



# The Impact of Public Deliberation on Climate Change Opinions Among U.S. Citizens

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Governance of climate change has become a major global environmental issue in the 21<sup>st</sup> century, and in the absence of wider citizen engagement poses risks of global proportions. Much of the current climate governance debate, unfortunately, is limited to scientists, politicians, and interest groups. With few exceptions, everyday citizens are spectators at best, their views, if not absent, are dismally represented in policy processes. To close the widening gap between citizens and policymakers, thereby increasing the sense of ownership of environmental policies by ordinary people, several methods of citizen engagement for global environmental governance have emerged. The effectiveness of these methods, however, relies upon the ability of citizens to deliberate meaningfully, especially in issues such as climate change. We conducted a study in conjunction with World Wide Views on Climate and Energy, a global citizen consultation that aims to solicit carefully considered public views on pressing issues, to determine whether American citizens are receptive to deliberation, and to ascertain what effect it had on their opinions, if any, could be observed. Along with the descriptive analysis, we performed a non-parametric Wilcoxon signed-rank test of selected pre-and post-event opinions of the participants from the US. Our study revealed that providing US citizens with the opportunity to engage in deliberation resulted in increased awareness regarding climate change and greater trust in science, technology, and international agreements. The change in opinion was more pronounced among people whose political orientation tilted to the right or who considered themselves as neutral. Citizen's opinions, especially after the event, resulted in less polarized views towards the global consensus on climate change. This finding suggests that US citizens are receptive to scientific information if it is communicated in an appropriate manner – a characteristic necessary for the creation of deliberative democratic governance on socially contested issues.

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## INTRODUCTION

With warnings of sweeping consequences for human lives and livelihoods, the latest scientific report from the Intergovernmental Panel on Climate Change (IPCC) raised the threat of climate change to a whole new level (Ricke et al., 2018). Nobody is going to be untouched by the impacts of climate change, and the predicted negative consequences are myriad: drought, extreme weather events, and increases in sea level, to name just a few (United States Environmental Protection Agency (EPA),

2017). Despite the imminent threats to society, public institutions have struggled to act decisively and effectively, however. As climate change is a global problem, most governments have little capacity to make a major difference by themselves (Rigaud et al., 2018). Furthermore, in the US, one of the major greenhouse gas emitters, the issue has become so politicized that it is extremely difficult to implement any solutions (Dunlap and McCright, 2013). With nation-states failing to act, international institutions will have to step-up to devise reasonable solutions to address the problem.

However, current international institutions have thus far failed to create a comprehensive, binding, and enforceable mechanism for international environmental governance (Zorthian, 2017). In light of this, several scholars have proposed new structures for global environmental governance, such as chambers of discourses, reflexive institutions, and constitutional adaptation (Berg and Lidskog, 2018). These three ideas all contain a component of deliberation and offer some hope for building consensus. Not only could the promotion of international deliberation create a more democratic means of solving problems, but the creation of deliberative structures might increase the public legitimacy of the international institutions which they inhabit (Dryzek, 2009; Higgott and Erman, 2010).

Still, institutions of environmental governance built upon deliberation face a major hurdle: is effective deliberation possible on such a topic? Especially for a country such as the US, where the process of finding solutions to climate change has become paralyzed by a lack of political will, it makes sense to be skeptical about whether citizens can deliberate regarding the issue of climate. Indeed, even the most educated people in the US are intensely polarized on the issue (Kahan et al., 2012). Furthermore, because the US is such a major contributor to global greenhouse gas emissions, any potential solution would be somewhat blunted if it could not succeed there. Despite this dark reality, large-scale citizen deliberations have evolved to address increasingly complex issues, many of which cross national boundaries (Anderson, 1991). One such initiative is World Wide Views (WWViews), initiated by the Danish Board of technology. In June 2015, WWViews on Climate and Energy was organized in 97 locations in 75 countries around the world.

Using pre-and post-event data collected as part of the event, our study aims to empirically test whether the citizens of the US are willing to change their opinion towards climate and energy after having the opportunity to deliberate during the event. More specifically we ask, did the deliberation make any significant difference in the public opinion regarding climate change? Does the change signal an increase in agreement with the global consensus? How did the participants' political orientation influence participants' opinions? The following *Theoretical Background* section presents the literature that we draw from and ultimately seek to contribute to. The subsequent sections present *The World Wide Views Methodology* and the procedure for *Data Analysis* followed by the presentation of *Results and Discussion*. Finally, the *Conclusion* section presents some of our key observations and insights.

## THEORETICAL BACKGROUND

Co-created by governments and civil society, deliberative events have been able to carve out a space for citizens to help shape, prioritize, and set government policies. Taken together, these cases reveal a growing body of cross-national deliberative practices that have the potential to foster truly global debates on some of the most urgent issues facing society today. However, for such deliberations to ultimately be productive citizens must be able to communicate with one another in good faith and operate under a shared commitment to facts and evidence. If deliberation is defined as “a logic of action oriented towards reaching common understanding,” (Bächtiger et al., 2010, p. 35), then the ability of citizens to keep an open mind to legitimate opposing evidence would be crucial to the effectiveness of international deliberations. Even if deliberation is defined more flexibly, containing alternative forms of communication such as roleplay, stories etc., and prioritizing outcomes more than the process, a shared understanding of factual information would be important for the development of mutual understanding among participants. Specifically, with respect to climate change, deliberative forums and structures of governance would require citizens to participate in reasoned discourse on a politically polarized topic, calling into question whether current forms of deliberation could be meaningfully utilized to address the issue.

Deliberative methods vary considerably in scope and intensity, with some lasting a few hours to several days (Chhetri et al., 2020). Deliberation in its broadest meaning is a process used by juries, legislatures, councils, or a group of people for decision making after a reasoned discussion on any topic (Gastil and Keith, 2005). On the other hand, deliberative events can be more global, specialized, or local in scope. For example, the WWViews event on climate and energy intends to engage the public in deliberation simultaneously in multiple countries with the aim of soliciting public views and presenting them to the leaders entrusted with preparing international agreements. In another example, using online deliberation held to rebuild the former World Trade Center, Black (2008) presents how personal storytelling can be used in local decision making. In other cases, scholars have conducted experimental deliberative pools to see how public view changes after a deliberation—in a recent example Mar and Gastil (2020) found out that a deliberative mini-public can improve voter knowledge. As a result, participants transcended their partisan identities and environmental belief in favor of empirical evidence presented. In general, the idea of public deliberation presumes that policymaking should not be left to just experts and politicians. Rather, a diverse group of citizens should discuss public issues as citizens have something important to contribute to the discussion.

The history of deliberation in the US is long and complicated. The late 20<sup>th</sup> century saw a surge of interest in deliberation with the rise of new forms of democratic discussion and the concept of deliberative democracy (Gastil and Keith, 2005). According to Gutmann and Thompson (2009), deliberative democracy has four major characteristics. First, it is based on the presenting

logic or justification regarding the issue at hand. Second, the process should be accessible to the citizens who are free and equal. Third, the deliberation should aim to reach a conclusion that is binding or agreeable to all citizens. Finally, the decision should be dynamic—it can be challenged or changed in the future. Mansbridge (1983) mentions that there are two contrasting models of democracy—one adversarial and another unitary. The former is a dominant form that relies on voting and the latter engages the public in a respectful deliberation, weighing reasons and sentiments, and aims for a group consensus on a given issue. One of the ideas of deliberation that has received considerable attention recently is the idea of deliberative polling (Fishkin, 1991; Fishkin, 1997) which is the process of bringing in a diverse group of people, providing them with balanced information and enough time to deliberate in the presence of trained facilitators, and collecting their considered opinions. Thus, one of the underlying features of a deliberative process is the orientation towards reaching a common understanding based upon the factual background information presented to participants ahead of time, while the discourse itself is moderated and information is available to settle factual disputes (Bächtiger et al., 2010).

Because of its rigorous attention to the integrity of the process and presentation of prior information as a baseline for the topic and direction of the discussion, our assumption is that deliberation would offer significant changes in public views after it occurs—even about an issue as polarized as climate change. The presentation of information as a component of the deliberative process would both strengthen and streamline the measurement of results by allowing changes in opinion to serve as a barometer of participants' ability to understand the issue and offer unbiased judgement. If participants' views were not significantly affected by exposure to factual information during their participation in the deliberation, then it would point to the notion that the openness to opposing evidence necessary for deliberation on polarized issues may not be characteristic of US citizens. Conversely, if significant opinion change occurred in the direction of greater agreement with the global discourse on climate change, it could indicate the utility of deliberation as a means of engaging the public in reasoned discussions of climate change and other polarizing issues.

Given the polarization around the issue in the US, the general attitude of the public towards climate change is rather skeptical (Dunlap and McCright, 2013), which gives rise to murky socio-climatic imaginary (Milkoreit, 2017). Here, socio-climatic imaginary refers to collectively held visions of the future based on the dis/beliefs regarding climate change and associated complexities that shape pathways towards action or inaction. In the US, conservative imaginary based on business as usual and driven by fossil fuel industries has been more successful in creating visions of the future than liberal imaginary based on renewable energy, and community-based adaptation (Milkoreit, 2017). Looking at the action or inaction in two recent administrations in the US explains how the narratives and priorities regarding climate change flip with the change in administration. President Obama's administration considered climate change as an urgent problem and aimed to address it

with government policies, technological innovation, and international cooperation. On the other hand, President Trump's administration highlighted the negative consequences of climate action to coal plans and the American economy. The Trump administration made an argument that unfair international agreements in dealing with climate change gave an unfair advantage to other countries and pulled the US out of the Paris agreement.

This contestation at the national level has left citizens puzzled in the tug of war of opposing arguments that fuels distrust and apathy towards the issue of climate change among the general public and inaction on the part of the country. A Pew Research Center survey on climate change reports that political partisanship is a strong factor in determining public perception towards climate change irrespective of the educational attainment or knowledge about climate change among American citizens (Funk and Kennedy, 2020). Due to partisan politics regarding the scientific findings and the level of action required to combat climate change, the US has not been able to enact strong policies to deal with climate change (Worland, 2017; Chhetri et al., 2020). Despite initial efforts in launching the UNFCCC, the United States has had a complicated relationship with the global community in reducing greenhouse gases and keeping up with global agreements. A survey in the three North American countries has shown that the citizens of the United States were less concerned about climate change and renewable energy than the citizens of Canada and Mexico (Hagen and Pijawka, 2015). Our paper goes one step ahead to explore how the perceptions of American citizens regarding climate and energy issues change after participating in deliberation and whether the change is influenced by participants' political orientation. By doing so, our study investigates the major assumption of deliberative events, such as WWViews, that once people (from any part of the globe) are provided with balanced information and an environment conducive to deliberation their awareness rises and their views change significantly in acknowledgment of the data and arguments that are presented, even on extremely contested issues such as climate change in the United States.

Governance of global issues such as climate change at the international level requires people to think of themselves as global citizens. This expanded understanding of citizenship is primarily due to the economic, political, and cultural transformation that has taken place over the years and particularly due to the globalization of issues that has extended the meaning of citizenship which has traditionally been rooted in national boundaries. According to Anderson, a nation-state is an "imagined community" that depends on making a persuasive representation of nationhood on people's minds (Anderson, 2006). Several scholars contend that imaginaries created by national policies and priorities are still stronger as public reasoning is more situated than universal, which suggests that normative commitment is rooted in a national or institutional context (Jasanoff, 2004; Blue, 2017). For example, a comparative study of the public policy of life science across the US, the European Union, and the United Kingdom suggested that though each country has a similar background, each of them

perceive risk differently and citizens in each nation-state are accustomed to a settled practice of knowledge making and collective reasoning (Jasanoff, 2004; Chhetri et al., 2020). Further, since climate change touches different values, meanings, ideologies, and goals, “A singular “future” imagined by a collective “we” is an unachievable goal” (Hulme, 2015, p. 900). Climate change means different things to different people based on their context, location, and network (Hulme, 2009).

Our study uses the case of deliberation in climate and energy conducted by WWViews at the global level in which the authors’ institution and one of the authors played a significant role in organizing these events in the United States. WWViews is characterized as the first-ever global citizen consultation, building on the growing number and variety of deliberative events at local, regional, and national levels (Joss and Bellucci, 2002). It is an innovative platform for engaging citizens in dialogue about complex global issues (e.g., climate change) and represents a novel and practical method for assessing ordinary citizens’ views through deliberation. Inasmuch as deliberative forums anticipate that participants take their real differences into account, sidestep the distorting power of special interests, and avoid polarization among participants, WWViews demonstrated the basic principles of deliberation and citizen engagement at a global level (Fishkin, 2009).

In brief, the design of WWViews calls for approximately 100 citizens, selected randomly, at each deliberation site. The selected citizens receive briefing materials, written in local languages, before the event. During the day of deliberation, the participants sit at tables of five to eight with a facilitator trained to ensure that everyone is engaged. After watching short information videos covering the theme of the discussion, the participants then engage in a facilitated dialogue, giving them time to reflect. Each thematic session concludes with citizens casting their votes anonymously on two to six questions. From this process participants’ opinions after deliberation has occurred and information has been provided can be ascertained. In addition to voting at the end of each session, the WWViews process also used pre-and post-event surveys at some locations, allowing researchers to determine the change in participants’ opinions on various climate change related topics after the deliberative and informative components of the deliberation are complete. This study takes the latter approach in order to determine whether participants’ opinions changed as a result of the deliberation.

## THE WORLD WIDE VIEWS METHODOLOGY

Our study is based on data collected as a part of WWViews on Climate and Energy. Aiming to create a global citizen voice, WWViews on Climate and Energy is the largest global democratic deliberation on the topic of climate and energy transitions. Coordinated by the Danish Board of Technology, it is part of the ambitious and ongoing efforts by partners in the World-Wide Views Alliance to help close a widening democratic gap between citizens and policymakers as policymaking grows increasingly global in scale and complex in nature. WWViews on

Climate and Energy implemented 97 debates involving around 10,000 citizens in 76 countries spanning five continents. The citizens gathered in their respective countries to deliberate about some of the core issues at stake in the ongoing, international discussions and negotiations about how to deal with climate change. They received balanced information about climate change and energy, discussed the issues with fellow citizens, and voted individually (and anonymously) on the questions presented to them. Importantly, the discussions involved were highly mediated, with trained facilitators present to ensure that all participants were given time to speak and to keep the discussions going during the time allotted. These discussions took place during daylong meetings on June 6, 2015, at participating locations. The first meeting started at 9 am in Fiji and the last one ended 27 h later with a meeting in Arizona (Bedstead et al., 2015).

All participants were carefully chosen to represent the diversity of their location with respect to age, gender, occupation, education, and geography. In addition, the participants were not scientists, experts, or stakeholders regarding climate and energy. In Arizona, for example, researchers from ASU worked very hard to find a representative sample. They published advertisements on craigslist and searched for underrepresented people in public places, grocery stores, etc. in order to recruit a representative sample for the meeting.

In the US, after participants were identified, pre-survey data was collected a few weeks before the WWViews event day. Participants were assigned a specific identifier code, and their demographic information (including age, gender, geographic location, and political orientation) was recorded. Participants then were asked for their responses to a pre-survey questionnaire. All participants were provided an informational booklet before the event and during the WWViews event watched informational videos. The information materials addressed the causes of climate change, its potential impact on human societies, and the potential for international agreements to cut down on carbon emissions. After short videos, participants had the opportunity to deliberate and discuss the issue amongst themselves in small groups of six to eight people. At the end of the day, participants were asked to rate their agreement with statements on a post-event survey.

## DATA AND ANALYSIS

Our study is based on fully standardized pre-event and post-event surveys collected before and after WWViews events at four locations inside the United States—Colorado, Arizona, Minnesota, and Massachusetts—selected for the evaluation of the event. Among 97 locations where the event was organized, the pre-and post-event survey was conducted at 18 locations including all four locations inside the United States. Since our focus is the United States and as the other locations are diverse, each having about 70 participants per national site we decided to analyze the data of the United States only for this paper. This data is different from the main survey that was used by the event for public sharing.

**TABLE 1** | List of statements with null hypothesis ( $H_0$ ) and alternative hypothesis ( $H_a$ ).

S. No	Statements	$H_0$	$H_a$
1	Climate change already has a negative effect on my everyday life	$\mu_1 - \mu_2 = 0$	$\mu_1 - \mu_2 \neq 0$
2	Climate change will certainly reduce quality of life for our children	$\mu_1 - \mu_2 = 0$	$\mu_1 - \mu_2 \neq 0$
3	New technologies will help solve most climate change	$\mu_1 - \mu_2 = 0$	$\mu_1 - \mu_2 \neq 0$
4	We have to accept significantly reduced income and comfort if we want to avoid serious climate problems	$\mu_1 - \mu_2 = 0$	$\mu_1 - \mu_2 \neq 0$
5	International agreements on CO <sub>2</sub> reductions will finally pave the way to combat global warming	$\mu_1 - \mu_2 = 0$	$\mu_1 - \mu_2 \neq 0$
6	Experts and science will help solve most climate change problems	$\mu_1 - \mu_2 = 0$	$\mu_1 - \mu_2 \neq 0$
7	The seriousness of climate change has been exaggerated by environmentalists	$\mu_1 - \mu_2 = 0$	$\mu_1 - \mu_2 \neq 0$

In the United States, the pre-event survey contained 75 statements and the post-event survey had about a hundred statements. For most of the questions participants simply had to rate their agreement on a Likert Scale of 1–7. Administered to WWViews participants approximately 1 month before the event, the pre-survey questionnaire had eight sections: motivation to participate, interest and knowledge, climate change, citizen participation in decision making, social and environmental activities, political orientation, views of climate change, and demographics. Conducted immediately after the WWViews event, the post-survey questionnaire had nine sections: organization of the WWViews event, results of the dialogue, interest and knowledge, influence of participation in the event, climate change, citizen participation in decision making, political orientation, views of climate change, and evaluation of process. Four sections were included in both surveys in the United States: climate change, views of climate change, political orientation, and citizen participation in decision making. For the purposes of our study, we included seven out of ten questions from the climate change section that consisted of public opinion regarding climate change (Table 1).

These questions reflect honest public opinion regarding climate change, international initiatives to deal with climate change, and the role of experts, science, and technology. These statements are both less absolutely worded and less politically charged than yes or no questions about the existence of climate change or statements about whether climate change is caused by human activities. All statements were on a Likert Scale of 1–7, where one indicates total disagreement and seven indicates total agreement. A total of 195 responses were analyzed after sorting out cases with missing or improper answers to any of the selected statements. In addition to the analysis of change in opinion among the American public, we analyzed the degree of changes following their political orientation. For this, the entire sample was divided into two groups-left and right/neutral, it is important to note that nine participants did not mention their political orientation. Fifty percent of the participants considered themselves as left, followed by 35% as neutral, and only 15% considered themselves to be oriented to the right. The self-selection process of the WWViews event may have precluded the people leaning towards the right from taking part in the deliberation on the climate and energy event. It could also be that participants who engaged in deliberation may have chosen to downplay their disbelief or preferred to state their political orientation as neutral.

We used a paired two-tailed non-parametric Wilcoxon signed-rank test on each statement to determine whether there were significant differences in the mean of the public views between the pre-and post-event surveys. As the responses of each person in the pre-and post-event surveys could be paired, we used the paired test method that is commonly used to compare two population means when there are two sets of samples in which all observations in one sample can be paired with corresponding observations in the other sample. We used a two-tailed test as our interest was in determining whether there existed significant differences in the mean. The Wilcoxon signed-rank test is a non-parametric alternative to the parametric t-test that is used to compare paired data when the data is not normally distributed (Roberson et al., 1995). For all statements.

$$H_0: \mu_1 - \mu_2 = 0$$

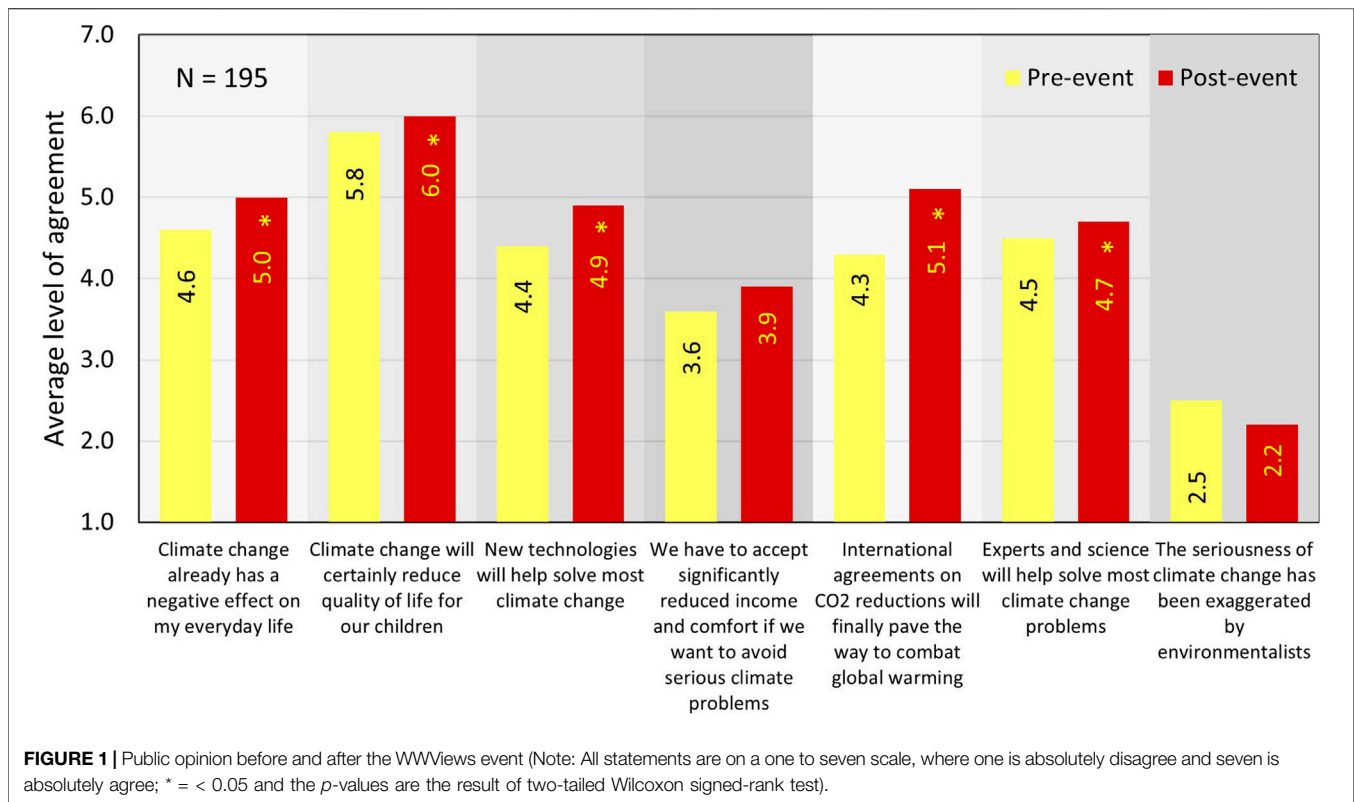
$$H_a: \mu_1 - \mu_2 \neq 0$$

Where,  $\mu_1$  = the mean level of agreement in the pre-event survey  $\mu_2$  = the mean level of agreement in the post-event survey. For each statement, our null hypothesis ( $H_0$ ) is that there is no difference in the mean level of agreement between the pre-and post-event surveys. For all statements, the alternative hypothesis ( $H_a$ ) is that there is a significant difference between participants' opinions in the pre-and post-event surveys.

## RESULTS AND DISCUSSION

The results of the Wilcoxon signed-rank test indicate that there is a significant difference between the mean level of agreement among the participants in the US in five out of seven statements after participation in the event (Figure 1). For these five statements, since the calculated  $p$ -value was lower than the significance level of 0.05 used for the two-tailed test, we have sufficient evidence to reject the null hypothesis which mentions that there is no significant difference between the mean level of agreement in the pre-and post-event surveys. All five statements with significant change in public opinion before and after the event showed a net increase in the average level of agreement.

The results show an increase in acknowledgement with regards to the negative effects of climate change in everyday life and the likelihood of reducing the quality of life for future generations, after participating in the event. The lower average level of agreement among the public in the pre-event survey indicates that the US public is less aware or interested in

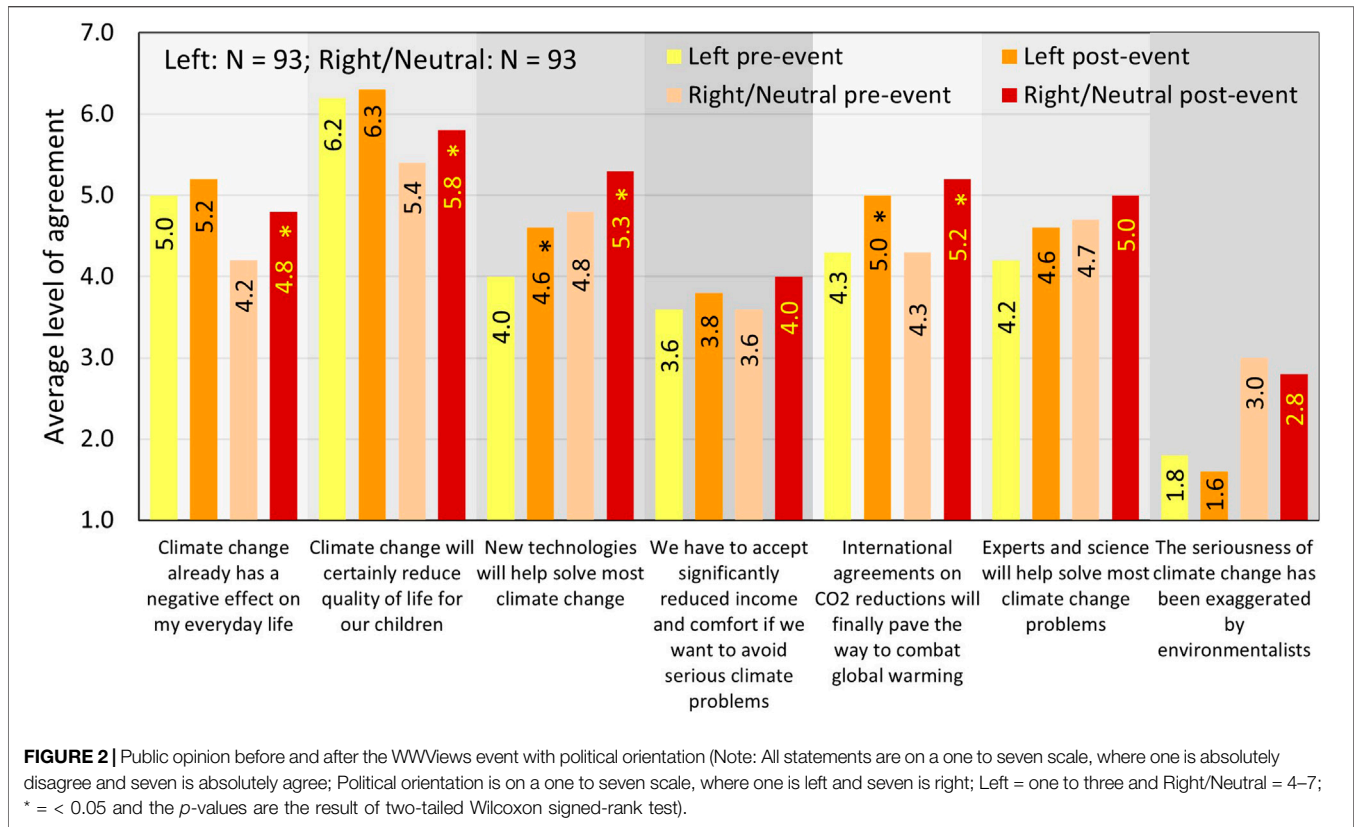


understanding the severity of the problem. The low level of agreement in the pre-test also corroborates with a recent Pew Research Center poll which reveals that the American public is less likely to be concerned about climate change (59%) ranking 20<sup>th</sup> among 26 countries surveyed (Fagan and Huang, 2019). However, no significant change in pre-and post-survey opinion was observed in the statement which mentioned that that people have to accept significantly reduced income and comfort to avoid serious climate problems. It is understandable that accepting the negative impacts of climate change is one thing and being willing to accept reduced income and comfort is another thing.

In general, after engaging in deliberation, the public expressed more faith in international agreements on the reductions of greenhouse gases. It may be that the United States public were less informed about the potential role of international initiatives and the event itself may have informed the significance of international agencies in delivering much needed solutions to tackle the problems associated with climate change. Strict association with the party lines at the national level and the simultaneous spread of myths around the science of climate change may have created disbelief and false imaginaries making the US public complacent about the severity of the issue. The significant increase in trust in climate science after engagement in the deliberative event suggests that the US citizens might have been more convinced about the causes and proposed solutions to climate change. The increase in the belief that innovation in technology can solve most climate change problems may be due to the exposure to a range of technological options to reduce the dependency on fossil fuels

during the event. However, in the statement regarding whether the seriousness of climate change has been exaggerated by environmentalists no significant change in opinion was observed among the participants. This question was tricky and perhaps not straightforward – there is a visible decrease in agreement for this statement but not statistically significant, probably due to a relatively smaller sample size.

Our analysis of the pre-and post-event survey and participants' political orientation reveals two important findings (Figure 2). First, participants who considered themselves right or neutral changed their opinion significantly in four statements: climate change already has a negative effect on everyday life, climate change will certainly reduce the quality of life for our children, new technologies will help solve most climate change, international agreement will pave the way to combat global warming. Likewise, participants with political orientation tilted towards the left changed their opinion significantly in two statements: new technologies will help solve most climate change and the international agreements will contribute to combating global warming. The change in opinion from the people who considered themselves right and/or neutral towards acknowledging that the climate change is real, and it will have consequences in the quality of life in the future is quite interesting. More specifically, though the number of people who considered themselves having the political orientation to the right was lesser, we observed that the degree of change among this group was greater compared to people with the orientation to the left—and this is a promising change in perception for deliberation. It is important to note here that the lesser



number of respondents-necessitated in part by the deliberative intervention-has made sub-sample analysis tough and the change in pre-and post-event opinions was less significant for both groups in three out of seven statements. Considering that each statement was on a scale of one to seven, a half-point shift in the average level of agreement, for example, for citizens having right/neutral political orientation in the first statement “climate change already has a negative effect on my everyday life” is not only statistically significant, but also large substantially (Chirawurah et al., 2019).

Thus, from the analysis of these statements, we came to understand that participants in the United States increased their confidence in international agreements, experts, and science after participation in the event. The fact that many participants were willing to change their opinions about all these statements when presented with evidence during the deliberation suggests that they remained open to scientific evidence and came into the process with an open mind. Citizen deliberation in complex issues such as climate change may be able to reduce polarization while fostering a general agreement suggests that citizens can successfully deliberate and can also come to agreed solutions.

The relationship between public deliberation and change in opinion is long established. One of the most prevalent arguments is that deliberation “... tends to change things—opinions, rationales, intensity, attitudes toward opposing views, and so on—and often aims to influence policy” (Goold et al., 2012, p. 24). This can be problematic if the deliberation is biased towards

reinforcing the voices of people in power or manipulated to reinforce radical thoughts by shifting the position of the group to one extreme (Sunstein 2000). However, emerging scholarship in deliberative democracy postulates that a carefully organized deliberation welcoming a diversity of thought while offering consensus on the topic. According to Curato et al. (2017), clarity on the issue at hand automatically brings people together. In our case, efforts were made to bring together a diverse group of people, which would mitigate some of the potentially extreme effects of deliberation. Additionally, deliberating on the basis of uniform and balanced information, as well as engaging participants in small, facilitated groups with a commitment to spend a day in learning and deliberating together, as we did, has been shown to result in a carefully considered judgment (Klüver 1995). Deliberation swayed public opinions among US citizens towards acknowledgement of climate change as well as greater trust in the facts presented. To this end, engagement and deliberation may have avoided some of the pitfalls that other scholars have noted. Our study also suggests that opportunities for deliberation among ordinary citizens can greatly enhance their confidence regarding their own ability to participate in conversations surrounding critical issues (Stirling, 2008).

The opinion change has been a major metric for evaluating whether participants change their mind after the deliberation, however, scholars caution that the opinion change can be due to deliberative or non-deliberative persuasion (Gerber et al., 2014). In general, there are two major concerns. First, in a group

discussion, there might be cognitive constraints that hinder communication (Lupia et al., 1998), or framing effects while designing the informational materials or survey questions (Druckman 2001). Second, the deliberative process consists of a package of interventions, and out of which group discussion is the only deliberation part of it (Gerber et al., 2014). With the prior experience of DBT and partner organizations in organizing global democratic deliberation (Worthington et al., 2013; Rask and Worthington, 2015), long preparation, and careful curation of information materials and questions asked (Bedsted et al., 2015), the WWViews Climate and Energy event considerably reduced cognitive constraints and framing pitfalls. The design of the event provided greater emphasis and ample time for deliberation in small groups in the presence of a trained facilitator, whereas other interventions such as informational videos and interaction with experts were kept brief. The time between pre- and post-event was short and, in the United States at least, no large event such as a political event or an extreme climate condition occurred that could change public opinion. Therefore, there are sufficient reasons to believe that the change in opinion can be attributed to the deliberation that happened during the day in small group discussions.

The results of our study demonstrate that through deliberation, WWViews on climate and energy substantially affected the opinions of the United States participants. Interestingly, the change in opinion was profound for people of a rightwing or neutral political orientation who are generally considered skeptical of climate change and the efforts to address the issue. The event also ignited the interest and passion of many participants to actively engage in a discussion of climate change, while increasing their confidence in their own knowledge of the subject. This in turn demonstrates the effectiveness of the deliberation that took place in yielding positive individual outcomes for participants. As such the deliberation which took place can be said to have been effective by the criteria of opinion change through rational discourse, and positive outcomes for participants' understanding of the topic. Consequently, we find that deliberation by citizens of the United States is possible even regarding the polarized subject of climate change and that models of global environmental governance based on deliberation should not be written off as ineffective for the United States.

## CONCLUSION

WWViews demonstrates a distinctive form of public consultation that creates an atmosphere of mutual respect such that participants have the opportunity to concentrate on deciding issues based primarily on their merits and not on ideologies. The method focuses on: 1) demographic representation and diversity of viewpoints, 2) informed citizenry and their ability to impact policy outcomes, 3) improved understanding of complex social issues through deliberation (e.g., climate change), 4) overcoming differences in perceptions of complex issues through face-to-face discussions, 5) conscious decision to avoid the influence of special interest groups in public policy.

We have investigated the potential for citizens in the United States to change their views regarding topics related to climate change and found that significant changes can be observed when citizens engage in deliberation. These changes occurred mostly in the direction of recognition of the problem of climate change and greater confidence in international diplomacy. The change was more visible in the case of people having neutral or right political orientation. Therefore, our research demonstrates United States citizens' possession of capacities integral to deliberation, namely openness to opposing arguments, and the effectiveness of the deliberation at producing a positive outcome for participants (Bächtiger et al., 2010). If, as our results demonstrate, deliberation on the issue of climate change is possible, then our study would also suggest that deliberative democratic institutions of environmental governance might be functional in the United States.

Our study represents a preliminary step in determining the potential for public deliberation to serve as an effective governance mechanism on a polarized topic. Given that, there are several components that would make for a more accurate and conclusive experiment. For one thing, a study with a larger and more random sample would be able to discuss absolute levels of agreement with the survey statements more accurately and might have large enough samples within each demographic group to yield statistically significant results for individual groups. For another, our study relies on a limited measure of opinions, a more extensive sum variable would be helpful to better understand the deliberative potential. Finally, this is not an ideal experimental research as the research design does not include a control group - future research might use multiple ways to compare public views. With that being said, since the span between the pre- and post-event survey is not long, it can be assumed that there was not any political event or an extreme climate condition occurring in the United States between the pre- and post-event surveys. Therefore, our findings account for the change due to the participation in the event.

## DATA AVAILABILITY STATEMENT

The data analyzed in this study is subject to the following licenses/restrictions: Dataset is a part of World Wide Views initiatives. Requests to access these datasets should be directed to <http://climateandenergy.wwwviews.org/>

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Arizona State University Institutional Review Board (IRB) and others as appropriate. The patients/participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

RG conceptualized the paper, wrote and edited the paper, performed analysis, and synthesized the results. NA



performed the initial analysis, wrote the initial drafts of the paper, contributed to the editing of the final draft. NC provided guidance and support, edited the manuscript, contributed to the revision of the paper. All authors contributed to the article and approved the submitted version.

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## SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpos.2021.606829/full#supplementary-material>.

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**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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