will skew the data. For that reason, I try to be careful when generalizing the findings of my research. Although, having an accessible survey tool such as Lucid helps to conduct experimental social research without enormous costs.

Both surveys have started with a short consent form, that informed the respondents about the procedures, anonymity of the data, and contact details of the investigators. If the respondents agreed with the proposed conditions, then they were taken to the attention check, which is inserted to make sure that the respondent is involved and paying attention. The consent form and attention check are presented in Appendix A.

Both survey designs, as well as sample breakdowns, are described in detail below.

3.1. Survey Experiment – Effects of Framing on Policy Preference

The initial survey flow was structured as follows. First, the respondents are exposed to the short pieces of speeches by Democratic Representatives in Congress (the fragments used in a framing experiment were based on the actual speeches of democratic politicians in Congress in the address of the climate aspect of the Build Back Better Act (C-Span 2021). The fragments of speeches were short – 4-5 sentences –to keep the respondents engaged. Both snippets of speeches are dedicated to the climate policy, however, they outline the impacts of the policy on two different levels – one is highlighting the importance of mitigation of climate change on the local level (specifically, the name of the respondent's state was piped into the snippet of speech), and the other is pointing out the global responsibility of the US to adopt the environmental policies. The two fragments of speeches, as well as the questions behind

outcome variables, are presented in Appendix B. Table 2 below presents the descriptive statistics of the sample of the first survey.

Table 2. Sample overview (survey experiment)

	Local Treatment [N=1018]	Global Treatment [N=1020]
Age	46.83	46.29
Female	53.34%	52.94%
Democrat	35.95%	36.27%
Republican	30.55%	27.25%
Independent	27.99%	29.7%

The respondents were randomly assigned to either the Local or Global Treatment group. The control group is absent, as the primary focus of the study is not the analysis of differences between the primed and unprimed respondents. Rather, the variation in the effects of the two treatments was of particular interest.

After being exposed to one of the treatment conditions, the manipulation check was conducted, which was aimed at testing to which category the respondents attribute the previously read politician's speech – global, local, both, or not sure. Then the respondents were asked to indicate their support for six different climate policies, which could be summarized on three following scales: 1) willingness to pay for renewable energy; 2) pollution taxation preferences; 3) the preference of urgency of climate policies. Those were measured on the 5-point scale, where 1 indicated full support and 5 indicated full opposition. The exact wording of the questions and answer options are provided in Appendix B as well.

Unfortunately, the survey experiment did not yield the expected results – I did not observe consistent treatment effects. I discuss the possible reasons and implications in the section dedicated to research results. For that reason, the survey with open-ended answers was conducted as well.

3.2. Open-Ended Survey

To get more descriptive data regarding the initial research question – what type of framing of climate change incentivizes people to support environmental policies – an open-ended survey was conducted as a part of the research. The main goal of the survey is to identify the key events and topics that the respondents associate with implications of climate change on different levels of its geographical scope – local (state-level), national and global. The survey was fielded in May 2022 also using Lucid, as in the case with the previous survey within the presented research.

The survey was structured in a different way than the previous one. First, the respondents were asked several general socio-demographic questions: gender, state of residency, and party identification (the exact formulations of the questions can be found in Appendix D). Then all of the respondents were randomly assigned to three treatment groups – local (state-level), national and global. The first question included the prompt for the open-ended answer: "Now try to think of how climate change might have affected the **city or town where you live/the United States as a country/world as a whole** [depending on the treatment condition] **in the last couple of years and please shortly describe it in the box below**". Unlike the first survey within this research, here an open-ended question is used as a type of treatment. So, the respondents are asked to actively engage, recall information and express their opinion. Additionally, the collected data is going to be much richer than from multiple-choice questions, which will allow me to incorporate quantitative text analysis in the research.

Like the previous survey, the latter one includes the between-subjects type of research design, though the number of treatment groups has increased from 2 to 3. I decided to do it, as the binary local/global framing employed in the previous survey did not seem to be perceived by the respondents due to the results of the manipulation check. Additionally, the same dimensions of geographical scale have been already employed by existing studies (Konisky,

Milyo, and Richardson 2008). Additionally, the national-level response to climate change has proven to be appealing to the population (Bernauer et al. 2016), that is why this dimension has been added to the second wave of the survey. The overview of the sample is presented in the table below.

Table 3. Sample overview (open-ended survey)

	Local Treatment [N=416]	National Treatment [N=415]	Global Treatment [N=410]
Age	46.26	45.18	45.44
Female	46.6%	60%	50.5%
Democrat	38.2%	38.6%	35.4%
Republican	32.9%	30.6%	30.5%
Independent	24.5%	26.3%	29.0%

After the treatment, the respondents were asked to express their preference (or disapproval) for four policy proposals. The proposals were taken from Cooperative Election Study (CCES), specifically from their environment-related block of policy preferences (Dagonel 2021):

1. Require that each state use a minimum amount of renewable fuels (wind, solar, and hydroelectric) in the generation of electricity even if prices increase a little – measures the preference for renewables and willingness to pay for it;
2. Strengthen the Environmental Protection Agency's enforcement of the Clean Air Act and Clean Water Act even if it costs U.S. jobs – Clean Air Act and Clean Water Act are two federal laws, that have been in place for several decades now and have undergone several amendments, so those names are likely to be familiar to the respondents. On a bigger scale, the point of this item is to measure the preference between valuing environmental protection and the possible economic setbacks that it might entail.

3. Give the Environmental Protection Agency power to regulate Carbon Dioxide emissions – EPA is an executive agency of the US government. Currently, it is allowed to regulate powerplants and factories as the main sources of carbon emissions (Barnes 2014). The point of including this item is to measure the preference for regulations of emissions vs. preference for minimal government interference in industries and production.
4. The United States re-joins the Paris Climate Agreement – this item is included as a measure of preference for international collaboration when it comes to fighting the consequences of climate change.

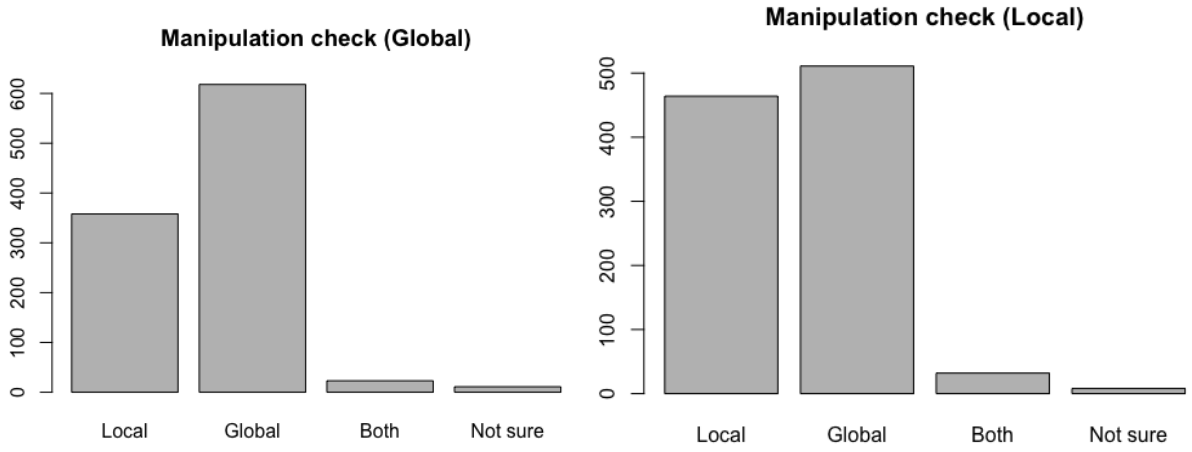
After indicating their policy preferences, the respondents are asked to attribute the responsibility for the response to climate change to three levels of governance – international organizations, the federal government, and the local state government. In the end, the manipulation check inquires which level of implications of climate change seems to be the most worrisome to the respondent – the negative effects on one's home state, the US as a country, or planet Earth as a whole.

4. Results

4.1. Results of Survey Experiment

Figures 1 and 2 below present the distribution of the manipulation check. We can see that the local treatment was not correctly perceived by the respondents, however, the global treatment was more identifiable. One of the explanations behind it might be the fact that climate change generally tends to be perceived by the public as a global and distant issue (Spence and Pidgeon 2010).

Figure 1 and Figure 2. Manipulation check for treatment groups



However, further analysis demonstrates that this assumption is not grounded. Appendix C provides the summary of all six outcome variables divided by the treatment type. It is clear that all of the distributions are nearly identical, which means that the exposure to treatment did not lead to a change in attitudes. Additionally, Table 3 presents the results of the two-sample t-test, which demonstrates that in none of the cases the difference between the two treatment groups is statistically significant enough to reject the null hypothesis.

The only factor that seems to cause a change in policy attitudes is party identity (see the differences in four outcome variables by party identity in Figures 4 and 5 below). The figures demonstrate the distribution of two policy preference scales (willingness to switch for renewables even if prices increase a little and preference for corporate tax) by party identity. The means of distribution strongly vary based on the party identity. Indeed, this observation is

not surprising, as the climate agenda is a very polarizing topic in the American political landscape and that has been established by a myriad of existing studies (Corner, Whitmarsh, and Xenias 2012; Gustafson et al. 2019; McCright and Dunlap 2011b; Williams et al. 2015).

Table 4. Descriptive statistics and T-test results comparing treatment conditions on outcome variables

	Local Treatment		Global Treatment				
	M	SD	M	SD	df	T	Sign.
Support renewables	2.42	1.19	2.32	1.16	1899.6	1.9307	0.05367
Renewables are expensive	2.67	1.23	2.63	1.22	1897.8	0.66796	0.5042
Tax corporations	2.34	1.18	2.27	1.14	1897.2	1.1901	0.2342
Tax households	2.48	1.15	2.44	1.16	1895.9	0.7761	0.4378
Immediate climate action	3.05	1.31	3.06	1.27	1892.1	-0.01971	0.9843
Long-term CC mitigation	2.36	1.16	2.30	1.10	1893.4	1.0715	0.2841

It is also worth mentioning that party cues might have played a big role in shaping the results. As it also has been pointed out by previous research, Americans strongly rely on party cues in forming their attitudes towards climate change, whereas Democrats are strongly associated with pro-climate agenda, whereas Republicans have built their climate rhetoric in direct opposition to the rival party's points (Merkley and Stecula 2018).

Figure 3. Distribution of policy preference by Party ID

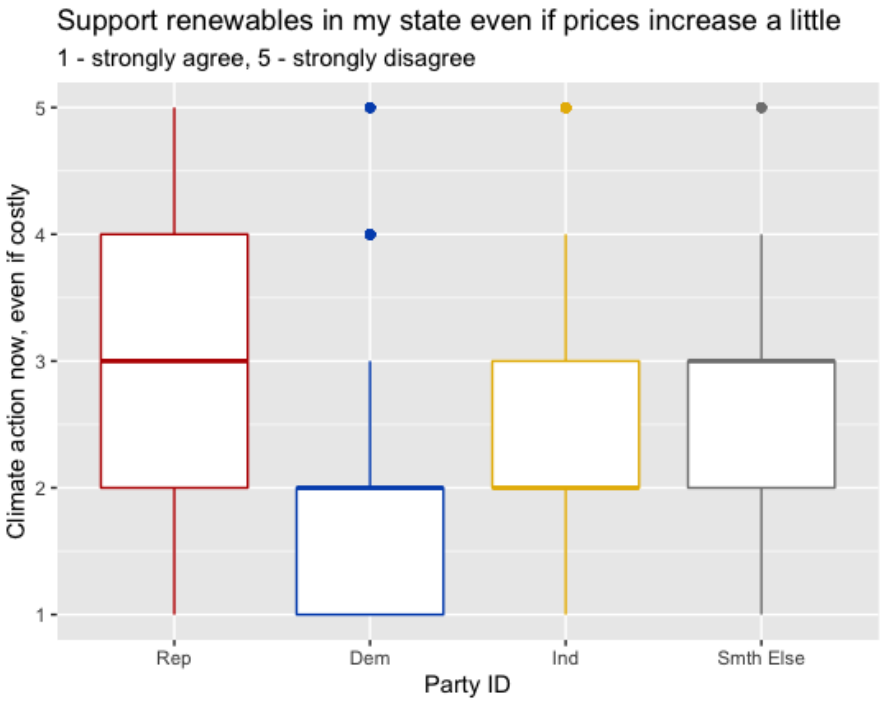
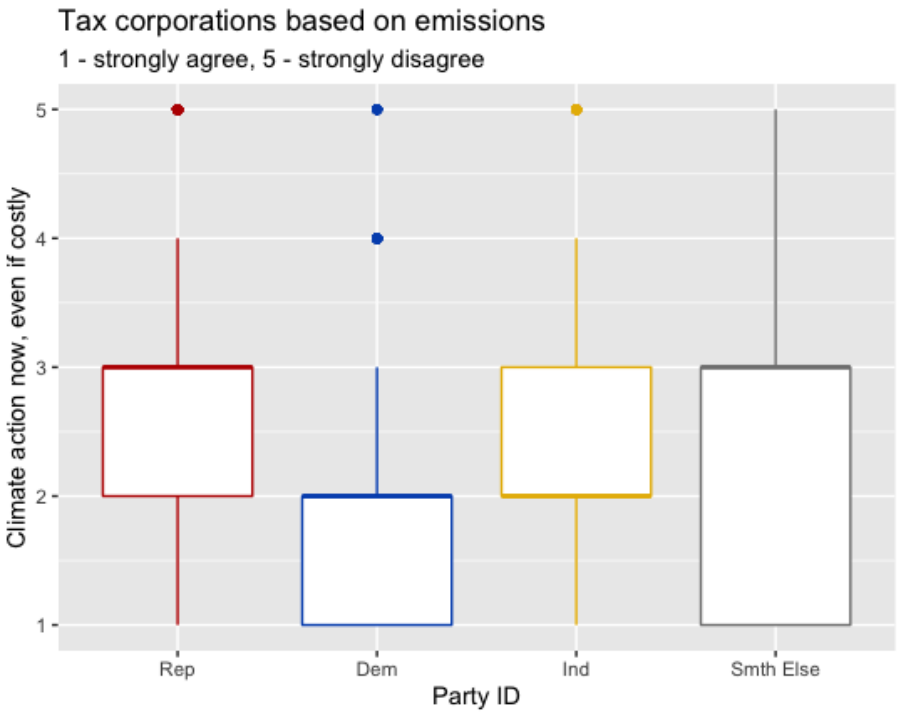


Figure 4. Distribution of policy preference by Party ID



To further explore and provide evidence on whether the treatment groups have significant differences from each other or whether other groupings possess more statistical power, I have conducted a two-way ANOVA analysis, which is quite common for the between-subjects type

of research design. The results of the test are presented in Table 4 below. It can be seen that F-value is consistently larger for party identification grouping, rather than for the treatment type. It means that the variation that is observed in outcome variables is better predicted by party identification, rather than the treatment type.

Table 4. Results of Two-Way ANOVA Test (F value and Significance Levels)

	Treatment Type	Party ID
Support renewables	3.746 (.)	10.486 (**)
Renewables are expensive	0.457	45.700 (***)
Tax corporations	1.424	11.302 (***)
Tax households	0.603	4.060 (*)
Immediate climate action	0.000	5.019 (*)
Long-term CC mitigation	1.156	14.100 (***)

Note: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Additionally, in line with the previous research, I have run the analysis only among Democrats. As it is commonplace in the literature to expect to see higher support for environmental policies among liberals and specifically among Democrats in the American context. The effects of treatment on the outcome variables specifically for Democrats are summarized in Table 5. Again, the difference between the control and treatment groups is not statistically significant in any of the cases. Therefore, the null hypothesis of no difference cannot be rejected, even for the subset of democratic participants of the survey.

Overall, the observation that party cues are strongly shaping the attitudes towards climate policies is well-established in the literature and I cannot claim that my research has brought any particular novelty in that aspect. One of the reasons why the first study did not produce the expected results might be since simple framing has very modest effects on public opinion, and therefore it is often outweighed by other factors. The existing experimental research on the topic highlights the importance of "[…] the need to carefully consider the political outcome of interest and the type of issue being framed when assessing the broader implications of issue framing effects. […] [E]ven large changes in the public's policy opinions due to frames may

ultimately have limited consequences for its subsequent political decision making…" (Peterson and Simonovits 2018, 1295).

Table 5. Descriptive statistics and T-test results comparing treatment conditions on outcome variables – for Democrats only

	Local Treatment		Global Treatment				
	M	SD	M	SD	df	T	Sign.
Support renewables	1.97	0.991	1.84	0.954	683.51	1.754	0.07987
Renewables are expensive	2.79	1.32	2.80	1.32	682.8	-0.14504	0.8847
Tax corporations	1.89	1.00	1.89	0.999	683.87	-0.09331	0.9257
Tax households	2.07	1.04	2.02	1.00	681.7	0.56742	0.5706
Immediate climate action	2.58	1.20	2.66	1. 23	682.75	-0.78981	0.4299
Long-term CC mitigation	1.93	0.977	1.87	0.915	681.28	0.83419	0.4045

Therefore, it should be kept in mind that the effects of framing on a policy preference are rather limited. However, we can expect to see some fluctuations in its effectiveness depending on the type of issue being framed. And climate does not seem to be the topic where the framing could sway the policy preference, which is demonstrated by my findings. Additionally, it is safe to assume that is specific framing that I have used in this study (global vs. local effects of climate change) does not produce any significant results (which is also often referred to as type II error – the null hypothesis is false and not rejected – so I failed to detect a treatment effect that does exist). And there is a possibility that my treatment was not appealing to the respondents and it could have been stronger and more engaging – for instance, the respondents could have been exposed to pictures or posters, where they are not required to read much.

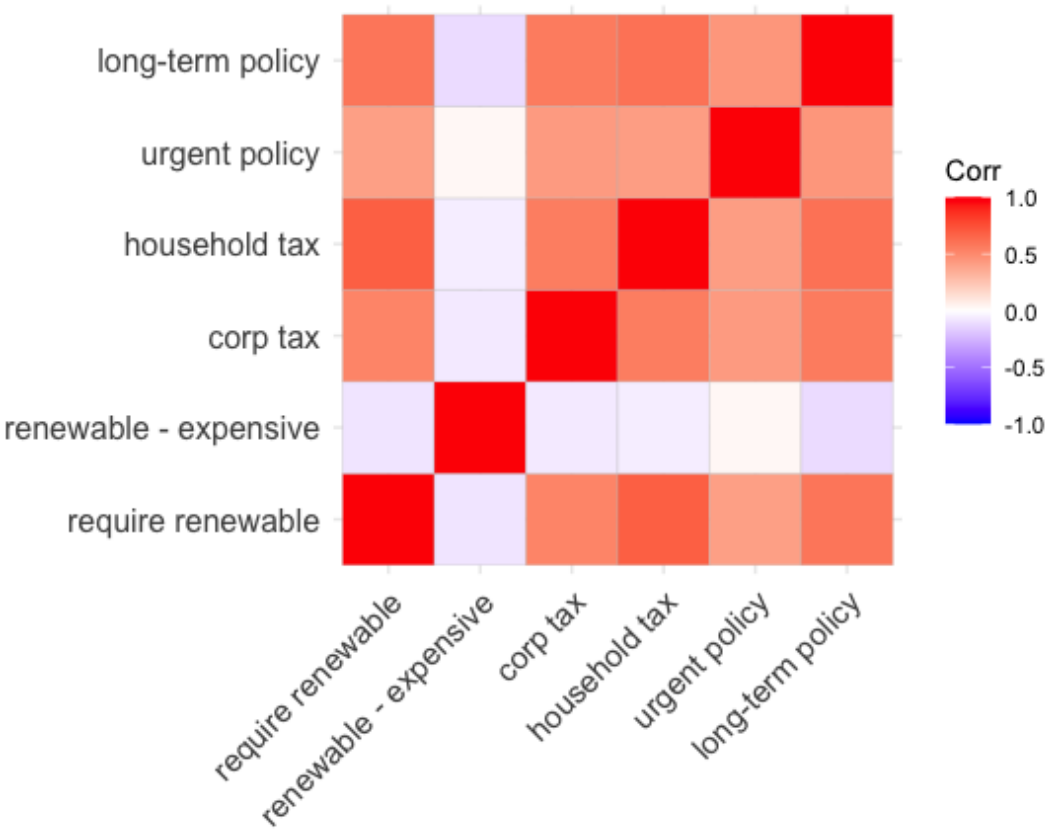
However, I am not the only researcher who has faced the lack of treatment effect when it comes to identifying the effects of different types of framing of climate change. For instance,

Svenningsen and Thorsen have conducted a conjoint experiment in Denmark that focused on framing climate change in terms of financial gains and losses and they also failed to find a difference between their two framings (Svenningsen and Thorsen 2021). Additionally, a series of survey-embedded experiments on the effects of reframing climate change mitigation measures also resulted in very small and inconsistent treatment effects in their study (Bernauer and McGrath 2016). What is specifically interesting about this research is the fact that the change of framing of greenhouse gas emissions did not change the attitudes of either climate change skeptics or even those who generally have pro-environmental baseline attitudes.

Framing effects are extremely hard to measure, especially on such a complex issue like climate change, which lies at the intersection of the issues of belief in science, political ideology, preference for government spending, type of media consumption, gender, residence, educational attainment, and dozens of other dimensions. Citizens exist in an environment of excess information and sentiment around environmental policies, especially since this issue has become an inseparable part of the media and political landscape of the United States and other countries. So, when the respondents enter the survey experimental setting on framing, in a way they come in "pre-treated", as it is extremely likely that they have been exposed to a certain type of information on the problem for a long time before the intervention. For that reason, identification of the frames that would lead to a change in attitudes is very difficult. Although it would make sense to expect to see the variation in attitude change among people who have a low level of awareness about climate change, that could be a potential avenue for further research. Additionally, it is quite natural to expect that since the experiments on framing effects of climate change seem to produce consistent statistically significant results, a lot of "non-findings" remain unpublished. That is a big problem for the field of social sciences in general, as publication bias is very much widespread. It entails that the results of quantitative research

analysis with a higher level of significance of the coefficients are more likely to be published (Gerber and Malhotra 2008).

Figure 5. Correlation matrix for outcome variables



Additionally, having analyzed and processes the results of the survey, I have realized that the formulation of questions for the outcome variable was rather inconsistent and probably was not well understood by respondents. Some questions were longer than the others, some included some justification for the policy, whereas the others included only the proposal. Therefore, another problem with the initial survey might have been the fact that it resulted in a measurement error when it came to the outcome variables.

Furthermore, to evaluate the quality of the employed measurement, I have looked into the correlation matrix of dependent variables (see Figure 6 above). It can be seen that the only variable that has a 0 or slightly negative correlation coefficient with other predictors is a policy preference stating that switching to renewable energy is expensive, therefore the government

should focus on extracting fossil fuels for now. As the justification for this policy suggests support for fossil fuel extraction, it explains why it differs from other rather pro-environment in their formulation, and policy proposals offered to the respondents.

Overall, it can be concluded that the employed outcome measures are rather repetitive and do not capture many variations in the attitudes, which is taken into consideration for further work on this project.

Considering all of the abovementioned issues, I have decided to conduct a second survey to collect more descriptive data. The collection of that sort of information helps me to find answers to my initial research question using a somewhat bottom-up approach. Instead of exposing the respondents to certain types of treatment, the respondents were asked to recall the most important implications of climate change on a local, national and global level according to their perception. The results of this survey are presented in the following section.

4.2. Results of Open-Ended Survey

The table below presents the results of the two-way ANOVA test, which analyzes the results of the manipulation check based on the treatment type. It can be seen that there is again no significant difference in between values between the three groups.

Table 6. Descriptive statistics and ANOVA results comparing treatment conditions on manipulation check

	Global Treatment		National Treatment		Local Treatment			
	M	SD	M	SD	M	SD	F value	p
CC – global problem	1.822	1.213	1.661	1.046	1.797	1.185	2.088	0.124
CC – national problem	1.975	1.295	1.835	1.159	1.904	1.295	1.211	0.298
CC – state-level problem	2.15	1.295	2	1.242	2.059	1.306	1.282	0.278

To obtain more statistical power in my findings I have constructed an index of climate policy preference, which summarizes the means of each value of four policy preference

variables used in my research. The value of the index ranges from 1 to 2, where 1 corresponds to support of climate policies and 2 to the opposition towards it. This index is included in the latter models in the analysis.

Table 7 presents the results of logistic regressions for different levels of responsibility attribution. Models are grouped based on treatment type, where each treatment group is broken down into three dichotomous categories – preference for international, national, or local levels of governance in dealing with climate change.

Younger respondents prefer assigning responsibility for dealing with the climate crisis to the national government across all three treatment groups. It can also be seen that Democrats tend to see environmental problems as a primary responsibility of either national government or intergovernmental bodies – but not the government of their local state, as the coefficient for the latter is consistently negative and statistically significant in most of the models. Additionally, we can observe some priming effects, as exposure to global treatment and agreement with the view that climate change is a global issue corresponds with assigning responsibility to the international organizations. We can also observe a peculiar dynamic within policy preference and assignment of responsibility. Support for pro-environmental policies corresponds with assigning responsibility to the national level of governance. The reverse is also true – opposition to climate policies goes hand in hand with support for the claim that changing the climate should be a primary responsibility of local government. It can be explained by the fact that those who support climate policies, tend to view environmental policies as urgent and therefore also agree that those issues should be dealt with at the national level. Whereas those who oppose climate policies do not view those issues as utterly important, and so the responsibility for that is assigned to "the lower" level of governance. Results of regression analysis that check the robustness of these assumptions are presented in Appendix E.

Table 7. Results of Logistic Regression (Preference for the Level of Governance in Response to Climate Change)

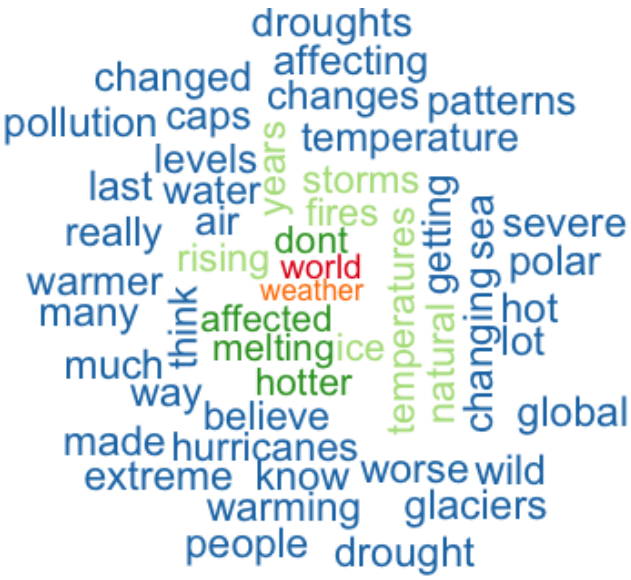
	Assigning responsibility:								
	Global Treatment			National Treatment			Local Treatment		
	(Int'l)	(Nat'l)	(Local)	(Int'l)	(Nat'l)	(Local)	(Int'l)	(Nat'l)	(Local)
Age	0.01	-0.01**	0.01	0.01	-0.01**	0.01	0.01	-0.02**	0.02*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Female	-0.05	0.10	-0.10	-0.09	-0.11	0.38	-0.49**	0.46**	0.01
	(0.22)	(0.22)	(0.29)	(0.23)	(0.22)	(0.30)	(0.23)	(0.22)	(0.28)
Democrat	0.35	-0.20	-0.37	0.61**	0.002	-1.37***	-0.02	0.57**	-1.12***
	(0.25)	(0.25)	(0.38)	(0.24)	(0.23)	(0.40)	(0.25)	(0.24)	(0.36)
Policy Preference	0.66	-1.89***	1.68***	-0.43	-1.57***	2.40***	-0.67	-0.47	1.26***
	(0.44)	(0.46)	(0.50)	(0.42)	(0.42)	(0.48)	(0.42)	(0.40)	(0.45)
CC-global issue	-0.47***	0.15	0.28**						
	(0.15)	(0.14)	(0.14)						
CC-national issue				0.08	-0.14	0.03			
				(0.12)	(0.12)	(0.14)			
CC-local issue							0.10	-0.14	0.02
							(0.11)	(0.11)	(0.13)
Constant	-0.99*	2.55***	-4.72***	-0.80	2.77***	-5.06***	-0.05	0.94*	-3.45***
	(0.57)	(0.58)	(0.74)	(0.60)	(0.61)	(0.75)	(0.57)	(0.56)	(0.66)
Observations	366	366	366	369	369	369	374	374	374
McFadden pseudo R2	0.03	0.06	0.17	0.02	0.07	0.22	0.01	0.06	0.12
Log-Likelihood	-229.85	-234.52	-153.96	-226.47	-236.49	-148.12	-234.48	-241.35	-171.42
Akaike Inf. Crit.	471.70	481.04	319.92	464.94	484.98	308.24	480.96	494.70	354.85
Note:									*p<0.1; **p<0.05; ***p<0.01

To enrich my research findings, I further employ quantitative text analysis to study in more detail the output of open-ended questions that were answered by respondents. First, I constructed a corpus of all the recorded answers and did some cleaning of the data (removed encoding characters and common English stop words, such as articles and auxiliary verbs). Below I provide the results of the exploratory analysis of texts and summarize the general trends. Figures 7-9 present word clouds for each treatment. The colors and the sizes of words on the plot indicate frequency – the same color represents the same frequency, as well as the size of a word. Interestingly that at first glance it seems that local and national prompts seem to have a lot of high-frequency keywords in common.

Figure 6. Word cloud (Local prompt)

Figure 7. Word cloud (National prompt)

Figure 8. Word cloud (Global prompt)



To further explore the composition of textual data I have employed simple sentiment analysis, breaking down each answer into positive, negative, and neutral sentiments. In my analysis, I used a sentiment lexicon developed by Neal Caren (Barberá 2018; Caren 2019). This method computes whether the words used by the respondents have positive, negative or neutral connotations according to a pre-defined lexicon. The function automatically matches the textual data with the three categories within the lexicon (positive, negative, and neutral) and assigns a score to each word. The table below presents the results of lexicon analysis for three groups. To make it more digestible, the results are presented as a percentage of sentiments for each treatment condition.

Table 8. Results of sentiment analysis

	Local Treatment [N=416]	National Treatment [N=415]	Global Treatment [N=410]
Positive	22%	18%	21%
Negative	28%	28%	25%
Neutral	50%	54%	54%

It can be seen that there are no strong disbalances in terms of sentiment for different prompts. So, we can conclude that none of the employed prompts cause a consistently strong emotional response.

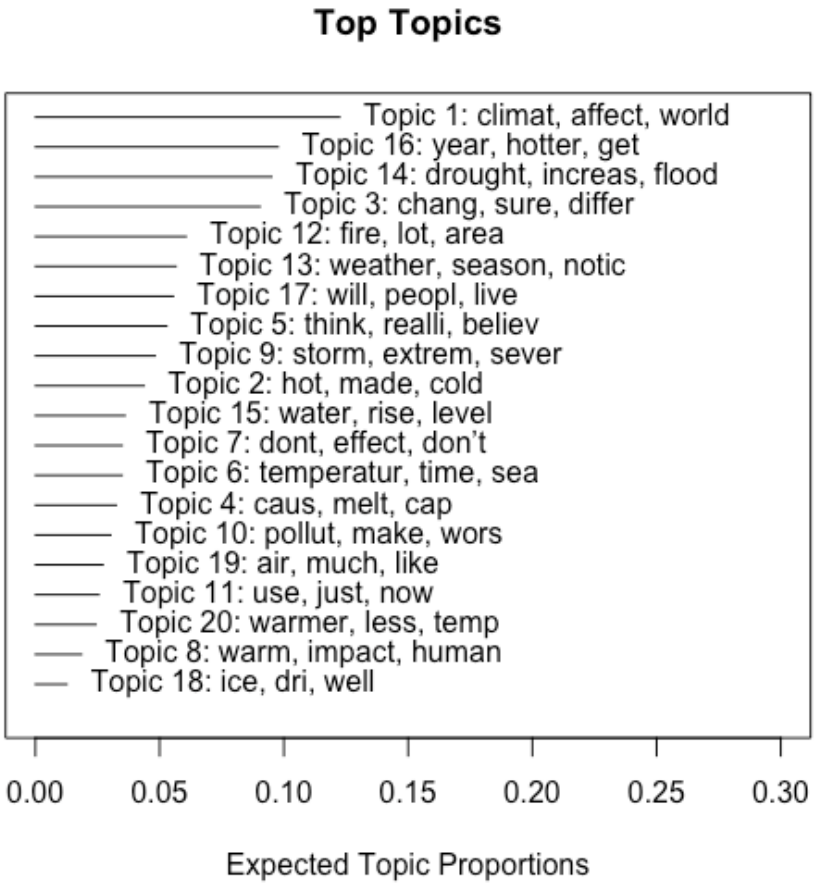
Apart from analyzing the textual data on the aggregate level (i.e., measuring word frequencies) and identifying general sentiment, I have also tried to convey a more substantive analysis of textual data on my hands. Specifically, I have employed structural topic modeling (STM) to identify the key topics in respondents' answers. In particular, I have fitted several LDA (latent Dirichlet allocation) models. LDAs posit that sets of observations can be explained by identifying unobserved groups. In the case of textual data, it views the body of text as a mixture of topics, where each word belongs to one of them. A study by Roberts et al. compared the quality of textual data analysis performed via semiautomated structural topic modeling vs. hand-coding of data by research assistants (2014). While the hand-coding was more precise and accurate, compared to STM, both research assistants and LDA models identified the same list of topics (Roberts et al. 2014, 1079).

In my research, I have used the STM package for R developed by Roberts et al. (Roberts, Stewart, and Tingley 2019). The package was specifically designed for machine-assisted analysis of textual data in social science research. The main logic behind the STM analysis is to identify key topics within the body of the texts and match them with their metadata. In my case, the topics were identified for the open-ended answers for the survey and the metadata is constructed out of the dependent variables.

Figure 10 presents the overview of 20 topics and their expected proportions identified by the analysis. The number of topics is arbitrary, however, I have settled on 20, as such model provided the optimal level of semantic coherence, meaning that the words that are the most probable within one topic are likely to co-occur within a single response. Keywords for each topic are presented in Appendix F.

After identifying the topics, I have focused on the analysis of their relationship with metadata, specifically, I was trying to see whether specific topics have prevalence among the two groups. The charts in Appendix F summarize the prevalence of chosen 5 topics among the three levels of assigned responsibility – International, National, and Local. It can be seen that there are no stark differences among those, except for the assignment of the local level of responsibility, where it can be seen that the probability of confirming that the change of the weather is consistently happening is lower. That finding is consistent with the finding of my regression analysis, which revealed that the assignment of responsibility to deal with the climate crisis to the local level of governance corresponds with the perception of the problem as non-important.

Figure 9. Top topics (STM analysis)



The figures below (11 and 12) outline the effect of partisan affiliation on the prevalence of selected topics. It is an established viewpoint in the literature, that ideological identification is

a strong predictor of attitude towards climate change (Guber 2017). And this is especially true for the US, where a meta-analysis of existing research on climate-denialist attitudes has shown that the effect of political ideology on shaping the attitudes towards the environment is stronger than in any other industrialized country (McCright et al. 2016). My findings highlight a dynamic that is very much in line with the argument of the importance of political ideology. It can be seen that those who identified as Republicans tend to report on extreme weather conditions and acknowledge that they are happening. However, they are less likely to say that they notice a consistent change in the weather in the area around them.

So, while Republicans are ready to confirm that there is some evidence for changing climate, they do not tend to see it as a systematic problem, which has also been pointed out by previous research. It has been shown that those who share the conservative political views tend to not view climate change to be human-induced and therefore it is not considered to be a salient issue on the respective end of the political spectrum (Jylhä 2016).

Figure 10. Effect of Democratic Party ID on Topic Prevalence

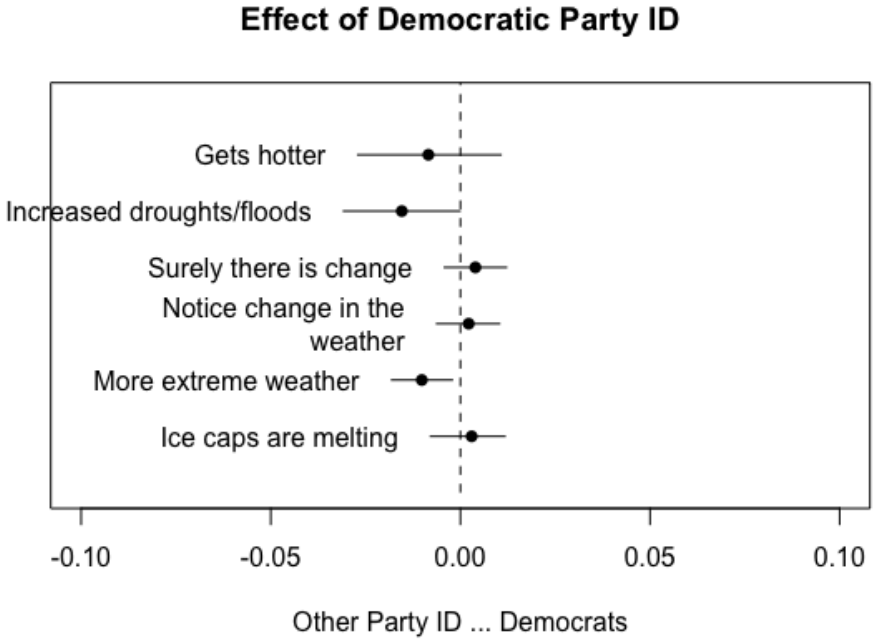
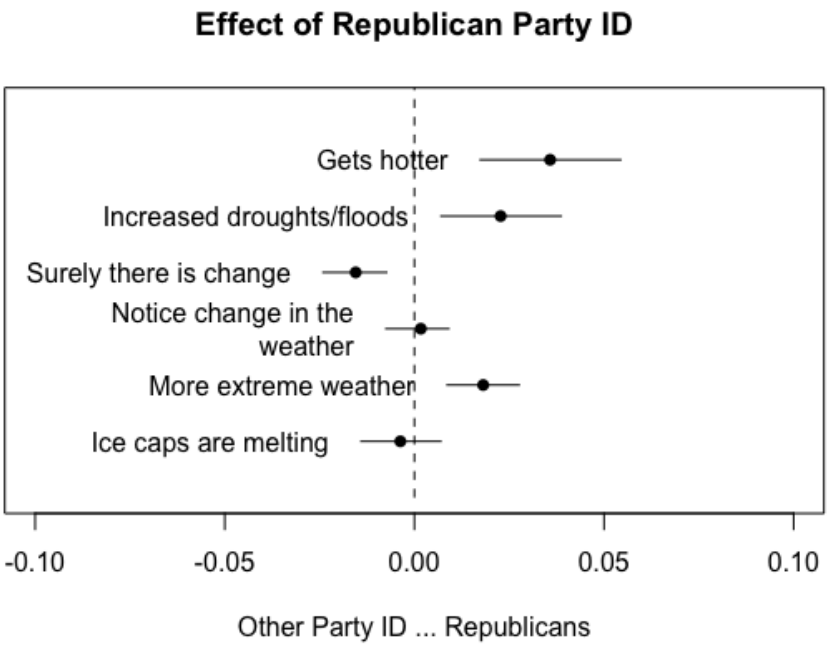


Figure 11. Effect of Republican Party ID on Topic Prevalence



Conclusion

As climate change is becoming a more and more pressing problem with each passing year, the politicians in democratic countries would need strong public support to implement the costly pro-environmental policy proposals. How it can be done? This thesis was an attempt to answer this question.

First, I examined the existing research behind climate policies and framing of climate change to identify the already established trends in the literature. Second, I have developed my hypotheses, which were not covered in pre-existing studies with big balanced samples. Then I tested my theoretical assumptions empirically by putting together and fielding a survey experiment with a sample of the American population. The initial findings revealed that the hypotheses were not supported by the empirical test. No matter whether climate change was framed as a global or local phenomenon, the treatment assignment did not explain much of the variation within the data, however, party identity did. My second survey consisted of open-ended questions, which prompted respondents to list the implications of climate change for their home state, country, and the world as a whole. The findings of the second survey revealed that assigning responsibility for dealing with climate change corresponds with opposition to climate policies. I argue that the assignment of responsibility to the local level of government is indicative of the perception of the problem as unimportant. Future research might explore deeper the causal link between the preference for the governance level for dealing with a certain policy problem and the perceived importance of the issue in the eyes of voters.

The biggest contribution of my research is that it employed an experimental research design to the issue of climate change with a US-wide large-N sample, as most of the existing studies with a similar design have employed convenience sampling (Sinatra et al. 2012; Spence and Pidgeon 2010). Another hallmark of this study is that it used attitudes towards climate policy as an outcome variable and not individual-level behavioral characteristics. However, despite its

originality, my study, especially the first experiment, lacked internal validity, as it failed to produce meaningful results, and I have discussed at length above how problems with the construction of the initial questionnaire might have affected that. That prevented me from drawing the causal link between treatment and its effect on dependent variables. With the second survey, I have managed to collect more descriptive data and come up with more substantive findings relating to the original hypotheses.

One of the biggest weaknesses of this research is that it has failed to identify any significant treatment effects in both waves of the survey. It can be explained by internal issues: not the prime choice of frames themselves (it can be assumed that distance of the possible effects of climate change does not matter to people) or simply wording of the questionnaire was not appealing to the respondents. Although we cannot exclude the possibility that simple reframing is not likely to change people's attitudes towards climate change, especially since it has been pointed out by existing research (Bernauer and McGrath 2016; Svenningsen and Thorsen 2021).

Climate change and the design of possible policies to mitigate its effects is an extremely complex issue at an intersection of various factors – belief in science, education, political ideology, party identification, etc. and, all the related dimensions to these. So, it is natural to expect that the respondents come into studies related to framing climate change very much "pre-treated".

Measurement of treatment effects is already a contested topic within the field of political science primarily for the reasons that I have already outlined above. Therefore, future research could look at this issue on a more of a meta-level and analyze whether there is something specific about topics that are more likely to yield a framing effect, or identify whether there is something particular about climate policies, which makes them "unframeable".

Appendix A. Consent Form and Attention Check

Q122 Central European University Informed Consent Form

Title: Exploring the Effects of Framing of Climate Policies

Principal Investigator: Anastasiia Andreeva

Procedures: You are being asked to take part in a research study. If you decide to take part, you will complete an online survey that will take about 7-10 minutes of your time. You may take the survey wherever is convenient for you.

Compensation: You will receive compensation as you have previously agreed with your supplier panel.

Anonymity and data use: We will not receive any personal data on you and thus your responses will be completely anonymous. We will use your responses for research purposes only.

Voluntary Participation and Withdrawal: You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time.

Contact Information: Anastasiia Andreeva andreeva_anastasiia@student.ceu.edu

If you are willing to volunteer for this research, please click on the Agree button and start the survey.

- ○ AGREE (1)
- ○ DISAGREE (2)

To show you are paying attention, please select "Red" and "Blue" from the items below.

- ☐ Pink (1)
- ☐ Blue (2)
- ☐ Red (3)
- ☐ Yellow (4)

Appendix B. Survey Flow (Survey Experiment)

In recent years the topic of climate change is becoming a more and more prevalent part of the political discussion. Specifically, the policies that can combat climate change or mitigate its effects are being widely discussed in Congress this year. In this section of the survey, you will be asked to read a short excerpt of the speech of a Democratic representative in Congress addressing a climate policy proposal. After reading the text, you will be asked several questions about your attitudes toward environmental policies.

1. **TREATMENT 1 – LOCAL**:

   This year, it was an unbelievable spring and summer in my home state of ${e://Field/respondent_state} *where we watched historic storms bring catastrophic flooding over and over again. Cars, homes, and roads, were destroyed as our existing infrastructure just couldn't keep up with the increased precipitation and extreme weather caused by climate change. And my constituents are paying the price for our inability to combat climate change effectively.*

2. **TREATMENT 2 – GLOBAL**:

   This year we have seen the devastating consequences of rising global temperature around the world. When we see the glaciers melting and the rivers drying up; when we see hurricanes, tornadoes, flooding, and wildfires around the world as we've never seen. The scariest thing about climate change is that it affects the entire planet, causing damage to communities, infrastructure, and ecosystems in every corner of the world. And people all over the world are paying the price for our inability to combat climate change efficiently.

MANIPULATION CHECK

Do you think that the snippet of the speech that you have just read emphasizes rather local or global implications of climate change?

a. Local.
b. Global.
c. Both
d. Not sure

POLICY PREFERENCE

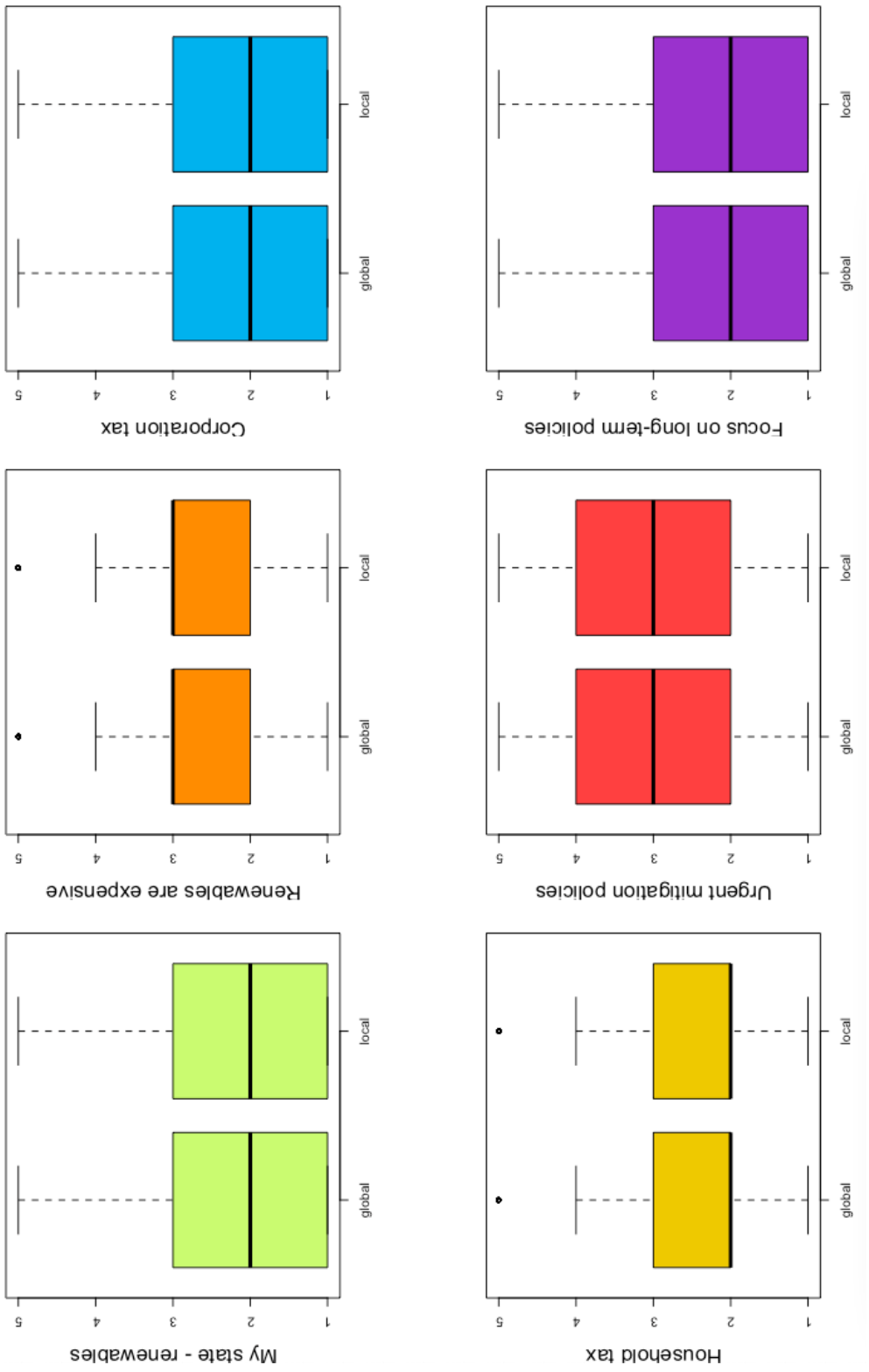
What is your opinion about the following political proposals?

1. I would support the state of ${e://Field/respondent_state} requiring the use of a minimum amount of renewable fuels (wind, solar, hydroelectric) in the generation of electricity even if prices increase a little.
   a. Strongly support.
   b. Somewhat support.
   c. Neutral.
   d. Somewhat oppose.
   e. Strongly oppose.
2. While using renewable energy is sustainable in the long run, it is very expensive to switch to it fully. That is why the government should focus on expanding fossil fuels (such as oil and coal) extraction now.
   a. Strongly support.
   b. Somewhat support.
   c. Neutral.

    d. Somewhat oppose.
    e. Strongly oppose.
3. Corporations should be taxed based on their carbon emissions to incentivize them to reduce pollution.
    a. Strongly support.
    b. Somewhat support.
    c. Neutral.
    d. Somewhat oppose.
    e. Strongly oppose.
4. Households should be taxed based on their carbon emissions to incentivize individuals to reduce pollution.
    a. Strongly support.
    b. Somewhat support.
    c. Neutral.
    d. Somewhat oppose.
    e. Strongly oppose.
5. In an attempt to combat the worsening environmental conditions, the government must focus on mitigating the negative effects of changing climate right here and right now, even though those projects might be costly.
    a. Strongly support.
    b. Somewhat support.
    c. Neutral.
    d. Somewhat oppose.
    e. Strongly oppose.
6. The government must focus on long-term effects when dealing with climate change. Such policy could benefit people in the future, though it would have costs in the shorter term for people alive today.
    a. Strongly support.
    b. Somewhat support.
    c. Neutral.
    d. Somewhat oppose.
    e. Strongly oppose.

Appendix C. Post-treatment Outcome Variables Summary

(Survey Experiment) [1]



[1] 5-level scale, where 1 – strongly support, 5 – strongly oppose.

Appendix D. Survey Flow (Open-Ended Survey)

INTRODUCTION

1. gender – Are you…
    a. Male
    b. Female
    c. Non-binary / third gender
    d. Prefer not to say
2. usstate – In Which state do you currently reside?
    a. [drop-down list of 50 states, D.C. and Puerto Rico]

PARTY ID ANES

1. pid1 – Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or what?
    a. Republican
    b. Democrat
    c. Independent
    d. Something else
2. pidr [display if pid1 Republican is selected] – Would you call yourself a strong Republican or a not very strong Republican?
    a. Strong Republican
    b. Not very strong Republican
3. pidd [display if pid1 Democrat is selected] – Would you call yourself a strong Democrat or a not very strong Democrat?
    a. Strong Democrat
    b. Not very strong Democrat
4. pidi [display if pid1 Independent or Something else is selected] – Do you think of yourself as closer to the Republican or Democratic party?
    a. Republican party
    b. Democratic party
    c. Neither

CLIMATE – TREATMENT

Clim_openend – Now try to think of the ways in which climate change might have affected the **city or town where you live/United States as a country/world as a whole** in the last couple of years and please shortly describe it in the box below.

CLIMATE

Do you support or oppose the following policy proposals?

1. renewable_cces - Require that each state use a minimum amount of renewable fuels (wind, solar, and hydroelectric) in the generation of electricity even if prices increase a little
    a. Support
    b. Oppose
2. air_jobs_cces – Strengthen the Environmental Protection Agency enforcement of the Clean Air Act and Clean Water Act even if it costs U.S. jobs
    a. Support
    b. Oppose
3. carbon_cces – Give the Environmental Protection Agency power to regulate Carbon Dioxide emissions
    a. Support
    b. Oppose
4. paris_cces – The United States re-joins the Paris Climate Agreement

a. Support
b. Oppose

RESPONSIBILITY

In your opinion, which level of the political bodies should be the most active in solving the challenges posed by climate change?

a. International Organizations
b. The federal government of the US
c. The local government of my state

MANIPULATION CHECK

To what extent do you agree that…

	Strongly agree	Somewhat agree	Neutral	Somewhat disagree	Strongly disagree
Climate change is a global problem	○	○	○	○	○
Climate change is a national problem	○	○	○	○	○
Climate change is a state-level problem	○	○	○	○	○

Appendix E. Robustness check for Preference for the Level of Governance in Response to Climate Change

Table E1. Assignment of responsibility to the level of governance with non-corresponding manipulations checks to the treatment groups

	Global Treatment			National Treatment			Local Treatment		
	(Int'l)	(Nat'l)	(Local)	(Int'l)	(Nat'l)	(Local)	(Int'l)	(Nat'l)	(Local)
Age	0.01	-0.01**	0.01	0.01	-0.02**	0.01	0.01	-0.01**	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Female	-0.07	-0.10	0.32	-0.52**	0.46**	0.06	-0.04	0.08	-0.08
	(0.23)	(0.22)	(0.30)	(0.23)	(0.22)	(0.28)	(0.22)	(0.22)	(0.29)
Democrat	0.62**	0.02	-1.44***	-0.04	0.57**	-1.10***	0.43*	-0.23	-0.41
	(0.25)	(0.23)	(0.40)	(0.25)	(0.24)	(0.36)	(0.25)	(0.24)	(0.38)
Policy Preference	-0.63	-1.71***	3.08***	-0.19	-0.30	0.53	-0.06	-1.46***	1.98***
	(0.40)	(0.40)	(0.50)	(0.45)	(0.44)	(0.49)	(0.40)	(0.41)	(0.48)
CC-national issue	0.22**	-0.06	-0.34**						
	(0.10)	(0.10)	(0.15)						
CC-local issue				-0.12	-0.22	0.34**			
				(0.14)	(0.13)	(0.14)			
CC-global issue							-0.11	-0.05	0.15
							(0.11)	(0.11)	(0.13)
Constant	-0.94	2.82***	-5.19***	-0.23	0.79	-3.01***	-0.65	2.36***	-4.89***
	(0.60)	(0.61)	(0.76)	(0.58)	(0.57)	(0.69)	(0.55)	(0.56)	(0.74)
Observations	369	369	369	374	374	374	366	366	366
McFadden pseudo R^2	0.01	0.06	0.16	0.02	0.07	0.23	0.01	0.06	0.13
Log-Likelihood	-224.36	-237.01	-145.29	-234.47	-240.86	-168.71	-235.09	-235.06	-155.21

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

The presented results allow me to claim that the treatment has indeed triggered a priming mechanism, as in comparison with Table 7, we can see that there is no significant correspondence between viewing climate change at a certain geographical level and assigning it to the corresponding level of governance.

To test my second interpretation of the results, which is the correspondence of support of pro-environmental policies and assignment of responsibility to the national level of governance, I have run an additional regression analysis for all respondents, without the consideration of treatment groups. The results are presented in the table below. A similar pattern can be observed here as well – a higher level of support for environmental policies corresponds with a preference for the national government in taking the lead in solving challenges posed by changing climate. Whereas the higher level of disapproval of climate policies corresponds with the assignment of responsibility to the local government.

Table E2. Analysis of policy preference

	Assigning responsibility:		
	International	National	Local
	(1)	(2)	(3)
Age	0.004	-0.01***	0.01***
	(0.004)	(0.003)	(0.004)
Female	-0.21*	0.12	0.15
	(0.12)	(0.12)	(0.15)
Democrat	0.25*	0.18	-0.93***
	(0.13)	(0.13)	(0.20)
Policy Preference	-0.41**	-1.39***	2.10***
	(0.19)	(0.19)	(0.21)
Constant	-0.38	2.04***	-4.61***
	(0.31)	(0.31)	(0.38)
Observations	1,232	1,232	1,232
McFadden pseudo R^2	0.01	0.05	0.17
Log-Likelihood	-772.04	-798.67	-533.17
Akaike Inf. Crit.	1,554.10	1,607.30	1,076.30
Note:		*p<0.1; **p<0.05; ***p<0.01	

Appendix F. Structural Topic Modeling: Overview and Additional Results of Analysis

Topic 1 Top Words:
Highest Prob: climat, affect, world, way, none, environ, chang
FREX[2]: climat, world, none, affect, way, environ, chang
Lift[3]: none, world, climat, environ, way, affect, chang
Score[4]: climat, none, affect, world, way, environ, chang
Topic 2 Top Words:
Highest Prob: hot, made, cold, due, global, one, high
FREX: hot, cold, global, due, made, high, one
Lift: hot, cold, global, due, high, made, one
Score: global, hot, cold, due, made, one, high
Topic 3 Top Words:
Highest Prob: chang, sure, differ, state, way, affect, environ
FREX: chang, sure, differ, state, affect, way, area
Lift: sure, chang, differ, state, way, affect, environ
Score: sure, chang, differ, state, way, affect, environ
Topic 4 Top Words:
Highest Prob: caus, melt, cap, anim, area, fire, ocean
FREX: caus, cap, melt, anim, area, less, heat
Lift: cap, caus, melt, anim, area, fire, ocean
Score: cap, caus, melt, anim, fire, area, ocean
Topic 5 Top Words:
Highest Prob: think, realli, believ, know, good, earth, citi
FREX: know, believ, realli, think, good, earth, citi
Lift: know, good, believ, realli, think, earth, citi
Score: know, believ, think, realli, good, earth, citi
Topic 6 Top Words:
Highest Prob: temperatur, time, sea, higher, normal, differ, high
FREX: time, sea, temperatur, higher, differ, storm, normal
Lift: sea, time, higher, temperatur, normal, differ, high
Score: sea, temperatur, time, higher, normal, differ, high
Topic 7 Top Words:
Highest Prob: dont, effect, don't, thing, town, affect, citi
FREX: dont, don't, effect, thing, town, affect, citi
Lift: don't, dont, effect, thing, town, affect, citi
Score: dont, don't, effect, thing, town, affect, citi

Topic 8 Top Words:
Highest Prob: warm, impact, human, issu, seem, live, earth
FREX: warm, impact, human, issu, seem, live, earth

[2] FREX is a measure of topic quality through a combination of semantic coherence and exclusivity of words to the topic (Roberts, Stewart, and Tingley 2019, 13).

[3] Weighting of words by dividing their frequency in other topics – giving higher weight to words that appear less in other topics (Roberts, Stewart, and Tingley 2019, 13).

[4] Divides the log frequency of the word in the topic by the log frequency of the word in other topics (Roberts, Stewart, and Tingley 2019, 13).

Lift: human, issu, impact, warm, seem, live, earth
Score: warm, issu, impact, human, seem, live, earth
Topic 9 Top Words:
Highest Prob: extrem, sever, becom, pattern, past, crazi, weather
FREX: extrem, becom, sever, crazi, past, pattern, weather
Lift: becom, crazi, extrem, sever, past, pattern, weather
Score: crazi, extrem, becom, pattern, sever, past, weather
Topic 10 Top Words:
Highest Prob: pollut, make, wors, qualiti, bad, live, earth
FREX: pollut, make, wors, qualiti, bad, differ, affect
Lift: pollut, qualiti, bad, make, wors, live, earth
Score: qualiti, pollut, wors, make, bad, live, earth
Topic 11 Top Words:
Highest Prob: use, just, now, can, anyth, one, normal
FREX: use, just, now, can, anyth, one, area
Lift: can, anyth, just, now, use, one, normal
Score: anyth, can, just, now, use, one, normal
Topic 12 Top Words:
Highest Prob: fire, storm, area, rain, mani, also, less
FREX: fire, mani, rain, storm, wild, also, area
Lift: wild, mani, fire, rain, also, normal, storm
Score: wild, fire, storm, rain, mani, area, less
Topic 13 Top Words:
Highest Prob: weather, season, notic, differ, normal, pattern, seem
FREX: season, notic, weather, differ, seem, normal, snow
Lift: notic, season, weather, differ, normal, pattern, seem
Score: notic, weather, season, differ, normal, pattern, seem
Topic 14 Top Words:
Highest Prob: drought, increas, flood, hurrican, natur, wildfir, state
FREX: drought, flood, increas, hurrican, disast, wildfir, natur
Lift: disast, flood, drought, increas, wildfir, damag, hurrican
Score: disast, drought, increas, flood, hurrican, wildfir, natur
Topic 15 Top Words:
Highest Prob: water, rise, level, ocean, citi, temperatur, melt
FREX: rise, water, level, ocean, citi, temperatur, storm
Lift: rise, level, water, ocean, citi, temperatur, melt
Score: level, rise, water, ocean, citi, temperatur, melt
Topic 16 Top Words:
Highest Prob: year, hotter, get, summer, winter, last, snow
FREX: hotter, year, winter, last, summer, get, coupl
Lift: coupl, winter, colder, littl, year, hotter, last
Score: littl, winter, hotter, summer, year, get, last
Topic 17 Top Words:
Highest Prob: will, peopl, live, heat, countri, crop, price
FREX: will, peopl, price, countri, live, heat, need
Lift: price, will, need, countri, peopl, live, heat
Score: price, will, peopl, countri, heat, crop, need
Topic 18 Top Words:
Highest Prob: ice, well, dri, state, differ, ocean, fire
FREX: ice, well, dri, differ, state, snow, area

Lift: dri, ice, well, state, differ, ocean, fire
Score: ice, dri, well, state, ocean, differ, fire
Topic 19 Top Words:
Highest Prob: air, much, like, live, one, environ, also
FREX: air, much, like, one, seem, live, environ
Lift: air, like, much, live, one, environ, also
Score: air, much, like, live, one, environ, also
Topic 20 Top Words:
Highest Prob: warmer, lot, less, temp, crop, snow, differ
FREX: lot, warmer, temp, less, crop, snow, differ
Lift: temp, lot, warmer, less, crop, snow, differ
Score: temp, warmer, lot, less, crop, snow, differ

Figure F1. Prevalence of Topic for Assignment of International Responsibility

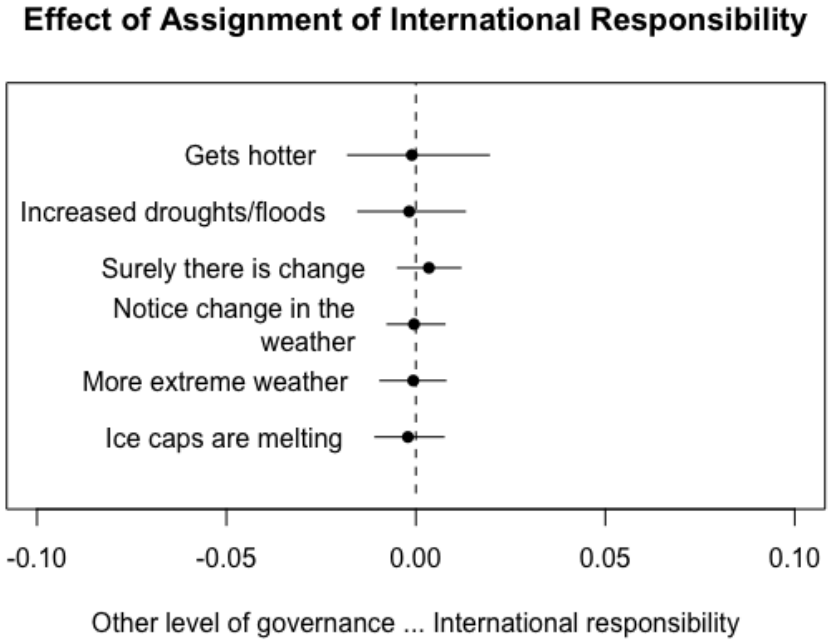


Figure F2. Prevalence of Topic for Assignment of National Responsibility

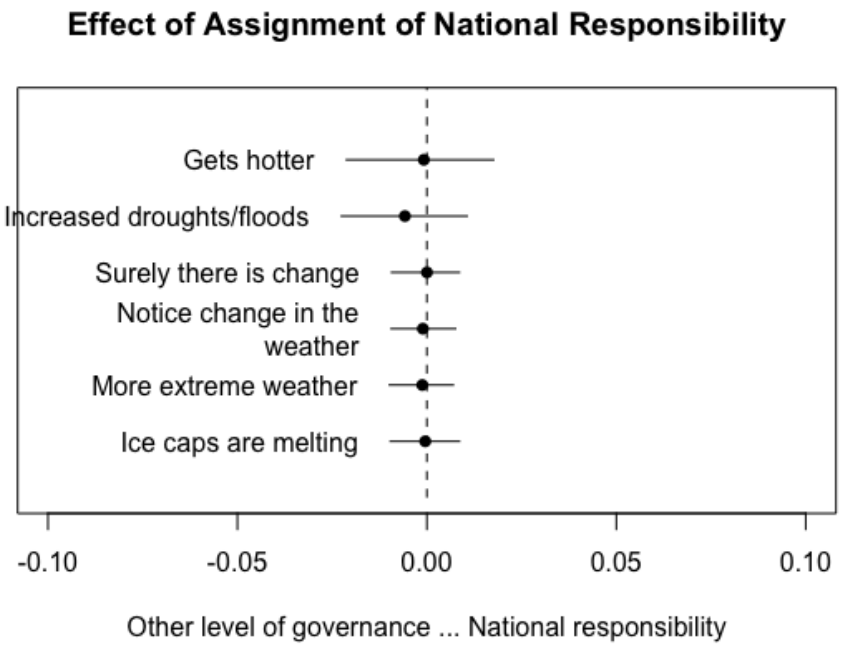
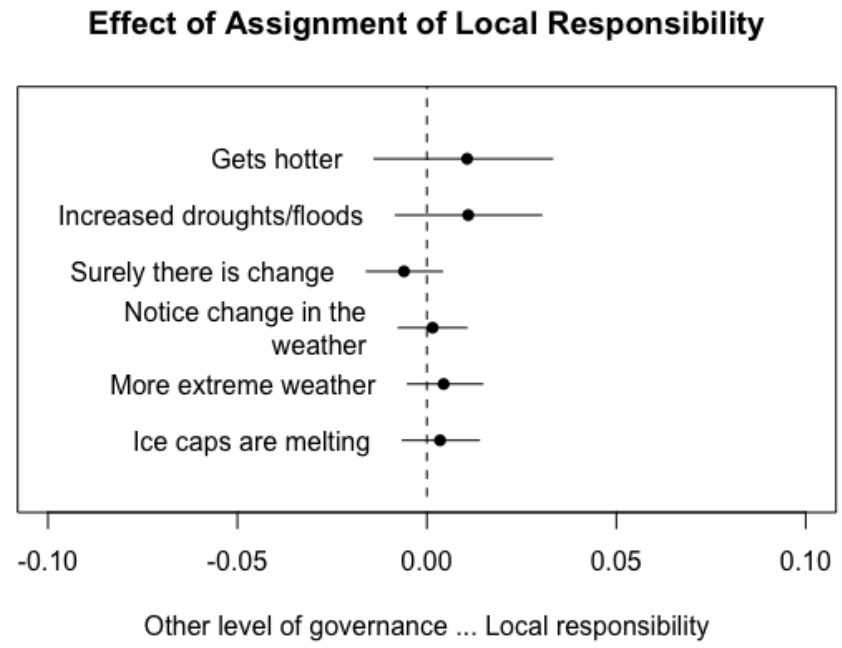


Figure F3. Prevalence of Topic for Assignment of Local Responsibility



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