Interests and Norms Shape Support for Global Climate Cooperation

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The provision of manageable greenhouse gases to mitigate climate change is the paradigmatic global public good. As with most global public good problems, domestic political conflict over its provision determines success or failure of cooperation on climate policy. We explore the extent to which domestic disagreement over climate cooperation mirrors the distribution of economic interests or differences in social norms. We examine observational and experimental data from original surveys in France, Germany, the United Kingdom, and the United States, using various measures of the pollutiveness of individuals' industries of employment and behavioral measures of altruism and reciprocity. Our results suggest that both sector-based interests and social norms determine support for global climate cooperation. We also find evidence that these factors interact, mediating each other's effect on support for climate change cooperation.

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1 Introduction

Addressing the causes and consequences of climate change presents one of the major policy challenges to humankind. Climate policy poses a particular problem for policymakers because of its public goods character: Countries need to cooperate on adaptation and mitigation measures and these policies need to be enforced domestically. Yet, there exists a strong incentive to free ride on the climate policy efforts of other countries. A potential solution to this problem may stem from the domestic politics of climate policy. If there exists strong enough support for global climate cooperation, electoral accountability may induce policymakers to agree on and domestically enforce international climate policy objectives. This path to an effective international climate deal hinges on the dividing lines that characterize public support for or opposition to global climate cooperation. To the extent that conflict mirrors differences in economic interests, there exist substantial opportunities to adopt policies and institutions that guarantee that the costs and benefits of mitigating greenhouse gases are widely shared. To the extent that conflict mirrors differences in social norms that facilitate public goods cooperation, there may be less room for successful conflict resolution and, in any event, the required interventions would be substantially different.

Examining how interests and social norms determine public support for policy lies at the heart of a classic debate in political science and many other social science disciplines (e.g., economics, sociology, and philosophy) that has explored whether actors are motivated primarily by their economic well-being or their values and identities. The interests versus norms debate links contemporary policy discussions and scientific fields of research inquiry, as contemporary media evaluations of the Obama administration's foreign policy or academic discussions on endogenous trade theory demonstrate. Often the debate is posed in either or terms: in one view actors are primarily motivated by their interests while in the other their behavior should be understood as a product of their values and deeply held social norms.

We argue that this dichotomy is a false one. In most areas of social and economic life, individuals are thought to be motivated by both interests and values. People prefer to make more money than less and to pay less for goods than more, but they also choose careers that they find meaningful at substantial financial sacrifice and recoil at the idea of buying cheap goods produced by mistreated workers. Thus, we argue that both interests and norms influence support for international climate cooperation, and that the two are connected and moderate each other when individuals elaborate opinions on climate change agreements.

We propose a direct evaluation of our argument by leveraging original large-scale surveys fielded in France, Germany, the United Kingdom and the United States. We examine how interests and norms influence support by constructing new measures of each tailored for the climate change issue. We collected information about pollution production and energy intensity to reflect economic considerations at the individual's sector of employment. Furthermore, based on a payoff-relevant experiment embedded in the representative surveys, we constructed quasi–behavioral measures of altruism and reciprocity.

We estimate the effects of anticipated costs and social norms on several aspects of climate policy support, using both correlational and experimental data. The correlational results show that interests and norms have significant but contrasting effects with similar magnitudes. More specifically, our estimates based on pooled data from all four countries imply that belonging to a high environmental impact sector decreases support for climate change agreements by 7 percentage points, while being more altruistic or reciprocal increases support by roughly 10 percentage points. In our correlational analysis, we find mixed evidence for the conjecture that interests and norms moderate each other in the formation of policy opinions. We find no significant interactions for our main policy opinion measure of support for international cooperation but find some support for a significant interaction for working in a high environmental impact sector and reciprocity when the policy opinion is framed in terms of willingness to pay and absent any reference to the international efforts of others. Specifically, the reluctance of high reciprocal types to pay for mitigation efforts that do not condition on reductions in other countries is magnified for individuals who work in high environmental impact sectors.

Our experimental data also suggests that both sectoral–based interests and social norms are important considerations among the public. In a conjoint analysis we randomly assigned individuals to hypothetical treaties with different attributes. The attributes we focus on belong to two main dimensions of global climate cooperation: monetary costs of the treaty and forms of international participation. We then examined how variation on each of these dimensions affects mass support for global climate agreements. The results indicate that economic interests and social norms are influential and interact, but not always and not under all conditions. Specifically, we find that sector–based concerns make individuals less sensitive to the participation aspects of climate agreements, while reciprocity exacerbates public sensitivity to the cost of agreements.

Overall, our findings reveal that domestic political conflict over international climate policy in our four countries are comparable, and that economic self-interest and social norms are crucial domestic foundations of global governance in wealthy democracies. Although most societies value the benefit from participating in international emission abatements, our results show that distributional concerns can limit enthusiasm for climate change agreements. Similarly, we demonstrate that norms can sometimes mitigate individuals' economic concerns over international climate policies.

The remainder of the paper starts with a theoretical discussion about how interests and norms may influence public support of climate change cooperation. Section 3 presents the first set of correlational results based on our four surveys. Section 4 presents the results of our original conjoint experiments, and the final section discusses the implications of our study for understanding international cooperation.

2 Interests, Norms, and International Cooperation

The intuition that interests and norms explain individual behavior has received strong support in laboratory and lab-in-the field experimental research across the social sciences

(Ostrom 1990; Ostrom 2000; Bellemare and Kröger 2007; Tsai 2007; Henrich, Heine and Norenzayan 2010; Fischbacher and Gächter 2010). When individuals face social dilemmas, they often do not make choices that can be explained by their economic interests narrowly conceived. For example, in ultimatum games many individuals do not make nor do they accept the minimum offers as would be predicted by standard economic theory. This type of result is repeated across a diverse set of problems in the literature. The conclusion of this research is not, however, that interests do not matter. The implication rather is that there are other factors influencing behavior. In particular, this body of research has emphasized the importance of social norms such as altruism, inequality aversion, and reciprocity as central to understanding how people behave in social dilemmas. For example, altruism and inequality aversion inform individuals' assessments about the fairness of distributive outcomes. Expectations about the contributions of others – reciprocity – influences the willingness of individuals to contribute to public goods. Establishing the empirical importance of these norms has been one of the signature achievements of this literature.

To more precisely develop our expectations for the role of interests and norms in guiding behavior in international relations, we need to consider the specific type of problem. We focus on international cooperation and specifically international cooperation over climate change. The provision of manageable greenhouse gases to mitigate climate change is a model global public good (Keohane and Victor 2011; Barrett 2003). As such, focusing on how individuals behave in the context of climate change cooperation may provide insights on how both interests and norms account for the success and failure of international agreements in this setting.

Put in general terms, the problem societies face is whether to mitigate emissions (cooperate and contribute) or continue polluting (defect and free ride). Cooperation involves incurring costs by reducing energy consumption, paying more for energy, conserving energy, or otherwise adopting costly technologies to reduce greenhouse gas emissions. The magnitude of these costs is likely to vary across different countries and across different individuals, depending on national and individual circumstances. The benefits of cooperating are instead the collective enjoyment of reduced emissions in the form of preserved natural resources and, in the long-run, a stable climate.[1]

In an international scenario such as the Kyoto Protocol, mitigation targets follow the principle of burden sharing. Accordingly, emissions reductions are openly discussed and agreed among countries. At the climate negotiations of the United Nations, countries collectively decide global emission targets through democratic (unanimous) voting. However, the benefits of setting reductions in this international framework are only higher than the marginal cost of reducing agreed emissions if participation in the agreement is full and the treaty is cost–effective (Barrett 2003; Victor 2006). Evidently, the limitations of the Kyoto Protocol and the few successful agreements negotiated afterwards indicate that countries are still at loggerheads with cost concerns on the one side, and participatory issues on the other side. Research has provided important insights on the politics of domestic commitment to climate agreements (Ward, Grundig and Zorick 2001; von Stein 2008; Hovi, Sprinz and Underdal 2009) as well as the trade–off of participation and compliance in environmental treaties (Barrett and Stavins 2003; Pittel and Rübbelke 2008). Nonetheless, little is still known about how embedded these considerations are in the domestic context, and to what extent they generate mass disagreements with respect to international climate cooperation.

We expect the domestic distribution of costs and benefits of emission abatement to influence the desire for individuals to cooperate on the climate change problem. For some individuals, their assessment of the costs and benefits to themselves will be such that they will prefer not to contribute to this global public good under any circumstances. For others, the costs and benefits of cooperation are likely to be one of a number of considerations. These considerations may be related to the public's 'time horizon,' which means that individuals who believe that the ecosystem impact will occur in the near future will be more inclined

[1] Certainly individuals in some places and countries may have more to benefit from reduced emissions than others, but generally most of the world population would benefit from less variability in temperatures and weather patterns (UNEP 2012).

to support climate change agreements (Layton and Brown 2000). Relatedly, the costs and benefits of approving an international agreement may be related to individuals' sensitivity to sacrifice their current earnings. Consequently, international agreements that impinge directly on individuals' economic revenue are more likely to be rejected by the public.

The laboratory literature on public goods provision (Fehr and Gächter 2000; Fischbacher and Gächter 2010) suggests that two additional factors are likely to be important. First, individuals' propensity to contribute may depend on their expectations about the contribution behavior of others. Reciprocity has been found to have a powerful impact on public goods provision. Second, contributions are likely to be higher among individuals with greater altruism. Altruism may play a particularly important role in climate change cooperation because many of the benefits of emission reductions will be realized by future generations.

In this paper, we also advance a further expectation with respect to public opinion on climate change cooperation. Specifically, we argue that interests and norms are connected, and they can moderate each other's effect when examining mass support for climate agreements. Reciprocity and altruism not only help determine opinions on emission abatement treaties but that their impact varies with the costs and benefits of the specific treaty. By the same token, the weight of the economic costs that individuals confront with a new climate change treaty should be weakened by their intrinsic generosity, or influenced by their expectations of the mitigation efforts of others. Although the examination of how public characteristics influence support for international climate policy agreements has received some attention (see e.g. Bechtel and Scheve (2013) and Tingley and Tomz (2014)), we provide the first systematic cross-national evaluation employing sector-based measures of economic interests and behavioral measures of normative characteristics with the main objective of determining how these factors, individually and in combination, influence support for climate cooperation.

3 Correlates of Support for Climate Change Cooperation

3.1 Data and Econometric Model

We begin our analysis by examining the extent to which measures of economic interest and norms are correlated with public opinion about climate change policy. Our analysis is based on original surveys that we fielded in the summer of 2012 in France, Germany, the United Kingdom, and the United States. All four surveys were conducted by YouGov over the internet on representative samples of the adult population.[2] The sample size was 2,000 for France, Germany, and the United Kingdom and 2,500 for the United States.

To measure international climate change policy opinions, we asked respondents the following question:

> "As you probably know, many experts say that countries have to reduce their greenhouse gas emissions to address global warming. Generally speaking, how strongly do you support or oppose international cooperation to reduce greenhouse gas emissions even if this involves significant costs?"

Respondents could answer that they 'strongly oppose' (1), 'somewhat oppose' (2), 'neither oppose nor support' (3), 'somewhat support' (4), or 'strongly support' (5) cooperation. We set the variable *Support: Global Climate Cooperation* equal to one for those who 'support' or 'strongly support' international climate cooperation, and equal to zero otherwise.

International cooperation on environmental issues is multifaceted and respondents may think of different aspects of global climate cooperation. So, to strengthen the interpretation of our findings with the *Support: Global Climate Cooperation* measure, we generated two additional indicators of public opinion about climate change policies based on our survey.

[2] YouGov employs an opt-in panel together with matched sampling to approximate a random sample of the adult population (Rivers 2011). Matched sampling involves taking a stratified random sample of the target population and then matching available internet respondents to the target sample. Ansolabehere and Rivers (2013) and Ansolabehere and Schaffner (2013) show that matched sampling also produces accurate population estimates and replicates the correlational structure of random samples using telephones and residential addresses.

Importance of CO2 Reductions is a measure of the saliency of carbon abatements. The variable takes values from 0 to 10 based on the question: "How important do you think it is for [France, Germany, the United Kingdom, the United States] to reduce greenhouse gas emissions?" The answers ranged from 0 for 'not at all important' to 10 for 'extremely important.' Additionally, *Willingness to Pay for the Environment* is a measure of the value that respondents attach to environmental quality. The variable is based on responses to the question: "If you consider your monthly income, how much of it would you be willing to invest into reducing greenhouse gas emissions (for example, buying energy efficient electric appliances, installing heat insulation in your home, buying electric power produced from renewable energy sources, buying locally produced food)?" We set the variable on a scale between 0 to 100, with 0 meaning 'nothing at all' and 100 meaning 'my whole income.'

To measure economic interests, we choose to focus on how costly reducing greenhouse gas emissions is likely to be in the sectors in which individuals are employed. This choice constrains us to concentrate on the subset of employed respondents in our sample, but comes with several advantages. It allows us to analyze a rather clear group of people that is politically relevant both in terms of policy preferences and interest group representation. It also permits the collection of industry–based indicators that reflect concrete (rather than elicited) economic interests.

We consider measures that reflect abatement costs of respondents' industries as the function of their environmental impact. We identify 21 industries, which correspond to the 21 categories of the United Nations Statistics Division's International Standard Industrial Classification (ISIC) of All Economic Activities (Revision 4). Respondents that selected 'paid work' on a simple employment status question were asked to specify which of the 21 ISIC categories represented their industry. In total 4009 respondents identified themselves as workers of one of the 21 sectors (817 in France, 929 in Germany, 1141 in the UK, 1122 in the US).[3]

[3]In the Appendix we describe how we collected information on each individual's employment and which industry sectors we listed for selection. Note that we also included a 'none of these' answer for the sectors,

Our main industry cost indicator is the *Greenhouse Gases (GHG) Emissions* variable. The indicator measures gross direct emissions in million tons of produced CO2–equivalent gases for the year 2011. We collected the raw figures from the OECD Environmental Statistics database, which follows the GHG concept of the International Panel on Climate Change (IPCC), the scientific intergovernmental body of the United Nations Framework Convention on Climate Change. According to the IPCC definition, GHG includes natural and human–caused constituents of the atmosphere that absorb and emit radiation. The gases included in the definition are carbon dioxide (CO2), nitrous oxide (N2O), methane (CH4), plus sulphur hexafluoride (SF6), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs). The reason we prefer this measure to alternative indicators of pollution–based industrial interests is that it captures comprehensive costs. GHG combines emissions from energy use and industrial processes, which are mainly CO2–based, and methane emissions from solid waste, mining and agriculture, which are mainly CH4–based, in addition to the rest of the gases. Note that the OECD GHG values are calculated at the sectoral level for most but not all ISIC categories—the emissions from service sectors are aggregated into one figure.[4] In order to generate an estimate of GHG emissions for the ISIC public service sectors (ISIC 9 to 21), we multiplied the total services emissions by each of the 13 service sectors' proportion of their total value added.[5] This allows us to generate weighted emissions for service sectors with possibly different environmental 'footprints.'

The *GHG Emissions* measure is distributed as one would expect, but it is important to note that the differences in emissions across sectors are relatively large and similar – in relative terms – across the four countries. For example, in the US, the Transportation sector is the generator of 1743.6 million CO2 equivalent emissions in 2011 (roughly one

which resulted in the respondent having the option of verbally describing her profession. In the Appendix we describe how we qualitatively assessed whether the industry of those individuals that selected this alternative category is identifiable based on their verbal response.

[4]This is not a feature of the OECD only, but service sectors are generally reported as aggregated. See, for example, the United Nations Industrial Development Organization's Industrial Efficiency Policy Database or the World Bank Indicator Database.

[5]See Appendix for a detailed description of the coding decisions for the conversion of emissions from the IPCC categories to the ISIC categories.

third of total emissions, according to our calculations). By contrast, the Education sector emits about 8.5 million emissions (less than 1 percent). To facilitate the interpretation of the effect of such differences, we dichotomize the pollution measures. Specifically, we split the sectors at the median of their pollution measure distribution within each country. Thus, the GHG emissions as well as the alternative variables are transformed into binary indicators, where zero corresponds to low GHG emissions, while one corresponds to high GHG emissions. Accordingly, 2261 individuals in our sample are assigned to the *GHG Emissions: Low* category, while 1748 are assigned to the *GHG Emissions: High* category.[6]

We measure reciprocity using the strategy method within the context of a two-player linear public good game (Fischbacher, Gächter and Fehr 2001; Selten 1967). Specifically, respondents were told that individuals completing the survey had a chance to win one of two Amazon gift cards and that the amount of the gift card would depend on their decision about whether to give some amount of the gift card to another winner and the analogous decision made by that winning respondent. Any amount given to another respondent would be subtracted from the individual's winnings and doubled before it was distributed to the other winner. The strategy method asks individuals how much that they would like to give the other winner if they knew that respondent's gift to them. Individuals are considered to be high reciprocity types if their gift amount is relatively sensitive to the gift of the other winner. Specifically, we estimated an auxiliary regression for each respondent in which we regressed her/his contribution on a variable that indicated the amount given by the other person (0, 25, 50, 75, and 100). The regression coefficient provides us with a measure of reciprocity. We converted this reciprocity measure into a binary indicator, *Reciprocity: High*, that scores one for respondents that exhibited more reciprocal behavior than the median respondent and is zero otherwise.

We also use a quasi-behavioral measure for altruism. This measure is based on the

[6]The numbers by country are: 360 in low emissions and 457 in high emissions for France; 502 in low emissions and 427 in high emissions for Germany; 723 in low emissions and 418 in high emissions for the United Kingdom; and 676 in low emissions and 446 in high emissions for the United States.

following survey instrument: We informed respondents that we would raffle another 100 €/£/$ among all respondents that completed the survey and that the winner could decide to donate parts of the voucher to a charity. We then asked respondents whether they would like to donate in case they won a voucher. If respondents indicated that they wanted to donate, we offered a long list of charities from which individuals could choose and we asked them the amount they would like to give. We coded the binary variable *Altruism: High* equal to one if respondents donated a nonzero amount (which also was the median donation) and zero otherwise.

The empirical strategy we use to estimate the partial correlation between our measures of interests and norms and support for global climate cooperation is a series of ordinary least squares regressions of *Support: Global Climate Cooperation* on measures of socio-demographic characteristics, *Reciprocity: High*, *Altruism: High*, and our sectoral-based interest variable, *GHG Emissions: High*. We include fixed effects for the four countries, and calculate robust standard errors.[7]

3.2 Results

We first explore the socio-demographic dividing lines in support for global climate policy. Model 1 in Table 1 shows the results. We find that those with higher levels of education are significantly more in favor of international climate cooperation as are individuals in the highest income quartile. We do not find significant differences by sex or age.

In Model 2 we add our binary measures of reciprocity and altruism. Both variables are highly significant and have positive signs. On average, more reciprocal respondents are significantly more in favor of global climate policies as are individuals that are more altruistic. The effect of both variables is roughly a 10 percent point increase in public support. In Model 3 we evaluate instead the importance of sectoral–based interests by including the *GHG Emissions: High* variable. We find that respondents working in a more pollutive

[7]The regressions are weighted by sampling weights although there is no significant differences between the weighted and unweighted estimates.

sector are significantly less supportive of global climate cooperation. The magnitude is closely comparable to the effects of social norms, in that working in an industry with a high environmental impact increases the support for climate cooperation by 7 percentage points. Column 4 reports our fully specified model that includes all socio-demographic predictors as well as our measures of norms and interests. The estimates are qualitatively the same.

One interesting question is whether these results are specific to international climate cooperation or are indicative of the correlates of more general measures of climate policy. To shed light on this question, we re-estimate the fully specified model using our two additional measures of environmentalism. In Model 5 we find that the partial correlations of industry–based interests and social norms with the importance of CO2 reductions are qualitatively similar to the analogous correlations with general climate cooperation support. The results from Model 6, however, are interestingly changed. For the willingness to pay measure we estimate that the reciprocators are less willing to pay than those with low levels of reciprocity, while the partial correlations for altruists and workers in high pollution sectors remain in the same direction as for main specifications. A way to explain the switch of sign of the reciprocity measure is that the reciprocal respondents are particularly sensitive to the cost aspect of climate change cooperation. These individuals are willing to pay for public goods conditional on others contributing as well. Therefore, in the context of a question that does not include a reference to the efforts of other countries, conditional cooperators are less willing to spend on mitigation efforts.

The results in Table 1 provide evidence that work–based concerns and social norms matter for individuals' responses to global public goods. To evaluate the prediction that these factors interact, we investigate how norms and interests together shape support for climate cooperation in the correlational data. In Table 2 we explore this possibility by interacting our measures of norms and sectoral interests. We regress the support for climate cooperation, the importance of CO2 reductions and the willingness to pay for the environment on the interaction of GHG emissions with reciprocity and GHG emissions with altruism, their constitutive terms, and social demographics. The result in the first two columns of Table 2 is a null finding. The lack of an interaction with GHG emissions for either altruism or reciprocity in these models suggests that both interests and norms influence opinions on climate cooperation but they do not necessarily influence the effect of each other. In the willingness to pay model, however, there is a significant negative interaction for reciprocity and high GHG emissions. This coefficient indicates that the reluctance of high reciprocal types to pay for mitigation efforts that do not condition on reductions in other countries is magnified for individuals who work in high environmental impact sectors. Overall, our mixed findings for interactions between interests and norms are consistent with the conjecture that although both norms and interests are influential, they sometimes but not always influence each other.

3.3 Robustness

We evaluate the robustness of these results in a number of ways. We redefine our measure of support for climate cooperation on a scale from 1 (strongly oppose) to 5 (strongly support), and re-estimate our main analyses using an ordered probit model. Table A-6 in the Appendix reports these estimates, and shows that our findings remain unchanged. Interests as measured by sectoral greenhouse gas emissions are negatively and significantly correlated with support for international climate policy. Further, individuals who are more altruistic and more reciprocal are more in favor of climate cooperation. We also re-estimate the main models for our measure of the importance of CO2 reductions and their willingness to pay for environmental protection to explicitly take into account possible censoring of these dependent variables (Table A-6 in the Appendix, Models 5 and 6). Since these dependent variables are bounded, we estimate tobit models and find that our results are unchanged.

We also explore the robustness of our findings to how we measure the pollutiveness of individuals' sectors of employment. We first reestimate our main model using an alternative measure of a sectors' level of greenhouse gas emissions that is based on the World Bank Development Indicators database. This database provides information about GHG emissions calculated for slightly different types of categories compared to the OECD indicators. Model 1 in A-7 in the Appendix shows that this variable (*GHG Emissions (WB): High*) has a significantly negative coefficient, consistent with the prediction that those working in sectors that emit more greenhouse gases are systematically less in favor of climate cooperation. Model 2 reestimates our model using the difference between the level of greenhouse gas emissions and the level of non-CO2 gases as a measure of sectoral interests. This variable is based on data from the OECD Detailed CO2 Estimates database and the United Nations Industrial Development Organization (UNIDO)'s Industrial Efficiency Policy Database. Again, this alternative measure of sector-based interests has a significantly negative coefficient. Model 3 uses a measure of climate-relevant energy intensity by including the annual net flow of coal, oil, energy output, gas, electricity, heat, combustible renewables and waste in tonnes of oil equivalent (2011) weighted by the sectors' value added. Again, the coefficient is significantly negative which suggests that those working in more energy-intense sectors are more opposed to global climate policy efforts. Finally, in Model 4 we include an *Employee–weighted GHG Emissions* variable, which is the main GHG Emissions variable weighted by the number of employees in each of the 21 ISIC sectors. The results remain similar: Those working in more pollutive sectors are significantly less in favor of international climate cooperation.

We conducted an analogous set of robustness tests for our Importance of CO2 Reductions dependent variable, again using the same alternative measures of employment sector-based pollution costs. Table A-8 in the Appendix reports the estimates. Irrespective of the measure that we employ, our results suggest that those working in more pollutive industries oppose emission reductions significantly more than those employed in relatively cleaner sectors. We repeat this exercise using our willingness to pay measure as the dependent variable. Table A-9 in the Appendix reports the estimates. The results again suggest that those working in more pollutive industries are less willing to pay for environmental protection. It is worth noting that the strength of sectoral-based cleavages in public opinion over climate change policy stands in stark contrast to the public opinion literature on trade policy opinions which has largely failed to detect substantively significant cleavages by industry of employment (see e.g. Scheve and Slaughter (2001)).

We also explore whether our estimates remain robust to including a variable that captures whether a respondent owns a car or not. This test is helpful to distinguish employment-based interests from other private, interest-related factors that may explain support for climate policy. We report the results from these estimations in Table A-10 in the Appendix. Model 1 shows that car ownership correlates significantly negatively with support for international climate cooperation. More importantly, however, our sector-based interest findings remain unaffected by the inclusion of the car ownership variable. Models 2 and 3 reestimate our models for the two additional dependent variables, the importance of reducing CO2 emissions (Appendix Table A-10, Model 2) and willingness to pay for environmental protection (Appendix Table A-10, Model 3). Our key findings are qualitatively the same.

A large literature has demonstrated that ideological predispositions are correlated with environmental policy preferences. Model A-11 in the Appendix includes an ideology measure that is based on individuals self-reported ideological position, and takes the value of one if the respondent identifies with the right and zero otherwise. We find that more left ideological individuals are significantly more in favor of climate cooperation, more strongly believe that reducing emissions is important, and have a significantly higher willingness to pay for the environment. Most importantly, however, all our main findings remain intact: More reciprocal and more altruistic individuals are significantly more supportive of climate cooperation while those working in more pollutive industries are significantly more opposed.

So far we have only considered employed individuals for theoretical and empirical reasons since the industry-based pollution measures are naturally missing for all respondents that are not in paid work. To further explore the robustness of our results we recode our main measure of industry-based pollutiveness such that it incorporates missing values as a separate category. Table A-12 reports the results. The estimates in Model 1 suggest that those working in more pollutive sectors are significantly less supportive of climate cooperation.

Although in Model 1 those individuals not in paid employment, i.e., respondents for which the sectoral GHG emissions information is naturally missing, are somewhat less in favor of climate cooperation than those working in cleaner sectors, which forms the reference group, this correlation – which is only borderline significant – is no longer significant when we reestimate the model using the original 5-point scale. Our main results, however, remain robust: Those working in sectors that emit more greenhouse gases are significantly less supportive of global climate policy.

Finally, we investigate the within-country consistency of our findings by estimating our main model for each separate country. Table A-13 reports the results. The implication of these findings is that our countries show some important heterogeneity. Reciprocity has a strong positive effect on climate cooperation support among employed individuals in France, Germany and the United Kingdom, but the effect only borders significance in the United States. Contrastingly, altruists are not significantly more supportive of climate change agreements in France and Germany, while they are in the United Kingdom and the United States. With regards to our measure of economic interests based on sectors of employment, we also find that the most notable differences exist in the United Kingdom and the United States. We believe these findings are implicitly interesting but also consistent with a large literature on the interaction between the welfare state and support for trade openness. In that literature, the idea is that generous welfare states that redistribute the costs and benefits of integration with the world economy increase overall support for openness by mitigating domestic distributive conflict and making the gains from globalization more widely shared (see e.g. Rodrik (1998) and Hays, Ehrlich and Peinhardt (2005)). Note however that the direction of the effects across all countries is consistent with our expectations, and overall validate our aggregate results.

4 Experimental Conjoint Analysis of Support for Global Climate Cooperation

We have presented evidence suggesting that both norms and interests matter when trying to explain support for international climate policy. While informative, the interpretation of these results remains correlational. Ideally, one would test the effects of norms and interests in the context of a randomized experiment to estimate the causal effects of these factors. In the following we present such causal evidence by drawing on respondent choices between alternative global climate agreements presented within an experimental conjoint framework.

4.1 Conjoint Design

Conjoint analysis has been developed in psychology and marketing and involves having respondents rank or rate two or more hypothetical choices that have multiple attributes with the objective of estimating the influence of each attribute on respondent choices or ratings.[8] Hainmueller, Hopkins and Yamamoto (2012) develop conjoint methods using fully randomized designs and analyze its properties in the potential outcomes framework for causal inference.[9] We devise a fully-randomized conjoint in which each respondent is shown two international agreements in comparison and asked to choose between them. This forced-choice design allows us to assess the influence of different features of climate change agreements on how individuals evaluate a given agreement relative to another. Each respondent was shown four such binary comparisons. For each agreement that a given respondent considered, we constructed the variable *Agreement Support* and coded it 1 if an individual chose that agreement and 0 if not.

Table 3 shows the dimensions and values used in the conjoint experiment. We focus on the cost and reciprocity dimensions of climate agreements, because of our theoretical

[8] For discussion of early work, see Luce and Tukey (1964), Green and Rao (1971), and Green, Krieger and Wind (2001).

[9] Political science applications of conjoint analysis include Shamir and Shamir (1995), Bechtel, Hainmueller and Margalit (2012), Bechtel and Scheve (2013), and Hainmueller and Hopkins (2012).

focus and since they are contentious aspects of international environmental decision-making (Barrett and Stavins 2003) that have become major objects of debate in public opinion polls on international climate policy (Nisbet and Myers 2007). The cost dimension comprises the costs from policy implementation and potential sanctions that are imposed in case a country fails to meet its emission reduction obligations. We have chosen the values of the different features such that they correspond to the most plausible and widely discussed cost scenarios (Stern 2007; Cline 1992; Cline 2004).[10] To make these cost quantities as informative as possible to our respondents, we computed prices in monthly costs to the average household in the country's currency. We computed monthly abatement costs to the average household for five different cost scenarios, ranging from 0.5 to 2.5% of a country's GDP in steps of 0.5 percentage points (OECD 2010; Ackerman and Bueno 2011). For sanctions, we distinguish between no sanction and a low, medium, and high sanction. For each country, the low, medium, and high sanction values correspond to 5%, 15%, and 20% of the monthly household costs for the 2% of GDP scenario.

The reciprocity dimension captures aspects that relate to issues of conditional cooperation. Specifically, we consider the number of countries that participate in a climate agreement and, as an alternative conceptualization of this dimension, the share of global emissions represented by these countries. The number of participating countries can vary from 20 to 80 to 160 out of 192, and the percent of emissions accounted for by participating countries from 40% to 60% to 80% of current emissions. All these values were randomly assigned in the agreements that respondents had to consider.[11] This experimental setup allows us to non-parametrically estimate the causal effects of interests and reciprocity aspects on support for international climate cooperation by comparing levels of support across different values of the different agreement dimensions (Hainmueller, Hopkins and Yamamoto 2012; Bechtel,

[10] A modal estimate by climate scientists is that it will cost about 2 percent of industrialized countries' GDP to achieve a constant level of CO2 concentration at 550 particles per million (ppm).

[11] The order of the dimensions was randomly assigned for each respondent but remained consistent across the four binary comparisons. See Appendix for further information on the explanation and presentation of the conjoint experiment.

Hainmueller and Margalit 2012).

Our primary substantive focus here is estimating the *average marginal component-specific effect*, which corresponds to the average effect of a change in values of one of our four dimensions of global climate agreements on the probability that that agreement is chosen by the respondent. Our analysis also explores how these treatment effects vary across different types of respondents in our sample—specifically respondents who face different costs or hold different norms. These conditional treatment effects are also non-parametrically identified in our fully randomized conjoint experiment as long as the respondent characteristics are not affected by the treatments, an assumption that appears plausible in our application.

We obtain the difference-of-means estimators by regressing the variable *Support Agreement* on a set of dummy variables for each value of each dimension (with the exclusion of one value in each dimension as the baseline).[12] The regression coefficient for each dummy variable indicates the average marginal component-specific effect of that value of the dimension relative to the omitted value of that dimension. We report standard errors for these estimates clustered by respondent to account for within respondent correlations in responses. Because we are interested in understanding if economic interests and norms influence individuals' view of these agreements, we will examine our results by subgroups which split the sample by energy intensity of employment sectors, levels of reciprocity and levels of altruism.

4.2 Climate Agreement Conjoint Results

We start our conjoint analysis by estimating the effects of the costs and reciprocity features of climate agreements on support for climate cooperation for all respondents. Figure 1 shows the main results.[13] The effects on the two main dimensions of climate change agreements indicate that individuals are indeed concerned about, on the one hand, the costs of implementing an agreement, and on the other hand, the reciprocity features of an agreement. The

[12] The regressions are weighted by sampling weights. We find no significant differences between the weighted and unweighted estimates.

[13] For informational purposes we report the conjoint results on all dimensions, including monitoring and the rich–poor distributional dimensions, in Figure A-2 in the Appendix.

results suggest that an increase of average household payments from 0.5% to 1% decreases public support for an agreement by 10 percentage points. Although the results indicate that the public prefers a small sanction over no sanction at all, sanctions that exceed a minimal threshold decrease support for a climate cooperation. For example, an agreement that imposes a high sanction on countries that failed to meet their obligations decreases public support by about 5 percentage points on average.

How important is reciprocity for understanding support for climate policy? Our results suggest that individuals are sensitive to the number of other countries participating in a climate agreement. An increase in the number of participating countries from 20 to 160 (out of 192) causes an increase in support for an agreement of 15 percentage points on average. Similarly, although with smaller magnitudes, the proportion of current global emissions increases support for international climate policy. These experimental results suggest that both costs and reciprocity factors cause shifts in support for climate cooperation.

We are also interested in how the interaction between economic interests and norms affects climate policy support. To explore this question we again leverage information about greenhouse gas emissions emitted by individuals' sectors of employment. Figure 2 reports the results from estimations that contrast respondents employed in sectors with different levels of *GHG Emissions*. We find that respondents working in more pollutive sectors are significantly less sensitive to the reciprocity dimension. For example, increasing the number of participating countries from 20 to 160 increases climate policy support by about 19 percentage points among respondents working in cleaner sectors. Among individuals employed in sectors with high greenhouse gas emissions, however, this effect is only 14 percentage points, a difference that is statistically significant. This difference is also noteworthy in terms of magnitude. It represents a 9% shift in the baseline level of support (which is 60%). The difference in treatment effects is even more pronounced when we examine the effects of the share of emissions represented by participating countries. Here, respondents in clean sectors are more than twice as sensitive than respondents in dirty sectors. Distributive conflict related to respondents' sector of employment seems to interact with reciprocity features of international climate policy.

We do not find any significant differences in the treatment effects of household costs when partitioning the data by industry pollution levels. This seems plausible given how the cost dimension was framed: It stipulated a constant cost for households that does not depend on individuals sector of employment. Therefore, we would not necessarily expect significant differences on the cost dimension when comparing more and less pollutive industries.

Considerations related to individuals' sector of employment may, however, be correlated with beliefs about the probability of meeting emission reduction targets. Individuals employed in sectors that are large emitters of greenhouse gases may find it more likely that the country will fail to meet its emission targets. Thus, respondents working in less pollutive industries may be less sensitive to sanctions than individuals employed in pollutive sectors. We find that a medium sanction decreases support for climate cooperation by about 5 percentage points among respondents in sectors with high greenhouse gas emissions. In contrast, the effect is close to zero and insignificant for individuals working in industries with low greenhouse gas emissions.

We carry out the same type of analyses to examine whether norms of reciprocity and altruism interact with the cost features of a climate agreement. We use our pre-conjoint measures of altruism and reciprocity from the previous section to split the sample. Figure 3 breaks out the treatment effects by respondents' level of reciprocity. We find that more reciprocal individuals are more cost-sensitive. This finding is again consistent with the argument that their willingness to pay is conditional on cooperation by others. In contrast, there is some evidence that more reciprocal individuals are less concerned about medium and high levels of sanctions (and view low sanctions more positively) than low reciprocal types. This seems intuitive because sanctions are a feature of international agreements to ensure that parties to a treaty fulfill their obligations which should be appealing to conditional cooperators. We also document that reciprocal individuals are much more sensitive to both the number of countries participating in a climate agreement and the share of emissions these countries represent than respondents that exhibit less reciprocal behavior in our pre-conjoint measure of reciprocity. This result strongly supports our interpretation that the experimental manipulation of participation is measuring a reciprocity effect.

We repeat our subgroup analysis for more and less altruistic individuals. Figure 4 shows the results. We find that less altruistic individuals are slightly more cost–averse than altruistic individuals when we consider the effects of costly to very costly agreements, although the difference is not statistically significant. We do find, however, a significant interaction between individual levels of altruism and sanctions: Less altruistic respondents are more sensitive to sanctions than altruists.

Overall, these experimental conjoint results suggest that interests—in terms of costs—and reciprocity influence support for international climate change cooperation. Moreover, they suggest that these effects interact with individual-level characteristics measuring both sectoral-based economic interests and shared norms of conditional cooperation.

4.3 Robustness

Our experimental results are robust to a number of sensitivity tests. Our main analysis uses only employed individuals. We first re-estimate the effects of agreement features by levels of reciprocity and altruism measures on the full sample of respondents. Figure A-3 and Figure A-4 show the conjoint results broken down by reciprocity and altruism, respectively. These results are very similar to our main findings. We find that individuals' levels of reciprocity moderate the effects of costs, sanctions and also strongly interact with participation features.

Next we explore potential cross-country heterogeneity in our results. Figures A-5 to A-8 show that the causal effects we estimated in the pooled data remain very similar when considering individual countries. In all countries we find very similar sensitivities to cost and reciprocity features of global climate agreements.

We uncover some cross-country differences when looking at differences between individuals that work in more and less pollutive industries. Specifically, we find that the difference between workers in more and less pollutive sectors is particularly strong in Germany and the United States. For France and the United Kingdom, the patterns of the point estimates are largely comparable, but we lack statistical precision. We note, however, that the country-level conjoint results confirm our results on the interaction between reciprocity and the cost features of climate agreements.

Finally, we explore the robustness of our findings by reestimating the results by alternative measures of industry-level pollution. Figure A-9 shows the results for the *GHG (WB) Emissions* indicator. The findings remain very similar, and are perhaps even stronger than in our main findings. Figure A-10 reports the results by *CO2–only Emissions* and Figure A-11 shows the treatment effect by *Oil equivalent Energy Flows*. Again, we find that economic interests have similar effects on support for climate cooperation when looking a the effects of reciprocity features, e.g., the number of participating countries. Our results remain also unchanged when using the *Employee–weighted GHG Emissions* (Figure A-12) to split our sample.

5 Conclusion

What explains public support for climate cooperation? We have argued that, first, both interests and norms shape the popularity of international climate policy and, second, that these two sets of factors interact with each other. We examine the effects of norms and interests using correlational and experimental evidence based on original surveys in France, Germany, the United Kingdom, and the United States. Our correlational results suggest that sector of employment-related interests and social norms, such as, reciprocity and altruism, are significant predictors of general support for climate cooperation. Leveraging a randomized conjoint experiment we also present causal evidence on the effects of cost- and reciprocity related features of climate agreements. These results show that both sets of factors matter and that norms and interest-based factors often interact when examining individual support for climate treaties.

Our results not only provide a rich picture of support for environmental policy and climate cooperation, but also contribute to a long-standing debate about the origins of preferences for public goods and policy. By exploring the material and behavioral foundations of support for international environmental cooperation we also provide useful information for policymakers interested in the conditions under which climate cooperation is likely to be receive majority support among citizens. Our results suggest that both policies that compensate those who fear to lose economically from intensified climate policy and forms of cooperation that resonate with widespread social norms contribute to reducing public opposition to costly global climate policy.

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Tables

Dependent Variable	Support for Climate Cooperation				Importance of CO2 Reductions	Environment: Willingness to Pay
Model	(1) Socio-demographics	(2) Norms	(3) Interest	(4) Full	(5)	(6)
Female	-0.002	-0.006	-0.011	-0.014	0.587***	1.682***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.091)	(0.631)
Age: 30-49	0.001	0.006	0.009	0.016	0.064	0.141
	(0.025)	(0.025)	(0.026)	(0.026)	(0.146)	(1.063)
Age: 40-49	-0.010	0.008	-0.003	0.015	-0.178	-0.603
	(0.025)	(0.025)	(0.026)	(0.025)	(0.151)	(1.042)
Age: 50-59	0.004	0.026	0.005	0.028	-0.067	-0.751
	(0.025)	(0.024)	(0.025)	(0.025)	(0.150)	(1.020)
Age: 60+	0.001	0.020	0.005	0.025	-0.046	-1.230
	(0.031)	(0.031)	(0.032)	(0.032)	(0.199)	(1.284)
Income: Lower Middle	0.035	0.029	0.040	0.035	0.320*	0.096
	(0.031)	(0.030)	(0.032)	(0.031)	(0.178)	(1.332)
Income: Middle	0.050*	0.044	0.051*	0.045	0.349**	-0.683
	(0.029)	(0.029)	(0.030)	(0.030)	(0.174)	(1.252)
Income: High	0.064**	0.055**	0.066**	0.058**	0.030	-1.174
	(0.028)	(0.028)	(0.029)	(0.029)	(0.171)	(1.206)
Education: High	0.147***	0.138***	0.128***	0.118***	0.302***	-0.179
	(0.016)	(0.016)	(0.017)	(0.017)	(0.102)	(0.706)
Reciprocity: High		0.106***		0.103***	0.536***	-2.649***
		(0.015)		(0.015)	(0.093)	(0.662)
Altruism: High		0.095***		0.097***	0.503***	3.871***
		(0.017)		(0.017)	(0.104)	(0.748)
GHG Emissions: High			-0.076***	-0.070***	-0.401***	-2.263***
			(0.016)	(0.015)	(0.095)	(0.660)
Germany	0.035*	0.047**	0.039*	0.051**	-0.025	-0.516
	(0.021)	(0.021)	(0.022)	(0.021)	(0.116)	(1.001)
United Kingdom	-0.065***	-0.072***	-0.083***	-0.089***	-0.898***	-5.153***
	(0.021)	(0.021)	(0.022)	(0.022)	(0.114)	(0.931)
United States	-0.234***	-0.242***	-0.242***	-0.249***	-1.548***	-3.137***
	(0.022)	(0.022)	(0.023)	(0.022)	(0.136)	(1.014)
Constant	0.586***	0.507***	0.637***	0.555***	6.435***	21.803***
	(0.035)	(0.036)	(0.037)	(0.038)	(0.223)	(1.676)
Observations	4,175	4,175	4,008	4,008	4,009	4,009
R-squared	0.072	0.092	0.078	0.097	0.086	0.024

Table 1: *Support for Climate Cooperation: Norms and Interests.* This table reports OLS regression coefficients and robust standard errors (in parentheses). *** $p < .01$, ** $p < .05$, *$p < .10$. Reference groups are: *Sex: Male*, *Age: 18-29*, *Income: Low*, *Education: Low*, *Reciprocity: Low*, *Altruism: Low*, *GHG Emissions: Low*, *Country: France*. The sample is employed respondents in the pooled data for France, Germany, the United Kingdom, and the United States.

Dependent Variable	Support for Climate Cooperation	Importance of CO2 Reductions	Environment: Willingness to Pay
Model	(1)	(2)	(3)
Female	-0.015	0.586***	1.646***
	(0.015)	(0.091)	(0.631)
Age: 30-49	0.017	0.067	0.124
	(0.026)	(0.147)	(1.064)
Age: 40-49	0.016	-0.172	-0.651
	(0.025)	(0.152)	(1.045)
Age: 50-59	0.029	-0.062	-0.828
	(0.025)	(0.151)	(1.023)
Age: 60+	0.026	-0.041	-1.339
	(0.032)	(0.200)	(1.291)
Income: Lower Middle	0.035	0.319*	0.126
	(0.031)	(0.178)	(1.331)
Income: Middle	0.045	0.347**	-0.629
	(0.030)	(0.174)	(1.250)
Income: High	0.058**	0.031	-1.165
	(0.029)	(0.171)	(1.205)
Education: High	0.118***	0.302***	-0.191
	(0.017)	(0.102)	(0.706)
Reciprocity: High	0.107***	0.526***	-1.847**
	(0.018)	(0.111)	(0.789)
Altruism: High	0.107***	0.546***	3.332***
	(0.020)	(0.119)	(0.871)
GHG Emissions: High	-0.060***	-0.385***	-1.657*
	(0.021)	(0.128)	(0.909)
GHG EmissionsXReciprocity	-0.012	0.027	-2.650*
	(0.034)	(0.213)	(1.353)
GHG EmissionsXAltruism	-0.000	-0.002	0.024
	(0.000)	(0.003)	(0.024)
Germany	0.052**	-0.023	-0.507
	(0.021)	(0.116)	(1.001)
United Kingdom	-0.089***	-0.897***	-5.126***
	(0.022)	(0.114)	(0.932)
United States	-0.248***	-1.543***	-3.230***
	(0.022)	(0.136)	(1.009)
Constant	0.550***	6.424***	21.554***
	(0.039)	(0.227)	(1.720)
Observations	4,007	4,008	4,008
R-squared	0.098	0.086	0.026

Table 2: *Support for Climate Cooperation and Environmentalism: Norms, Interests, and their Interactions.* This table reports OLS regression coefficients and robust standard errors (in parentheses). *** $p < .01$, ** $p < .05$, *$p < .10$. Reference groups are: *Sex: Male*, *Age: 18-29*, *Income: Low*, *Education: Low*, *Reciprocity: Low*, *Altruism: Low*, *GHG Emissions: Low*, *Country: France*. The sample is employed respondents in the pooled data for France, Germany, the United Kingdom, and the United States.

Dimension	*Values*
Costs	
Costs to Average Household	€28, €39, £15, $53 per month €56, €77, £30, $107 per month €84, €116, £45, $160 per month €113, €154, £60, $213 per month €141, €193, £75, $267 per month
Sanctions to Average Household	No sanction €6, €8, £3, $11 per month €17, €23, £9, $32 per month €23, €31, £12, $43 per month
Reciprocity	
Number of Participating Countries	20 out of 192 80 out of 192 160 out of 192
Emissions Represented	40% of current emissions 60% of current emissions 80% of current emissions
Other	
Monitoring	Own government Independent commission United Nations Greenpeace
Distribution of Costs	Only rich countries pay Proportional to current emissions Proportional to history of emissions Rich countries pay more than poor countries

Table 3: *Policy Dimensions and Values for the Global Climate Agreement Experiment.* The table shows the policy dimensions and corresponding values used in the conjoint experiment. For average costs and sanctions, the values are given in order for France, Germany, the United Kingdom, and the United States.

Figures

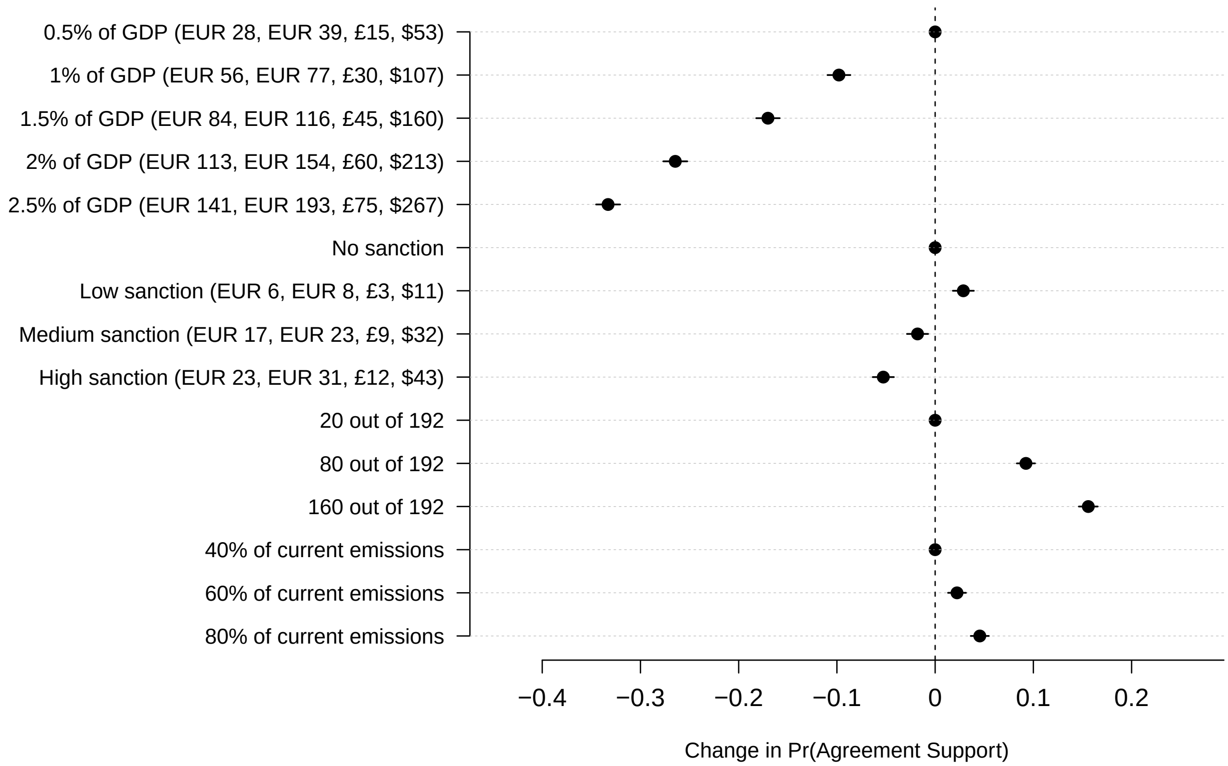

Figure 1: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement ($N = 68,000$ agreements, pooled data for France, Germany, the United Kingdom, and the United States). Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

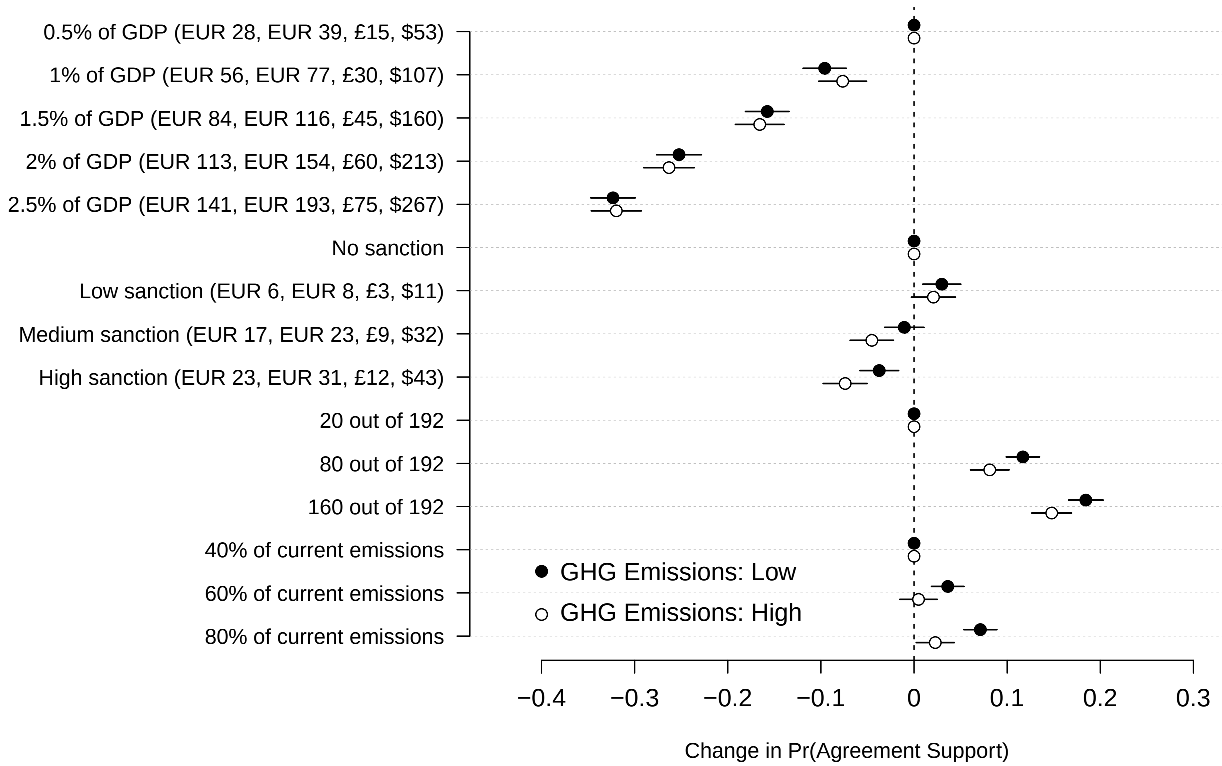

Figure 2: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements by GHG (CO2 equivalent) Emissions.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for employed respondents ($N = 33,408$ agreements, pooled data for France, Germany, the United Kingdom, and the United States) by CO2–equivalent GHG emissions of respondents' sector of employment. Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

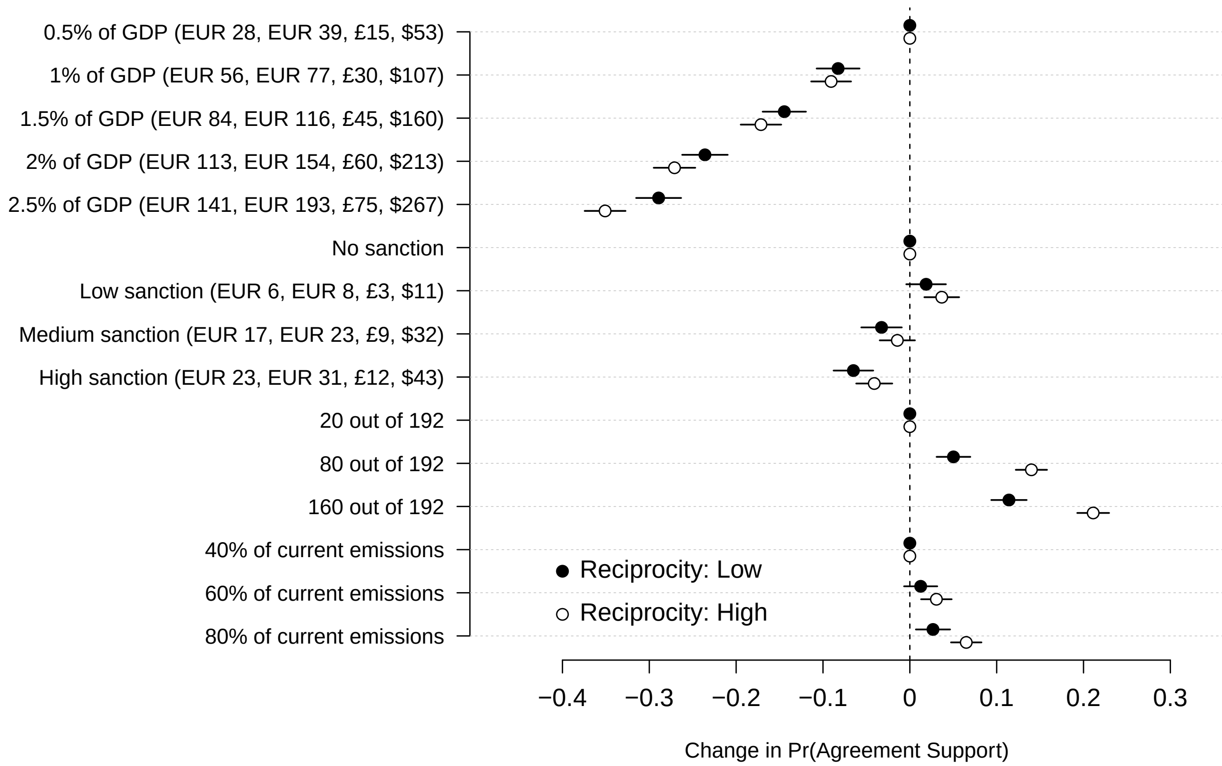

Figure 3: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements by Reciprocity.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for employed respondents ($N = 33,408$ agreements, pooled data for France, Germany, the United Kingdom, and the United States) by reciprocity (see text for measurement details). Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

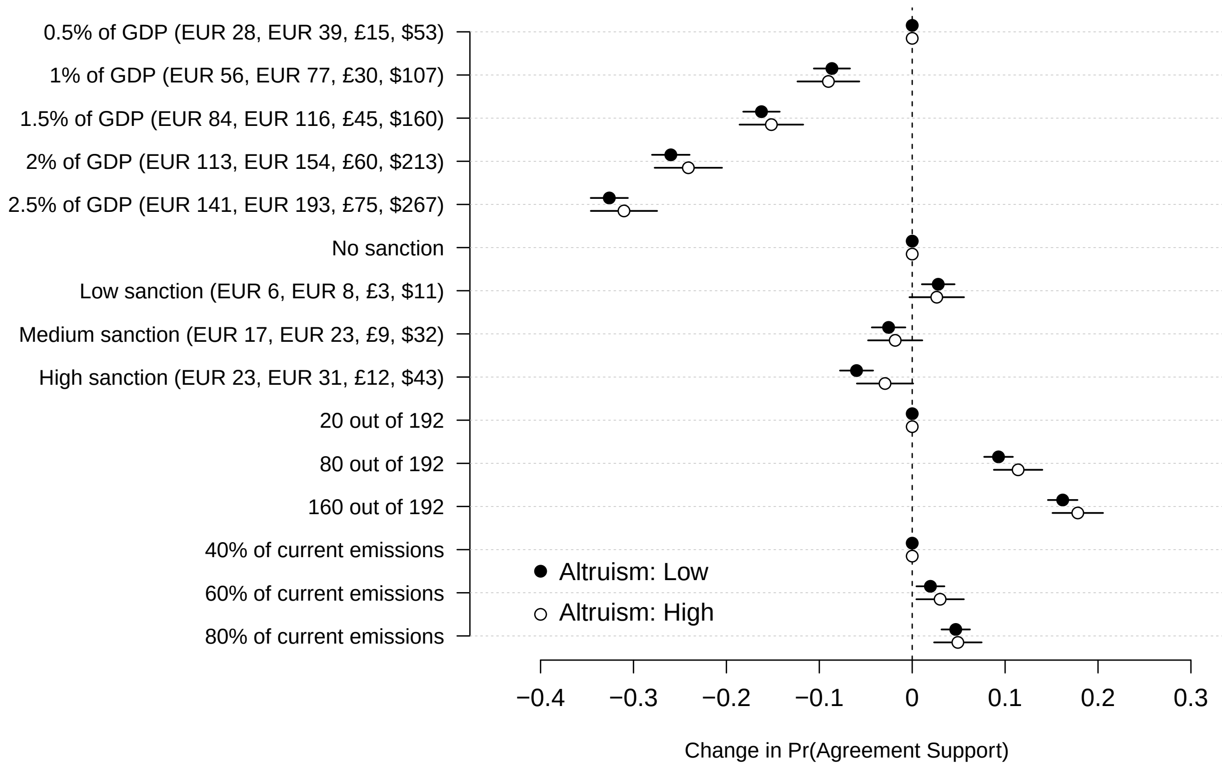

Figure 4: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements by Altruism.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for employed respondents ($N = 33,408$ agreements, pooled data for France, Germany, the United Kingdom, and the United States) by altruism (see text for measurement details). Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

Online Appendix

Appendix: Sample

Respondents were interviewed in summer 2012. In each country, respondents were subsequently matched down to a sample of 2,000 (except for the US were the sample was 2,500) based on gender, age, and education. The matched set of respondents was then weighted to the marginal distributions of sociodemographics in the country's total population. Weights were applied to remove remaining imbalances after the matching procedure. Table A-1 shows the distributions of the sociodemographics in the population, the weighted sample, and the raw sample.

France

- Interview period: August-September 2012
- Sample size: 2,000
- Source of data on population socio-demographics: Based on 2009 French population census, available from the French Statistical Institute (INSEE)
- Weights range from 0.66 to 1.39, with a mean of one and a standard deviation of 0.28.

Germany

- Interview period: August 2012
- Sample size: 2,000
- Source of data on population socio-demographics: September-October 2011 Eurobarometer survey
- Weights range from 0.63 to 1.60, with a mean of one and a standard deviation of 0.32.

United Kingdom

- Interview period: August 2012
- Sample size: 2,000
- Source of data on population socio-demographics: August-September 2010 Eurobarometer survey
- Weights range from 0.74 to 1.44, with a mean of one and a standard deviation of 0.29.

United States

- Interview period: June 2012
- Sample size: 2,500

- Source of data on population socio-demographics: 2007 American Community Survey, the 2008 Current Population survey and the 2007 Pew Religious Landscape Survey

- Weights range from 0.56 to 1.9, with a mean of one and a standard deviation of 0.29.

Group	Population	Weighted Sample	Raw Sample
France			
Age: 18-39	31.6	31.6	34.2
Age: 40-54	28.5	26.1	29.8
Age: 55+	39.9	42.4	36.0
Gender: Male	47.6	47.6	47.6
Gender: Female	52.4	52.4	52.4
Education: CAP/BEP or less	59.8	59.8	46.9
Education: Bac to Bac+2	27.5	27.5	36.1
Education: Bac +3 or more	12.7	12.7	16.9
Germany			
Age: 18-34	23.1	23.1	34.2
Age: 35-54	36.6	36.6	29.8
Age: 55+	40.3	40.3	36.0
Gender: Male	49.0	49.0	49.0
Gender: Female	51.0	51.0	51.0
Education: 16 years or fewer	43.4	43.2	30.3
Education: 17-19 years	33.0	32.8	44
Education: 20 years or more	23.6	24.1	25.7
United Kingdom			
Age: 18-34	23.4	23.4	25.4
Age: 35-54	33.7	33.7	44.6
Age: 55+	42.9	43.0	30.0
Gender: Male	47.3	47.3	47.3
Gender: Female	52.7	52.7	52.7
Education: 16 years or fewer	55.3	53.5	50.4
Education: 17-19 years	21.2	23.0	24.7
Education: 20 years or more	23.5	23.5	25.0
United States			
Age: 18-34	29.5	27.1	19.4
Age: 35-54	38.5	34.0	32.4
Age: 55+	32.1	39.0	48.1
Gender: Male	48.2	48.2	47.6
Gender: Female	51.8	51.8	52.4
Education: HS or less	45.0	44.9	39.7
Education: Some College	30.0	22.2	23.4
Education: College Graduate	16.3	24.1	27.5
Education: Postgraduate	8.8	8.7	9.5

Table A-1: *Distribution of Socio-demographics in the Survey Sample and the Population.* The table shows the distributions of socio-demographics in the population, the weighted sample, and the raw sample. See text for data sources on the population socio-demographics.

Appendix: Industry Measures

Our industry cost indicators measure the environmental impact (i.e. 'footprint') of the respondents' sectors of employment. In order to construct them, we first collected information on the respondents' employment status. In our survey we asked all 8,500 individuals to choose one of the following employment situations: *paid work*; *in education*; *unemployed actively looking for a job*; *unemployed not actively looking for a job*; *permanently sick or disabled*; *retired*; *in community service*; *in military service*; and *doing housework*. Those that selected *paid work* were asked in which type of industry they currently worked. We listed 21 options that correspond to the 21 categories of the United Nations Statistics Division's International Standard Industrial Classification (ISIC) of All Economic Activities (Revision 4),[14] plus an an alternative '*none of these*' category, in which case they were asked to describe in words their employment. After the survey we qualitatively evaluated the descriptions generated by this alternative category, to assess whether each of these individuals could actually be assigned to one of the 21 UNSD sectors based on the verbal description. For example, an American respondent in category 22 noted '*I work in a supermarket*', so we reassigned her to the Retail sector, because Group 471 under the ISIC Retail section (G) includes "sale in non-specialized stores, such as supermarkets or department stores." Similarly, a French respondent wrote '*securité privé*,' and was reassigned to the Administrative and Support Service sector, because Group 801 under the ISIC Administrative Services section (N) includes "security-related services such as investigation and detective services and guard and patrol services." The total of employed respondents is 4179 (854 in France, 978 in Germany, 1177 in the UK, 1170 in the US). Of these, 4009 respondents identified themselves as workers of one of the 21 specific sectors (817 in France, 929 in Germany, 1141 in the UK, 1122 in the US). Out of 792 '*none of these*' answers, we were able to reassign 625 employed respondents to one of the 21 ISIC categories. The ISIC categories upon which we constructed our pollution measures are listed in Table A-2.

		ISIC Category
1	(A)	Agriculture, forestry and fishing
2	(B)	Mining and quarrying
3	(C)	Manufacturing
4	(D)	Electricity, gas, steam and air conditioning supply
5	(E)	Water supply; sewerage, waste management and remediation
6	(F)	Construction
7	(G)	Wholesale and retail trade; repair of motor vehicles
8	(H)	Transportation and storage
9	(I)	Accommodation and food service activities
10	(J)	Information and communication
11	(K)	Financial and insurance activities
12	(L)	Real estate activities
13	(M)	Professional, scientific and technical activities
14	(N)	Administrative and support service activities
15	(O)	Public administration and defence; compulsory social sec
16	(P)	Education
17	(Q)	Human health and social work activities
18	(R)	Arts, entertainment and recreation
19	(S)	Other service activities
20	(T)	Activities of households as employers; undifferentiated services
21	(U)	Activities of extraterritorial organizations and bodies

Table A-2: *ISIC Categories*

[14]Detailed structure and explanatory notes at: `https://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27`. Accessed on 6 August 2014.

Our first and main industry indicator is the *Greenhouse Gases (GHG) Emissions* variable. This measures gross direct emissions in million tons of produced Co2 equivalent gases for the year 2011. The indicator comes from the OECD Environmental Statistics database,[15] where GHG emissions follow the concept of the International Panel on Climate Change (IPCC), the scientific intergovernmental body of the United Nations Framework Convention on Climate Change. According to the IPCC definition, GHG includes gaseous constituents of the atmosphere (both natural and anthropogenic) that absorb and emit radiations. The gases that are included in the definition are six: carbon dioxide (CO2), nitrous oxide (N2O), methane (CH4), plus sulphur hexafluoride (SF6), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs).[16]

The IPCC (and thus the OECD) refers to emissions by six main industrial categories: Energy (1), Industrial Processes and Solvents (2), Agriculture (3), Waste, including water treatment and disposal (4), Land use Change and Forestry (5), and Others (6). The Energy sector is further broken down into the following 'subsectors': Electricity and Heat (1.A1); Manufacturing and Construction (1.A2); Transportation (1.A3); Fuel Combustion at the Source (Commercial and Residential) (1.A4) and Fugitive Emissions (1.B), including Extraction and Mining (1.A1C, 1.A5). We exclude Land-Use Change and Forestry, because this captures emission absorption and we are interested in emission production. Based on the rest of these main categories, we derived the 21 ISIC-concordant measures of GHG emissions by sector of employment according to conversion table A-3:

IPCC (OECD) category	**Transformation notes**	**ISIC category**
Energy (1.A1)		ISIC 4
Manufacture & Construction (1.A2)	Manufacture & Construction GHG minus Manufacture & Construction (GHG-CO2)	ISIC 3
Manufacture & Construction (1.A2)	Manufacture & Construction (GHG-CO2) plus Construction CO2	ISIC 6
Energy (1.A1C, 1.A5) & Fugitive Emissions (1.B)		ISIC 2
Transport (1.A3)		ISIC 8
Industrial Processes (2)		ISIC 3
Agriculture (3)		ISIC 1
Waste (4)		ISIC 5
Fuel Combustion at Source (1.A4)		ISIC 7
Others (6)	Assigned to 'other sectors' and weighted by value added of each of these sectors	ISIC 9-21

Table A-3: *GHG Emissions Conversion Table: IPCC Categories and ISIC Categories.*

A few notes on Table A-3. The Manufacture & Construction GHG emissions are disaggregated following the notion that construction is the main source of GHG beyond CO2 in the industry and production sector. Consequently, the GHG of Manufacture should be virtually equal to the CO2 of Manufacture.[17] So we used the CO2-only emissions of manufacture and constructions from the

[15]See database at `10.1787/env-data-en`.

[16]Ozone (O3) is technically a greenhouse gas, but it is not included in these calculations, since it does not directly affect the climate.

[17]There is general agreement on this notion. For example, at page 9 of the report 'Buildings and Climate Change,' the UNEP (2009) writes that "the Construction Sector is responsible for the most significant non-CO2 GHG emissions such as halocarbons, CFCs, and HCFCs, due to their applications for cooling, refrigeration, and in the case of halocarbons, insulation material." See `http://www.unep.org/sbci/pdfs/sbci-bccsummary.pdf`. Accessed on 6 August 2014.

OECD CO2 Emissions from Fuel Combustion Statistics,[18] and subtracted them from the Manufacture & Construction GHG. The result is the non-CO2 emissions of the construction sector. We added this value to the construction sector CO2 and assigned the sum to ISIC 6 (Construction), while the CO2–only emissions for Manufacture were assigned to ISIC 3 (Manufacture). Both the Energy subcategories 1.A1C and 1.A5 are used to calculate the emissions in the Mining sector (ISIC 2), because together they make up the total emissions from fuel combusted in petroleum refineries, coal mining and oil and gas extraction. Fuel Combustion at Source (1.A4) instead measures combustion from public and commercial services, referring to emissions from trade and retail.[19] Finally, the Others (6) category includes all emissions that do not fall in the pre-set categories. Although it may overlap in some cases with residential emissions (from stationary sources), these are gases emitted mainly through 'Miscellaneous' combustion or small-scale installations from the rest of the economy. Unfortunately the 'others' value is not broken-down further, which makes it hard to match with the industries in the service sector from ISIC 9 (accommodation and food service) up to ISIC 21 (extraterritorial organizations). To calculate a proxy of the emissions for each employment sector in this range of service industries, we multiplied the total services emissions by each sector's proportion of the total service sectors value added. For example: for France 2011, the total value added of the tertiary (precisely ISIC 9 to ISIC 21) is 1136.05 billion Euros. The accommodation and food service activity sector (ISIC 9) had a value added of 44.37 B Euros. Also, the service sectors total GHG emissions sum up to 23.75 Mt. Then the emissions for the accommodation and food service sector of France is (44.37/1136.05)*23.75 = 0.927. Note that the value added data for France, Germany and the United Kingdom comes from the Eurostat, and is naturally broken down in the 21 ISIC sectors (the values are in Euros). By contrast, the value added of the US comes from the US Department of Commerce "GDP by industry" data, and it is in USD.[20]

Additional to the *GHG Emissions* indicators, we collected other measures for industry costs and pollution. The first alternative indicator is the *World Bank GHG Emissions* from the World Bank Development Indicators database. The World Bank compiles data of the International Energy Agency (IEA) in collaboration with the Carbon Dioxide Information Analysis Center.[21] In the World Bank scheme, GHGs are measured for the following categories: (1) Agriculture; (2) Electricity and Heat; (3) Manufacture, Construction and Industrial Process; (4) Transportation; (5) Fuel Combustion at the Source (Extraction and Mining); (6) Residential; (7) Land Use Change and Forestry, (8) Other Sectors. These data is easier to use from an industrial sector point of view, but its most up to date series is from 2010, and the commercial and residential services are combined.[22] We make the same transformations and weighting that we did for the IPCC GHG Emissions indicator, as per Table A-4.[23]

[18]See database at `10.1787/co2-data-en`.

[19]See discussion in Chapter 4 of the IPCC Guidelines for National Greenhouse Gas Inventories, 2006, `http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/1_Volume1/V1_4_Ch4_MethodChoice.pdf`. Accessed on 6 August 2014.

[20]While in the paper we use the estimates based on this calculation of emissions in the service sectors, we alternatively followed a separate approach to find equal contributions in the service sectors. We divided the total emissions in 'others' by 13 and assigned this value to each of the ISIC from 9 to 21, without weighing by value added. The results are robust to both types of measures.

[21]See `http://data.worldbank.org/about/world-development-indicators-data/environment`.

[22]By including all activities of ISIC Divisions 41, 50-52, 55, 63-67, 70-75, 80, 85, 90-93 and 99 in the Residential (6) category, the GHG measure for trade and retail and residential emissions partially overlap.

[23]For a discussion of the World Bank GHG indicators data, see `http://www.tsp-data-portal.org/Breakdown-of-GHG-Emissions-by-SectortspQvAbout` (Accessed on 6 August 2014) .See also full database at the Shift Project Data Portal, `http://www.tsp-data-portal.org/`.

World Bank categories	Transformation notes	ISIC categories
Energy		ISIC 4
Manufacture, Construction & Indust'l Processes	Manufacture, Construction & Indust'l Processes GHG minus Manufacture, Construction & Indust'l Processes (GHG-CO2)	ISIC 3
Manufacture, Construction & Indust'l Processes	Manufacture, Construction & Indust'l Processes (GHG-CO2) plus Construction CO2	ISIC 6
Energy & Fugitive Emissions		ISIC 2
Transport		ISIC 8
Agriculture		ISIC 1
Waste		ISIC 5
Commercial services		ISIC 7
Residential and public services	Assigned to 'other sectors' and weighted by value added of each of these sectors	ISIC 9-21

Table A-4: *GHG Emissions (WB) Conversion Table: IPCC Categories and ISIC Categories.*

The two additional measures that we constructed for our analyses are the *CO2 Emissions* and the *Oil equivalent Energy Flows* variables. The CO2 Emissions are measured as gross directed emissions of million tons of produced carbon dioxide for the year 2011. This measure excludes the other greenhouse gases, which means that it discounts the pollution impact of sectors that produce N2O (e.g. agriculture), or CH4 (e.g. mining sectors). The Oil equivalent Energy Flows instead corresponds to the annual net flow (supply, trade and consumption) of coal, oil, energy output, gas, electricity, heat, combustible renewables and waste, expressed in tonnes of oil equivalent (toe) for the year 2011. We collect the CO2–only values from the 'Detailed CO2 Estimates' database based on the IEAs CO2 Emissions from Fuel Combustion Statistics and hosted by the OECD.[24] This data follows the IPCC emission reporting guidelines and is broken down at lower sectoral levels. By contrast, the Energy Flows indicator comes from the IEA 'Extended World Energy Balances' database hosted by the OECD.[25]

For both types of indicators, we match the industry flows to the ISIC categories as per conversion table A-5. We rely on the 26 industries in the Detailed CO2 and Extended World Energy Balances databases, and aggregate them if necessary. For example, the volumes of 'agriculture and forestry' and 'fishing' are summed and together form the CO2 volume of the ISIC 1 category. Note however that the 'Commercial and public services' category in the IEA database is aggregated. We split into Commercial (ISIC 7) and Public Services (ISIC 9-21) following the Industrial Efficiency Policy Database (IEPD) figures, collected by the Institute for Industrial Productivity of the United Nations Industrial Development Organization (UNIDO). The IEPD figures are identical to the IEA figures for all industrial sectors, but further differentiate trade emissions/energy production and other services.[26] We then subtracted from the IEA aggregate figures the two respective 'commercial' and 'other services' figures, to find the values for ISIC 7 and ISIC 9-21, respectively. We finally weighted the ISIC 9 through 21 CO2 values like we did for GHG Emissions, using the value added of each sector.

[24] See the database at `10.1787/co2-data-en`. Note also that we prefer this data over the 'Per capita Co2 Emissions by Sector' and any other IEA dataset in the CO2 Emissions from Fuel Combustion Statistics because the latter are aggregated at the higher levels to the IPCC sectors, and these are not congruent with the 21 ISIC sectors. The Detailed CO2 estimates dataset helps us assembling CO2 of the 21 specific ISIC categories.

[25] See the database at `10.1787/enestats-data-en`.

[26] See database at `http://iepd.iipnetwork.org/` and description at `http://www.unido.org/en/resources/statistics/statistical-databases.html`.

IEA code	Transformation notes	ISIC code
Agriculture and forestry		ISIC 1
Fishing		ISIC 1
Mining and quarrying		ISIC 2
Chemical manufacturing		ISIC 3
Food and tobacco manufacturing		ISIC 3
Iron and steel manufacturing		ISIC 3
Machinery manufacturing		ISIC 3
Non energy use industry		ISIC 3
Non ferrous metals manufacturing		ISIC 3
Non metallic minerals manufacturing		ISIC 3
Non specified industry		ISIC 3
Paper and pulp manufacturing		ISIC 3
Textile manufacturing		ISIC 3
Transport equipment manufacturing		ISIC 3
Wood production		ISIC 3
Heat and electricity production		ISIC 4
Heat and electricity autoproducers		ISIC 4
Waste and water disposal		ISIC 5
Construction		ISIC 6
Commercial and Public Services	Commercial and Public Services minus IEPD Other Services	ISIC 7
Domestic aviation		ISIC 8
Domestic navigation		ISIC 8
Pipeline transport		ISIC 8
Rail transport		ISIC 8
Road transport		ISIC 8
Commercial and Public Services	Commercial and Public Services minus IEPD Commercial	ISIC 9-21

Table A-5: *Conversion Table for CO2 Emissions and Oil Equivalent Energy Flows: IEA Categories and ISIC Categories.*

Fourthly, we generated a further industry measure that we call the *Employee–weighted GHG Emissions*. Here we standardize the *GHG Emissions* variable by the total of employees in each sector. The employees data (in millions) for France, Germany and UK is broken down by 21 sectors and comes from the Eurostat's National Accounts. The employees data for the US comes from the US Department of Commerce 'GDP by industry' data, which breaks down employees across Bureau of Labor Statistics sub sectors that we aggregate at the 21 ISIC sectors.[27] Evidently we have specific numbers of employees for the different tertiary industries (ISIC 9 to 21), however we do not know the specific figures of emissions of each service sector. Therefore, we follow the approach for the original non-standardized data, and divided the total of employees in industries ISIC 9 to 21 by 13 and assigned this value to each of the ISIC in this range.

[27]See US data at `http://www.bea.gov/industry/gdpbyind_data.htm`.

Appendix: Correlational Results

Dependent Variable	Support for Climate Cooperation (scale 1–5)				Importance of CO2 Reductions	Environment: Willingness to Pay
Model	(1) Socio-demographics	(2) Norms	(3) Interest	(4) Full	(5)	(6)
Female	0.021	0.011	-0.014	-0.021	0.715***	2.258***
	(0.034)	(0.034)	(0.035)	(0.035)	(0.124)	(0.707)
Age: 30-49	-0.035	-0.024	-0.021	-0.007	0.070	0.087
	(0.057)	(0.057)	(0.058)	(0.058)	(0.199)	(1.177)
Age: 40-49	-0.074	-0.038	-0.056	-0.019	-0.175	-1.168
	(0.057)	(0.057)	(0.059)	(0.059)	(0.205)	(1.174)
Age: 50-59	-0.026	0.023	-0.025	0.024	-0.015	-1.022
	(0.057)	(0.057)	(0.058)	(0.058)	(0.204)	(1.147)
Age: 60+	0.035	0.071	0.035	0.075	0.062	-1.689
	(0.076)	(0.076)	(0.078)	(0.078)	(0.278)	(1.455)
Income: Lower Middle	0.077	0.066	0.082	0.070	0.325	0.473
	(0.064)	(0.065)	(0.067)	(0.068)	(0.238)	(1.489)
Income: Middle	0.084	0.072	0.083	0.070	0.407*	-0.408
	(0.062)	(0.063)	(0.065)	(0.066)	(0.234)	(1.406)
Income: High	0.070	0.051	0.079	0.061	-0.034	-1.021
	(0.061)	(0.061)	(0.064)	(0.064)	(0.229)	(1.361)
Education: High	0.350***	0.334***	0.311***	0.293***	0.389***	0.008
	(0.037)	(0.037)	(0.038)	(0.039)	(0.139)	(0.800)
Reciprocity: High		0.225***		0.221***	0.697***	-2.190***
		(0.035)		(0.036)	(0.127)	(0.744)
Altruism: High		0.242***		0.241***	0.673***	4.626***
		(0.042)		(0.043)	(0.144)	(0.827)
GHG Emissions: High			-0.205***	-0.195***	-0.518***	-2.456***
			(0.037)	(0.037)	(0.129)	(0.741)
Germany	0.061	0.090*	0.059	0.088*	0.055	-0.559
	(0.048)	(0.048)	(0.049)	(0.049)	(0.164)	(1.090)
United Kingdom	-0.187***	-0.205***	-0.239***	-0.256***	-1.098***	-5.760***
	(0.045)	(0.045)	(0.047)	(0.047)	(0.156)	(1.023)
United States	-0.592***	-0.618***	-0.628***	-0.653***	-1.844***	-4.573***
	(0.051)	(0.052)	(0.053)	(0.054)	(0.188)	(1.137)
Constant					6.658***	20.437***
					(0.302)	(1.865)
Observations	4,175	4,175	4,008	4,008	4,009	4,009

Table A-6: *Support for Climate Cooperation: Ordered Probit and Tobit Estimates.* Models 1-4 report ordered probit results for Support for Climate Cooperation defined on a 5-point scale (see main text for description). Models 5 and 6 report tobit estimates for Importance of CO2 Reductions and Willingness to Pay for the Environment. The table shows coefficients and robust standard errors (in parentheses). *** $p < .01$, ** $p < .05$, *$p < .10$. Reference groups are: *Sex: Male*, *Age: 18-29*, *Income: Low*, *Education: Low*, *Reciprocity: Low*, *Altruism: Low*, *GHG Emissions: Low*, *Country: France*. The sample is employed respondents in France, Germany, the United Kingdom, and the United States.

Dependent Variable	Support for Climate Cooperation			
Model	(1)	(2)	(3)	(4)
Female	-0.014	-0.007	-0.007	-0.014
	(0.015)	(0.015)	(0.015)	(0.015)
Age: 30-49	0.016	0.016	0.016	0.016
	(0.025)	(0.026)	(0.026)	(0.025)
Age: 40-49	0.014	0.013	0.013	0.014
	(0.025)	(0.025)	(0.025)	(0.025)
Age: 50-59	0.027	0.027	0.028	0.027
	(0.025)	(0.025)	(0.025)	(0.025)
Age: 60+	0.024	0.025	0.025	0.024
	(0.032)	(0.032)	(0.032)	(0.032)
Income: Lower Middle	0.035	0.030	0.030	0.035
	(0.031)	(0.031)	(0.031)	(0.031)
Income: Middle	0.044	0.045	0.045	0.044
	(0.030)	(0.030)	(0.030)	(0.030)
Income: High	0.057**	0.059**	0.059**	0.057**
	(0.029)	(0.029)	(0.029)	(0.029)
Education: High	0.117***	0.127***	0.127***	0.117***
	(0.017)	(0.017)	(0.017)	(0.017)
Reciprocity: High	0.103***	0.105***	0.105***	0.103***
	(0.015)	(0.015)	(0.015)	(0.015)
Altruism: High	0.097***	0.096***	0.097***	0.097***
	(0.017)	(0.017)	(0.017)	(0.017)
GHG Emissions (WB): High	-0.073***			
	(0.015)			
CO2 Emissions: High		-0.051***		
		(0.015)		
Oil eq Energy Flow: High			-0.047***	
			(0.015)	
Employee-weighted GHG: High				-0.073***
				(0.015)
Germany	0.057***	0.059***	0.059***	0.057***
	(0.021)	(0.021)	(0.021)	(0.021)
United Kingdom	-0.083***	-0.078***	-0.078***	-0.083***
	(0.021)	(0.021)	(0.021)	(0.021)
United States	-0.243***	-0.244***	-0.242***	-0.243***
	(0.022)	(0.022)	(0.022)	(0.022)
Constant	0.552***	0.538***	0.535***	0.552***
	(0.038)	(0.038)	(0.038)	(0.038)
Observations	4,008	4,008	4,008	4,008
R-squared	0.098	0.095	0.095	0.098

Table A-7: *Support for Climate Cooperation: Norms and Interests (Alternative Measures of Pollution Cost).* This table reports OLS regression coefficients and robust standard errors (in parentheses). *** $p < .01$, ** $p < .05$, *$p < .10$. Reference groups are: *Sex: Male*, *Age: 18-29*, *Income: Low*, *Education: Low*, *Reciprocity: Low*, *Altruism: Low*, *GHG (World Bank) Emissions: Low*, *CO2 Emissions: Low*, *Oil equivalent Energy Flow: Low*, *Employee–weighted GHG Emissions: Low*, *Country: France.* The sample is employed respondents in the pooled data for France, Germany, the United Kingdom, and the United States.

Dependent Variable	Importance of CO2 Reductions			
Model	(1)	(2)	(3)	(4)
Female	0.587***	0.624***	0.626***	0.587***
	(0.090)	(0.090)	(0.090)	(0.090)
Age: 30-49	0.063	0.061	0.061	0.063
	(0.146)	(0.146)	(0.147)	(0.146)
Age: 40-49	-0.184	-0.187	-0.189	-0.184
	(0.151)	(0.151)	(0.151)	(0.151)
Age: 50-59	-0.071	-0.071	-0.070	-0.071
	(0.150)	(0.150)	(0.150)	(0.150)
Age: 60+	-0.052	-0.049	-0.049	-0.052
	(0.199)	(0.199)	(0.199)	(0.199)
Income: Lower Middle	0.318*	0.294*	0.295*	0.318*
	(0.178)	(0.178)	(0.178)	(0.178)
Income: Middle	0.346**	0.347**	0.349**	0.346**
	(0.174)	(0.173)	(0.173)	(0.174)
Income: High	0.024	0.033	0.033	0.024
	(0.171)	(0.170)	(0.170)	(0.171)
Education: High	0.301***	0.352***	0.355***	0.301***
	(0.102)	(0.102)	(0.102)	(0.102)
Reciprocity: High	0.535***	0.545***	0.545***	0.535***
	(0.093)	(0.093)	(0.093)	(0.093)
Altruism: High	0.503***	0.501***	0.505***	0.503***
	(0.104)	(0.104)	(0.104)	(0.104)
GHG Emissions (WB): High	-0.398***			
	(0.094)			
CO2 Emissions: High		-0.287***		
		(0.092)		
Oil eq Energy Flow: High			-0.253***	
			(0.092)	
Employee-weighted GHG: High				-0.398***
				(0.094)
Germany	0.009	0.021	0.020	0.009
	(0.116)	(0.116)	(0.116)	(0.116)
United Kingdom	-0.864***	-0.836***	-0.835***	-0.864***
	(0.113)	(0.113)	(0.113)	(0.113)
United States	-1.514***	-1.516***	-1.508***	-1.514***
	(0.135)	(0.135)	(0.135)	(0.135)
Constant	6.408***	6.337***	6.313***	6.408***
	(0.220)	(0.220)	(0.220)	(0.220)
Observations	4,009	4,009	4,009	4,009
R-squared	0.086	0.084	0.084	0.086

Table A-8: *Importance of CO2 Reductions: Norms and Interests (Alternative Measures of Pollution Cost).* This table reports OLS regression coefficients and robust standard errors (in parentheses). *** $p < .01$, ** $p < .05$, *$p < .10$. Reference groups are: *Sex: Male*, *Age: 18-29*, *Income: Low*, *Education: Low*, *Reciprocity: Low*, *Altruism: Low*, *GHG (World Bank) Emissions: Low*, *CO2 Emissions: Low*, *Oil equivalent Energy Flow: Low*, *Employee–weighted GHG Emissions: Low*, *Country: France.* The sample is employed respondents in the pooled data for France, Germany, the United Kingdom, and the United States.

Dependent Variable	Environment: Willingness to Pay			
Model	(1)	(2)	(3)	(4)
Female	1.705***	1.875***	1.888***	1.705***
	(0.633)	(0.628)	(0.628)	(0.633)
Age: 30-49	0.128	0.138	0.143	0.128
	(1.063)	(1.064)	(1.065)	(1.063)
Age: 40-49	-0.650	-0.630	-0.636	-0.650
	(1.043)	(1.042)	(1.044)	(1.043)
Age: 50-59	-0.779	-0.760	-0.748	-0.779
	(1.021)	(1.021)	(1.022)	(1.021)
Age: 60+	-1.263	-1.231	-1.228	-1.263
	(1.285)	(1.288)	(1.288)	(1.285)
Income: Lower Middle	0.082	-0.065	-0.061	0.082
	(1.332)	(1.332)	(1.332)	(1.332)
Income: Middle	-0.699	-0.705	-0.691	-0.699
	(1.251)	(1.251)	(1.251)	(1.251)
Income: High	-1.207	-1.150	-1.144	-1.207
	(1.205)	(1.206)	(1.208)	(1.205)
Education: High	-0.162	0.097	0.114	-0.162
	(0.708)	(0.696)	(0.695)	(0.708)
Reciprocity: High	-2.646***	-2.602***	-2.602***	-2.646***
	(0.662)	(0.663)	(0.663)	(0.662)
Altruism: High	3.874***	3.853***	3.874***	3.874***
	(0.748)	(0.748)	(0.747)	(0.748)
GHG Emissions (WB): High	-2.085***			
	(0.658)			
CO2 Emissions: High		-1.923***		
		(0.643)		
Oil eq Energy Flow: High			-1.819***	
			(0.644)	
Employee-weighted GHG: High				-2.085***
				(0.658)
Germany	-0.321	-0.246	-0.250	-0.321
	(0.996)	(0.994)	(0.994)	(0.996)
United Kingdom	-4.948***	-4.818***	-4.816***	-4.948***
	(0.922)	(0.918)	(0.918)	(0.922)
United States	-2.937***	-2.979***	-2.930***	-2.937***
	(1.008)	(1.011)	(1.010)	(1.008)
Constant	21.554***	21.425***	21.334***	21.554***
	(1.664)	(1.652)	(1.644)	(1.664)
Observations	4,009	4,009	4,009	4,009
R-squared	0.024	0.024	0.023	0.024

Table A-9: *Willingness to Pay for the Environment: Norms and Interests (Alternative Measures of Pollution Cost).* This table reports OLS regression coefficients and robust standard errors (in parentheses). *** $p < .01$, ** $p < .05$, *$p < .10$. Reference groups are: *Sex: Male*, *Age: 18-29*, *Income: Low*, *Education: Low*, *Reciprocity: Low*, *Altruism: Low*, *GHG (World Bank) Emissions: Low*, *CO2 Emissions: Low*, *Oil equivalent Energy Flow: Low*, *Employee–weighted GHG Emissions: Low*, *Country: France*. The sample is employed respondents in the pooled data for France, Germany, the United Kingdom, and the United States.

Dependent Variable	Support for Climate Cooperation	Importance of CO2 Reductions	Environment: Willingness to Pay
Model	(1)	(2)	(3)
Female	-0.013	0.590***	1.691***
	(0.015)	(0.090)	(0.632)
Age: 30-49	0.019	0.091	0.220
	(0.026)	(0.146)	(1.065)
Age: 40-49	0.020	-0.127	-0.453
	(0.025)	(0.152)	(1.048)
Age: 50-59	0.033	-0.016	-0.602
	(0.025)	(0.151)	(1.025)
Age: 60+	0.031	0.016	-1.048
	(0.032)	(0.201)	(1.288)
Income: Lower Middle	0.038	0.357**	0.204
	(0.031)	(0.178)	(1.326)
Income: Middle	0.051*	0.419**	-0.478
	(0.030)	(0.175)	(1.249)
Income: High	0.066**	0.119	-0.915
	(0.029)	(0.173)	(1.202)
Education: High	0.118***	0.306***	-0.166
	(0.017)	(0.102)	(0.706)
Reciprocity: High	0.102***	0.526***	-2.678***
	(0.015)	(0.093)	(0.662)
Altruism: High	0.096***	0.498***	3.857***
	(0.017)	(0.104)	(0.747)
GHG Emissions: High	-0.068***	-0.375***	-2.188***
	(0.016)	(0.095)	(0.665)
Car Ownership	-0.037*	-0.393***	-1.149
	(0.021)	(0.124)	(0.892)
Germany	0.048**	-0.055	-0.603
	(0.022)	(0.117)	(0.997)
United Kingdom	-0.094***	-0.950***	-5.307***
	(0.022)	(0.115)	(0.936)
United States	-0.249***	-1.545***	-3.128***
	(0.022)	(0.136)	(1.015)
Constant	0.577***	6.673***	22.497***
	(0.040)	(0.232)	(1.767)
Observations	4,008	4,009	4,009
R-squared	0.098	0.088	0.025

Table A-10: *Support for Climate Cooperation: Norms and Interests (Car Ownership).* This table reports OLS regression coefficients and robust standard errors (in parentheses). *** $p < .01$, ** $p < .05$, *$p < .10$. Reference groups are: *Sex: Male*, *Age: 18-29*, *Income: Low*, *Education: Low*, *Reciprocity: Low*, *Altruism: Low*, *GHG (CO2 equivalent) Emissions: Low*, *Car: No ownership*, *Country: France*. The sample is employed respondents in the pooled data for France, Germany, the United Kingdom, and the United States.

Dependent Variable	Support for Climate Cooperation	Importance of CO2 Reductions	Environment: Willingness to Pay
Model	(1)	(2)	(3)
Female	-0.028*	0.470***	1.556**
	(0.015)	(0.088)	(0.636)
Age: 30-49	0.026	0.148	0.232
	(0.025)	(0.141)	(1.069)
Age: 40-49	0.029	-0.061	-0.478
	(0.025)	(0.146)	(1.050)
Age: 50-59	0.033	-0.028	-0.709
	(0.024)	(0.145)	(1.023)
Age: 60+	0.045	0.117	-1.055
	(0.031)	(0.193)	(1.293)
Income: Lower Middle	0.034	0.315*	0.091
	(0.031)	(0.173)	(1.338)
Income: Middle	0.058**	0.459***	-0.565
	(0.029)	(0.168)	(1.262)
Income: High	0.079***	0.206	-0.985
	(0.029)	(0.164)	(1.221)
Education: High	0.120***	0.321***	-0.158
	(0.016)	(0.099)	(0.707)
Reciprocity: High	0.103***	0.532***	-2.654***
	(0.015)	(0.090)	(0.661)
Altruism: High	0.092***	0.467***	3.832***
	(0.017)	(0.099)	(0.747)
GHG Emissions: High	-0.061***	-0.328***	-2.186***
	(0.015)	(0.091)	(0.661)
Left-Right Ideology	-0.202***	-1.661***	-1.781**
	(0.016)	(0.101)	(0.731)
Germany	0.025	-0.237**	-0.743
	(0.022)	(0.119)	(1.000)
United Kingdom	-0.091***	-0.916***	-5.173***
	(0.022)	(0.115)	(0.933)
United States	-0.231***	-1.401***	-2.979***
	(0.022)	(0.129)	(1.022)
Constant	0.601***	6.810***	22.204***
	(0.038)	(0.220)	(1.669)
Observations	4,008	4,009	4,009
R-squared	0.133	0.153	0.026

Table A-11: *Support for Climate Cooperation: Norms and Interests (Left–Right Ideology).* This table reports OLS regression coefficients and robust standard errors (in parentheses). *** $p < .01$, ** $p < .05$, *$p < .10$. Reference groups are: *Sex: Male*, *Age: 18-29*, *Income: Low*, *Education: Low*, *Reciprocity: Low*, *Altruism: Low*, *GHG (CO2 equivalent) Emissions: Low*, *Left Ideology*, *Country: France*. The sample is employed respondents in the pooled data for France, Germany, the United Kingdom, and the United States.

Dependent Variable	Support for Climate Cooperation		
	(1)	(2)	(3)
Scale	Binary	5 Point Scale	Binary
Model	Full	Full	Employment Status
Female	-0.039***	-0.003	-0.034***
	(0.011)	(0.026)	(0.011)
Age: 30-49	-0.001	-0.026	-0.006
	(0.020)	(0.046)	(0.020)
Age: 40-49	0.001	-0.069	-0.003
	(0.019)	(0.045)	(0.019)
Age: 50-59	0.039**	-0.001	0.037**
	(0.018)	(0.043)	(0.018)
Age: 60+	0.035*	-0.056	0.032
	(0.018)	(0.043)	(0.021)
Income: Lower Middle	0.028	0.055	0.026
	(0.017)	(0.041)	(0.017)
Income: Middle	0.037**	0.042	0.038**
	(0.017)	(0.040)	(0.017)
Income: High	0.041**	0.015	0.041**
	(0.017)	(0.041)	(0.017)
Education: High	0.117***	0.276***	0.126***
	(0.012)	(0.028)	(0.011)
Reciprocity: High	0.096***	0.198***	0.097***
	(0.011)	(0.026)	(0.011)
Altruism: High	0.088***	0.212***	0.087***
	(0.012)	(0.030)	(0.012)
GHG Emissions: High	-0.071***	-0.205***	
	(0.015)	(0.038)	
GHG Emissions: Missing	-0.027*	-0.040	
	(0.014)	(0.034)	
Employment: Paid work			-0.004
			(0.014)
Employment: Unemployed			0.014
			(0.023)
Employment: Retired			0.007
			(0.020)
Germany	0.040***	0.036	0.038***
	(0.015)	(0.032)	(0.015)
United Kingdom	-0.076***	-0.290***	-0.068***
	(0.015)	(0.035)	(0.015)
United States	-0.208***	-0.694***	-0.205***
	(0.015)	(0.037)	(0.015)
Constant	0.576***	3.765***	0.537***
	(0.025)	(0.061)	(0.023)
Observations	8,329	8,329	8,499
R-squared	0.074	0.090	0.071

Table A-12: *Support for Climate Cooperation: GHG Emissions Missingness and Employment Status.* This table reports OLS regression coefficients and robust standard errors (in parentheses). *** $p < .01$, ** $p < .05$, *$p < .10$. Reference groups are: *Sex: Male*, *Age: 18-29*, *Income: Low*, *Education: Low*, *Reciprocity: Low*, *Altruism: Low*, *GHG (CO2 equivalent) Emissions: Low*, *Employment: Other Country: France*. The sample is employed respondents in France, Germany, the United Kingdom, and the United States.

Dependent Variable	Support for Climate Cooperation			
	(1)	(2)	(3)	(4)
Country	France	Germany	United Kingdom	United States
Female	-0.116*	-0.132**	0.073	0.178**
	(0.068)	(0.064)	(0.065)	(0.088)
Age: 30-49	-0.006	0.098	0.062	-0.010
	(0.112)	(0.107)	(0.095)	(0.151)
Age: 40-49	0.323***	0.183*	-0.166*	-0.241*
	(0.113)	(0.108)	(0.100)	(0.140)
Age: 50-59	0.264**	0.261**	-0.158	-0.173
	(0.113)	(0.105)	(0.114)	(0.127)
Age: 60+	0.435**	0.350***	0.004	-0.335**
	(0.189)	(0.133)	(0.151)	(0.152)
Income: Lower Middle	0.010	0.147	0.108	-0.020
	(0.120)	(0.282)	(0.116)	(0.175)
Income: Middle	0.212*	0.048	0.064	-0.152
	(0.112)	(0.283)	(0.109)	(0.170)
Income: High	0.190*	0.163	0.061	-0.239
	(0.106)	(0.282)	(0.108)	(0.165)
Education: High	0.232***	0.221***	0.312***	0.393***
	(0.073)	(0.070)	(0.071)	(0.101)
Reciprocity: High	0.308***	0.243***	0.174***	0.145
	(0.069)	(0.064)	(0.067)	(0.089)
Altruism: High	0.103	0.136	0.338***	0.341***
	(0.080)	(0.083)	(0.068)	(0.091)
GHG Emissions: High	-0.050	-0.090	-0.147**	-0.432***
	(0.068)	(0.063)	(0.071)	(0.093)
Constant	3.418***	3.575***	3.393***	3.229***
	(0.149)	(0.290)	(0.138)	(0.210)
Observations	816	929	1,141	1,122
R-squared	0.075	0.054	0.078	0.089

Table A-13: *Support for Climate Cooperation: Norms and Interests, by Country.* This table reports OLS regression coefficients and robust standard errors (in parentheses). *** $p < .01$, ** $p < .05$, *$p < .10$. Reference groups are: *Sex: Male*, *Age: 18-29*, *Income: Low*, *Education: Low*, *Reciprocity: Low*, *Altruism: Low*, *GHG (CO2 equivalent) Emissions: Low*, *Country: France*. The sample is employed respondents in the pooled data for France, Germany, the United Kingdom, and the United States.

Appendix: Experimental Results

Conjoint Instructions

The directions for the conjoint experiment appeared on two pages before the respondent began choosing between agreements. First, respondents were given the following instructions:

> Most countries around the world are currently discussing the possibility of agreeing to new policies that would address the problem of global warming. We are interested in what you think about these international efforts and the United States's possible participation in such an agreement.
>
> We will now provide you with several examples of what agreements between countries to address climate change could look like. We will always show you two possible agreements in comparison. For each comparison we would like to know which of the two agreements you prefer. You may like both alternatives similarly or may not like either of them at all. Regardless of your overall evaluation, please indicate which alternative you prefer over the other.
>
> In total, we will show you four comparisons. People have different opinions about this issue and there are no right or wrong answers. Please take your time when reading the potential agreements. In addition to deciding which climate agreement you would prefer, we also ask you how likely you would be to vote for or against the United States joining each agreement in a referendum.

Second, respondents were shown the following screenshot example with further instructions:

> Figure A-1 shows the features of the two possible agreements that you will be choosing between. Note that the order of the features may vary.

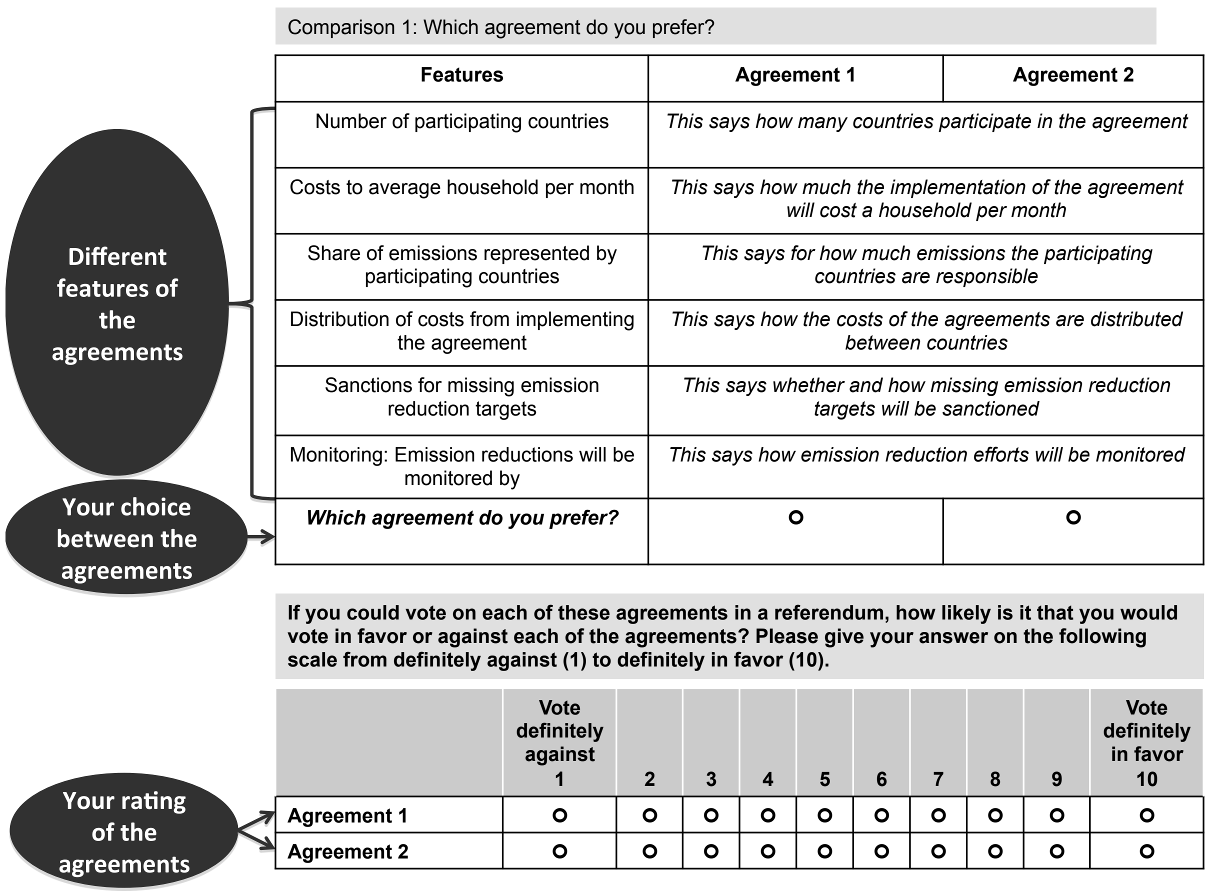

Figure A-1: *Conjoint Instructions*

Additional Conjoint Results

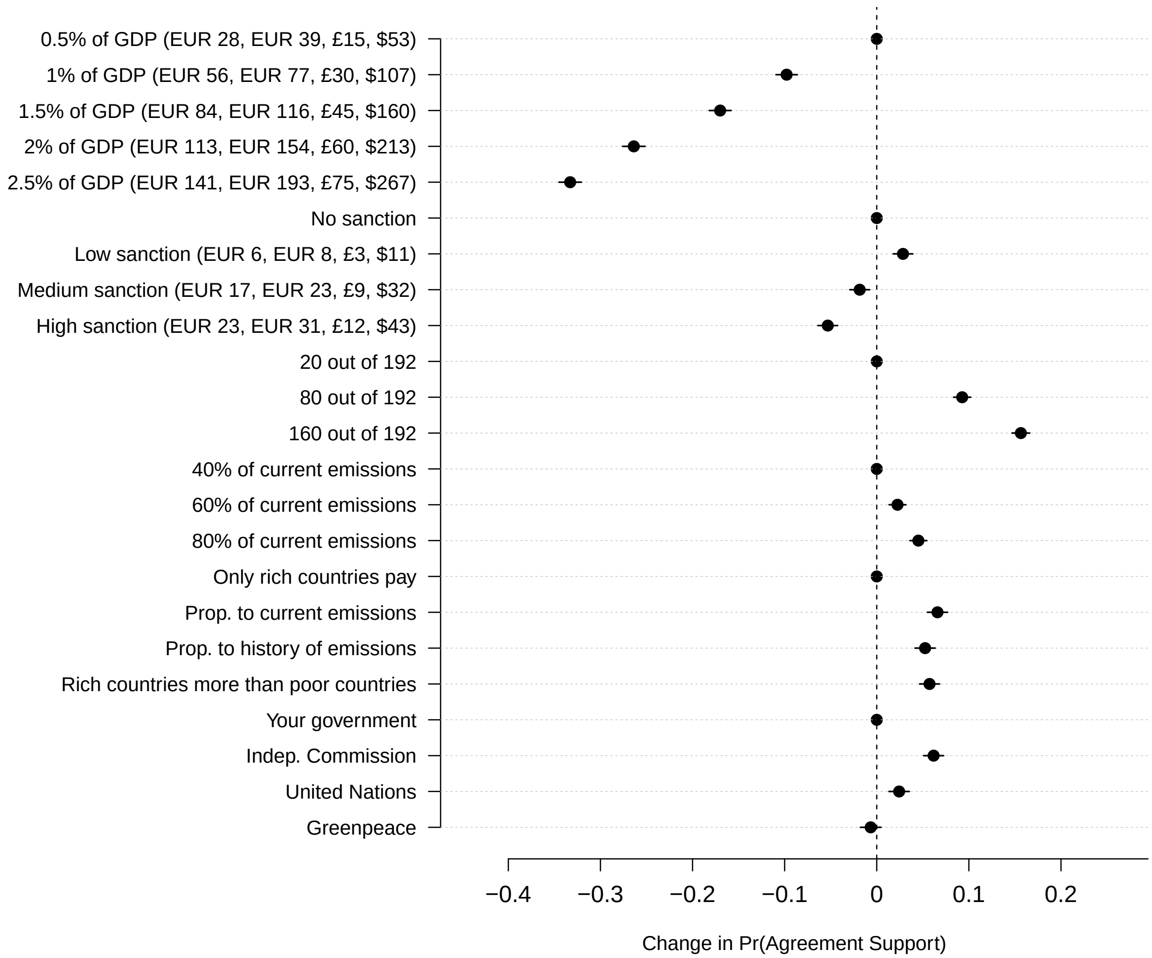

Figure A-2: *Conjoint Results: All Dimensions.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement ($N = 68,000$ agreements, pooled data for France, Germany, the United Kingdom, and the United States). Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent, and the points without bars indicate the reference category for a given agreement dimension.

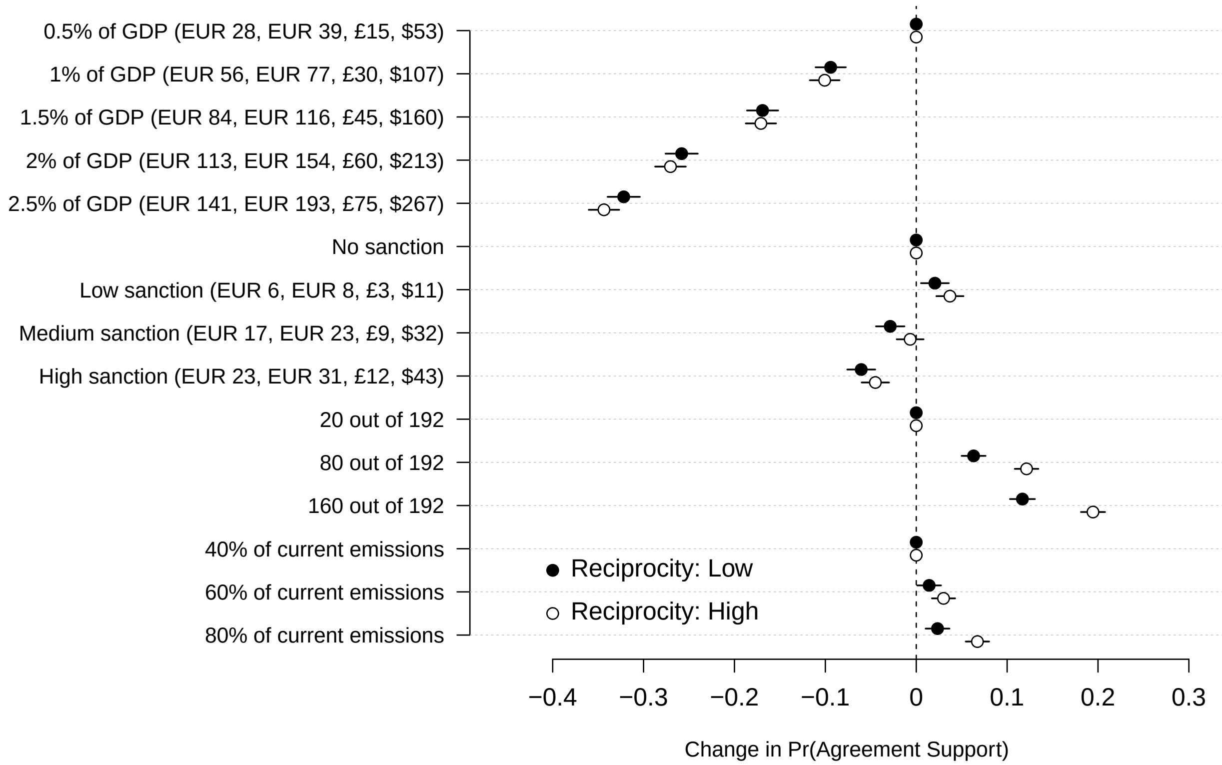

Figure A-3: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements by Reciprocity (all respondents).* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for all respondents ($N = 68,000$ agreements, pooled data for France, Germany, the United Kingdom, and the United States) by reciprocity (see text for measurement details). Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

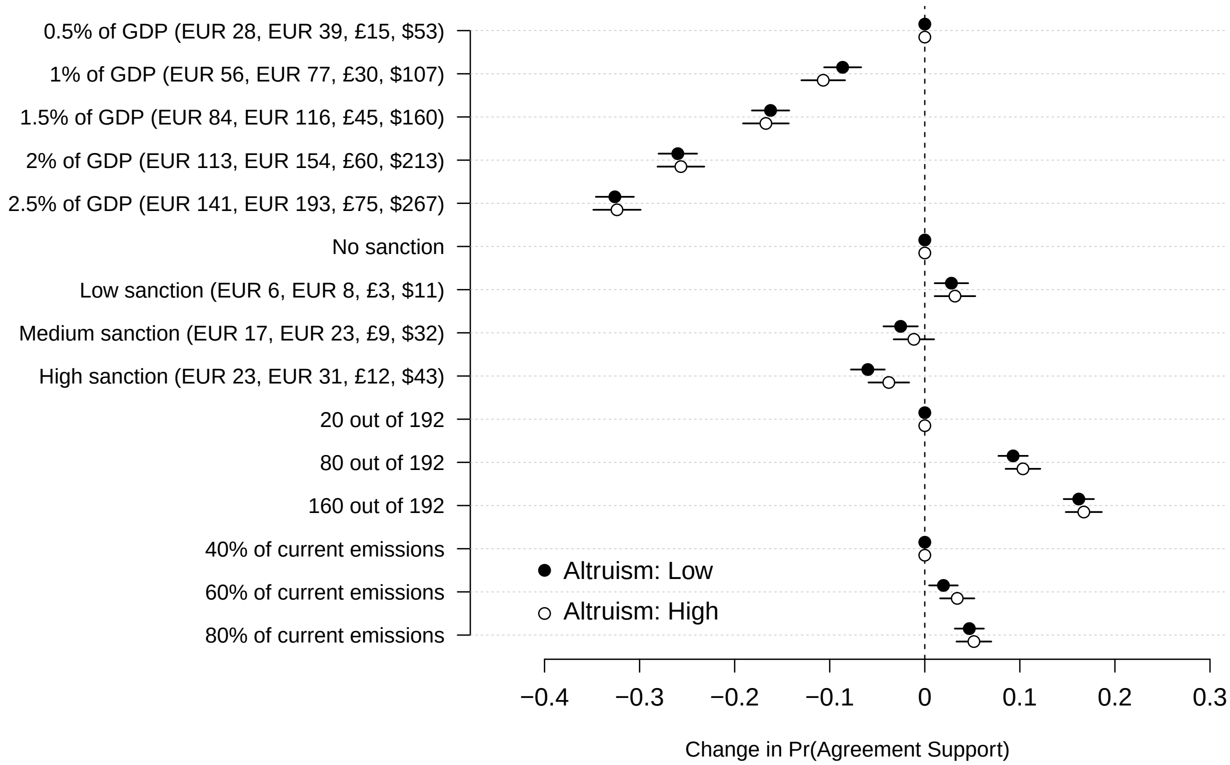

Figure A-4: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements by Altruism (all respondents).* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for all respondents ($N = 68,000$ agreements, pooled data for France, Germany, the United Kingdom, and the United States) by altruism (see text for measurement details). Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

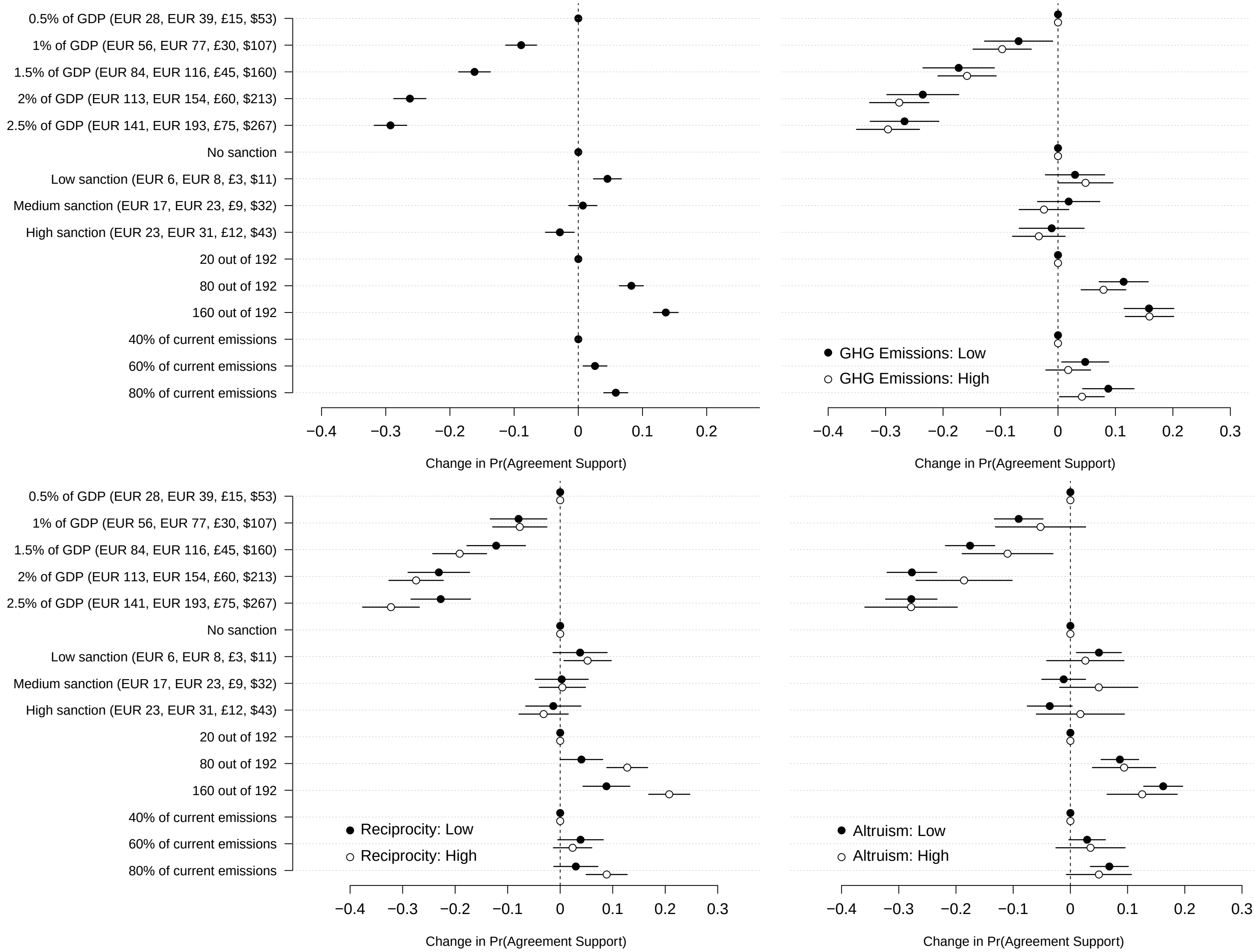

Figure A-5: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements: France.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for employed respondents in the France subset. Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

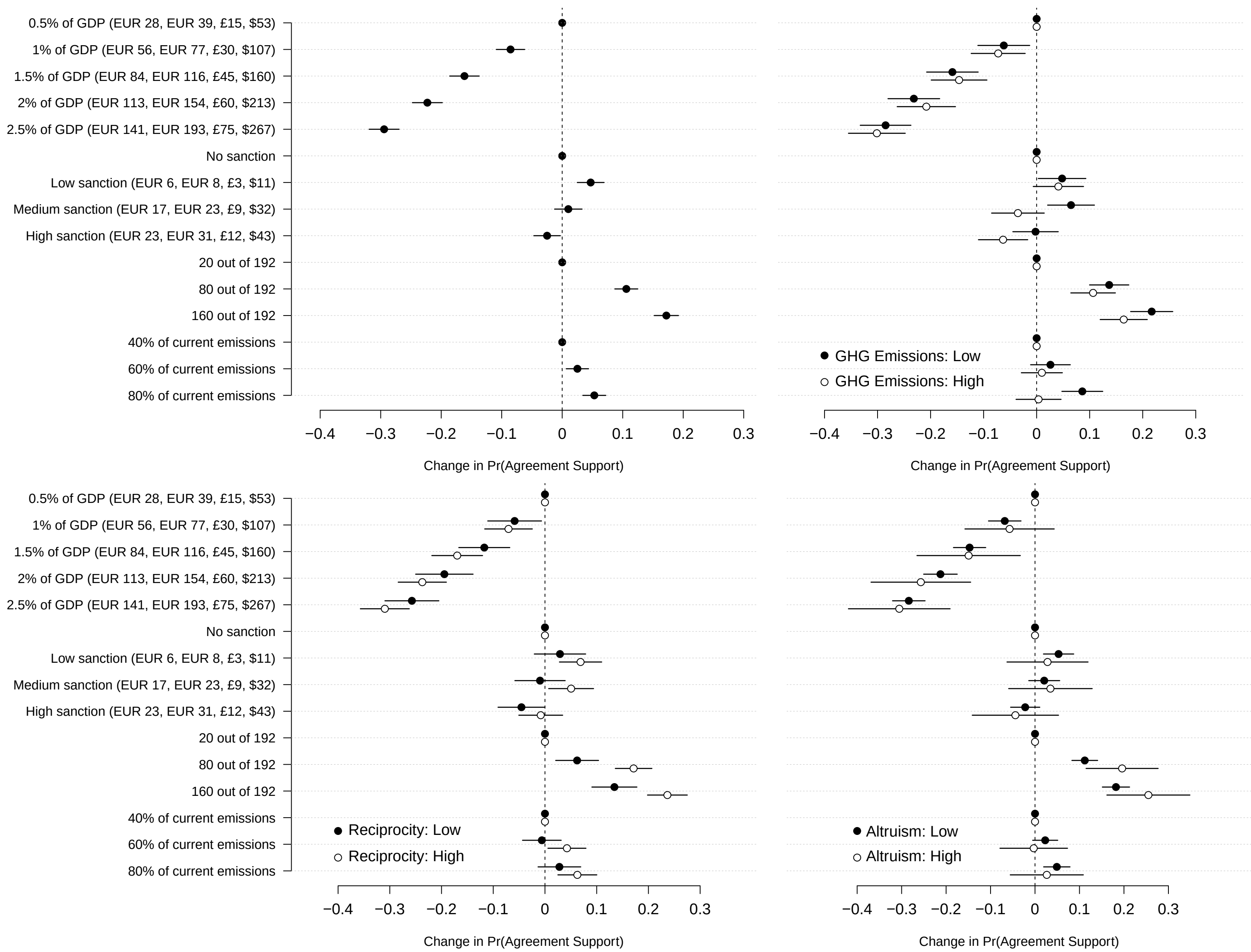

Figure A-6: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements: Germany.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for employed respondents in the Germany subset. Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

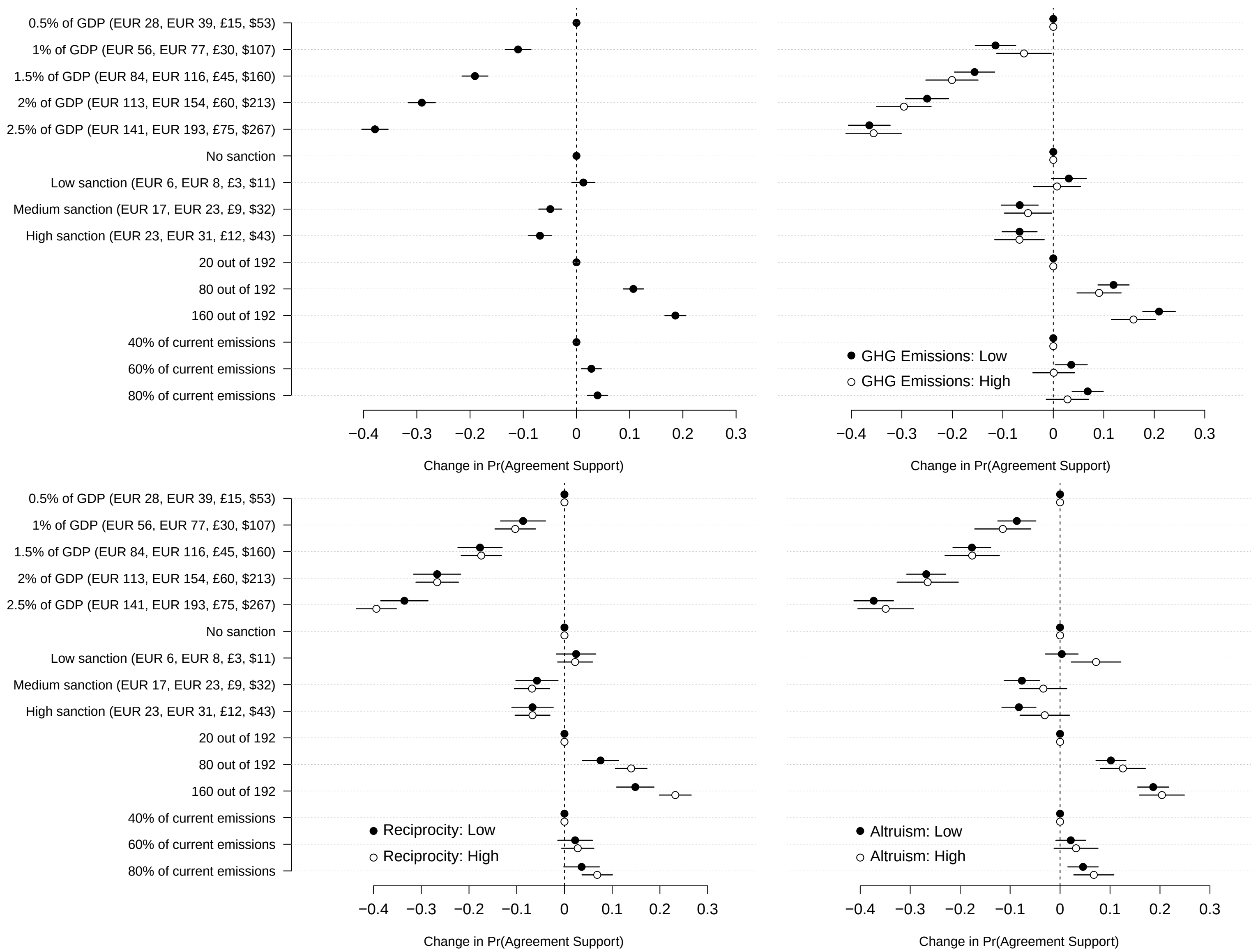

Figure A-7: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements: United Kingdom.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for employed respondents in the UK subset. Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

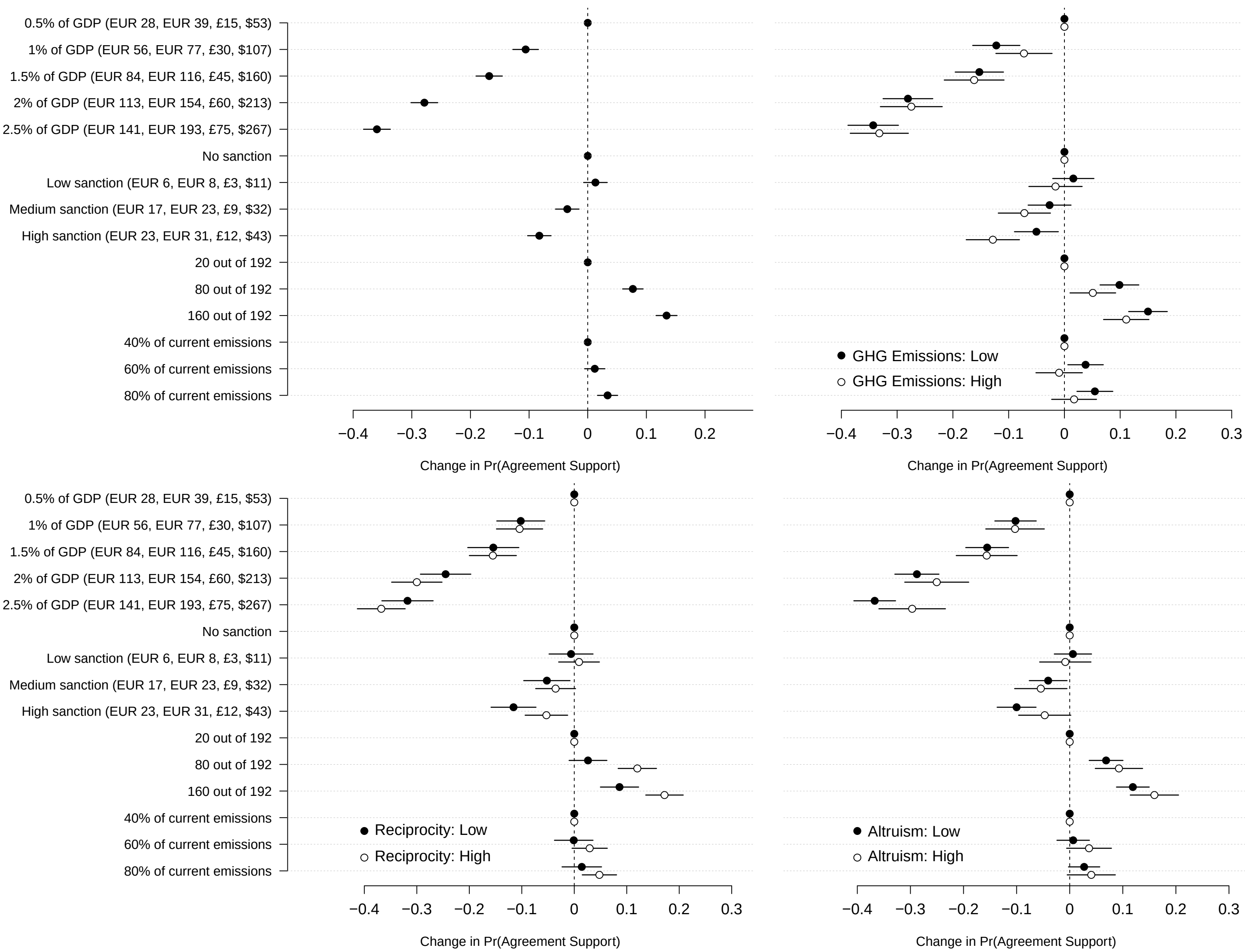

Figure A-8: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements: United States.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for employed respondents in the US subset. Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

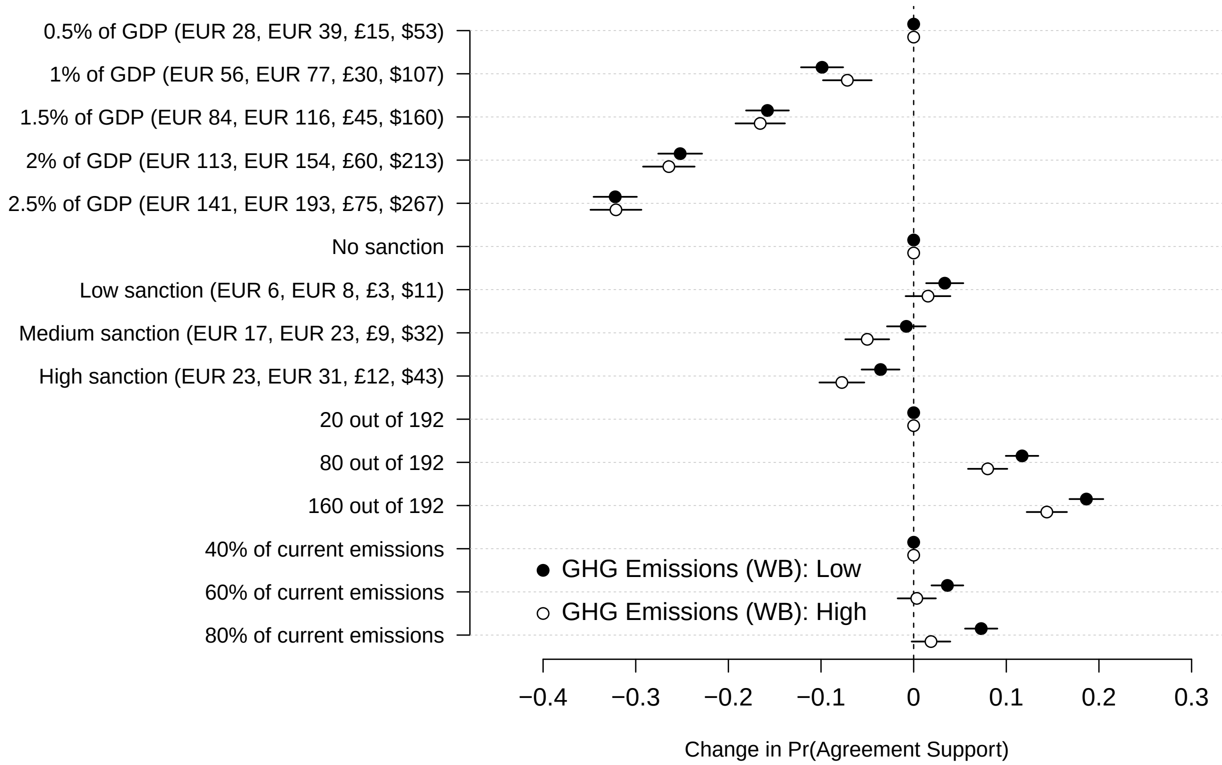

Figure A-9: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements by GHG Emissions (CO2 equivalent, World Bank measure).* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for employed respondents ($N = 33,408$ agreements, pooled data for France, Germany, the United Kingdom, and the United States) by CO2–equivalent emissions of respondents' sector of employment. Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

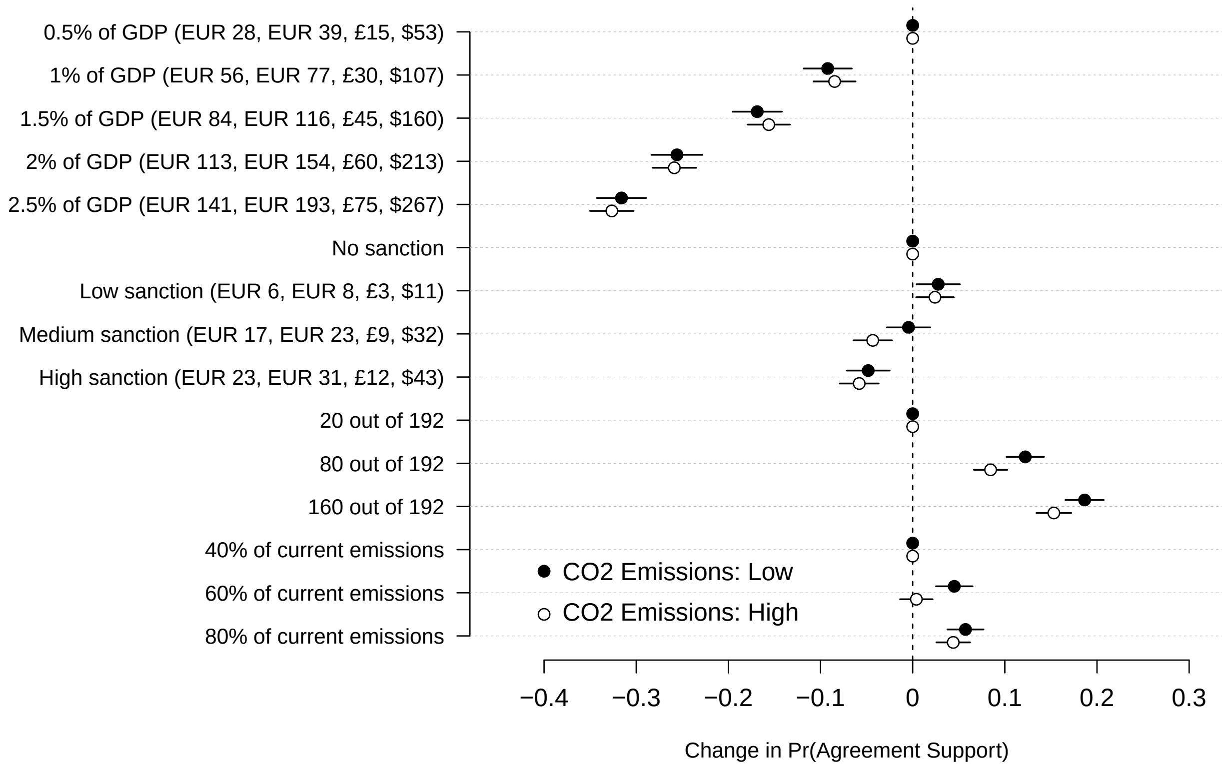

Figure A-10: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements by CO2–only Emissions.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for employed respondents ($N = 33,408$ agreements, pooled data for France, Germany, the United Kingdom, and the United States) by CO2–only emissions of respondents' sector of employment. Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

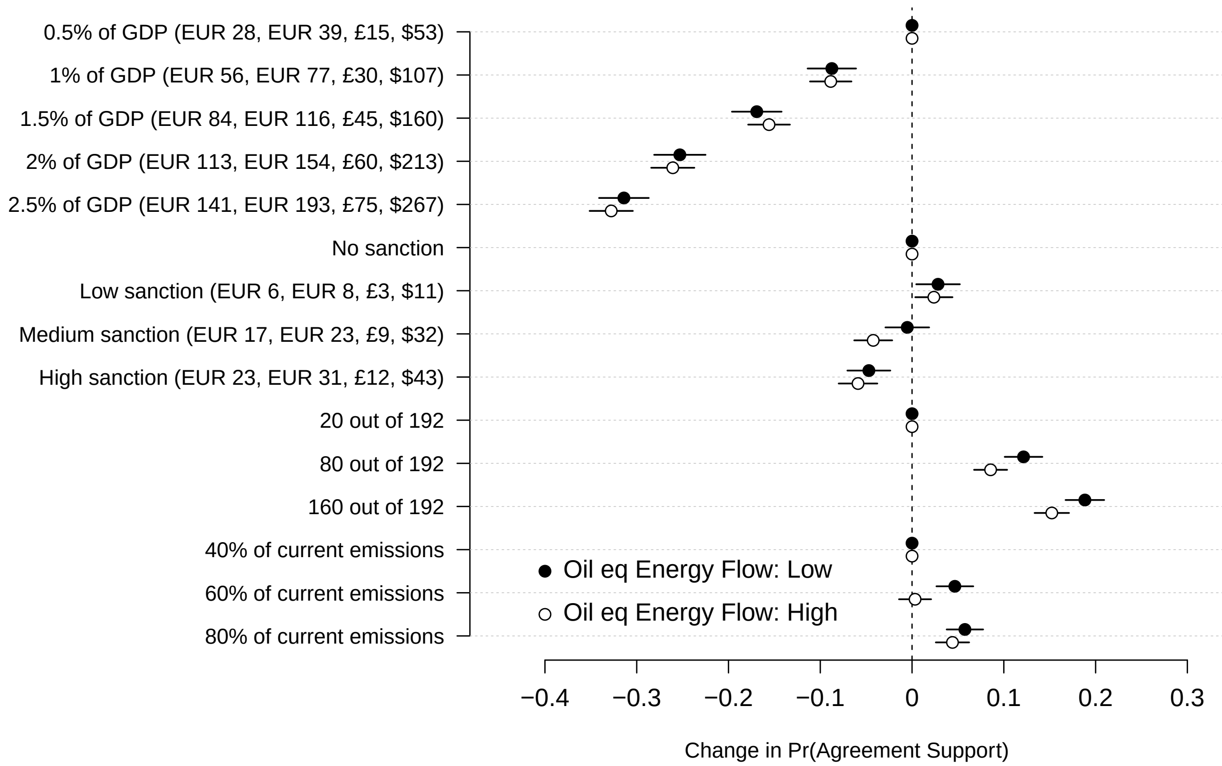

Figure A-11: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements by Oil–equivalent Energy Flows.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement for employed respondents ($N = 33,408$ agreements, pooled data for France, Germany, the United Kingdom, and the United States) by net energy transfers of respondents' sector of employment. Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.

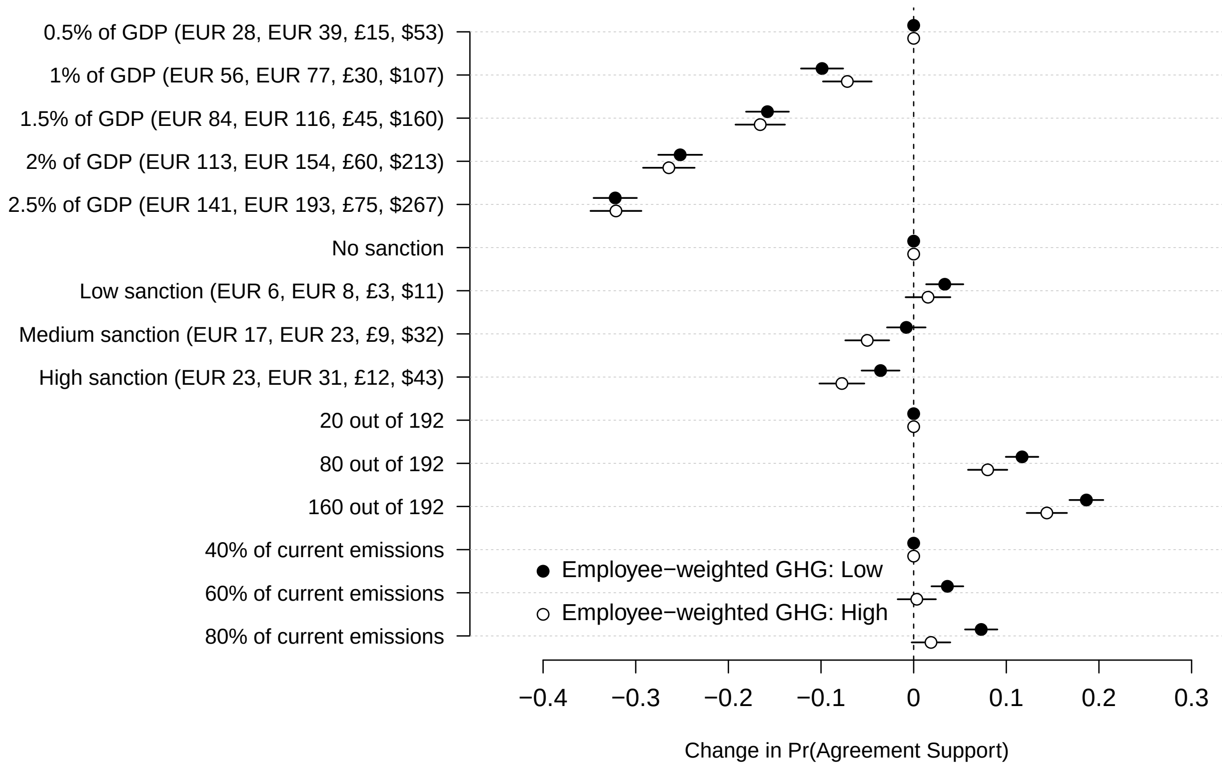

Figure A-12: *The Causal Effect of Costs and Reciprocity on Support for Climate Agreements by Employee–weighted GHG Emissions.* This plot shows estimates of the effect of randomly assigned agreement features on the probability of supporting an agreement ($N = 33,408$ agreements, pooled data for France, Germany, the United Kingdom, and the United States) by employee–weighted GHG (CO2–equivalent) emissions of respondents' sector of employment. Estimates are based on the regression of Agreement Support on dummy variables for values of the agreement dimensions, with SEs clustered by respondent. The bars indicate 95% confidence intervals based on robust standard errors clustered by respondent. Points without bars indicate the reference category for a given agreement dimension.