What Determines Climate Policy Preferences If Reducing Greenhouse-Gas Emissions Is A Global Public Good?*

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Abstract

A wide variety of international policy problems, including climate change, have been characterized as global public goods. This paper adopts this theoretical framework to identify the baseline determinants of public opinion about reducing greenhouse-gas emissions. We show formally that this model implies that support for climate action will be increasing in future benefits, their timing, and the probability that a given country's contribution will be decisive while decreasing in expected costs. Utilizing novel data from original surveys in France, Germany, the United Kingdom, and the United States, we provide experimental and observational evidence that expected benefits, costs, and the probability of successful provision are critical for explaining variation in support for climate action. Surprisingly, we find no evidence that the temporality of policy benefits shapes support for climate action. These results suggest effective strategies for building public support for climate action and designing institutions that facilitate global public goods provision.

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1 Introduction

Many international cooperation challenges are viewed at least in part, if not centrally, as global public goods problems (Barrett, 2007).[1] Prominent examples include security (Sandler and Hartley, 1995), free trade (Kindleberger, 1981), development (Kaul, Grunberg and Stern, 1999), and the enforcement of bargaining agreements (Fearon, 1998). The public goods view of international cooperation has also been emphasized as central to understanding global climate politics (Stavins, 2011; Barrett, 2003; Nordhaus, 2019). At the same time, there exists a large literature in international relations generally and specifically on climate politics that emphasizes the importance of public opinion and voting, particularly in democracies, for sustaining international cooperation. Putnam (1988) provides the canonical analysis of the importance of domestic audiences in determining the possibility of cooperation but a host of other scholars have pursued variations on this theme (Milner, 1997; Tarar, 2001; Schultz, 2005; Tomz, 2007; Chapman, 2009; Tomz and Weeks, 2013; Mattes and Weeks, 2019).

We ask what factors determine the extent of public support for climate cooperation if this challenge is usefully thought to be a global public good. Clearly, many important determinants of public support for climate action will not be captured by the model. However, the answer to our question might be thought of as offering a productive baseline model of the determinants of public support for the provision of a global public good in a particular, yet important domain. It could also serve as a productive starting point for understanding the mass politics of global public goods more generally. We focus on the provision of reduced greenhouse-gas emissions as the global public good of interest. Arguably, realizing significant reductions in greenhouse-gas emissions is the most daunting international cooperation problem that humanity currently faces and theorists have primarily treated its provision as a paradigmatic global public good.

[1]This study has been pre-registered at AEA RCT Registry under #AEARCTR-0004090. Analyses not specified in the pre-registration plan are identified as exploratory.

We present a formal model of the provision of discrete public goods applied to climate change and derive comparative statics about the factors that are likely to influence public policy preferences over climate action. The model predicts that support for climate policy is increasing in expected benefits, the extent to which individuals are patient and value future benefits, and expectations about the probability that a given country's greenhouse-gas emission reductions are pivotal to securing sustainable global emissions levels while support is decreasing in the costs of climate action.

We test the model through the analysis of two experiments in original surveys conducted in France, Germany, the United Kingdom, and the United States in 2018 and 2019. The surveys are representative of the adult population in each country and include 10,081 respondents. The first experiment manipulates the extent that a policy change reducing greenhouse-gas emissions would avoid the economically and environmentally damaging consequences of climate change and how soon that benefit would be realized in addition to manipulating the magnitude of household costs that the policy would entail.

We further explore all these factors by investigating whether there are heterogeneous treatment effects by beliefs about climate change, political ideology, individual time preferences, and income. We argue that individuals who are more sure that climate change is happening and individuals who adopt left-leaning political orientations value stabilizing climate change more and therefore will be especially supportive of costly policies when the expected benefits are higher. Similarly, we employ convex time budgets (Andreoni and Sprenger, 2012) to measure individual levels of patience since our experimentally manipulated information about how long emissions reduction policies will take to yield any benefits should be more effective among less patient respondents. Finally, we explore heterogeneous treatment effects for costs by individual income under the assumption that utility losses from a given nominal level of costs are greater for those with lower incomes.

Our experimental estimates suggest that the expected benefits of reducing emissions have a large and significant effect on support for climate action. In contrast, the timing of those benefits does not affect climate policy approval. We also find that increasing costs significantly decrease support for reducing emissions. The estimates for expected benefits and timing are new to the literature on the determinants of public opinion about climate action. Our investigation of heterogeneous treatment effects also suggest the importance of expected benefits in that individuals who value stabilizing the climate more, as measured by climate beliefs and ideology, are more affected by our expected benefit treatments. However, we find little evidence that time preferences account for differences in how individuals in the public assess climate policy. Nor do we find significant variation in the effects of our cost treatments by individual income suggesting that these groups are similarly sensitive to policy costs.

We also explore whether and why collaborative climate efforts between states affect public opinion by conducting a second experiment in France, Germany, and the United Kingdom. This experiment focuses on whether a given country's contribution will make a difference on policy opinions by experimentally manipulating the extent of multilateralism and estimating its effect on support for a carbon tax. We argue that the relevant concern in assessing the probability that a country is pivotal is whether enough other countries are contributing and therefore, learning that other countries are also implementing policies that will reduce emissions makes it more likely that the good of stabilizing climate change will be provided if a country participates. We also discuss other mechanisms for why multilateralism might matter in the context of the model—for example, in increasing benefits and possibly reducing costs and test the effect of multilateralism on these outcomes as well as overall support for a carbon tax.

Our estimates suggest that multilateralism has a large effect on the probability that respondents support a carbon tax. Further, while our results are consistent with the hypothesis that participation by other countries makes it more likely that an individual thinks its own country's participation will actually help provide the global public good, we also find evidence that participation by other countries causes respondents to have higher assessments of the environmental, social, and economic benefits of climate action and lower assessments of the costs. These sets of findings are consistent with the global public goods framework.

This study contributes to the literature on public preferences over climate cooperation (see e.g. Egan and Mullin, 2017; Bechtel, Genovese and Scheve, 2017; Tingley and Tomz, 2014; Gampfer, Bernauer and Kachi, 2014; Bechtel and Scheve, 2013; Egan and Mullin, 2012) by providing new evidence on the role of expected benefits and their timing which have not been explored previously. More broadly, our results suggest that the global public goods framework provides a richer baseline model of public preferences for climate action than might be expected. The model is designed to highlight the freeriding problem created by climate change and other global public goods but yields a framework that explains substantial variation across individuals and countries in support for such policies. Some analyses of climate politics have questioned how useful the public goods framework is and suggested the relative importance of other aspects of the policy challenge such as domestic and international distributional conflict. This paper suggests that the public goods framework already accommodates some of these considerations. Heterogeneity in costs and expected benefits across individuals is a natural starting point to incorporate distributive politics into the public goods framework. More generally, our results suggest that it may be productive to build from a public goods baseline in incorporating other considerations rather than abandoning a powerful lens for understanding the problem.

It is worth reflecting briefly on the one hypothesis central to the model as well as many other analyses of international cooperation that does not find support in our empirical work, which is the future-oriented nature of the public good. Valuing the future, whether in our simple two period model of climate cooperation, or in a repeated N-country prisoner's dilemma is commonly thought to be essential to cooperation. However, neither the experimental nor the observational tests we performed offer evidence consistent with this hypothesis. The null result could suggest that climate action is not made difficult politically because the benefits are temporally distant. This does not necessarily contradict that citizens prefer climate action to take place sooner rather than later (Rinscheid and Wüstenhagen, 2019). It does suggest, however, that much of the mass politics of reducing greenhouse-gas emissions may be captured successfully by static models that do not explicitly incorporate the temporality of the policy benefits.

2 Theoretical Framework

The most common theoretical approaches for studying the international politics of climate change policymaking start by defining the policy problem of greenhouse-gas emissions reduction as a global public good (Stavins, 2011; Barrett, 2003; Nordhaus, 2019). This paper considers the implications of this framework for understanding the mass politics of climate change policymaking. To do so clearly, it is useful to formalize the provision of greenhouse-gas emissions reduction and derive a set of hypotheses regarding the considerations that the model predicts are likely to be important as citizens evaluate climate action. These preferences, in turn, are critical to understanding the politics of climate action as they are likely, especially in democratic settings, to enable and restrict elite decisionmaking on domestic and international climate policy.

Our framework is based on the extensive formal literature on the provision of discrete public goods (Palfrey and Rosenthal, 1984; Suleiman, 1997; McBride, 2006). The key characteristic of these types of collective benefits is that the good is provided only if the contributions of the actors in the model exceed the required threshold of contributions. We think of each country's decision to contribute emission reductions and the need for a sufficient number of countries to do so for the world to generate sustainable emissions as approximating the discrete public goods problem. It is especially helpful if the problem is posed as participation in a climate cooperation agreement. One important characteristic of the emission reduction problem is countries are unsure exactly what the threshold is to ensure sustainable emissions.[2] We follow Suleiman (1997) and McBride (2006) in allowing for an uncertain threshold and generally follow McBride's formalization of discrete public goods problems to generate our predictions about public support for climate cooperation policies.

Let there be $N = \{1, ..., n\}$ countries $(n > 2)$ and indexed by i each with a representative citizen who decides whether or not the country should contribute to greenhouse-gas emissions reduction and participate in a global climate agreement. We relax the assumption of a representative citizen in our discussion below and empirically investigate various sources of heterogeneity within countries. Our initial discussion can also be thought to refer to a median voter who decides participation.

Let $P = \{0, 1\}$ index the participation decision with $p_i = 0$ indicating a decision not to contribute and $p_i = 1$ indicating a decision to contribute. The cost of participation is fixed at $c > 0$. An essential feature of climate cooperation is that the costs of participation must be incurred now while most of the benefits are realized in the distant future. Consequently, it is best to think of the collective action problem in terms of a two period model in which costs are incurred in sooner time $t = 0$ and benefits are realized in later time $t = 1$. That said, the participation decision can be simplified to weigh the costs and discounted benefits. Let $b > 0$ be the benefits at $t = 1$, δ be the discount rate, and δb be the discounted benefits at $t = 0$ when the participation decision is made. Although δb could be simplified into a single benefits term in the formalization, we will use both terms in order to highlight the importance of both the timing and the size of policy benefits in our empirical work. It should also be clear that the initial model treats all countries/representative citizens as identical in the costs and benefits that they face. Our experimental design will exogenously manipulate these parameters while other parts of

[2] See Hsiang and Kopp (2018) for a discussion of sources of uncertainty in climate science and emissions forecasting. It is critical to understand that the future emissions of one's own country and those of the rest of world are hard to predict as well as the physical consequences of those emissions. Both create uncertainty about the necessary threshold of emissions reduction contributions necessary to stabilize climate change.

our analysis will investigate observationally the consequences of variation in the valuation of benefits, costs, and timing across individuals and countries.

The contribution threshold or hurdle h is a random variable from a known unimodal, discrete distribution F (cdf) and f (pdf) where $F(0) = 0$. The probability of the public good being provided is equal to $F(\sum_{j=1}^{n} p_j)$. The expected payoff for country/representative individual i is $U(p_i) = F(\sum_{j=1}^{n} p_j)\delta b - p_i c$. All the parameters are known, except for, of course, the realization of h and the countries make their participation choices simultaneously.

In a pure strategy Nash equilibrium p^*, it must be the case that all countries/representative citizens who choose to participate receive payoffs from contributing that are at least as high as the payoff from not contributing and analogously for those who choose not to participate. For a contributor, this condition is equivalent to the requirement that the marginal increase in the probability of provision due to i's decision to participate $f(\sum_{j \neq i} p_j^* + 1)$ is greater or equal to the ratio of the costs c to benefits δb. For a non-contributor, this condition means that the marginal increase in the probability of provision due to i's decision to participate $f(\sum_{j \neq i} p_j^* + 1)$ is less than the ratio of the costs c to benefits δb (assuming indifferent individuals participate).

Let p^* be a pure strategy equilibrium profile of participation and P^* be the number of participating countries in the equilibrium p^*. In any equilibrium, a contributing country must believe that exactly $P^* - 1$ other countries are participating so that they are pivotal. The probability of being pivotal for a contributing country is equal to the marginal increase in the probability of provision due to i's decision to participate $f(\sum_{j \neq i} p_j^* + 1)$ which is equal to $f(P^*)$. The probability of being pivotal for a non-contributing country is $f(P^* + 1)$.

As shown in McBride (2006, Proposition 1), there is a unique equilibrium with no countries participating $P^* = 0$ if and only if the density, evaluated at unimodal point m is such that $f(m) < \frac{c}{\delta b}$ and there is a unique equilibrium with all countries participating

$P^* = n$ if and only if $f(x) \geq \frac{c}{\delta b}$ for all $x \in N$. If any $P^* > 0$ equilibrium exist, there are at most two equilibrium and one of them is the trivial $P^* = 0$ case with no countries contributing while for the other equilibrium $P^* > 0$. Assuming the condition for all countries participating is not met, the equilibrium with positive participation will be such that $f(P^*) \geq \frac{c}{\delta b}$ but $f(P^* + 1) < \frac{c}{\delta b}$.

The key idea of the model is that countries only participate and contribute to the public good if their probability of being pivotal is greater than the ratio of costs to the discounted future benefits. While the model is essentially designed to highlight the collective action problem between nations in providing sustainable greenhouse-gas emissions, it also suggests that costs, expected benefits, and the extent of discounting are important factors in the decision to cooperate. What often gets lost in the focus on free-riding in the provision of the global public good of sustainable emissions is that the model yields useful comparative statics about the conditions in which contributions to the collective good are more or less likely. While we have presented a specific model here, our comparative statics resonate with a much larger interdisciplinary literature on the factors that contribute to the successful provision of public goods (see e.g. Olson (1965), Ostrom (1990), and Barrett (2003)).

For the representative citizen/median voter, the model makes three predictions that we evaluate experimentally.

Hypothesis 1. Support for climate policies and participation in international climate agreements is increasing in expected benefits.

Hypothesis 2. Support for climate policies and participation in international climate agreements is increasing (decreasing) in patience (discounting).

Hypothesis 3. Support for climate policies and participation in international climate agreements is decreasing in costs.

One important element of the model is that unless $f(x) \geq \frac{c}{\delta b}$, there is always an equilibrium in which no country participates. If a second equilibrium with positive participation exists, the representative citizen has to expect that other countries are also participating but not so many that the country's contribution is not pivotal for providing the good. In the context of climate change, we would suggest that the representative citizen of any of the major emitting economies is unlikely to be worried about overprovision. Collectively, the global community is mostly receiving messages that not enough is being done to address climate change. In this setting, we think that expectations of other countries participating are likely to raise the probability that a given country is pivotal and therefore increase the probability of participation.[3]

Hypothesis 4. Support for climate policies and participation in international climate agreements is increasing in the expectation of the number of other countries implementing similar policies or participating in international agreements.

It is, of course, also case that the participation of other countries is likely to have an impact on assessments of the size of the benefit of providing the good and might even reduce expectations about the cost of climate action both of which reinforce the effect on pivot probabilities in the context of the model. Our empirical work will investigate a number of these mechanisms.

Our theoretical discussion so far has focused on the preferences of a representative citizen (or alternatively a median voter) in each country. The framework, however, also has interesting implications for conflict over climate action within each country. We can index each of the parameters c_k, b_k, and δ_k and predict different policy and participation preferences across individuals facing different costs, having different expectations about the benefits, and varying degrees of patience. One way to interpret the experimental treatments that we present below is that they are manipulating c_k, b_k, and the importance of δ_k and so those results provide information about the extent to which variation across individuals in these considerations is an important source of conflict over climate action.

[3] An alternative way of thinking about this is in terms of effectiveness. The representative citizen will not want to contribute if the effort is not going to be effective, which is equivalent to the public good not being provided.

We also focus on using observational data to measure differences across individuals in b_k and δ_k. We investigate whether the magnitude of the effects of our experimental treatments vary by these measures. For example, individuals who are more patient–higher δ_k–should be less effected by our experimental treatments that suggest that the benefits of climate policies will be further in the future. We study differences in c_k observationally indirectly by studying heterogeneity by income under the assumption that we would expect utility losses from a given nominal level of costs to be greater for those with lower incomes.

The model presented in this section follows much of the existing literature on the international politics of climate change and treats reducing greenhouse-gas emissions as a global public good and asks what are the predictions of that model for determinants of public support for climate action. The resulting comparative statistics, focused on benefits, patience, costs, and expectations of the actions of other countries, provide a baseline model of policy preferences that we evaluate in the remainder of the paper.

3 Empirics: Public Support for Climate Policies

We evaluate these four hypotheses using two vignette experiments that we embedded in surveys of the adult population in France (N=2,000), Germany (N=2,000), the United Kingdom (N=2,000), and the United States (N=4,081). The surveys were fielded between December 2018 and April 2019. Appendix A provides a detailed description of the sampling frame. The survey instrument is part of the replication archive for this study. Appendix Table A.1 offers a comparison of the distribution of sociodemographic characteristics in the target population, the raw sample, and the weighted sample.

3.1 Research Design: Climate Benefits, Timing, and Costs Experiment

We designed a vignette experiment that informed respondents about a potential climate policy to reduce greenhouse-gas emissions along with randomized information about the expected policy benefits (low, medium, high, very high) and when they would be realized (2030, 2040, 2050). The surveys in France, Germany, and the United Kingdom also randomized information about the associated costs of climate action in terms of increased energy prices (low, high). The cost levels are taken from Bechtel and Scheve (2013) who compute cost scenarios as a function of each country's gross domestic product and number of households based on available estimates of the aggregate costs of climate action (Stern, 2007; Nordhaus, 2007; UNEP, 2012). The low cost scenario corresponds to 0.5% percent and the high cost scenario is equivalent to 2% of gross domestic product. The exact question wording was as follows:

"Experts suggest that COUNTRY and other major economies should reduce greenhouse-gas emissions today and over the coming years at a level that would raise energy prices in COUNTRY by about [France: €28, €113, Germany: €39, €154, United Kingdom: £15, £60] per month and household.

Suppose that this would avoid [most, some, few, very few] of the economically and environmentally damaging consequences of climate change by [2030, 2040, 2050].

Do you approve or disapprove of COUNTRY implementing those policies?"

For each respondent we randomly selected one of the benefits and timing information stated in parentheses above. For the European surveys we also randomly assigned one of the cost levels. Respondents expressed their policy support on a 1-10 scale ranging from strongly approve to strongly disapprove. We recode answers so that higher values indicate higher levels of approval.

Given the implications of the formal model we expect that greater benefits, an earlier timing, and lower costs increase support for supporting climate action. We evaluate these predictions in the following section.

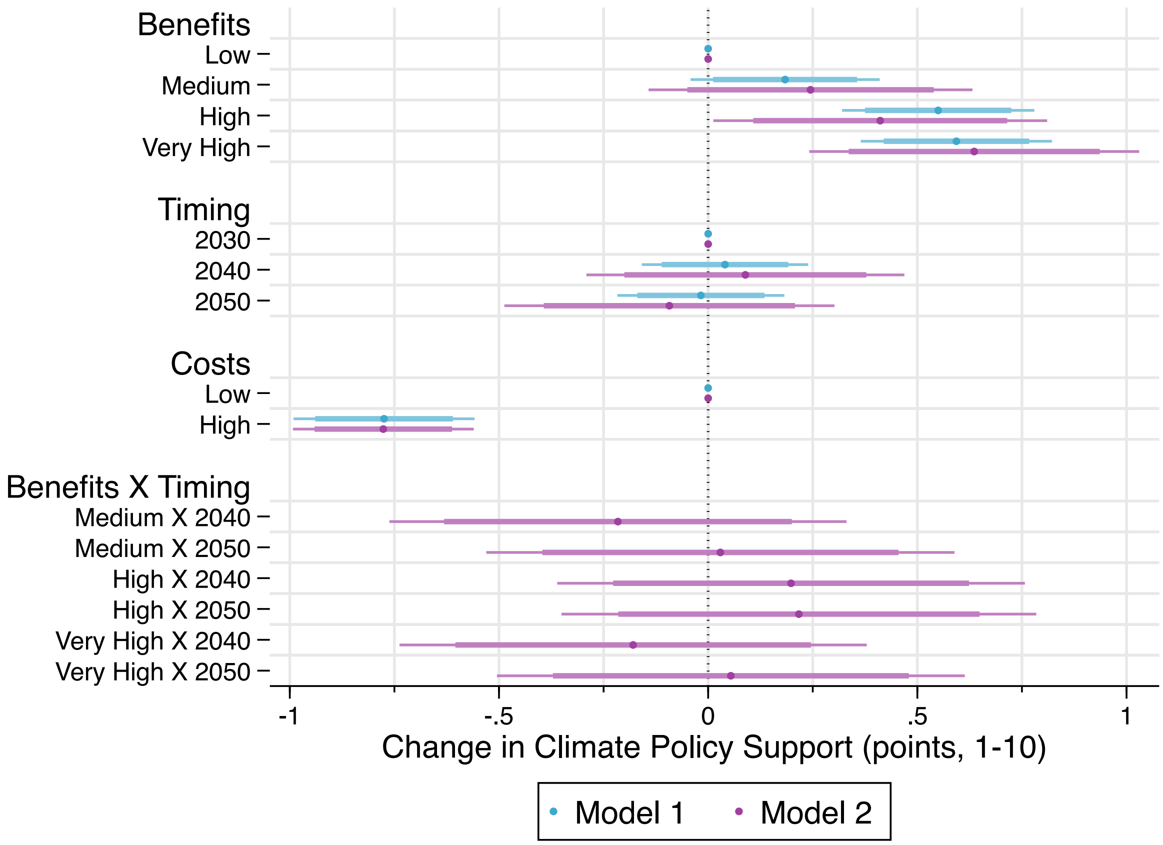
3.2 The Causal Effects of Climate Policy Benefits, Timing, and Costs

We estimate the causal effects of policy benefits, their timing, and costs by regressing the 1-10 climate policy approval measure on a full set of treatment indicators, a large set of sociodemographic covariates and country fixed effects. We employ survey weights although the results remain virtually identical if re-estimated on the raw data (see Appendix Table A.2). Model 1 in Figure 1 reports the point estimates along with 99% and 95% confidence intervals. We find that greater benefits have a significantly positive impact on climate policy support. Compared to the reference group of low benefits, a policy that promises medium benefits increases climate policy approval by about 0.2 points. If the effectiveness of climate action increases to high levels, policy support increases by 0.6 points. Compared to the level of climate policy approval in the control group (which is 6), this effect is equivalent to an 10 percent increase over the baseline. We estimate a somewhat similar effect for the very high benefits treatment. These results lend empirical support to Hypothesis 1.

We now turn to the issue of temporality (Hypothesis 2). We find that none of the timing treatments has a significant impact on climate policy approval. This means that although the size of the policy benefits are significant drivers of public support, the willingness to back more progressive climate action is not driven by when in the more or less distant future the policy effects will be realized. We also test whether temporality moderates the impact of policy benefits by including a full set of interaction terms between benefits and timing indicators. The results for Model 2 in Figure 1 suggest that delay does not affect the effect of policy benefits on climate policy approval which contradicts Hypothesis 2. Finally, policy approval decreases significantly by about 0.8 points if the climate action entails high costs. This result confirms Hypothesis 3. In absolute terms this effect size is not much bigger than the impact of an effective policy that promises high or very high benefits.

To test whether costs have different effects by income, we re-estimate the treatment

Figure 1: Climate Policy Support: Benefits, Timing, and Costs (France, Germany, United Kingdom, United States, N=10,081)



Note: This figure shows coefficients from linear regressions of climate policy support (1-10) on randomly assigned policy benefits, their timing, and policy costs. All models include a full set of sociodemographic covariates and country fixed effects. Sample has been weighted. Unweighted results are reported in Appendix Table A.2. Error bars indicate 99% and 95% confidence intervals. Point estimates without confidence intervals denote reference categories. Model 2 includes interactions between benefits and timing indicators. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. N(France)=2,000, N(Germany)=2,000, N(United Kingdom)=2,000, N(United States)=4,081.

effects for low and high earners separately. This test is informative about the importance of costs under the assumption that those with lower incomes experience greater utility losses from a given nominal level of costs. All models include country fixed effects, a full set of sociodemographic covariates, and are estimated on the weighted data.[4] Since costs were only varied experimentally in the European surveys these subgroup estimations ex-

[4]Appendix Table A.3 reports results estimated on the raw data. These estimates indicate that the results do not depend on whether survey weights are applied.

clude the US data. Table 1 reports the results. For both groups we find that policy benefits and costs are significant drivers of climate support. We test whether there exist significant differences in these treatment effects by estimating a model that includes interaction terms between income and each of the treatment indicators. The results are reported in Model 3 in Table 1. None of the interactions reaches statistical significance. Therefore, the causal effects of policy benefits and costs do not seem to be related to wealth differences.

As an additional test of whether delay in the benefits of climate action matters we explore potential heterogeneity by individuals' time horizons. According to the theory, more patient individuals would expect a higher net present value of climate policy benefits than impatient respondents. Patient respondents, therefore, should be less sensitive to delays in the benefits of climate action. Andreoni and Sprenger (2012) propose the convex time budget approach to measure individual-level discounting as it offers advances over previous techniques that tend to rely on stated preference measures or multiple price lists. We implement this approach which has recently been adapted for inclusion in mass surveys (Bechtel, Jensen and Scheve, 2019). This technique asks respondents to choose between combinations of sooner and later payments and convex combinations of these. The appendix provides details about this measurement approach and estimation. We use the median of the estimated temporal discount factor to generate a binary indicator that distinguishes between more and less patient individuals. When re-estimating the treatment effects separately by patience, we find little differences in how benefits, timing, and costs affect climate policy approval. Most importantly, the estimands in Table 1 do not suggest that patient individuals are significantly less sensitive to delays in policy benefits.

Table 1: Climate Policy Support: Benefits, Timing, and Costs by Subgroups (France, Germany, and the United Kingdom)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Moderator	Income			Patience			Ideology					Global Warming Belief		
	Low	High	Interaction	Low	High	Interaction	Left	Middle	Right	Left vs. Middle	Left vs. Right	Low	High	Interaction
Benefits: Medium	0.304*	0.735***	0.301*	0.337	0.435**	0.351	0.526**	0.365**	0.326	0.361**	0.366*	-0.039	0.562***	-0.092
	(0.173)	(0.188)	(0.173)	(0.224)	(0.201)	(0.224)	(0.208)	(0.165)	(0.218)	(0.167)	(0.221)	(0.287)	(0.132)	(0.299)
Benefits: High	0.714***	1.108***	0.713***	1.028***	0.638***	1.026***	0.857***	0.497***	1.156***	0.509***	1.165***	0.726***	0.920***	0.693**
	(0.174)	(0.195)	(0.175)	(0.216)	(0.214)	(0.217)	(0.212)	(0.179)	(0.225)	(0.182)	(0.229)	(0.277)	(0.133)	(0.297)
Benefits: Very High	0.750***	1.099***	0.739***	1.230***	0.849***	1.213***	1.346***	0.686***	0.406*	0.660***	0.428*	0.554*	1.036***	0.564*
	(0.172)	(0.194)	(0.172)	(0.219)	(0.209)	(0.219)	(0.194)	(0.167)	(0.225)	(0.168)	(0.229)	(0.286)	(0.134)	(0.301)
Timing: 2040	0.176	-0.055	0.157	0.061	-0.119	0.060	0.065	-0.130	0.279	-0.140	0.246	-0.042	0.112	-0.099
	(0.151)	(0.169)	(0.152)	(0.186)	(0.183)	(0.186)	(0.169)	(0.150)	(0.198)	(0.151)	(0.201)	(0.234)	(0.116)	(0.243)
Timing: 2050	0.108	-0.065	0.088	0.095	-0.051	0.102	0.141	-0.158	0.257	-0.155	0.257	-0.014	0.098	-0.068
	(0.147)	(0.169)	(0.147)	(0.188)	(0.183)	(0.188)	(0.186)	(0.145)	(0.198)	(0.146)	(0.199)	(0.237)	(0.115)	(0.248)
Costs: High	-0.757***	-0.879***	-0.760***	-0.674***	-0.827***	-0.689***	-0.873***	-0.749***	-0.690***	-0.759***	-0.726***	-0.598***	-0.801***	-0.615***
	(0.124)	(0.138)	(0.123)	(0.154)	(0.152)	(0.153)	(0.146)	(0.120)	(0.161)	(0.121)	(0.162)	(0.195)	(0.095)	(0.201)
Moderator M			0.125			0.496*				0.162	1.260***			0.612**
			(0.249)			(0.294)				(0.255)	(0.293)			(0.305)
Benefits: Medium X Moderator			0.443*			0.108				0.168	0.154			0.652**
			(0.256)			(0.302)				(0.269)	(0.304)			(0.327)
Benefits: High X Moderator			0.403			-0.365				0.338	-0.316			0.223
			(0.263)			(0.305)				(0.281)	(0.311)			(0.325)
Benefits: Very High X Moderator			0.381			-0.322				0.722***	0.950***			0.478
			(0.261)			(0.303)				(0.258)	(0.301)			(0.330)
Costs: High X Moderator			-0.127			-0.134				-0.125	-0.162			-0.188
			(0.186)			(0.217)				(0.191)	(0.220)			(0.222)
Timing: 2040 X Moderator			-0.216			-0.172				0.227	-0.153			0.216
			(0.227)			(0.261)				(0.228)	(0.264)			(0.269)
Timing: 2050 X Moderator			-0.153			-0.147				0.323	-0.081			0.170
			(0.225)			(0.262)				(0.237)	(0.274)			(0.274)
Constant	5.855***	5.751***	5.834***	5.519***	6.067***	5.542***	6.199***	5.965***	4.697***	6.083***	4.848***	5.706***	6.083***	5.526***
	(0.253)	(0.340)	(0.221)	(0.369)	(0.379)	(0.304)	(0.374)	(0.279)	(0.393)	(0.244)	(0.317)	(0.437)	(0.236)	(0.329)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Weights	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,726	2,280	5,006	1,869	1,873	3,742	1,981	2,409	1,610	4,390	3,591	782	4,418	5,200
R-squared	0.061	0.081	0.071	0.073	0.077	0.072	0.131	0.053	0.066	0.097	0.138	0.086	0.073	0.089

Note: This table reports coefficients from linear regressions of climate policy support on randomly assigned policy benefits, timing, and costs by subgroups. The results have been estimated using survey weights. Apppendix Table A.3 reports the unweighted results. Model 10 includes interaction terms between a binary indicator *Ideology: Left vs. Center* that is 1 for left ideology respondents and 0 for center ideology respondents. This model excludes right ideology respondents. Model 11 includes interactions between *Ideology: Left vs. Right* that is 1 for left ideology respondents and 0 for right ideology individuals. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The results we have presented so far carry three main implications. First, the benefits of climate action are systematic drivers of mass support. Second, given that the timing of policy benefits seems to play a limited role, the dynamic nature of climate politics may be less important for understanding global climate (in-)action than is often believed, at least when applied to the policy's potential payoffs. Third, public opinion on climate issues is sometimes portrayed as largely independent of costs.[5] Our results, however, suggest that mass support for climate action is strongly driven by the costs it entails and how this financial burden is shared.

Next we explore whether the causal effects vary by left-right ideology and climate beliefs, both of which could be understood as proxies for whether an individual is a high demander of climate action more generally. We find that those on the ideological left are highly sensitive to climate policy benefits. Moving from low to medium benefits significantly increases support by about 0.5 points among those on the left whereas this effect is not significant among those on the right. More generally, the positive impact of policy benefits decreases as we move from the left to the center to the right. We test whether these differences are significant in Models 10 and 11 in Table 1. Model 10 includes interaction terms between a binary indicator *Ideology: Left vs. Center* that is 1 for left ideology respondents and 0 for center ideology respondents while excluding right ideology respondents. The results indicate that very effective policies have a significantly stronger impact on policy approval among leftist individuals compared to those in the ideological center. Model 11 includes interactions between *Ideology: Left vs. Right* that is 1 for left ideology respondents and 0 for right ideology individuals. These results confirm that leftist respondents are significantly more supportive of climate action if it promises very large benefits than those on the right.

To generate a more precise measure of climate policy demand, we asked respondents the following question: "How sure are you that global warming is happening?" Answers

[5] See, e.g., "The climate majority", *New York Times*, June 9, 2010.

are given on a 1 to 4 scale (not at all sure, somewhat sure, quite sure, extremely sure) and we recode respondents as *Global Warming Belief: High* if they score 3 or higher on this measure. When re-estimating the causal effects separately we find that those who are more certain that global warming is happening value the policy benefits more than those who are less certain. Model 14 in Table 1 again tests whether the causal effects of policy benefits are significantly different between the two groups. We find that the impact of medium benefits is systematically stronger among those who are quite or extremely sure that the earth is warming.

3.3 Multilateralism, Climate Policy Support, and Expected Benefits

According to the public goods perspective on climate policy the level of international participation affects the prospects of successfully addressing global warming. Therefore, support for climate action and expectations about the resulting benefits should be causally linked to whether climate action is unilateral or multilateral (Hypothesis 4). To explore this expectation we added the following randomized experiment to the European surveys:

"Suppose COUNTRY (decides, and other major economies decide) to implement a carbon tax, which is an additional tax on the CO2 content of fuels, to address climate change. Generally speaking, do you approve or disapprove of COUNTRY implementing such policies?

We randomized whether a respondent saw a question in which the carbon tax would be also implemented in other major economies or not. Respondents were given a 1-10 (strongly approve-strongly disapprove) answer scale to express their level of support for a carbon tax.

We also added a randomized vignette experiment that provided information about whether the policy is expected to be effective. This experiment allows us to probe whether the prevailing baseline belief among respondents indeed is that climate policy will yield benefits or not.[6] The experiment was crossed with the other treatments and consisted of one control group – which received no additional information – and two treatment groups (*Effectiveness: Low* and *Effectiveness: High*):

Effectiveness: Low: "Most experts think this will avoid a few of the economically and environmentally damaging consequences of climate change."
Effectiveness: High "Most experts think this will avoid most of the economically and environmentally damaging consequences of climate change."

We are also interested in how multilateralism affects expectations about the benefits of climate action to better understand why publics may be sensitive to international climate initiatives. The benefits of climate action are multi-faceted and include environmental, economic, and social benefits. We used the following question to elicit expectations about the benefits and costs of climate policy with four statements that relate to potential benefits and three statements that capture the potential political and economic costs of a carbon tax:

"In addition, if this policy is implemented by (COUNTRY, COUNTRY and other major economies), which of the following statements below do you think are true? Will this ...

- ...provide better life for children and grand children
- ...help with distributing the costs of climate change more fairly
- ...save many plant and animal species from extinction
- ...improve people's health
- ...lead to more government regulation
- ...cause energy prices to rise
- ...cost jobs and harm the economy.

We randomized whether respondents saw a question text that indicated the policy to be implemented only in their country or whether it could also be implemented in other major economies. Respondents then indicated for each statement whether they thought it would apply or not. According to Hypotheses 4 we would expect that a multilateral

[6] The effectiveness treatment and the corresponding analyses were not pre-registered and are therefore exploratory.

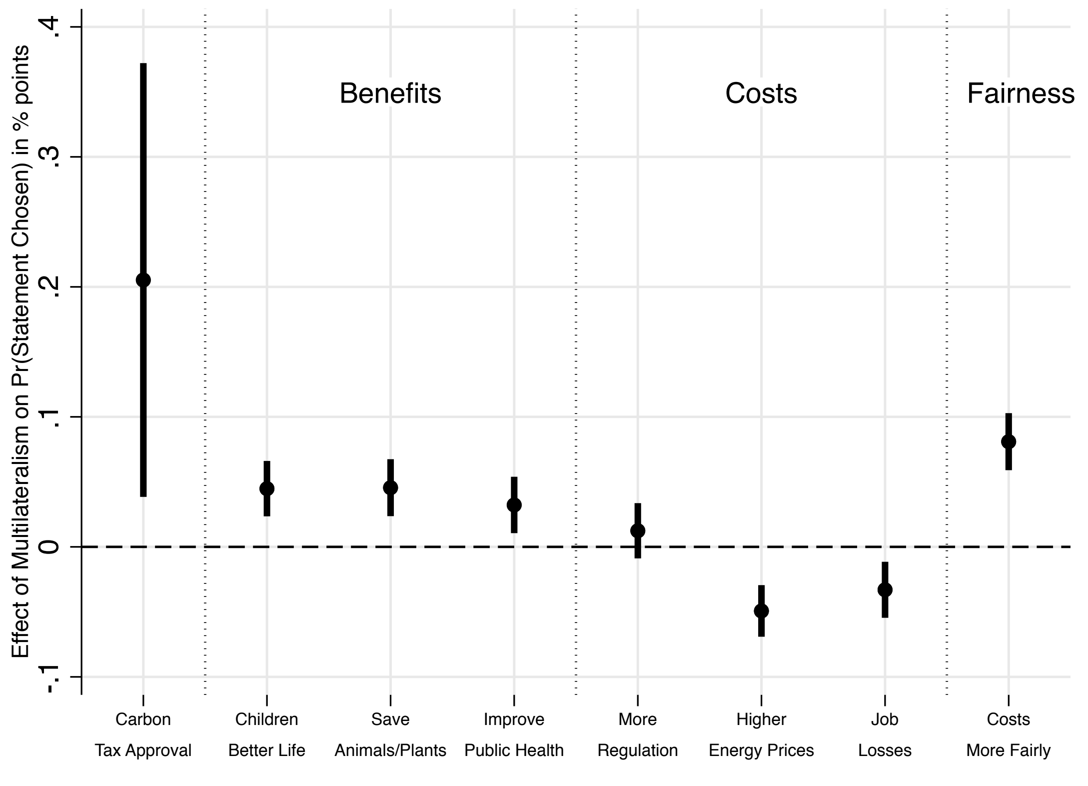
approach to climate action causes individuals to express stronger policy support. This increase should be linked to heightened expectations about the resulting benefits as it is more likely that countries will reach the critical threshold for the provision of effective climate policy.

We estimate the causal effect of multilateralism on carbon tax support by regressing a binary measure of policy support (if carbon tax approval is greater than 5) on a multilateralism treatment indicator. Figure 2 presents the results. We find that a multilateral approach causes support for a carbon tax to increase by about 19 percentage points on average and this effect is significant at the 5% percent level. This is in line with our expectation (Hypothesis 4).

Why is multilateralism appealing to publics? We argue that the answer to this question has at least partly to do with expectations about the environmental, social, and economic benefits of climate action. We explore whether this is the case by regressing a binary indicator that captures if a statement was chosen on our multilateralism treatment variable. The results in Figure 2 indicate that publics are significantly more likely to expect a multilateral approach to improve the lives of their children and grand children. We find broadly similar effects when analyzing expectations about whether a multilateral approach to climate action will ensure that the costs of climate action will be distributed more fairly, whether the policy will save endangered animals and plants, and whether it will improve public health.

We also test whether multilateralism affects the expected political and economic costs of implementing a carbon tax. We find that a multilaterally implemented carbon tax significantly reduces concerns about large energy price increases and potential job losses. It does not, however, alleviate the public's concerns about increased regulation. Finally, multilateralism also significantly increases expectations about whether the costs of climate action will be distributed more fairly compared to a scenario in which policy efforts remain unilateral. These results shed light on why more widespread international partic-

Figure 2: The Causal Effects of Multilateralism on Carbon Tax Support, Benefits, Costs and Fairness in France, Germany, and the United Kingdom (N=6,000)



Note: This plot reports coefficients from linear regressions of statement approval on a binary indicator that is one if climate action is multilateral and is zero if climate action is unilateral. Error bars indicate 95% confidence intervals. The results have been estimated using survey weights. Results for the unweighted data are very similar and reported in Appendix Figure A.2. N(France)=2,000, N(Germany)=2,000, N(United Kingdom)=2,000.

ipation seems attractive to publics. Multilateral approaches are believed to offer greater environmental, economic, and social benefits over unilateral policy efforts and are also expected to distribute the costs of climate policy more fairly.

We also evaluate the role of effectiveness beliefs and find that carbon tax support increases if the policy promises to prevent more of the damaging consequences of climate change (see Appendix Table A.6). The estimate for the low effectiveness treatment, however, is not significantly different from zero which is consistent with the view that low effectiveness is respondents' baseline expectation.

We explore heterogeneity in the importance of multilateralism across societal and political subgroups. We note that these results are meant to reveal heterogeneity in the treatment effect. This means that our interest is in the coefficient on the interactions between the treatment indicator and the subgroup indicator variable.[7] The results suggest that there exist little to no differences across income (see Appendix Table A.7) and, consistent with our findings above, individual time horizons do not help explain when respondents expect greater or smaller benefits due to international cooperation on climate (Appendix Table A.8). We find, however, that respondents with a left political ideology are significantly more likely to believe that multilateralism will help with distributing the costs of climate action more fairly (Model 3 in Appendix Table A.9). We find few differences across climate beliefs (Appendix Table A.10) and reciprocity (Appendix Table A.11). We report all these results using the raw data and the estimates are quite similar (Appendix Table A.12 to A.16).

4 Conclusion

Why is climate change such a thorny policy problem? In this study we have considered three possible reasons. First, climate action could be difficult because it resembles a public goods problem. Second, reluctance to backing ambitious climate policy efforts may reflect that benefits will not be realized until the distant future. Finally, the allocation of costs and benefits can create distributive conflict that may hinder attempts to implement policy changes needed to address global warming. Using a set of novel experiments that we fielded in France, Germany, the United Kingdom, and the United States, we can speak to the relative usefulness of these explanations to understanding the mass politics of global climate action.

Our results suggest that the structure of preferences over climate policy fit well with

[7] We note that the coefficient on the multilateralism indicator has to be interpreted accordingly, i.e., the marginal effect has to be computed as a linear function of the main effect and the interaction terms. For example, the marginal causal effect of multilateralism on carbon tax support among high earners is 0.044 with a p-value of 0.08 (Model 1 in Appendix Table A.7).

the public goods perspective on global warming. Consistent with the predictions from the formal model, support for climate action depends on the size of benefits, policy costs, and expected contribution of other nations. This implies that support for the provision of the global public good of climate protection depends on building multilateral coalitions and keeping costs low while assuring citizens of the benefits.

The fact that the rewards of climate action will not materialize until the distant future seems like it would dampen public support, as people often discount the future. Yet strikingly our results show that the delayed nature of the payoffs is not a significant driver of climate policy preferences. This suggests that—at least when focusing on the role of policy benefits—climate change more closely resembles an ordinary public goods problem, and that public support is not contingent on overcoming an inability of citizens to value long-term payoffs.

A number of scholars have also argued that the crucial challenge to climate action is the distribution of costs, rather than the collective action problem of public goods provision (Aklin and Mildenberger, 2018; Colgan, Green and Hale, 2019). Recent setbacks for pricing carbon, with the "Yellow Vests" movement in France being perhaps the most salient, certainly seem to resonate with the critique. Our study suggests that the public goods framework may be used productively while also allowing for concerns such as distribution within that structure. Since costs and benefits matter for the decision to contribute to a public good, any differences in these across individuals are a likely source of political conflict over climate action. Work on factors influencing the likely distribution of costs of a given climate policy, such as geographical location and sector of employment, need not be viewed as contradicting the challenges created by the public good characteristics of reducing greenhouse gas emissions. Future research could productively probe further how these considerations interact, what their relative magnitudes are, and what shapes people's perceptions of the size of expected benefits, costs, and the likely cooperation of other countries. Subsequent research may also explore whether the impact of participation, benefits, and costs depends on partisan-motivated rhetoric (Schuldt, Konrath and Schwarz, 2011) and policy instruments (e.g., climate dividends) and how these factors affect climate-relevant consumption behavior.

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Online Appendix

A Description of Climate Policy Survey (Germany, France, United Kingdom, United States, N=10,081)

The survey was conducted online by YouGov on representative samples of the adult populations in Germany, France, United Kingdom, United States. The survey contained the CTB module and the stated patience question item. YouGov employs matched sampling in which interviews are conducted from participants in YouGov's online panel. The matched cases were weighted to the sampling frame using propensity scores. The matched cases and the frame were combined and a logistic regression was estimated for inclusion in the frame. The propensity score model included age, gender, years of education, and region for the European countries and gender, age, race/ethnicity, region, and education for the United States. The propensity scores were grouped into deciles of the estimated propensity score in the frame and post-stratified according to these deciles. The weights were then post-stratified on vote choice in the most recent federal election, region, and a three-way stratification of gender, age, and education, to produce the final weights.

United States: The field period was December 18, 2018 to January 3, 2019 for the United States and March 31, 2019 to April 04, 2019 for the European countries. The sampling frames are constructed from the full 2016 American Community Survey. All matched respondents were then assigned weights stratified on 2016 presidential vote, age, sex, race, and education to correct for remaining imbalances. The final number of observations was 4,081.

Germany, France, United Kingdom: The field period was March 31, 2019 to April 04, 2019. The sampling frame was constructed by stratified sampling from the 2018 Eurobarometer with selection within strata by weighted sampling with replacements (using the person weights on the public use file). The final number of observations was 2,000 for Germany, 2,000 for France, and 2,000 for the United Kingdom.

Table A.1: Climate Policy Survey: Distribution of Socio-Demographics in the Target Population, the Raw Sample, and the Weighted Sample by Country (Total N=10,081)

United States			
	Population	Raw Sample	Weighted Sample
Age: 18-34	30	27	30
Age: 35-49	25	23	25
Age: 50-64	25	30	25
Age: 65+	20	22	20
Education: Less than High School	12	7	12
Education: High School Degree	28	29	28
Education: Associate's Degree or Some College	31	32	31
Education: BA or higher	29	32	29
Gender: Male	48	47	49
Gender: Female	51	53	51
Germany			
	Population	Raw Sample	Weighted Sample
Age: 18-29	19	18	19
Age: 30-44	21	21	21
Age: 45-64	35	24	35
Age: 65+	24	25	25
Education: 16yrs or less	38	43	38
Education: 17-18	19	32	19
Education: 19+	43	25	43
Gender: Male	49	48	48
Gender: Female	51	51	51
France			
	Population	Raw Sample	Weighted Sample
Age: 18-29	20	17	20
Age: 30-44	23	25	23
Age: 45-64	32	36	32
Age: 65+	26	22	26
Education: 16yrs or less	26	12	26
Education: 17-18	25	48	26
Education: 19+	49	40	48
Gender: Male	47	46	47
Gender: Female	53	54	53
United Kingdom			
	Population	Raw Sample	Weighted Sample
Age: 18-29	22	19	22
Age: 30-44	26	27	26
Age: 45-64	30	32	30
Age: 65+	22	23	22
Education: 16yrs or less	41	32	41
Education: 17-18	28	21	20
Education: 19+	31	47	38
Gender: Male	50	46	50
Gender: Female	50	55	50

B Measuring Individual-level Patience: Convex Time Budgets

We implement the convex time budget measure of time preferences as described in Andreoni, Kuhn and Sprenger (2015); Andreoni and Sprenger (2012) and recently adapted for inclusion in mass surveys (Bechtel, Jensen and Scheve, 2019) The CTB method starts with considering the allocation of payments x_t and x_{t+k} between two periods t and $t+k$. Preferences over these two payments are assumed to be described by the following utility function:

$$U(x_t, x_{t+k}) = \begin{cases} x_t^\alpha + \beta\delta^k x_{t+k}^\alpha, & \text{if } t = 0. \\ x_t^\alpha + \delta^k x_{t+k}^\alpha, & \text{if } t > 0. \end{cases} \tag{1}$$

The parameter δ measures long-run exponential time discounting, β measures the preference for payments now $t = 0$ and thus captures present bias, and α measures utility function curvature or the extent of risk aversion. Estimating all three of these parameters for a sample, population, or individual are of potential interest. However, our primary objective is to obtain a valid measure of time preference (δ) at the individual level.

The CTB approach asks respondents to choose repeatedly a bundle of payments that will be received at time t and time $t+k$. Each choice includes both extreme cases in which the full payment is at time t or at time $t+k$ as well as four convex combinations of these payoffs (see Figure A.1 for an example of the choice task). Some choices compare payments now to payments later while other choices compare payments at some $t > 0$ and payments later than that. The differences in those choices allow for the separate identification of β (present bias) from general time discounting (δ) and risk aversion (α). Choices at the extremes are consistent with $\alpha = 1$ and risk-neutrality while interior choices are consistent with $\alpha < 1$ and risk aversion. CTB identifies risk aversion based on the price-sensitivity of the intertemporal choice.

Once the choices have been elicited from respondents, the parameters of interest δ, α, and β can be estimated by ordinary least squares or nonlinear least squares. The estimates can be made for the sample of respondents as a whole and/or for each respondent separately.[8] We are interested in both sets of estimates but given our main objective of measuring individual time preferences in large surveys, it is the respondent-specific parameter estimates that are of greatest relevance.

C Measuring Individual-level Reciprocity

We measure reciprocity using the within-subjects design and estimation procedure proposed in Bechtel and Scheve (2017). The question wording is:
"We will raffle an additional two \$/€/£100 Amazon vouchers among all respondents that have completed the survey. The ultimate value of the voucher depends on your decision on the following: If you win a voucher, you can decide to increase the value of the second voucher that another person has won. You can give any amount between \$/€/£0 and \$/€/£100 by which the value of your voucher will be decreased. Each \$/€/£that you decide to give to the other individual will be doubled.

We then provided individuals with an example to illustrate the payoff mechanism. To estimate an individual's level of reciprocity we estimate an auxiliary regression for each respondent in which we regress her/his contribution on a variable that indicates the amount given by the other person (0, 25, 50, 75, and 100 \$/€/£). We code respondents as reciprocal if their contribution elasticity is greater than the median.

[8]The estimates based on the whole sample pool respondent choices and cluster standard errors on respondent. The parameters are identified based on variation across choices within and between individuals. The estimates for each respondent only use the choices for that single respondent and the parameters are, of course, estimated using only within-respondent variation.

D Appendix Tables

Table A.2: Climate Policy Support: Benefits, Timing, and Costs (France, Germany, United Kingdom, United States)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Benefits: Medium	0.171**	0.185**	0.167**	0.184**	0.302**	0.247	0.289**	0.245
	(0.079)	(0.089)	(0.078)	(0.088)	(0.135)	(0.152)	(0.134)	(0.150)
Benefits: High	0.518***	0.565***	0.505***	0.550***	0.429***	0.403***	0.440***	0.411***
	(0.078)	(0.090)	(0.078)	(0.089)	(0.136)	(0.155)	(0.135)	(0.155)
Benefits: Very High	0.632***	0.618***	0.609***	0.593***	0.755***	0.677***	0.717***	0.636***
	(0.079)	(0.090)	(0.078)	(0.089)	(0.137)	(0.156)	(0.136)	(0.153)
Timing: 2040	0.103	0.058	0.083	0.040	0.218	0.098	0.202	0.089
	(0.068)	(0.078)	(0.068)	(0.077)	(0.135)	(0.149)	(0.133)	(0.148)
Timing: 2050	0.032	-0.025	0.045	-0.017	0.041	-0.097	0.048	-0.093
	(0.069)	(0.078)	(0.068)	(0.078)	(0.136)	(0.154)	(0.135)	(0.153)
Costs: High	-0.774***	-0.756***	-0.797***	-0.775***	-0.776***	-0.757***	-0.799***	-0.777***
	(0.070)	(0.084)	(0.069)	(0.084)	(0.070)	(0.084)	(0.069)	(0.084)
Benefits: Medium X Timing: 2040					-0.289	-0.203	-0.287	-0.216
					(0.192)	(0.215)	(0.190)	(0.212)
Benefits: Medium X Timing: 2050					-0.106	0.015	-0.080	0.029
					(0.194)	(0.220)	(0.192)	(0.217)
Benefits: High X Timing: 2040					0.125	0.251	0.073	0.198
					(0.192)	(0.219)	(0.189)	(0.217)
Benefits: High X Timing: 2050					0.143	0.233	0.124	0.217
					(0.193)	(0.220)	(0.191)	(0.220)
Benefits: Very High X Timing: 2040					-0.299	-0.210	-0.262	-0.179
					(0.194)	(0.219)	(0.192)	(0.217)
Benefits: Very High X Timing: 2050					-0.072	0.037	-0.059	0.054
					(0.194)	(0.221)	(0.192)	(0.217)
Constant	5.990***	6.053***	5.950***	6.164***	5.950***	6.066***	5.913***	6.179***
	(0.093)	(0.106)	(0.138)	(0.155)	(0.115)	(0.130)	(0.155)	(0.174)
Sociodemographics			Yes	Yes			Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Weights		Yes		Yes		Yes		Yes
Observations	10,081	10,081	10,081	10,081	10,081	10,081	10,081	10,081
R-squared	0.041	0.044	0.065	0.068	0.042	0.045	0.065	0.068

Note: This table reports coefficients from linear regressions of climate policy support on randomly assigned household costs, policy benefits, and their timing. Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.3: Climate Policy Support: Benefits, Timing, and Costs by Subgroups in France, Germany, United Kingdom (Unweighted)

Moderator	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Income			Patience			Ideology					Global Warming Belief		
	Low	High	Interaction	Low	High	Interaction	Left	Center	Right	Left vs. Center	Left vs. Right	Low	High	Interaction
Benefits: Medium	0.291**	0.598***	0.288**	0.427**	0.380**	0.442**	0.464***	0.411***	0.118	0.410***	0.139	-0.230	0.489***	-0.270
	(0.146)	(0.162)	(0.146)	(0.176)	(0.177)	(0.177)	(0.173)	(0.149)	(0.186)	(0.149)	(0.189)	(0.224)	(0.113)	(0.223)
Benefits: High	0.675***	0.963***	0.673***	0.976***	0.525***	0.989***	0.840***	0.584***	0.792***	0.593***	0.793***	0.499**	0.840***	0.495**
	(0.145)	(0.161)	(0.145)	(0.172)	(0.174)	(0.172)	(0.169)	(0.152)	(0.186)	(0.152)	(0.187)	(0.225)	(0.112)	(0.227)
Benefits: Very High	0.712***	1.031***	0.704***	1.241***	0.805***	1.232***	1.270***	0.658***	0.523***	0.648***	0.547***	0.510**	0.990***	0.504**
	(0.144)	(0.164)	(0.144)	(0.174)	(0.176)	(0.174)	(0.171)	(0.147)	(0.186)	(0.147)	(0.187)	(0.225)	(0.113)	(0.226)
Timing: 2040	0.201	0.026	0.193	0.229	-0.047	0.240	0.110	-0.022	0.241	-0.026	0.240	-0.180	0.204**	-0.204
	(0.125)	(0.140)	(0.125)	(0.149)	(0.152)	(0.149)	(0.142)	(0.130)	(0.163)	(0.130)	(0.164)	(0.198)	(0.096)	(0.200)
Timing: 2050	0.204	-0.046	0.195	0.212	-0.027	0.221	0.054	-0.028	0.221	-0.017	0.246	-0.063	0.122	-0.106
	(0.124)	(0.138)	(0.124)	(0.152)	(0.153)	(0.151)	(0.149)	(0.126)	(0.165)	(0.126)	(0.165)	(0.192)	(0.098)	(0.192)
Costs: High	-0.732***	-0.857***	-0.735***	-0.797***	-0.817***	-0.799***	-0.888***	-0.734***	-0.833***	-0.722***	-0.849***	-0.887***	-0.792***	-0.916***
	(0.103)	(0.114)	(0.103)	(0.124)	(0.126)	(0.124)	(0.120)	(0.105)	(0.133)	(0.105)	(0.133)	(0.160)	(0.079)	(0.160)
Moderator M			0.219			0.473**				0.374*	1.094***			0.286
			(0.206)			(0.234)				(0.214)	(0.242)			(0.229)
Benefits: Medium X Moderator			0.319			-0.051				0.051	0.335			0.757***
			(0.218)			(0.250)				(0.228)	(0.255)			(0.250)
Benefits: High X Moderator			0.297			-0.452*				0.245	0.040			0.345
			(0.216)			(0.245)				(0.228)	(0.252)			(0.253)
Benefits: Very High X Moderator			0.346			-0.406				0.634***	0.742***			0.489*
			(0.218)			(0.247)				(0.226)	(0.254)			(0.252)
Costs: High X Moderator			-0.124			-0.015				-0.162	-0.042			0.122
			(0.154)			(0.176)				(0.160)	(0.180)			(0.178)
Timing: 2040 X Moderator			-0.160			-0.292				0.153	-0.102			0.409*
			(0.188)			(0.213)				(0.193)	(0.218)			(0.222)
Timing: 2050 X Moderator			-0.241			-0.257				0.088	-0.165			0.227
			(0.186)			(0.215)				(0.195)	(0.223)			(0.216)
Constant	5.580***	5.668***	5.601***	5.396***	5.757***	5.341***	6.108***	5.805***	4.582***	5.824***	4.772***	6.131***	5.811***	5.634***
	(0.222)	(0.293)	(0.192)	(0.307)	(0.322)	(0.249)	(0.317)	(0.244)	(0.342)	(0.209)	(0.269)	(0.386)	(0.201)	(0.251)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,726	2,280	5,006	1,869	1,873	3,742	1,981	2,409	1,610	4,390	3,591	782	4,418	5,200
R-squared	0.054	0.073	0.064	0.078	0.072	0.071	0.109	0.051	0.071	0.090	0.126	0.089	0.066	0.083

Note: This table reports coefficients from linear regressions of climate policy support on randomly assigned policy benefits, timing, and costs by subgroups. Model 10 includes interaction terms between a binary indicator *Ideology: Left vs. Center* that is 1 for left ideology respondents and 0 for center ideology respondents. This model excludes right ideology respondents. Model 11 includes interactions between *Ideology: Left vs. Right* that is 1 for left ideology respondents and 0 for right ideology individuals. This model excludes center ideology respondents. Robust standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A.4: Climate Policy Support: Benefits, Timing, and Costs by Inequality Aversion and Reciprocity in France, Germany, United Kingdom (Weighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Moderator	Disadvantageous IA						Advantageous IA						Reciprocity		
	Equalizer	Interaction	Non-Equalizer	Interaction	Other	Interaction	Equalizer	Interaction	Non-Equalizer	Interaction	Other	Interaction	Low	High	Interaction
Benefits: Medium	0.308**	0.078	0.121	0.205**	0.041	0.242**	0.084	0.077	0.200	0.168	-0.179	0.260***	0.235*	0.142	0.232*
	(0.129)	(0.120)	(0.169)	(0.103)	(0.169)	(0.103)	(0.127)	(0.127)	(0.159)	(0.106)	(0.209)	(0.096)	(0.123)	(0.125)	(0.124)
Benefits: High	0.706***	0.404***	0.665***	0.499***	0.123	0.705***	0.361***	0.360***	0.403**	0.602***	0.275	0.623***	0.562***	0.546***	0.555***
	(0.127)	(0.125)	(0.171)	(0.104)	(0.178)	(0.102)	(0.129)	(0.129)	(0.159)	(0.107)	(0.209)	(0.098)	(0.123)	(0.127)	(0.124)
Benefits: Very High	0.842***	0.397***	0.532***	0.614***	0.294*	0.727***	0.312**	0.310**	0.363**	0.678***	0.184	0.687***	0.490***	0.682***	0.488***
	(0.130)	(0.120)	(0.168)	(0.104)	(0.169)	(0.103)	(0.129)	(0.129)	(0.164)	(0.105)	(0.205)	(0.097)	(0.123)	(0.126)	(0.124)
Timing: 2040	-0.005	0.069	0.189	-0.010	-0.016	0.070	0.087	0.082	0.211	-0.022	-0.082	0.077	0.043	0.047	0.034
	(0.113)	(0.105)	(0.149)	(0.090)	(0.147)	(0.090)	(0.112)	(0.112)	(0.139)	(0.093)	(0.185)	(0.084)	(0.109)	(0.109)	(0.109)
Timing: 2050	-0.033	-0.010	0.105	-0.062	-0.119	0.021	-0.021	-0.022	0.076	-0.050	-0.151	0.017	-0.005	-0.022	-0.004
	(0.113)	(0.106)	(0.149)	(0.091)	(0.150)	(0.090)	(0.111)	(0.111)	(0.137)	(0.093)	(0.184)	(0.085)	(0.108)	(0.110)	(0.109)
Costs: High	-0.770***	-0.772***	-0.742***	-0.810***	-0.782***	-0.735***	-0.796***	-0.749***	-0.588***	-0.855***	-1.082***	-0.706***	-0.686***	-0.834***	-0.764***
	(0.119)	(0.110)	(0.162)	(0.094)	(0.165)	(0.093)	(0.127)	(0.116)	(0.154)	(0.096)	(0.206)	(0.088)	(0.119)	(0.116)	(0.112)
Moderator M		0.002		-0.206		0.211		0.066		-0.208		0.170			0.233
		(0.158)		(0.174)		(0.181)		(0.157)		(0.171)		(0.205)			(0.158)
Benefits: Medium X Moderator		0.232		-0.095		-0.205		0.208		0.041		-0.414*			-0.093
		(0.176)		(0.198)		(0.198)		(0.176)		(0.191)		(0.232)			(0.176)
Benefits: High X Moderator		0.314*		0.173		-0.587***		0.380**		-0.187		-0.344			-0.004
		(0.179)		(0.201)		(0.207)		(0.178)		(0.193)		(0.234)			(0.178)
Benefits: Very High X Moderator		0.452**		-0.077		-0.472**		0.549***		-0.295		-0.519**			0.203
		(0.177)		(0.197)		(0.200)		(0.177)		(0.194)		(0.231)			(0.176)
Costs: High X Moderator		-0.004		0.147		-0.137		-0.032		0.296*		-0.363*			-0.015
		(0.143)		(0.161)		(0.164)		(0.144)		(0.153)		(0.196)			(0.143)
Timing: 2040 X Moderator		-0.060		0.182		-0.110		-0.065		0.235		-0.196			0.018
		(0.155)		(0.174)		(0.175)		(0.154)		(0.167)		(0.206)			(0.154)
Timing: 2050 X Moderator		-0.017		0.163		-0.149		0.015		0.125		-0.172			-0.013
		(0.155)		(0.174)		(0.175)		(0.154)		(0.166)		(0.204)			(0.155)
Constant	6.137***	6.179***	6.083***	6.219***	6.204***	6.115***	6.200***	6.133***	5.919***	6.222***	6.635***	6.145***	6.074***	6.146***	6.033***
	(0.235)	(0.171)	(0.296)	(0.164)	(0.288)	(0.161)	(0.219)	(0.174)	(0.285)	(0.163)	(0.341)	(0.160)	(0.217)	(0.225)	(0.173)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Weights	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,579	10,081	2,746	10,081	2,756	10,081	4,880	10,081	3,002	10,081	1,878	10,081	4,993	5,088	10,081
R-squared	0.088	0.070	0.073	0.068	0.044	0.070	0.059	0.072	0.073	0.069	0.058	0.072	0.056	0.077	0.070

Note: This table reports coefficients from linear regressions of climate policy support on randomly assigned policy benefits, timing, and costs by subgroups. The results have been estimated using survey weights. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.5: Climate Policy Support: Benefits, Timing, and Costs by Inequality Aversion and Reciprocity in France, Germany, United Kingdom (Unweighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Moderator	Disadvantageous IA						Advantageous IA						Reciprocity		
	Equalizer	Interaction	Non-Equalizer	Interaction	Other	Interaction	Equalizer	Interaction	Non-Equalizer	Interaction	Other	Interaction	Low	High	Interaction
Benefits: Medium	0.250**	0.096	0.128	0.182**	0.071	0.206**	0.076	0.073	0.179	0.155*	-0.140	0.232***	0.190*	0.147	0.190*
	(0.115)	(0.107)	(0.156)	(0.091)	(0.148)	(0.092)	(0.113)	(0.113)	(0.144)	(0.093)	(0.182)	(0.087)	(0.111)	(0.110)	(0.111)
Benefits: High	0.645***	0.382***	0.580***	0.470***	0.160	0.628***	0.357***	0.357***	0.423***	0.533***	0.228	0.574***	0.506***	0.512***	0.503***
	(0.114)	(0.106)	(0.151)	(0.091)	(0.150)	(0.091)	(0.111)	(0.111)	(0.142)	(0.093)	(0.177)	(0.086)	(0.109)	(0.111)	(0.109)
Benefits: Very High	0.856***	0.415***	0.487***	0.654***	0.351**	0.718***	0.320***	0.326***	0.345**	0.708***	0.238	0.690***	0.495***	0.722***	0.492***
	(0.116)	(0.106)	(0.153)	(0.092)	(0.149)	(0.092)	(0.113)	(0.113)	(0.144)	(0.093)	(0.184)	(0.087)	(0.111)	(0.111)	(0.111)
Timing: 2040	0.037	0.114	0.252*	0.025	0.006	0.120	0.129	0.125	0.185	0.045	0.059	0.097	0.076	0.092	0.071
	(0.100)	(0.092)	(0.132)	(0.079)	(0.129)	(0.079)	(0.097)	(0.097)	(0.123)	(0.081)	(0.159)	(0.075)	(0.096)	(0.095)	(0.096)
Timing: 2050	0.023	0.061	0.170	-0.003	-0.052	0.080	0.095	0.094	0.149	0.002	0.032	0.054	0.060	0.029	0.065
	(0.100)	(0.092)	(0.132)	(0.079)	(0.130)	(0.080)	(0.097)	(0.097)	(0.124)	(0.081)	(0.158)	(0.075)	(0.095)	(0.097)	(0.095)
Costs: High	-0.783***	-0.801***	-0.817***	-0.827***	-0.781***	-0.763***	-0.765***	-0.725***	-0.689***	-0.868***	-0.887***	-0.768***	-0.715***	-0.867***	-0.732***
	(0.100)	(0.090)	(0.136)	(0.078)	(0.134)	(0.078)	(0.102)	(0.094)	(0.128)	(0.079)	(0.167)	(0.074)	(0.100)	(0.096)	(0.092)
Moderator M		0.091		-0.160		0.050		0.173		-0.163		-0.059			0.209
		(0.140)		(0.158)		(0.158)		(0.140)		(0.154)		(0.179)			(0.141)
Benefits: Medium X Moderator		0.156		-0.060		-0.136		0.181		0.031		-0.357*			-0.046
		(0.157)		(0.179)		(0.174)		(0.156)		(0.172)		(0.201)			(0.156)
Benefits: High X Moderator		0.267*		0.114		-0.468***		0.298*		-0.100		-0.332*			0.009
		(0.155)		(0.175)		(0.175)		(0.155)		(0.170)		(0.196)			(0.155)
Benefits: Very High X Moderator		0.448***		-0.163		-0.382**		0.545***		-0.340**		-0.442**			0.232
		(0.157)		(0.177)		(0.175)		(0.156)		(0.171)		(0.202)			(0.156)
Costs: High X Moderator		0.008		0.111		-0.121		-0.127		0.248*		-0.149			-0.128
		(0.119)		(0.135)		(0.134)		(0.119)		(0.130)		(0.156)			(0.119)
Timing: 2040 X Moderator		-0.062		0.210		-0.136		-0.069		0.143		-0.080			0.027
		(0.136)		(0.154)		(0.151)		(0.135)		(0.148)		(0.174)			(0.135)
Timing: 2050 X Moderator		-0.034		0.171		-0.134		-0.092		0.148		-0.036			-0.034
		(0.136)		(0.154)		(0.152)		(0.135)		(0.148)		(0.174)			(0.136)
Constant	6.085***	5.930***	5.941***	5.996***	5.730***	5.951***	5.986***	5.875***	5.868***	5.997***	6.162***	5.982***	5.867***	5.962***	5.837***
	(0.211)	(0.151)	(0.262)	(0.146)	(0.261)	(0.145)	(0.195)	(0.155)	(0.252)	(0.146)	(0.316)	(0.143)	(0.198)	(0.198)	(0.155)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,579	10,081	2,746	10,081	2,756	10,081	4,880	10,081	3,002	10,081	1,878	10,081	4,993	5,088	10,081
R-squared	0.080	0.068	0.072	0.065	0.044	0.068	0.060	0.069	0.072	0.066	0.051	0.069	0.054	0.073	0.067

Note: This table reports coefficients from linear regressions of climate policy support on randomly assigned policy benefits, timing, and costs by subgroups. Appendix Table A.4 reports results estimated on the weighted data. Robust standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A.6: The Causal Effects of Multilateralism on Carbon Tax Support, Expected Benefits, and Cost Beliefs in France, Germany, and the United Kingdom (Unweighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Policy Support	Policy Benefits				Policy Costs		
Outcome:	Carbon Tax: Approve	Children: Better Life	Costs: More Fairly	Save: Animals and Plants	Improve Public Health	More Regulation	Higher Energy Prices	Job Losses
Multilateralism	0.043***	0.030***	0.058***	0.029**	0.027**	0.015	-0.021**	-0.023*
	(0.013)	(0.011)	(0.013)	(0.012)	(0.012)	(0.011)	(0.010)	(0.013)
Effectiveness: Low	-0.025	-0.026*	-0.017	-0.020	-0.019	0.009	0.010	-0.002
	(0.016)	(0.014)	(0.016)	(0.015)	(0.015)	(0.014)	(0.012)	(0.016)
Effectiveness: High	0.031**	-0.003	-0.010	0.008	0.013	0.002	0.015	0.007
	(0.016)	(0.014)	(0.016)	(0.015)	(0.015)	(0.014)	(0.012)	(0.016)
Constant	0.605***	0.748***	0.575***	0.694***	0.714***	0.720***	0.761***	0.470***
	(0.030)	(0.027)	(0.030)	(0.028)	(0.028)	(0.027)	(0.024)	(0.030)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
R-squared	0.029	0.022	0.013	0.020	0.021	0.041	0.027	0.017

Note: This table reports coefficients from linear regressions of the outcome on whether the policy would be unilateral or multilateral. Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.7: The Causal Effects of Multilateralism on Carbon Tax Support and Expected Benefits and Costs by Income in France, Germany, and the United Kingdom (Weighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Policy Support	Policy Benefits				Policy Costs		
Outcome:	Carbon Tax: Approve	Children: Better Life	Costs: More Fairly	Save: Animals and Plants	Improve Public Health	More Regulation	Higher Energy Prices	Job Losses
Multilateralism	-0.002	0.010	0.026	-0.029	-0.011	0.019	-0.031	0.013
	(0.023)	(0.020)	(0.023)	(0.021)	(0.021)	(0.021)	(0.019)	(0.023)
Multilateralism X Income: High	0.046	0.048	0.056	0.124***	0.073**	0.016	0.001	-0.065*
	(0.034)	(0.030)	(0.034)	(0.032)	(0.031)	(0.030)	(0.026)	(0.034)
Income: High	0.015	-0.043	-0.016	-0.064*	-0.012	0.027	-0.012	0.002
	(0.036)	(0.031)	(0.036)	(0.034)	(0.033)	(0.031)	(0.026)	(0.035)
Effectiveness: Low	-0.003	-0.031*	-0.028	-0.039**	-0.029	0.001	0.009	-0.017
	(0.021)	(0.018)	(0.021)	(0.019)	(0.019)	(0.018)	(0.016)	(0.020)
Effectiveness: High	0.055***	0.000	-0.027	-0.013	0.007	0.008	0.011	0.002
	(0.021)	(0.018)	(0.021)	(0.019)	(0.019)	(0.018)	(0.016)	(0.021)
Constant	0.642***	0.756***	0.592***	0.769***	0.767***	0.732***	0.759***	0.406***
	(0.039)	(0.035)	(0.039)	(0.036)	(0.035)	(0.034)	(0.032)	(0.039)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Weights	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,006	5,006	5,006	5,006	5,006	5,006	5,006	5,006
R-squared	0.024	0.024	0.012	0.027	0.026	0.038	0.033	0.022

Note: This table reports coefficients from linear regressions of the outcome on whether the policy would be unilateral or multilateral. The results have been estimated using survey weights. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.8: The Causal Effects of Multilateralism on Carbon Tax Support and Expected Benefits and Costs by Patience in France, Germany, and the United Kingdom (Weighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Policy Support	Policy Benefits				Policy Costs		
Outcome:	Carbon Tax: Approve	Children: Better Life	Costs: More Fairly	Save: Animals and Plants	Improve Public Health	More Regulation	Higher Energy Prices	Job Losses
Multilateralism	0.018	0.030	0.025	-0.002	0.000	0.034	-0.016	-0.024
	(0.028)	(0.025)	(0.028)	(0.026)	(0.026)	(0.024)	(0.021)	(0.028)
Multilateralism X Patience: High	0.046	0.026	0.037	0.070*	0.060*	-0.009	-0.006	0.014
	(0.039)	(0.035)	(0.039)	(0.037)	(0.036)	(0.034)	(0.030)	(0.038)
Patience: High	-0.002	-0.002	-0.046*	-0.041	-0.037	0.004	0.011	-0.029
	(0.028)	(0.025)	(0.028)	(0.027)	(0.026)	(0.025)	(0.020)	(0.027)
Effectiveness: Low	0.010	-0.063***	-0.028	-0.051**	-0.042*	-0.010	0.021	-0.027
	(0.024)	(0.021)	(0.024)	(0.023)	(0.023)	(0.021)	(0.018)	(0.024)
Effectiveness: High	0.063***	-0.017	-0.013	0.008	0.016	-0.027	0.012	-0.007
	(0.024)	(0.021)	(0.024)	(0.023)	(0.022)	(0.021)	(0.019)	(0.024)
Constant	0.594***	0.760***	0.626***	0.735***	0.743***	0.767***	0.769***	0.460***
	(0.046)	(0.042)	(0.046)	(0.044)	(0.043)	(0.041)	(0.038)	(0.045)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Weights	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,742	3,742	3,742	3,742	3,742	3,742	3,742	3,742
R-squared	0.031	0.033	0.016	0.025	0.030	0.042	0.031	0.025

Note: This table reports coefficients from linear regressions of the outcome on whether the policy would be unilateral or multilateral. The results have been estimated using survey weights. Standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A.9: The Causal Effects of Multilateralism on Carbon Tax Support and Expected Benefits and Costs by Ideology in France, Germany, and the United Kingdom (Weighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Policy Support	Policy Benefits				Policy Costs		
Outcome:	Carbon Tax: Approve	Children: Better Life	Costs: More Fairly	Save: Animals and Plants	Improve Public Health	More Regulation	Higher Energy Prices	Job Losses
Multilateralism	0.035	0.026	0.018	0.014	0.045	0.014	-0.023	-0.021
	(0.030)	(0.029)	(0.031)	(0.029)	(0.029)	(0.026)	(0.022)	(0.030)
Multilateralism X Ideology: Left	0.010	0.024	0.098**	0.035	0.000	0.010	-0.002	-0.028
	(0.040)	(0.036)	(0.040)	(0.038)	(0.037)	(0.035)	(0.030)	(0.039)
Ideology: Left	0.181***	0.124***	0.072**	0.101***	0.136***	-0.022	-0.011	-0.168***
	(0.029)	(0.026)	(0.029)	(0.028)	(0.027)	(0.025)	(0.021)	(0.028)
Multilateralism X Ideology: Center	-0.020	0.014	0.037	0.018	-0.046	0.014	-0.018	0.027
	(0.038)	(0.036)	(0.039)	(0.037)	(0.037)	(0.033)	(0.029)	(0.039)
Ideology: Center	0.106***	0.029	0.018	0.044	0.071***	-0.019	-0.026	-0.030
	(0.028)	(0.026)	(0.028)	(0.027)	(0.027)	(0.024)	(0.020)	(0.028)
Effectiveness: Low	-0.005	-0.018	-0.014	-0.025	-0.017	0.012	0.014	-0.015
	(0.019)	(0.017)	(0.019)	(0.018)	(0.018)	(0.017)	(0.014)	(0.018)
Effectiveness: High	0.048**	0.005	-0.009	0.004	0.016	0.007	0.014	-0.002
	(0.019)	(0.017)	(0.019)	(0.018)	(0.017)	(0.017)	(0.015)	(0.018)
Constant	0.510***	0.685***	0.544***	0.667***	0.653***	0.721***	0.779***	0.516***
	(0.040)	(0.036)	(0.040)	(0.037)	(0.037)	(0.035)	(0.032)	(0.039)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Weights	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
R-squared	0.046	0.040	0.026	0.033	0.039	0.037	0.034	0.046

Note: This table reports coefficients from linear regressions of the outcome on whether the policy would be unilateral or multilateral. The results have been estimated using survey weights. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.10: The Causal Effects of Multilateralism on Carbon Tax Support and Expected Benefits and Costs by Climate Beliefs in France, Germany, and the United Kingdom (Weighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Policy Support	Policy Benefits				Policy Costs		
Outcome:	Carbon Tax: Approve	Children: Better Life	Costs: More Fairly	Save: Animals and Plants	Improve Public Health	More Regulation	Higher Energy Prices	Job Losses
Multilateralism	0.085**	0.073*	0.095**	0.056	0.057	-0.004	-0.054*	-0.085**
	(0.042)	(0.039)	(0.043)	(0.041)	(0.041)	(0.037)	(0.030)	(0.042)
Multilateralism X Warming: Sure	-0.053	-0.028	-0.024	-0.017	-0.028	0.038	0.031	0.075
	(0.046)	(0.042)	(0.046)	(0.044)	(0.044)	(0.040)	(0.033)	(0.045)
Warming: Sure	0.128***	0.129***	0.149***	0.102***	0.152***	0.008	-0.049**	-0.148***
	(0.033)	(0.031)	(0.033)	(0.032)	(0.032)	(0.029)	(0.022)	(0.033)
Effectiveness: Low	-0.005	-0.027	-0.025	-0.032*	-0.030	0.024	0.003	-0.023
	(0.020)	(0.017)	(0.020)	(0.019)	(0.018)	(0.018)	(0.015)	(0.020)
Effectiveness: High	0.045**	-0.004	-0.020	0.005	0.010	0.018	0.014	-0.001
	(0.020)	(0.017)	(0.020)	(0.018)	(0.018)	(0.017)	(0.015)	(0.020)
Constant	0.549***	0.686***	0.513***	0.690***	0.641***	0.715***	0.807***	0.545***
	(0.046)	(0.043)	(0.047)	(0.044)	(0.044)	(0.042)	(0.036)	(0.046)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Weights	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,200	5,200	5,200	5,200	5,200	5,200	5,200	5,200
R-squared	0.033	0.034	0.023	0.029	0.039	0.032	0.031	0.027

Note: This table reports coefficients from linear regressions of the outcome on whether the policy would be unilateral or multilateral. The results have been estimated using survey weights. Standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A.11: The Causal Effects of Multilateralism on Carbon Tax Support and Expected Benefits and Costs by Reciprocity in France, Germany, and the United Kingdom (Weighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Policy Support	Policy Benefits				Policy Costs		
Outcome:	Carbon Tax: Approve	Children: Better Life	Costs: More Fairly	Save: Animals and Plants	Improve Public Health	More Regulation	Higher Energy Prices	Job Losses
Multilateralism	0.042*	0.046**	0.071***	0.046**	0.043**	0.013	-0.040**	-0.006
	(0.022)	(0.020)	(0.022)	(0.021)	(0.021)	(0.020)	(0.018)	(0.022)
Multilateralism X Reciprocity: High	-0.021	-0.008	-0.011	-0.022	-0.029	0.017	0.018	-0.031
	(0.031)	(0.027)	(0.031)	(0.029)	(0.029)	(0.027)	(0.024)	(0.031)
Reciprocity: High	0.061***	0.029	0.038*	0.011	0.041**	0.019	0.044***	-0.028
	(0.022)	(0.020)	(0.022)	(0.021)	(0.021)	(0.020)	(0.016)	(0.022)
Effectiveness: Low	-0.010	-0.022	-0.018	-0.028	-0.022	0.013	0.014	-0.009
	(0.019)	(0.017)	(0.019)	(0.018)	(0.018)	(0.017)	(0.014)	(0.019)
Effectiveness: High	0.042**	0.001	-0.013	0.002	0.012	0.007	0.013	0.004
	(0.019)	(0.017)	(0.019)	(0.018)	(0.017)	(0.017)	(0.015)	(0.019)
Constant	0.589***	0.726***	0.559***	0.718***	0.711***	0.693***	0.738***	0.461***
	(0.037)	(0.033)	(0.037)	(0.034)	(0.034)	(0.033)	(0.031)	(0.036)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Weights	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
R-squared	0.028	0.025	0.016	0.023	0.026	0.037	0.037	0.021

Note: This table reports coefficients from linear regressions of the outcome on whether the policy would be unilateral or multilateral. The results have been estimated using survey weights. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.12: The Causal Effects of Multilateralism on Carbon Tax Support and Expected Benefits and Costs by Income in France, Germany, and the United Kingdom (Unweighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Policy Support	Policy Benefits				Policy Costs		
Outcome:	Carbon Tax: Approve	Children: Better Life	Costs: More Fairly	Save: Animals and Plants	Improve Public Health	More Regulation	Higher Energy Prices	Job Losses
Multilateralism	0.038**	0.023	0.036*	-0.003	0.015	0.022	-0.026*	-0.017
	(0.019)	(0.017)	(0.019)	(0.018)	(0.018)	(0.017)	(0.015)	(0.019)
Multilateralism X Income: High	0.008	0.013	0.034	0.069***	0.035	-0.005	0.003	-0.009
	(0.028)	(0.025)	(0.028)	(0.026)	(0.026)	(0.024)	(0.021)	(0.028)
Income: High	0.012	-0.014	-0.008	-0.056*	0.004	0.038	-0.022	-0.022
	(0.030)	(0.026)	(0.030)	(0.029)	(0.028)	(0.025)	(0.022)	(0.030)
Effectiveness: Low	-0.023	-0.032**	-0.025	-0.031*	-0.023	0.002	0.007	-0.010
	(0.017)	(0.015)	(0.017)	(0.016)	(0.016)	(0.015)	(0.013)	(0.017)
Effectiveness: High	0.037**	-0.001	-0.024	-0.001	0.014	-0.000	0.016	-0.001
	(0.017)	(0.015)	(0.017)	(0.016)	(0.016)	(0.015)	(0.013)	(0.017)
Constant	0.608***	0.758***	0.581***	0.723***	0.736***	0.734***	0.759***	0.455***
	(0.034)	(0.030)	(0.034)	(0.031)	(0.031)	(0.030)	(0.027)	(0.034)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,006	5,006	5,006	5,006	5,006	5,006	5,006	5,006
R-squared	0.028	0.023	0.011	0.023	0.023	0.041	0.028	0.017

Note: This table reports coefficients from linear regressions of the outcome on whether the policy would be unilateral or multilateral. The results have been estimated using survey weights. Robust standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A.13: The Causal Effects of Multilateralism on Carbon Tax Support and Expected Benefits and Costs by Patience in France, Germany, and the United Kingdom (Unweighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Policy Support	Policy Benefits				Policy Costs		
Outcome:	Carbon Tax: Approve	Children: Better Life	Costs: More Fairly	Save: Animals and Plants	Improve Public Health	More Regulation	Higher Energy Prices	Job Losses
Multilateralism	0.042*	0.028	0.027	-0.002	0.003	0.020	-0.016	-0.038*
	(0.023)	(0.021)	(0.023)	(0.022)	(0.021)	(0.019)	(0.017)	(0.023)
Multilateralism X Patience: High	0.030	0.007	0.032	0.057*	0.041	-0.006	0.017	0.029
	(0.032)	(0.029)	(0.033)	(0.031)	(0.030)	(0.027)	(0.024)	(0.032)
Patience: High	0.008	0.006	-0.018	-0.024	-0.022	0.008	0.012	-0.033
	(0.023)	(0.021)	(0.023)	(0.022)	(0.021)	(0.019)	(0.017)	(0.023)
Effectiveness: Low	-0.016	-0.061***	-0.028	-0.043**	-0.034*	-0.007	0.017	-0.030
	(0.020)	(0.018)	(0.020)	(0.019)	(0.019)	(0.017)	(0.015)	(0.020)
Effectiveness: High	0.037*	-0.024	-0.024	0.004	0.006	-0.022	0.020	-0.003
	(0.020)	(0.018)	(0.020)	(0.019)	(0.018)	(0.017)	(0.015)	(0.020)
Constant	0.593***	0.778***	0.599***	0.719***	0.742***	0.766***	0.755***	0.481***
	(0.040)	(0.036)	(0.040)	(0.037)	(0.037)	(0.034)	(0.031)	(0.039)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,742	3,742	3,742	3,742	3,742	3,742	3,742	3,742
R-squared	0.031	0.027	0.017	0.020	0.023	0.048	0.031	0.020

Note: This table reports coefficients from linear regressions of the outcome on whether the policy would be unilateral or multilateral. Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.14: The Causal Effects of Multilateralism on Carbon Tax Support and Expected Benefits and Costs by Ideology in France, Germany, and the United Kingdom (Unweighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Policy Support	Policy Benefits				Policy Costs		
Outcome:	Carbon Tax: Approve	Children: Better Life	Costs: More Fairly	Save: Animals and Plants	Improve Public Health	More Regulation	Higher Energy Prices	Job Losses
Multilateralism	0.028	0.006	0.027	0.012	0.039	0.021	-0.021	-0.031
	(0.025)	(0.023)	(0.025)	(0.024)	(0.024)	(0.020)	(0.018)	(0.025)
Multilateralism X Ideology: Left	0.039	0.039	0.068**	0.029	-0.008	-0.015	-0.004	-0.017
	(0.032)	(0.029)	(0.033)	(0.031)	(0.031)	(0.028)	(0.024)	(0.032)
Ideology: Left	0.171***	0.099***	0.087***	0.095***	0.129***	-0.016	-0.008	-0.166***
	(0.023)	(0.021)	(0.024)	(0.023)	(0.022)	(0.020)	(0.017)	(0.023)
Multilateralism X Ideology: Center	0.003	0.023	0.019	0.017	-0.026	-0.003	-0.000	0.042
	(0.032)	(0.030)	(0.032)	(0.031)	(0.030)	(0.027)	(0.024)	(0.032)
Ideology: Center	0.091***	0.014	0.044*	0.039*	0.055**	-0.019	-0.035**	-0.046**
	(0.022)	(0.021)	(0.023)	(0.022)	(0.022)	(0.019)	(0.016)	(0.023)
Effectiveness: Low	-0.020	-0.022	-0.013	-0.017	-0.015	0.008	0.010	-0.008
	(0.015)	(0.014)	(0.016)	(0.015)	(0.015)	(0.014)	(0.012)	(0.015)
Effectiveness: High	0.034**	-0.000	-0.008	0.010	0.015	0.001	0.016	0.003
	(0.015)	(0.014)	(0.016)	(0.015)	(0.014)	(0.014)	(0.012)	(0.015)
Constant	0.511***	0.711***	0.528***	0.647***	0.650***	0.734***	0.780***	0.540***
	(0.033)	(0.030)	(0.034)	(0.032)	(0.032)	(0.029)	(0.026)	(0.033)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
R-squared	0.051	0.034	0.023	0.029	0.032	0.041	0.029	0.040

Note: This table reports coefficients from linear regressions of the outcome on whether the policy would be unilateral or multilateral. Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A.15: The Causal Effects of Multilateralism on Carbon Tax Support and Expected Benefits and Costs by Climate Beliefs in France, Germany, and the United Kingdom (Unweighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Policy Support	Policy Benefits				Policy Costs		
Outcome:	Carbon Tax: Approve	Children: Better Life	Costs: More Fairly	Save: Animals and Plants	Improve Public Health	More Regulation	Higher Energy Prices	Job Losses
Multilateralism	0.087**	0.048	0.083**	0.049	0.057*	0.001	-0.038	-0.065*
	(0.035)	(0.033)	(0.036)	(0.034)	(0.034)	(0.030)	(0.025)	(0.036)
Multilateralism X Warming: Sure	-0.049	-0.018	-0.026	-0.020	-0.034	0.016	0.018	0.051
	(0.038)	(0.035)	(0.039)	(0.036)	(0.036)	(0.032)	(0.027)	(0.038)
Warming: Sure	0.130***	0.118***	0.142***	0.107***	0.152***	0.015	-0.040**	-0.123***
	(0.027)	(0.025)	(0.027)	(0.026)	(0.026)	(0.023)	(0.019)	(0.027)
Effectiveness: Low	-0.019	-0.025*	-0.018	-0.025	-0.021	0.020	0.006	-0.007
	(0.016)	(0.014)	(0.017)	(0.015)	(0.015)	(0.014)	(0.013)	(0.016)
Effectiveness: High	0.034**	-0.004	-0.012	0.011	0.016	0.010	0.020	0.007
	(0.016)	(0.014)	(0.017)	(0.015)	(0.015)	(0.015)	(0.013)	(0.017)
Constant	0.533***	0.709***	0.511***	0.666***	0.630***	0.721***	0.797***	0.546***
	(0.039)	(0.035)	(0.040)	(0.037)	(0.036)	(0.034)	(0.030)	(0.039)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,200	5,200	5,200	5,200	5,200	5,200	5,200	5,200
R-squared	0.036	0.027	0.019	0.025	0.033	0.037	0.025	0.022

Note: This table reports coefficients from linear regressions of the outcome on whether the policy would be unilateral or multilateral.Robust standard errors are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Table A.16: The Causal Effects of Multilateralism on Carbon Tax Support and Expected Benefits and Costs by Reciprocity in France, Germany, and the United Kingdom (Unweighted)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Policy Support	Policy Benefits				Policy Costs		
Outcome:	Carbon Tax: Approve	Children: Better Life	Costs: More Fairly	Save: Animals and Plants	Improve Public Health	More Regulation	Higher Energy Prices	Job Losses
Multilateralism	0.059***	0.028*	0.071***	0.025	0.027	0.005	-0.022	-0.008
	(0.018)	(0.017)	(0.018)	(0.017)	(0.017)	(0.016)	(0.015)	(0.018)
Multilateralism X Reciprocity: High	-0.030	0.003	-0.025	0.009	0.001	0.018	0.001	-0.029
	(0.025)	(0.023)	(0.026)	(0.024)	(0.024)	(0.022)	(0.019)	(0.025)
Reciprocity: High	0.058***	0.022	0.022	-0.009	0.024	0.020	0.053***	-0.032*
	(0.018)	(0.017)	(0.018)	(0.018)	(0.017)	(0.016)	(0.014)	(0.018)
Effectiveness: Low	-0.026	-0.026*	-0.017	-0.020	-0.019	0.009	0.010	-0.003
	(0.016)	(0.014)	(0.016)	(0.015)	(0.015)	(0.014)	(0.012)	(0.016)
Effectiveness: High	0.030*	-0.003	-0.011	0.008	0.013	0.001	0.014	0.007
	(0.016)	(0.014)	(0.016)	(0.015)	(0.015)	(0.014)	(0.012)	(0.016)
Constant	0.575***	0.736***	0.564***	0.699***	0.701***	0.709***	0.732***	0.488***
	(0.031)	(0.028)	(0.031)	(0.029)	(0.029)	(0.028)	(0.025)	(0.031)
Sociodemographics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Survey Weights	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
R-squared	0.031	0.022	0.014	0.021	0.021	0.042	0.032	0.019

Note: This table reports coefficients from linear regressions of the outcome on whether the policy would be unilateral or multilateral. Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

E Appendix Figures

Figure A.1: CTB Example Screenshot

Please choose one of the following options of payment TODAY and payment in 5 WEEKS from today.

Payment TODAY of $19.00
and payment in 5 WEEKS of $0

Payment TODAY of $15.20
and payment in 5 WEEKS of $4.00

Payment TODAY of $11.40
and payment in 5 WEEKS of $8.00

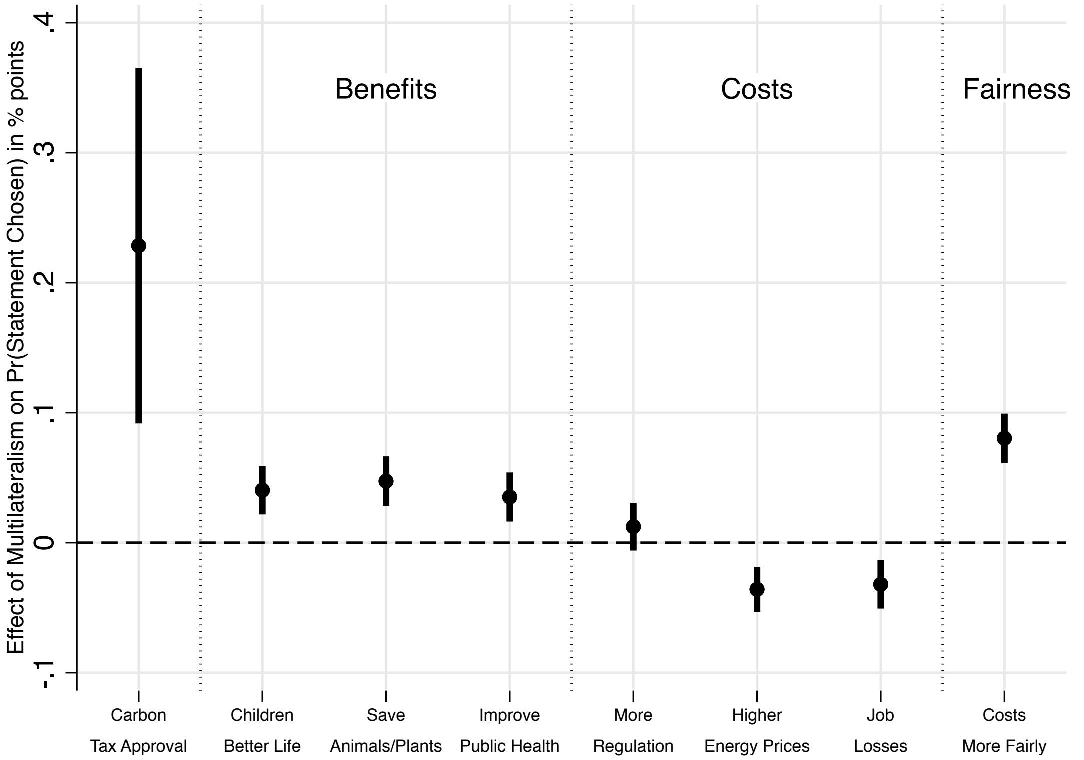
Payment TODAY of $7.60
and payment in 5 WEEKS of $12.00

Payment TODAY of $3.80
and payment in 5 WEEKS of $16.00

Payment TODAY of $0
and payment in 5 WEEKS of $20.00

Note: This figure shows a screenshot of a CTB choice task.

Figure A.2: The Causal Effects of Multilateralism on Carbon Tax Support, Benefits, Costs and Fairness in France, Germany, and the United Kingdom (N=6,000, Unweighted Data)



Note: This plot reports coefficients from linear regressions of statement approval on a binary indicator that is one if climate action is multilateral and is zero if climate action is unilateral. Error bars indicate 99 and 95% robust confidence intervals. N(France)=2,000, N(Germany)=2,000, N(United Kingdom)=2,000.