

# **Does Solar Geoengineering Crowd-out Climate Change Mitigation Efforts? Evidence from a Stated Preference Referendum on a Carbon Tax**

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**Abstract:** Solar geoengineering is increasingly being considered as a realistic approach to managing climate change. One crucial concern is whether geoengineering crowds-out efforts to mitigate greenhouse gas emissions. Adding to a limited body of empirical evidence, we use a survey experiment to estimate how informing the U.S. public about solar geoengineering impacts support for a proposed national carbon tax. In contrast to the crowding-out hypothesis, we find that respondents who are provided with information about geoengineering are significantly more likely to support the tax. Further, we document systematic variation as people with egalitarian and communitarian worldviews are more responsive to the information relative to those with hierarchical and individualist worldviews. Our study suggests that the availability and awareness of solar geoengineering options may lead to an increase in greenhouse gas abatement efforts.

**Key Words:** climate change, solar geoengineering, moral hazard, emissions, experiment

## 1. Introduction

With the failure of the international community to sufficiently address climate change, researchers are increasingly contemplating the potential for geoengineering—the large-scale intentional intervention in the Earth’s environment to offset the harmful effects of anthropogenic climate change (Peters et al., 2020). Geoengineering includes an array of options such as removing carbon dioxide from the atmosphere to diminish the greenhouse effect or increasing the albedo of the atmosphere by reflecting more solar radiation back into space (i.e., solar geoengineering). While carbon removal or negative emissions technologies present longer-term potential, solar geoengineering offers quick and inexpensive—albeit imperfect—ways to lower global temperatures (Barrett, 2008; Mahajan et al., 2019).

A long-standing behavioral concern surrounding geoengineering, and particularly solar geoengineering, is that it may decrease efforts to mitigate greenhouse gas emissions (Keith, 2000; Lawrence and Crutzen, 2016).<sup>1</sup> Reynolds (2019 p. 32) contends this issue “has been the most widespread basis for resistance to solar engineering.”<sup>2</sup> However, this view is not universal. A number of researchers have suggested solar geoengineering may serve as a clarion call to increase mitigation efforts (e.g., Moreno-Cruz, 2015). There are several reasons for this response: It could result from the public viewing solar geoengineering as a threat, making mitigation more attractive (Reynolds, 2015; Burns et al. 2016). It could also result from the fact that the discussion of solar geoengineering itself makes the climate change problem more salient (Kahan et al., 2015). Or it could be due to a combination of a “polluter-pays bias” and “naturalist bias” (Baron, 2006)—many people see human-made risks such as anthropogenic climate change as something humans have to address (“polluter-pays bias”), and, given the choice, they prefer a “natural” solution such as abatement over an “artificial” solution such as geoengineering (“naturalist bias”).

A small but growing body of literature has explored empirically whether the availability of solar geoengineering crowds-out or crowds-in mitigation efforts. Thus far, the evidence is mixed. This research generally relies on focus groups, surveys and survey experiments to

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<sup>1</sup> See Schneider (1996) for a review of the early debates on geoengineering in climate change negotiations and the development of the report by the National Research Council in 1992.

<sup>2</sup> David Keith, borrowing from the insurance literature, referred to the potential for solar engineering to diminish mitigation efforts as “moral hazard” (Keith, 2000), and while this term has gained traction in the literature, many consider mitigation displacement to be more appropriate (Morrow, 2014).

measure how people respond to the prospects of solar geoengineering. Some studies find that individual support for mitigation efforts is unaffected by exposure to solar geoengineering (e.g., Fairbrother, 2016), while others report that people respond to the potential of solar geoengineering with increased concern for climate change (Kahan et al., 2015) and increased willingness to purchase carbon offsets (Merk et al., 2016).<sup>3</sup> Recent work finds a person's response to solar geoengineering depends on the role that geoengineering has in solving the climate crisis, with solar geoengineering crowding-out emissions abatement when it is presented as a major solution to climate change (Raimi et al., 2019).<sup>4 5</sup>

Our study contributes to this body of research by investigating whether providing the U.S. public with information about solar geoengineering significantly influences support for one specific mitigation instrument, a carbon tax. We expand on previous work by presenting participants with a detailed national carbon tax proposal that is based on Washington state's 2018 carbon tax referendum. Since support for general climate policy tends to be higher than support for specific climate policy instruments (e.g. Leiserowitz 2006), it is important to consider how the prospects for solar geoengineering may affect support for a specific climate policy. We also consider heterogeneous effects by considering how individual cultural worldviews interact with the prospects of solar geoengineering.<sup>6</sup> That cultural worldviews shape people's perception of risk and support for related policies originates from Douglas and Wildavsky's (1982) cultural theory of risk, and the literature provides considerable evidence that attitudes towards environmental risk and policies are indeed skewed along cultural lines (Kahan et al., 2011; 2015; Cherry et al., 2017). "Thus, persons with *individualistic* values can be expected to be relatively dismissive of environmental and technological risks, which if widely accepted would justify restricting commerce and industry, activities that people with such values hold in high regard. The same goes for individuals with *hierarchical* values, who see assertions of environmental risk as indictments of social elites. Individuals

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<sup>3</sup> See Reynolds (2019) for a summary of the literature.

<sup>4</sup> Campbell-Arva et al. (2017) consider carbon dioxide removal and find that learning about that technology can reduce support for mitigation policies.

<sup>5</sup> Game-theoretic studies (for example, Millard-Ball, 2012, and Urpelainen, 2012) have also illustrated the possibility that a credible threat of future geoengineering can provide enough incentive for self-interested countries to increase their current abatement levels and to form meaningful climate agreements.

<sup>6</sup> In a closely related study, Kahan et al. (2015) examined how worldviews may explain any effect that geoengineering may have on people's concern for climate change. Raimi et al. (2019) considers political ideology and finds that conservatives and moderates are less affected by the prospects of solar geoengineering.

with *egalitarian* and *communitarian* values, in contrast, see commerce and industry as sources of unjust disparity and symbols of noxious self-seeking, and thus readily credit assertions that these activities are hazardous and therefore worthy of regulation.” (Kahan, p. 194). Understanding how culture governs the public’s response to solar geoengineering is increasingly important as the technology becomes more relevant, and as it pits one type of risk (risk from climate change) against another one of a different type (risk from downsides of geoengineering).<sup>7</sup>

## 2. Experimental Design

To investigate whether solar geoengineering crowds-in or crowds-out mitigation efforts, we design a survey experiment that introduces information about solar radiation management (SRM) prior to eliciting support for a proposed carbon tax. We focus on SRM because it is the leading candidate among the solar geoengineering technologies. The survey experiment was designed to address two primary research questions. First, how does the presence of SRM information affect a person’s support for carbon taxes? And second, do behavioral responses to SRM information vary across people with different cultural worldviews?

The survey consisted of five sections. After an introduction that elicited informed consent, the survey started with a warm-up section with three questions on beliefs about the presence, cause and severity of climate change. The survey concluded with a demographic section that collected general socio-economic characteristics, including education, gender, age, income and political orientation. The middle three sections constitute the main elements of the experimental design.

In section two, respondents were randomly assigned to one of two SRM information treatments. This is the only section to vary across respondents. A *no-information baseline* did not provide any SRM information and constitutes a baseline or control group. An *SRM-information treatment* provided the treatment group a summary and illustration of SRM, which was drawn from Carlisle et al. (2020).<sup>8</sup>

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<sup>7</sup> Of course, public perception is just one factor in the decision-making process on the introduction of geoengineering technologies. Researchers should also examine how the attitudes towards climate change mitigation of, for example, policymakers, scientists, lobby groups and media will be impacted by the availability of such technologies.

<sup>8</sup> One reviewer wondered if just reading more about climate change in the additional text by itself, not its geoengineering content, could have had an impact on respondents’ answers. While we acknowledge that we cannot

The third section elicited preferences for mitigation policies. The primary policy of interest is a proposed hypothetical carbon tax. After a brief introduction of carbon taxes, the survey presented the following proposal:

*Suppose that the U.S. Congress decides to hold a national referendum on the 2020 ballot on the following carbon tax proposal:*

*A national carbon tax will be implemented in 2021, with a starting rate of \$15 per ton of carbon dioxide (CO<sub>2</sub>). The proposed carbon tax is estimated to cost the average person \$10 per month in higher prices. It's expected to generate \$800 billion in revenues, which will be used to fund programs that develop clean energy, protect clean air and water, and develop local communities.*

Respondents were subsequently asked “*how would you most likely vote on this proposed carbon tax?*”.<sup>9</sup> The referendum question was followed with three questions that may explain their support—how certain they were in their voting decision; how effective they believe the carbon tax will be at reducing greenhouse gases; and to what extent they believe the carbon tax will negatively impact their local economy. In order to capture a more general willingness to support reducing carbon emissions that is independent of a particular policy, we also asked respondents *to what extent should the U.S. prioritize reducing carbon dioxide (CO<sub>2</sub>) emissions to address climate change?* Responses were elicited using a five-point Likert scale.

Section four employs the cultural worldview measure developed by Kahan et al. (2007) and used extensively in the literature (e.g., Kahan et al., 2011; Cherry et al., 2017). This approach measures cultural worldview along two dimensions. The first is hierarchy-egalitarianism, which reflects attitudes toward social stratifications that connect social roles and authority. The second is individualism-communitarianism, which indicates attitudes toward social orderings that expect individual self-sufficiency versus those with greater collective orientations. For each dimension, four statements were presented to respondents, who use a five-point Likert scale to indicate the degree to which they agree or disagree. Answers were assigned one to five points with higher (lower) numbers indicating stronger agreement (disagreement). Aggregating the points from the four questions in each dimension yields a cultural worldview measure ranging from four to 20. A higher (lower) score on the hierarchy-egalitarianism questions indicates a more hierarchical (more egalitarian) worldview, and a higher (lower) score

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disentangle the effects of the two (since we do not have a treatment with additional climate change text that is not about geoengineering) we feel confident that the content was driving the results. WHY?

<sup>9</sup> Respondents could choose between “Yes - support the proposal” and “No – oppose the proposal”.

on the individualism-communitarianism questions indicate a more individualistic (more communitarian) worldview.

The survey experiment was conducted online on June 4, 2020 among a national sample of adults 18 years and older. Respondents were drawn from SurveyMonkey Audience, a professionally maintained panel. The survey took less than 5 minutes to complete and had a 98% completion rate. We received 1,739 completed surveys. To identify suspicious data, the survey included an attention question (what is 3+2). After eliminating 168 observations that failed this reliability test, we have 1,571 observations for the analysis. We note the sample is diverse in age, income and geographical location, but overrepresents women (59%) and people with at least a bachelor's degree (46%). Though not entirely representative to the U.S. population, the sample effectively serves our interests of estimating treatment effects rather than point estimates. The usual caveat about the reliability of inconsequential responses to hypothetical survey questions applies.

### **3. Results**

We begin by reviewing aggregate behavior in the baseline and information treatments and continue by investigating the potential for heterogeneous treatment effects among individual cultural worldviews. Table 1 summarizes the support for a carbon tax. From the first column, 67.2 percent of all respondents indicated support for the proposed carbon tax. Recall the proposal earmarks the tax revenue to environmental, energy and community programs. The observed level of support similar to a recent report from the Energy Policy Institute at the University of Chicago that found two-thirds of respondents supported a carbon tax when the proceeds were directed for environmental restoration (EPIC, 2019).

We consider the first hypothesis by comparing the level of support for the proposed carbon tax across the baseline and SRM information treatments. The aggregate numbers indicate that information about SRM increased support for the carbon tax proposal. The first column of Table 1 shows that 68.7 percent of respondents indicated support for the carbon tax in the information treatment, which is 3.2 percentage points higher than the 65.5 percent observed in the baseline treatment. The aggregate numbers are consistent SRM crowding-in rather than crowding-out mitigation efforts.

[insert Table 1 here]

To consider a more nuanced understanding, we explore how the treatment effects vary across worldviews. To facilitate comparisons, we assign subjects to worldview categories based on their scores. The hierarchy measure has a mean of 9.93 (on a range from 4 to 20) and standard deviation of 3.50, while the individualism measure has a mean and standard deviation is 12.42 and 3.32. Participants that scored above the mean of the hierarchy and individualism measures are defined as hierarchists and individualists, respectively, while those that scored below the mean of each measure are defined as egalitarians and communitarians.

Table 1 reports the level of support for the carbon tax by worldview and treatment. The numbers reveal two main findings. First, consistent with the literature, we find that individual cultural worldviews have substantial influence on how people view public policy (e.g., Cherry et al., 2017). Independent of treatment, support for the tax varied considerably across worldviews. Second, we find the SRM information treatment effect varies across worldview types. The SRM information appears to increase support for the carbon tax among egalitarian and communitarian types but not among hierarchical and individualistic types.

We follow the aggregate numbers with a formal conditional analysis by estimating the likelihood of supporting the proposed carbon tax with the following linear probability model:

$$y_i = \alpha + \beta SRMInfo_i + \omega' Worldviews_i + \theta' X_i + \varepsilon_i,$$

where  $y_i$  is a binary variable that indicates whether the  $i^{\text{th}}$  respondent indicated support for the proposed carbon (=1 if yes; =0 otherwise);  $SRMInfo_i$  is an indicator variable that signifies whether the  $i^{\text{th}}$  respondent was in the SRM information treatment (=1 if yes; =0 otherwise); and  $Worldviews_i$  is a vector containing the  $i^{\text{th}}$  respondent's two continuous worldview measures for the hierarchy and individualism dimensions;  $\alpha$  is the estimated intercept;  $\varepsilon_i$  is the well-behaved error term; and  $X_i$  is a vector of controls that includes education, age, gender, concern for climate change, and views of the tax's efficacy at reducing emissions and negative impact on the economy.<sup>10</sup> We estimate five models—a pooled model that uses the full sample of data and four worldview-specific models that use data from one of the four worldview types. The pooled

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<sup>10</sup> Concern for climate change, tax efficacy in reducing emissions and tax negative impact on local economy are measured using a 5-point Likert scale with higher numbers indicating more concern, greater efficacy and more negative impact.

model provides average treatment effects while the worldview models allow for possible heterogeneous treatment effects.<sup>11</sup>

Table 2 presents the estimates of the carbon tax support model. The estimated coefficients for the treatment (SRM Info) inform the primary research question—does introducing information about SRM affect support for the proposed carbon tax? Results in the pooled model indicates the answer is yes. The estimated coefficient indicates that support for the carbon tax was 3.5 percentage points higher in the SRM information treatment than in the no-information baseline ( $p=0.040$ ). However, the worldview models reveal this average treatment effect varies across people with different worldviews. Estimates indicate a significant SRM information treatment effect for egalitarian and communitarian types, but not for hierarchical and individualistic types. These results are consistent with the unconditional tests. We note that, across all models, support for a carbon tax was significantly influenced by the tax’s perceived efficacy at reducing emissions and negative impact on the economy. Estimates for these and other control variables correspond to a priori expectations and therefore offer some confidence in the internal consistency of the data.

[insert Table 2 here]

In addition to the main findings regarding support for the tax, we consider how the prospect of SRM affects people’s general views on how to prioritize emissions abatement. For this analysis the dependent variable is the respondent’s opinion on how the US should prioritize reducing carbon emissions. We estimate five models that mirror the carbon tax models in Table 2 but without the tax effectiveness and tax impact questions. The results are qualitatively similar to the carbon tax regressions. In particular, the SRM information treatment has a significant positive effect on how people prioritize carbon emissions abatement in the pooled model ( $p=0.060$ ), and the effect is only significant for egalitarian ( $p = 0.003$ ) and communitarian worldviews ( $p = 0.058$ ).

#### **4. Conclusion**

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<sup>11</sup> Results are robust to probit and logit specifications.



Our study contributes to the small, but growing, literature on whether the availability of solar geoengineering crowds-out the public's willingness to support climate policies. Using a survey experiment, we provide half of respondents in a sample of the U.S. population with moderately framed information about SRM before asking them about their level of support for a carbon tax proposal. The other half of the sample receive no information about SRM. We find that providing information about SRM significantly increases support for a carbon tax, a result that contradicts the crowding-out (or moral hazard) hypothesis. We note the crowding-in response to SRM information varied strongly with cultural worldviews as the treatment only impacts those with egalitarian and communitarian views. People that hold more hierarchical and individualistic views did not significantly respond to the SRM information. We augment the analysis of a specific carbon tax with a look at how SRM information may affect the public's view on how the U.S. should prioritize reducing carbon emissions, independent of any particular policy. Similar to the tax, we find that information on SRM increases the priority-level respondents place on reducing carbon emissions to stop global warming. In contrast to the crowding-out (or moral hazard) hypothesis, our study provides evidence that the prospects of solar geoengineering may lead to an increase in support for efforts to mitigate GHG emissions. Future research should try to disentangle whether this "crowding-in" is due to the looming (real or perceived) threats from geoengineering, the increased salience of the climate change problem due to the discussion of geoengineering or different types of bias (naturalism and polluter-pays) respondents might have.

## Appendix

### Instrument for Survey Experiment for “Does Solar Geoengineering Crowd-out Climate Change Mitigation Efforts? Evidence from a Stated Preference Referendum on a Carbon Tax”

1. There have been on-going discussions among policymakers about energy policy and climate change. How likely do you think it is that climate change is happening?

- Very likely
- Likely
- Neither likely nor unlikely
- Unlikely
- Very unlikely

2. Assuming climate change is happening, how likely do you think that it is mostly caused by human activities?

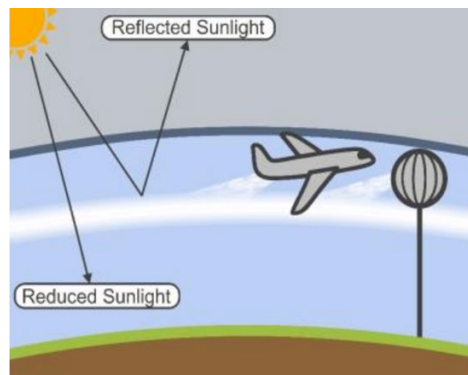
- Very likely
- Likely
- Neither likely nor unlikely
- Unlikely
- Very unlikely

3. How concerned are you about the risk of climate change?

- A great deal
- A lot
- A moderate amount
- A little
- None at all

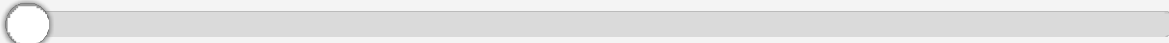
4. **[NOTE: this item (#4) was included in the SRM Information treatment but not in the No Info Baseline treatment]**  
The conventional approach to address climate change is to reduce carbon dioxide (CO<sub>2</sub>) emissions. The lack of success in reducing emissions has led scientists to begin considering *the alternative approach of climate engineering*, which could hold off climate change without reducing emissions.

*Solar radiation management* is one type of climate engineering. It seeks to offset rising temperatures by reflecting a small fraction of sunlight back into space. One of the leading solar radiation management technologies is *Stratospheric Aerosol Injection*. As illustrated below, this involves spreading tiny reflective particles into the stratosphere, which reflect sunlight back into space, cooling Earth and offsetting the rising temperatures that cause climate change. The particles could be spread using airplanes or balloons. To maintain the cooling effect this must be continued indefinitely and at large scale. The particles would make the sky whiter and could affect the ozone layer, rainfall patterns and crop yields. Environmental and local impacts are poorly understood.



Use the following scale to indicate how well you understand the basic idea of *Stratospheric Aerosol Injection*?

Not at all Completely



5. The conventional approach to address climate change is to implement policies that lead to a reduction in carbon dioxide (CO<sub>2</sub>) emissions. Policy debates have focused on the urgency of U.S. efforts to reduce emissions. To what extent should the U.S. prioritize reducing carbon dioxide (CO<sub>2</sub>) emissions to address climate change?

- High priority
- Moderate priority
- Neutral
- Low priority
- Not a priority

6. Experts generally agree that a carbon tax can offer a cost-effective means of reducing carbon dioxide (CO<sub>2</sub>) emissions. A carbon tax puts a price on carbon dioxide (CO<sub>2</sub>) emissions by charging money for the amount of carbon someone emits when they use fossil fuels such as gasoline, coal and heating oil. This encourages people and businesses to lower emissions by reducing energy consumption and investing in clean energy.

Suppose that the U.S. Congress decides to hold a national referendum on the 2020 ballot on the following carbon tax proposal:

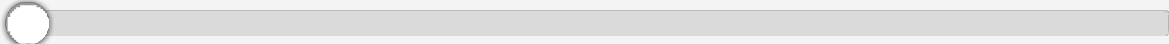
*A national carbon tax will be implemented in 2021, with a starting rate of \$15 per ton of carbon dioxide (CO<sub>2</sub>). The proposed carbon tax is estimated to cost the average person \$10 per month in higher prices. It's expected to generate \$800 billion in revenues, which will be used to fund programs that develop clean energy, protect clean air and water, and develop local communities.*

How would you most likely vote on this proposed carbon tax?

- YES: support the proposal
- NO: oppose the proposal

7. Use the following scale to indicate how certain are you in your voting decision on the proposed carbon tax?

100% Uncertain 50-50 100% Certain



8. How effective do you think the proposed carbon tax will be at reducing carbon dioxide (CO<sub>2</sub>) emissions in the U.S.?

- Extremely effective
- Very effective
- Somewhat effective
- Not so effective
- Not at all effective
- Don't know

9. To what extent do you think the proposed carbon tax will negatively impact your local economy?

- A great deal
- A lot
- A moderate amount
- A little
- Not at all
- Don't know

10. Below is a list of policies other than a carbon tax that can reduce carbon dioxide (CO<sub>2</sub>) emissions. Please indicate your general level of support for each.

	Strongly support	Support	Neither support nor oppose	Oppose	Strongly oppose	Don't Know
Fuel Efficiency Standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tradable Pollution Permits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gasoline Tax	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Subsidies for Clean Energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stricter Building Codes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. The Paris Agreement is an international accord to address climate change. It was adopted by nearly every nation in 2015 and allows each country to set its own emission reduction targets and adopt its own strategies for reaching them. It creates a framework for the transparent monitoring, reporting, and ratcheting up of countries' individual and collective climate commitments.

How much do you support or oppose the U.S. participating in the Paris Agreement?

- Strongly support
- Support
- Neither support or oppose
- Oppose
- Strongly oppose

12. For the next few items, please indicate how much you agree or disagree with the following statements.  
Government interferes too much in our everyday lives.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

13. Society as a whole has become too soft.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

14. Discrimination against minorities is still a very serious problem in our society.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

15. We have gone too far in pushing equal rights in this country.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

16. Our society would be better off if the distribution of wealth was more equal.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

17. It's not the government's business to try to protect people from themselves.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

18. The government should do more to advance society's goals, even if that means limiting the freedom and choices of individuals.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

19. Sometimes government needs to make laws that keep people from hurting themselves.

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

20. We want to make sure you are not a robot. What is the number two plus the number three equal to?

- 1
- 2
- 3
- 4
- 5

21. What is the highest level of school you have completed or the highest degree you have received?

- Less than high school degree
- High school degree or equivalent (e.g., GED)
- Some college but no degree
- Associate degree
- Bachelor degree
- Graduate degree

22. In general, how would you describe your views on most political issues?

- Very conservative
- Conservative
- Moderate
- Liberal
- Very liberal

23. In what state or U.S. territory do you live?

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**Table 1. Support for Carbon Tax by Treatment and Worldviews**

	Pooled	Hierarchy		Individualism	
		Hierarchical	Egalitarian	Individualistic	Communitarian
<i>All Treatments</i>	67.2	45.7	83.0	46.8	82.5
<i>By Treatment</i>					
Baseline No Information	65.5	45.6	79.8	47.0	79.4
SRM Information	68.7	45.7	86.1	46.7	85.6

**Table 2. Estimates of Carbon Tax Vote Models**

	Pooled	Hierarchical	Egalitarian	Individualist	Communitarian
SRM Information	0.035 (0.040)	-0.014 (0.622)	0.069 (0.001)	0.004 (0.892)	0.061 (0.006)
Tax Effectiveness	0.125 (0.000)	0.152 (0.000)	0.123 (0.000)	0.142 (0.000)	0.115 (0.000)
Tax Negative Impact	-0.041 (0.000)	-0.040 (0.000)	-0.070 (0.000)	-0.074 (0.000)	-0.043 (0.000)
Climate Change Concern	0.070 (0.000)	0.095 (0.000)	0.072 (0.000)	0.105 (0.000)	0.089 (0.000)
Education	-0.004 (0.532)	0.002 (0.861)	0.002 (0.775)	-0.014 (0.189)	0.012 (0.116)
Age	-0.034 (0.000)	-0.077 (0.000)	-0.020 (0.037)	-0.048 (0.000)	-0.027 (0.008)
Gender	0.027 (0.129)	0.041 (0.166)	0.007 (0.743)	0.008 (0.795)	0.029 (0.199)
Individualism	-0.020 (0.000)	--	--	--	--
Hierarchy	-0.019 (0.000)	--	--	--	--
Constant	0.683 (0.000)	0.103 (0.191)	0.310 (0.000)	0.201 (0.012)	0.165 (0.008)
R <sup>2</sup>	0.479	0.438	0.294	0.465	0.265
F (p-value)	159.58 (0.000)	73.42 (0.000)	53.26 (0.000)	83.21 (0.000)	45.57 (0.000)
N	1571	668	903	677	894

The dependent variable is support for the proposed carbon tax (=1 if support; =0 if opposed)  
p-values are reported in parentheses