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Short communication

Using deliberative democracy to identify energy policy priorities in the United States

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ABSTRACT

Energy policies to mitigate and adapt to climate change need public support to be successful. Deliberative democracy forums serve to both better inform the public of the available options and provide a way for policymakers to assess support for proposed policies. This work uses a pilot study in Pittsburgh to generate hypotheses regarding how a deliberative democracy process affects residents' perceptions of and support for City-wide energy policies to address climate change. A convenience sample completed pre and post-surveys during a deliberative forum: "Building a Resilient Pittsburgh: Climate Challenges and Opportunities". The surveys focused on knowledge, perceptions, and opinions related to the existence of climate change as well as energy policies to mitigate and adapt to climate change. Results suggest that the forum was useful in shifting perceptions, but did not significantly influence objective knowledge or policy support. Participants had a slight preference for energy efficiency strategies over renewable energy and public information. More research is needed to evaluate deliberative democracy approaches and expand these findings to a more diverse population.

1. Introduction

Worldwide, 97% of scientists agree that climate change is occurring and partially caused by man [1], and yet major polling entities such as Gallup, Yale, Stanford, and Reuters consistently demonstrate that 20–50% of the US public does not agree with this statement [2]. Many strategies to mitigate or adapt to climate change exist [3–5], with varying degrees of success. For instance, the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating has very strong public support, likely due to proven savings in maintenance that translate into higher property values [6,7]. In contrast, while nuclear power has the ability to generate power with zero greenhouse gas emissions, the Fukishima disaster and related public opinion have caused major setbacks [8]. Still other newer technologies, such as carbon capture and sequestration, face significant inertia in overcoming negative opinions even with significant education [9].

Central to these difficulties is public opinion; to be successful, energy policies to mitigate and adapt to climate change clearly need significant public support. Support for energy policies is related to (1) the presentation of the policy, (2) the characteristics of the constituency, and (3) trust. Policies that are presented with incentives and have little perceived impact on behavior (e.g. efficiency measures such as driving a hybrid car) tend to be perceived as more acceptable and effective than policies that use penalties or shift behavior (e.g. curtailment measures that lead to driving less) [10,11]. In addition, studies find that greater support for mitigation policies is associated with increased knowledge and perceived local risk of climate change, trust in environmentalists, higher income, being black and being older [12–14]. Finally, citizens must trust that the implementers of a policy, whether that is government or industry, are competent and share their values [15,16]. Evidence suggests that government agencies are perceived as more credible and trustworthy when they engage citizens earlier in the decision-making process, provide an opportunity to ask questions, and demonstrate that citizen input will be taken seriously [17].

While one cannot change the characteristics of the constituency, one can affect presentation of the policy. Approaches for soliciting public opinion on policies vary with topic and audience, and include methods such as passive mechanics (e.g., comment boxes), polling methods (e.g., surveys, elections), interview methods (individual, group, etc.), and deliberative democracy [18]. Specifically, the phrase *deliberative democracy* is used to describe civic engagement practices that share a number of features, despite differences in particular protocols [19]. Participants reflect on the diversity of the communities impacted by the outcomes of the deliberation; engage in structured small group discussions; and have an opportunity to compare values and experiences, consider a range of policy

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options, and engage relevant arguments and information. The goal of deliberative forums is to help participants develop an opinion informed by relevant facts, expert information, and an understanding of multiple perspectives held by others in their community. This process encourages citizens to engage in a structured discussion on polarizing issues, better informing the public and providing a way for policymakers to assess support for various proposals [20–24].

Building on previous work that has focused on college campuses [25], this work is a pilot test to explore how City government can use this process to engage citizens. This type of hypothesis-generating research serves to structure future studies. In this study, we investigate how this deliberative democracy process shifts people's knowledge and perceptions of climate change policies. We have three primary questions:

1. Do the participants' perceptions, knowledge or opinions shift after the forum?
2. Do participants have coherent policy preferences in terms of perceptions and preferences?
3. Do participants perceive the forum elements as effective?

2. Methods

2.1. Procedure

On October 14, 2014, Carnegie Mellon University, the City of Pittsburgh, the Pittsburgh Environmental Council, and the Pittsburgh Climate Initiative cohosted a deliberative forum entitled "Building a Resilient Pittsburgh: Climate Challenges and Opportunities" (see Appendix A). The forum was developed to gather participants' informed opinion on what policies and strategies the City of Pittsburgh should pursue to minimize and adapt to the local effects of climate change, as well as to identify which primary and co-benefits of CO_2 emission reduction strategies were important to the participants.

Protocols for this deliberative forum involved five elements: participants (1) completed a pre-survey, (2) received briefing materials on the topics to be discussed at the forum, (3) engaged in small group discussions facilitated by trained moderators, (4) had their questions addressed by a panel of experts, and (5) completed a post-survey.

Shortly after arriving at the forum, participants completed a pre-survey and were assigned to a table for small group discussions. Moderators at each table then encouraged participants to read the briefing materials prepared for the forum (see Appendix A). The forum officially began with introductory remarks followed by a "pedagogical introduction" provided by the director of the Steinbrenner Institute for Environmental Education and Research (see Appendix C). This introduction explained the extent and human cause of global temperature increases, and provided an overview of the projected impact of CO_2 emissions reductions. In addition, using a McKinsey Cost Curve [26] participants were introduced to the potential emission reductions, co-benefits (e.g. public health, saving money), and costs of differing strategies for reducing CO_2 emissions.

After the introduction, the moderator at each table presented an overview of the timing and agenda for the forum's small group discussions. The agenda included discussion of four prompts (see Appendix D), with 12 min allocated to the discussion of each. Moderators were supplied with additional resources to support participants' discussion of each prompt (e.g., a chart detailing primary and direct co-benefits of differing strategies). At the close of the small group discussions, participants at each table agreed on one question that the groups' members wished to ask the resource panel. In a plenary session, each table's question was addressed by the expert panel. After the plenary session, moderators asked participants to reflect on the questions and the panelists' responses before each participant completed a post-survey.

2.2. Survey questions

The pre and post-surveys were each approximately 20 questions long (see Appendices B and E). For **climate change science**, we measured *perceived understanding* ("How well do you feel you understand the issue of climate change compared to the average person?") and *importance* ("How important is the issue of climate change for society?") (Likert scale 1–5). *Climate knowledge* was assessed via 7 true/false questions (e.g. "Reducing carbon emissions helps to reduce the effects of climate change.") and one multiple-choice question (Which energy use in Pittsburgh leads to the most carbon emissions?").

For **support for energy policies**, we assessed perceptions of policy benefits as well as policy support. We measured *City responsibility* ("Do you think the City of Pittsburgh has a responsibility to encourage and promote strategies to deal with climate change (often called adaptation)?") for adaptation and mitigation policies (Likert scale 1–4). We measured *importance of benefits* ("How important is each benefit when considering strategies for dealing with and preventing climate change?") for four benefits including (1) reducing carbon emissions, (2) saving you money, (3) improving air quality and (4) improving water quality (Likert scale 1–4). We assessed *benefits knowledge* ("How effective is increasing renewable energy (such as wind and solar) at achieving these benefits?") for three strategies including (1) renewable energy, (2) energy efficiency, and (3) information (Likert scale 1–5). We solicited *policy support* ("Do you think the City of Pittsburgh should do any of the following?") differently between the pre and post-survey (Likert scale 1–5). The pre-survey included strategy categories (renewable energy, energy efficiency, information) while the post-survey assessed specific strategies (e.g. "Use solar energy on all City buildings with solar access by 2020."). In addition, we assessed *willingness to pay* for a stormwater utility fee ("Would you be willing to pay a similar monthly fee in Pittsburgh?" (Likert scale 1–4).

For **forum evaluation**, participants reported their perception of the individual elements of the forum, which included the written materials, small group discussions, and expert panel. We measured *positive experience* via 4 questions ("To what degree did participating in this conversation feel engaging? Enjoyable? Intellectually stimulating? Frustrating?"), where "frustrating" was reverse coded (Likert scale 1–4). The questions were combined into a single score, with a Cronbach's alpha of 0.64. We measured the *effectiveness of the discussion* via 6 questions (e.g. "Did the small group deliberation broaden your understanding of the challenges of climate change?") (Likert scale 1–4), which were combined into a single score with a Cronbach's alpha of 0.88. We measured *effectiveness of panel* via the same 6 questions and combined them into a single score with a Cronbach's alpha of 0.89. We also assessed *perceived usefulness* of each element (e.g. "How informative did you find the written materials?") (Likert scale 1–4).

In addition, we measured *demographic information* in the pre-survey. In the post-survey, we measured *trust* ("To what degree do you trust the following groups in the context of the issues discussed today?") (Likert scale 1–4) and *pro-environmental attitudes* via a shortened New Ecological Paradigm (NEP) scale [12]. Surveys were administered via paper, and double coded to minimize interpretation errors.

2.3. Sample

We recruited 75 participants in a convenience sample from both Carnegie Mellon University and the Pittsburgh area via