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Abstract
For global problems like climate change, strong international agreements are difficult to achieve. Alternative solutions might therefore be necessary. In this paper, we study the support for climate leadership in seven European countries. Climate leadership means that an individual country takes the lead by decreasing its carbon emissions above its level of commitment in the current EU agreement and with the intention of inspiring other countries to do likewise. Overall, we find that at realistic cost levels, a majority of people oppose their country taking the lead, and most do not expect that taking the lead will result in other countries following suit. The lack of support is caused by expectations that such leadership will result in other countries behaving as free riders. We do, however, find evidence of preferences for conditional leadership: People are more positive about their country taking the lead if assured that other countries will follow. These preferences are stronger among those who identify as left-wing. Moreover, citizens in smaller countries are more pessimistic that other countries would follow their country's lead and more sensitive to the response of other EU countries.

Keywords: climate leadership, conditional cooperation, climate change

JEL Classification: Q51, Q54

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1. Introduction

Climate change is often discussed as a social dilemma, prisoner's dilemma, or severe coordination problem in which there are significant risks that countries will free ride. For a global problem such as climate change, it is difficult to negotiate international agreements that are sufficiently strong and still incentive compatible (Barrett and Dannenberg, 2014). Hence, there is a risk that the world is caught in an equilibrium where no party does enough (Nordhaus, 2015). One potential way to resolve this might be through some countries showing leadership (Arce, 2001). The potential and impact of climate leadership, and its mechanisms, are debated (Schwerhoff, 2016; Reingewertz, 2017). Empirical estimates of the support for climate leadership are scarce, partly because of the difficulty in defining a baseline against which to define such leadership. We aim to inform this discourse by presenting evidence on the support for climate leadership from the perspective of citizens.

To solve the problem of defining a baseline, we take advantage of the existing agreement at the time of the survey on individual targets among EU member states, referred to as the Effort Sharing Regulation, to reduce emissions to 2030 by 30 percent in aggregate compared with 2005 emissions levels (European Union, 2018). Since then, the EU has proposed to increase the stringency of its policy by enacting the Fit for 55 package.[1] This policy was generally not known outside very specialist circles at the time of the survey experiment conducted in this paper.

In the last decade, pledges to take the lead in climate issues have become popular, with countries, states, cities, and even companies making such pledges. For example, the First Mover Coalition, a partnership between the US government, World Economic Forum, and over 50 global companies, was launched at the UN Climate Change Conference in Glasgow (COP26), taking the lead in creating markets for low-carbon or carbon-free materials and products. Leadership pledges are often aspirational and

[1] The current revision of EU policy serves to align it with the European Climate Law requiring climate neutrality by 2050. Specifically, the Fit for 55 legislative package outlines how the 2050 target should be achieved. The law requires that the EU achieve a net reduction of 55% of its GHG emissions by 2030, compared with 1990 levels. The suggested amendments to the Effort Sharing Regulation suggest an increase from 30% to 40% reduction of aggregate emissions. At the time of our survey, the European Commission's proposal had not yet been publicly presented. It is, however, a striking coincidence that it achieves (inter alia) an increase by 10 percentage points, just as in our experiment.

refer to some ambition or target in the future.[2] However, there is an underlying assumption that they will have an effect on emissions of greenhouse gases.

Leadership in organizations and society is a broad concept studied by scholars from many disciplines, including political science, psychology, management, and economics (see, e.g., Ahlquist and Levi, 2011; Schwerhoff, 2016; Zehnder et al., 2017). In economics, most of the literature on leadership has focused on understanding the circumstances under which leadership may effectively improve an outcome and how rational agents can be induced to voluntarily follow a leader (Hermalin, 1998). Leading by example can be perceived as a signal that the leader has superior information, which can increase group performance and efficiency in the presence of asymmetric information (Vesterlund, 2003). Related to leadership is the role of conditional commitments, whereby a leader would commit to reductions conditional on the reaction of a set of other countries (Helland et al., 2018).

Schwerhoff (2016) discusses potential effects of a country leading by example. First, by taking the lead, a country gains knowledge that other countries can use, thereby decreasing their costs and risks. Second, taking the lead signals that combating the problem is important, which can help in overcoming information asymmetries. However, the primary intended effect is behavioral, implied by the mechanism of conditional cooperation, meaning that nations are willing to do their bit assuming reciprocity. This implies that they would *follow* once a leader has shown the way.

Conditional cooperation, however, also implies that some agents are willing to *lead*, again assuming that others will follow. The broad concept of conditional cooperation thus subsumes both the concepts of following and of *conditional leadership.* This could reflect social preferences such as fairness, equity concerns, and reciprocal behavior. Reciprocal behavior and expectations thereof can motivate even selfish leaders, and the reciprocal nature of followers can reduce free riding and increase efficiency in providing public goods. Thus, we may well want to distinguish between conditional leadership as a pure preference and as a strategy. A recent meta-analysis of experimental studies on the effect of leadership on contributions to public goods

[2] Examples include the net zero goals of many countries and regions, such as the EU target of climate neutrality by 2050, as well as targets set by cities and companies for midcentury (European Commission, 2021; European Climate Foundation, 2021).

(Eichenseer, 2019) concludes that the effect of leadership "crucially depends on the example set by the leader as well as conditional cooperation of the followers. Leadership can only be successful if both are present."[3]

It should also be noted that the willingness to lead by example may be conditional on the leader's beliefs about the response of potential followers. While a large body of literature has focused on the followers' reactions in conditional cooperation situations (see, e.g., Fischbacher et al., 2001; Kocher et al., 2008; Gächter and Herrmann, 2009; Gächter, 2007), our paper examines the willingness of an actor to show leadership, focusing on potential leaders' expectations concerning the response of potential followers.

While Hermalin (1998) argues that a distinctive feature of leadership is "someone with followers," we cannot rule out that some actors may be willing to take the lead without expecting others to follow suit; we refer to this as *unconditional leadership*. We can think of leaders with ethical motives for taking the lead. In the case of climate change, it could be argued, for example, that reducing greenhouse gas emissions is the right thing to do or even a duty, irrespective of what others do. Such beliefs are well known within deontological ethics. In contrast, we define *conditional leadership* as the decision to lead based on some expectations or beliefs about others' responses. Consequentialism is important for this form of ethical reasoning and leadership. Motives for this type of leadership when it comes to climate change could be arguments related to economic or political benefits, such as the total effect on greenhouse gas emissions from leading by example, as well as job creation or improved competitiveness in green sectors. Efficiency and economic motives critically depend on others following suit to create export markets for green products and technologies, for example.

The ability of democratic countries to act as climate leaders depends on political will and the opinion of the electorates. Hence, citizens' beliefs and attitudes are key to understanding the potential of nations' climate leadership, and in this study, we provide empirical estimates of EU citizens' preferences for such leadership. Our analyses are

[3] This dimension of leadership (leading by example) has been extensively analyzed in the experimental economics literature using the closely related concepts of voluntary contribution and public goods games (see, e.g., Güth et al., 2007; Levati et al., 2007; Potters et al., 2007; Gächter and Renner, 2014; Eichenseer, 2019).

based on data from a survey distributed to representative panels of citizens in seven European countries that all are part of the EU Effort Sharing Regulation. To capture the geographic spread and heterogeneity among EU member states in terms of GDP per capita, emissions intensity, population size, and local political dynamics, we chose to include the following seven European countries in our study: Austria, Finland, France, Germany, Poland, Spain, and Sweden.

Focusing on the EU and using the EU Effort Sharing Regulation as a baseline, we first elicit citizens' beliefs about other EU member states' reactions toward their own country taking the lead on climate. Based on a survey experiment, we then estimate the support for leading by example, given various reactions by followers (i.e., the other EU member states) that are experimentally induced. Through the experiment, we can measure both the extent to which countries are unconditional leaders and the importance of followers' reactions in countries' willingness to lead by example (the degree of conditional leadership). Finally, we use the elicited beliefs about followers' reactions to predict the probability that citizens would support a policy proposal that their country should lead by example at different cost levels.

We find that most people do not expect that their country taking the lead will result in other countries following suit, but that women and left-leaning voters are more optimistic. However, we do find strong evidence of preferences for conditional leadership. Although the size of this support varies across countries, people in all seven are more positive toward their country taking the lead if told that others will follow suit. Interestingly, citizens in the smaller countries (Austria, Finland, and Sweden) are the most sensitive to the behavior of other countries. We also find that support is sensitive to the cost; in fact, support is drastically reduced with increased cost. At a realistic but moderate cost estimate, we find that a majority of people in all the surveyed countries oppose their country taking the lead.

The rest of the paper is organized as follows. In section 2, we describe the survey design and data. Section 3 presents results, and section 4 concludes.

2. Survey Design and Data

2.1. Survey design

The survey consisted of four segments. The first segment asked general questions about climate change, such as if the respondent believed that the world's average temperature has increased during the past 100 years, and if so, whether this increase has been caused by human behavior.

In the second segment, we introduced the EU agreement to reduce greenhouse gas emissions by 30% to 2030 (compared with 2005) in the non-ETS sectors (i.e., transport, buildings, and agriculture) to the respondents. The agreement provides a benchmark of the current state of emissions reductions, against which we defined what we meant by taking the lead. Respondents were then asked questions about their beliefs concerning the effect on other EU states if their own country decided to lead by example (by reducing emissions more than agreed on within the EU). More precisely, we asked respondents to state their beliefs as expected probabilities for the following three mutually exclusive outcomes: (i) other EU member states do not react and continue according to the EU agreement, (ii) other EU member states follow suit and decrease their emissions, and (iii) other EU member states react by increasing their emissions. The probabilities had to sum to 100% before the respondents could proceed to the next question. The segment ended with questions regarding the respondent's motives for why they believed their own country should (or should not) lead by example.

The third segment consisted of a survey experiment in which the respondents were faced with five consecutive choice situations, each with two options:

- Option 1: The respondent's own country continues with emissions reductions in accordance with the current EU agreement.
- Option 2: The respondent's own country takes a leadership role and reduces emissions by 10 percentage points more than stated in the EU agreement.

Note that while the option 1 was always the same (continue according to agreement), conditions for option 2 varied among the five choice situations in three important dimensions: (i) the other EU member states' reactions, (ii) the probabilities for each of these reactions, and (iii) the cost to the respondents' households and all other

households in their country. Each respondent made all five choices presented in Table 1. The order of the choices was randomized. The costs to the respondents' households were also randomized in each choice situation, and the possible cost levels were €25, €75, €120, and €200.[4]

Table 1. Choice situations in the experiment

	Option 1 (no additional cost)	**Option 2 (additional cost): leading by example with the following reaction from other EU member states**
Choice 1	Continue according to agreement	No reaction from the other EU member states
Choice 2	Continue according to agreement	Other EU member states increase emissions
Choice 3	Continue according to agreement	Other EU member states decrease emissions
Choice 4	Continue according to agreement	50% probability of no reaction and 50% probability of increase in emissions by other EU member states
Choice 5	Continue according to agreement	50% probability of no reaction and 50% probability of decrease in emissions by other EU member states

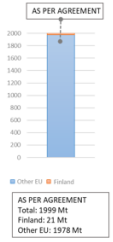
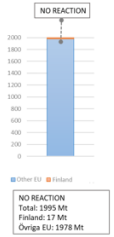
An important aspect of the experiment is the difference in impact depending on which country is leading by example. While a small country by itself does not have a significant effect on total emissions in the EU, a larger country has a more noticeable effect on aggregate emissions just through its own emissions reductions. In the survey, we visualized this and presented emissions data on the effects of the different reactions. Figures 1 and 2 show how the choice situations were presented to the respondents with illustrations to help them visualize the effects on emissions for both their own country and other EU member states and total emissions for the EU. The examples are for Germany (large country) and Finland (small country). For Finland, the national emissions reduction is almost imperceptible, as indicated by the size of the orange portion of the bars. For Germany, a reduction of 10 percentage points corresponds to quite a large emissions reduction, with the orange portion of the two bars showing a visible difference. The fourth segment of the survey collected background information on respondents.

[4] For Sweden, the costs were expressed in SEK, and for Poland, the costs were expressed in zloty, using these exchange rates: 1 euro = 10 SEK or 5 zloty.

Assume that a proposal has been made that Finland should take the lead over other Member States by reducing emissions by 10 percentage points more than its commitment under the EU agreement. In this case, the following applies:

- We are certain that there will be **no reaction**
- Finland taking the lead costs your and other Finnish households **EURO [random draw from bid vector]** more every year until 2030.

What is your position on such a proposal?

CURRENT AGREEMENT	"TAKE THE LEAD" PROPOSAL
 No extra cost	 SEK X [same figure as above] more every year until 2030
□ No, under these conditions Finland should not take the lead by exceeding its commitment under the EU agreement.	□ Yes, under these conditions Finland should take the lead by exceeding its commitment under the EU agreement.

Assume that a proposal has been made that Germany should take the lead over other Member States by reducing emissions by 10 percentage points more than its commitment under the EU agreement. In this case, the following applies:

- We are certain that there will be **no reaction**
- Germany taking the lead costs your and other German households **EURO [random draw from bid vector]** more every year until 2030.

What is your position on such a proposal?

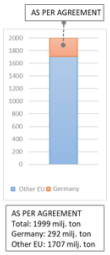
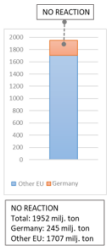
CURRENT AGREEMENT	"TAKE THE LEAD" PROPOSAL
 No extra cost	 SEK X [same figure as above] more every year until 2030
□ No, under these conditions Germany should not take the lead by exceeding its commitment under the EU agreement.	□ Yes, under these conditions Germany should take the lead by exceeding its commitment under the EU agreement.

Figure 1. Examples for Finland and Germany from the choice situation in the experiment showing choice 1 in Table 1, with no uncertainty regarding reaction from the other EU member states

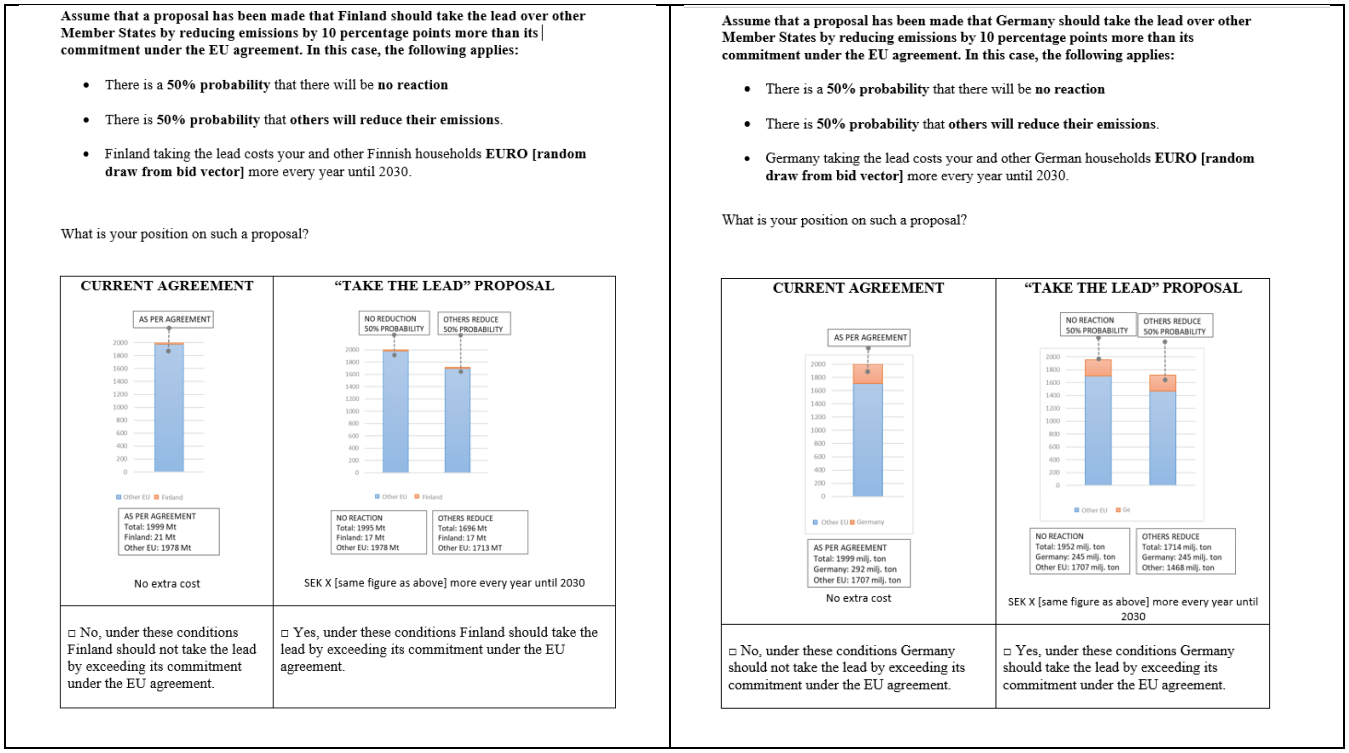


Figure 2. Examples for Finland and Germany from the choice situation in the experiment showing choice 5 in Table 1, with 50% probabilities regarding reactions from the other EU member states

2.2. Sampling and respondent and country characteristics

The study was conducted in May–June 2021 as a web survey in seven European countries: Austria, Finland, France, Germany, Poland, Spain, and Sweden. The surveys were translated into the respective languages by a professional translation institute. Before the main study, a pilot study was conducted in Sweden and France. The final survey yielded 2,117 usable responses in Austria, 2,185 in Finland, 2,075 in France, 2,139 in Germany, 2,134 in Poland, 2,134 in Spain, and 2,183 in Sweden. All respondents were recruited from random samples of representative panels from each population.

Descriptive statistics of the respondent data for each country are provided in Appendix Table A1. About 50% of the respondents in all the countries were males, and the average age was between 45 and 50 years. While the samples of respondents are representative in terms of gender and age, we have a misrepresentation in education for all countries. In the analysis, we therefore apply survey weights based on the correct level of educational attainment of the population for each country.[5]

Respondents in all countries exhibited the same attitudes toward climate change. Appendix Table A2 shows that almost all respondents believe that the global temperature has increased, and only small minorities believe that climate change does not exist. A large majority of the respondents in all countries believe that we can slow down but not stop climate change.

Emissions data are an integral part of the survey experiment. Although the countries are all part of the EU and thus share many climate policies, such as the EU ETS, there are also differences in the stringency and coverage of domestic policies across countries. Table 2 reports emissions, emissions per capita, and the emissions-weighted average carbon price for each country. The average carbon prices are as estimated in Dolphin (2022).

[5] France, Germany, Poland, and Sweden had an underrepresentation of subjects with lower education, while Austria, Finland, and Spain had an underrepresentation of subjects with higher education. According to the International Standard Classification of Education (UNESCO, 2011), lower education is defined as levels 0–4 (nontertiary education) and higher education is defined as levels 5–8 (tertiary education).

Table 2. Country carbon emissions, emissions per capita, and explicit carbon pricing (2019)

	Emissions (Mton CO_2 equivalent)	Emissions per capita (ton per capita)	Price CO_2 2019 US$
Austria	80	8.9	8.5
Finland	53	9.6	55.3
France	443	6.8	39.7
Germany	810	9.7	13.3
Poland	391	10.3	13.1
Spain	315	6.7	11.7
Sweden	51	5.1	67.4

Sources: Data on carbon emissions from OECD (2022); data on carbon prices from Dolphin (2022).

Germany is by far the biggest contributor to global emissions among the seven countries. As discussed, the bigger the contributor, the greater the effect on mitigation by taking the lead even if others do not follow suit. Emissions per capita are highest in Poland, followed by Germany and Finland. We also note that Sweden and Finland are the countries with the most stringent policies measured as explicit carbon prices, while Austria and Spain have the least strict carbon policies. The differences are large: the price of carbon is over eight times higher in Sweden than in Austria and almost six times higher than in Spain. Still, emissions per capita are among the lowest in Spain, and given the heterogeneity of the countries, it is perhaps not surprising that there is not a positive relationship between emissions or emissions per capita and the stringency and coverage of domestic policies.

3. Results

3.1. Beliefs about the behavior of others if taking the lead

As described in section 2, before the experiment section, respondents were asked about their expectations of other countries' reactions if their own country would lead by example and reduce emissions above its level of commitment in the current EU agreement. The respondents were asked to state their expected probabilities for the following outcomes: (i) other EU member states do not react and continue according to the EU agreement, (ii) other EU member states follow suit and decrease their emissions, and (iii) other EU member states react by increasing their emissions. Figure

3 summarizes respondents' stated average expected probabilities for other countries' reactions if their own country leads by example.

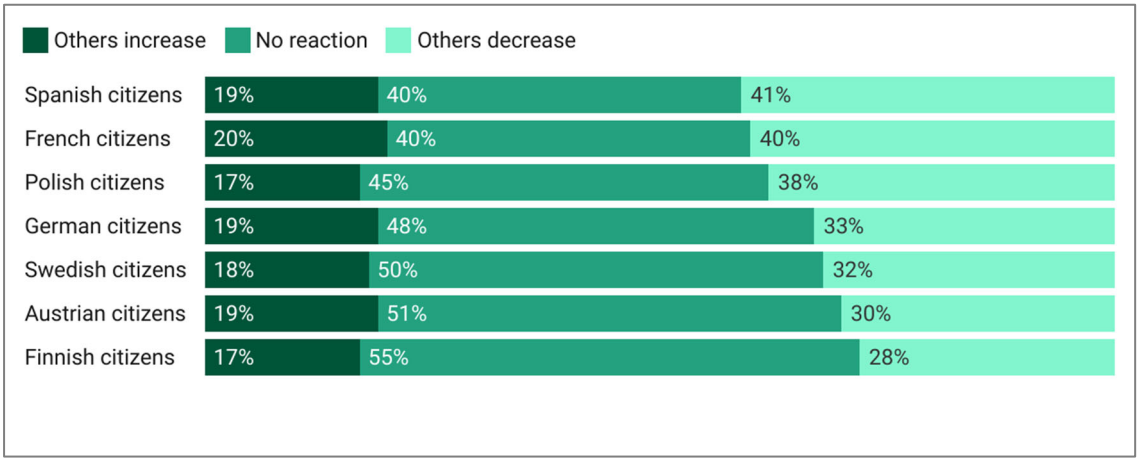


Figure 3. Beliefs, measured as stated probabilities, about how other EU countries would react if respondent's own country leads by example. Survey weights are used to correct for educational bias in the sample.

In all countries except Spain, the outcome with the highest average expected probability is that other countries would continue as before (no reaction), followed by the more optimistic belief that other countries would follow the leader and reduce their emissions too. For the outcome that other countries would react by increasing their emissions, the average expected probability is around 20%. Hence, while beliefs about conditional cooperators are non-negligible, people in general do not seem to be convinced by the conditional cooperator hypothesis; instead, they find it more likely that other countries would free-ride either by continuing as before or increase their emissions. There are modest differences among countries; for instance, the stated probabilities that others would follow are lower in the smallest countries, Finland, Austria, and Sweden.

Next, we investigate what factors are associated with the beliefs about other countries' reactions, using political and demographic variables. The respondents' political preferences are measured on a scale from 1 to 10, where 1 means that a person self-identifies as having strong left-wing preferences and 10 means that a person self-identifies as having strong right-wing preferences. The dependent variable is the stated probability that other EU countries would follow if the respondent's own country led

by example, and we estimate this using a simple OLS model. The results are reported in Table 3.

Table 3. Stated probability that others would follow if own country leads by example

	Sweden	Spain	Poland	Germany	France	Finland	Austria
Left-right	-1.63***	-0.74	-0.81*	-2.37***	-0.63*	-1.45***	-1.60***
	(0.26)	(0.40)	(0.33)	(0.34)	(0.27)	(0.25)	(0.28)
Female	3.14*	2.87	3.18*	2.82*	0.66	3.66***	4.11***
	(1.26)	(1.87)	(1.54)	(1.17)	(1.43)	(1.05)	(1.06)
Age	-0.21***	0.091	0.04	-0.05	0.12*	-0.03	-0.11**
	(0.40)	(0.06)	(0.05)	(0.04)	(0.05)	(0.03)	(0.04)
High school	-4.80	1.89	-1.55	2.78	7.20*	-5.73**	1.36
	(2.78)	(2.41)	(4.76)	(1.45)	(2.92)	(2.17)	(1.38)
University	-7.32**	-1.50	-4.33	3.75*	8.15**	-5.06*	-1.36
	(2.77)	(2.64)	(4.90)	(1.52)	(3.04)	(2.28)	(1.66)
No. of adults	0.08	0.27	-0.69	-0.02	2.95	-0.10	-0.06
	(0.78)	(0.96)	(0.78)	(0.67)	(1.68)	(1.25)	(0.52)
Kids in household	-1.75	-0.52	-2.01	1.83	-2.43	-0.03	2.21*
	(1.30)	(2.07)	(1.56)	(1.22)	(1.50)	(1.14)	(1.09)
Income	-0.06	1.01	3.84	-0.89*	0.17	0.07	-0.61
	(0.38)	(0.65)	(2.23)	(0.43)	(0.61)	(0.41)	(0.44)
No response inc.							-3.31
							(1.88)
Constant	55.33***	35.25***	40.84***	44.16***	24.79***	39.93***	41.32***
	(4.28)	(5.42)	(5.68)	(3.21)	(6.30)	(3.41)	(3.00)
No. of respondents	2183	2134	2134	2139	2075	2185	2117

Notes: Survey weights based on educational attainment. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

In all countries but Spain, the belief that other countries would follow and decrease emissions is associated with political orientation: left-wing voters are more likely to believe that other countries will follow suit. The difference between left- and right-wing voters is sizable in many countries. The left-right variable ranges from 1 to 10; thus in Germany, for example, the expected probability (belief) that other countries would follow differs by 24 percentage points between an individual identifying as far left on the political spectrum and an individual identifying as far right. Our experiment is not designed to identify why there are differences in preferences due to political orientation. However, there is evidence that prosociality and support for proenvironmental policies are associated with political views (see, e.g., Harring et al., 2017; Grünhage and Reuter, 2021). If a left-wing person is more likely to support a policy where their own country takes the lead, this person might tend to believe that others would likewise wish to follow other countries that take the lead, as suggested by

the false consensus effect (see, e.g., Gilovich, 1990). The opposite effect could hold for a right-wing person who does not support a stricter national climate policy and therefore thinks that others would not follow either. Another explanation could be a motivated reasoning or confirmation bias (Kunda, 1990; Nickerson, 1998). If support for climate policies is associated with political attitudes, those who are more supportive of the policy could have a more positive view on its effects, and those who are against the policy could have a more negative view.

In most countries, women are more likely to believe that others will follow the example of a climate leader. However, the association between education and beliefs varies among countries. In some countries, such as Germany and France, higher education is associated with a higher stated probability that other countries will follow, while in others, such as Sweden and Finland, a higher education is associated with a lower stated probability.

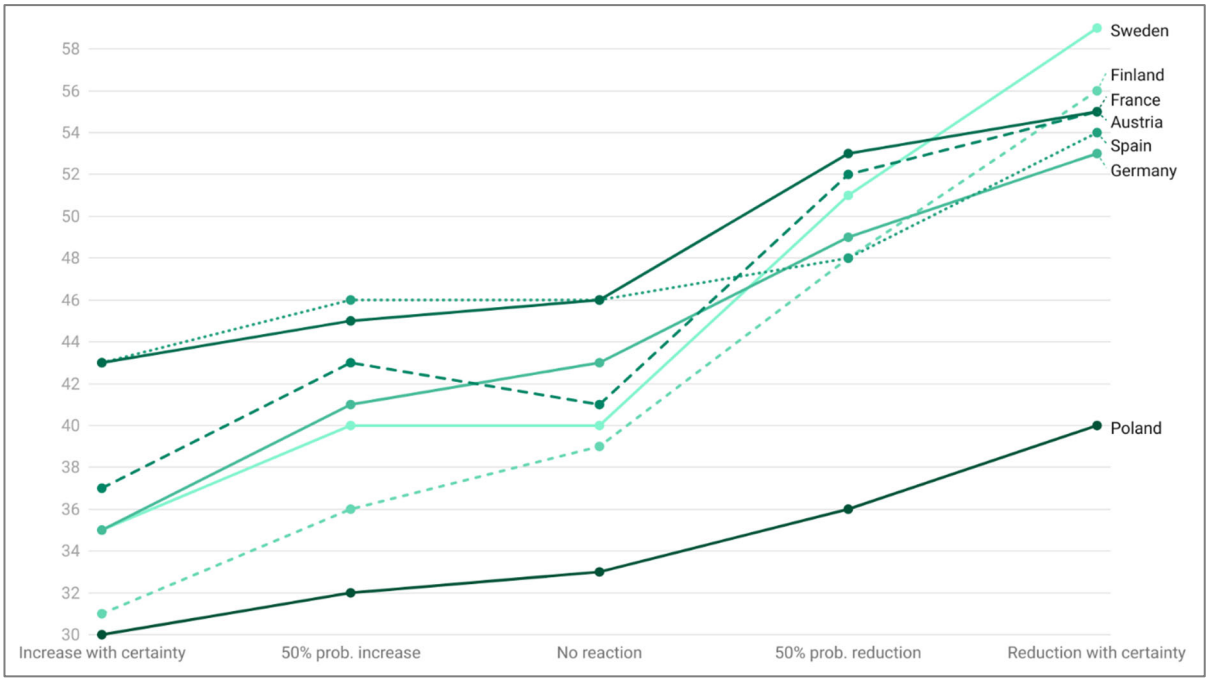
3.2. Unconditional or conditional leadership and the importance of followers

We next present the results of our experiment in which the respondents were asked whether they would like their own country to take the lead and decrease carbon emissions 10% more than its obligation according to the current EU agreement. As described in section 2.1, the choices were conditional on five different scenarios: (1) no reaction from other EU member states; (2) certainty that other states would increase emissions; (3) certainty that other states would decrease emissions; (4) a 50% probability that others would increase their emissions; and (5) a 50% probability that others would follow suit and decrease their emissions.

Based on the responses in the experiment, we estimate binary probit models for each country.[6] The dependent variable is equal to one if respondents would like their own country to take the lead. As independent variables, we include dummy variables for each scenario that capture other countries' reactions (the reference case is no reaction from the other EU member states), as well as the cost variable that captures annual cost for households when the respondent's own country takes the lead. Standard errors are clustered at the individual level, and marginal effects are evaluated at means of the

[6] A full distribution of the responses is presented in Appendix Table A3.

independent variables. Full results are presented in Appendix Table A4. Based on the estimated probit models in Appendix Table A4, and using a cost of €125, we estimate the predicted probability of supporting one's own country in taking the lead. These probabilities are presented in Figure 4 for the different reactions of other countries.



	Austria	Finland	France	Germany	Poland	Spain	Sweden
Increase with certainty	37%	31%	43%	35%	30%	43%	35%
50% prob. increase	43%	36%	45%	41%	32%	46%	40%
No reaction	41%	39%	46%	43%	33%	46%	40%
50% prob. reduction	52%	48%	53%	49%	36%	48%	51%
Reduction with certainty	55%	56%	55%	53%	40%	54%	59%

Figure 4. Predicted support for taking the lead given different reactions from other countries at a cost of €125 for each household

Remember that we define a *conditional leader* as someone who is willing to take the lead if there are followers, while an *unconditional leader* is willing to take the lead irrespective of what others do. Perhaps surprisingly, all countries have a substantial share of respondents (30% to 46%) who support unconditional leadership and would like their own country to lead by example even if other EU member states react by increasing emissions. The support is, as expected, sensitive to the cost of the policy and declines as the cost increases. Let us illustrate with Germany and the case when other

countries would not react at all to Germany's leadership. Support for taking the lead is 43% in Germany at a cost level of €125, given no reaction among other EU countries. If the cost were as low as €25, support would increase to 53%, while if the cost were €200, support would only be 35% (distribution of responses at different cost levels are reported in Appendix Table A3).[7]

Regarding conditional leadership, the likelihood of saying yes increases if other EU member states would follow suit. The size of this support varies, but people in all these countries are more positive toward their country taking the lead if told that others will follow suit. That support also increases as the followers' reaction becomes more certain. For example, in Sweden and Austria, the probabilities are 19 and 14 percentage points higher, respectively, if other EU countries would follow their country's example with certainty than in the scenario with no reaction at all. The Finnish respondents, who are the least likely to say yes in the case where others increase emissions, are as much as 17 percentage points more likely to say yes to leading when they know that others would follow their own country's example. Interestingly, citizens in the smaller countries with lower emissions (Austria, Finland, and Sweden) are those that are most sensitive to the behavior of other countries. This might not be surprising, as the smaller the contributor, the less the effect on mitigating climate effects if they take the lead but others do not follow suit.

The likelihood of saying yes to leadership decreases in all countries if other countries would react by increasing their emissions with certainty as compared with the case of no reaction. The biggest decrease in support for leadership is in Germany and Finland, where the probability of saying yes decreases by about 8 percentage points under this scenario.

Moreover, respondents react more to information that others will follow and decrease emissions than to information that others will increase their emissions. For instance, the probability of a respondent being supportive of Sweden leading by example increases by 19 percentage points if they know that others will follow suit, but the probability decreases by only 5 percentage points if they know that others will react

[7] Polish respondents are the most sensitive to the cost and almost three times more sensitive than the Finnish respondents, who are least sensitive to the cost. Polish residents also have the lowest income, on average, and hence the cost is a bigger relative burden for them.

by increasing emissions. Note that this effect follows from an asymmetry in the size of the effects. If a country with a 10% share of EU emissions reduces its emissions by 10%, then the effect (if there is no reaction from other countries) is a 1% reduction in EU emissions. If all other countries follow this country's leadership, the effect would be big: a 10% decrease instead of a 1% decrease.[8]

We next investigate the association between political attitudes and support for taking the lead. We estimate a model including a set of individual characteristics and a variable capturing political attitudes.[9] We also interact the political attitudes variable with the scenario-specific dummy variables. We do this to investigate whether left- and right-wing voters have different preferences for their own country to take the lead conditional on what the other EU countries would do. Remember that political attitudes are measured on a scale from 1 to 10, where 1 means that a person self-identifies as having strong left-wing preferences and 10 means that a person self-identifies as having strong right-wing preferences. Table 4 reports the results.

[8] Similarly, if the reaction of other countries is to increase their emissions, the 1% reduction is erased and there is no difference (0%) to EU emissions. This may be a disappointment, but it is a smaller effect to go from –1% to 0 than to –10%.

[9] In Appendix Table A5, we report estimates from a model with only socioeconomic controls and no interaction terms.

Table 4. Marginal effects: probability that respondents would like their own country to take the lead, using models that include political preferences and socioeconomic variables

	Sweden	Spain	Poland	Germany	France	Finland	Austria
Others increase for sure	-0.09**	-0.06	-0.12***	-0.17***	-0.03	-0.15***	-0.10**
	(0.03)	(0.04)	(0.03)	(0.04)	(0.04)	(0.03)	(0.04)
50% others increase	0.03	0.02	-0.01	0.004	-0.03	-0.05*	0.03
	(0.03)	(0.04)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)
50% others reduce	0.17***	0.04	0.04	0.10**	0.03	0.13***	0.12**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)
Others reduce for sure	0.25***	0.07	0.06	0.13***	0.11*	0.15***	0.12**
	(0.03)	(0.04)	(0.04)	(0.03)	(0.05)	(0.03)	(0.04)
Annual cost in 100 euros	-0.12***	-0.07***	-0.17***	-0.11***	-0.09***	-0.06***	-0.10***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Left-right, political scale	-0.05***	-0.02**	-0.03***	-0.06***	-0.02*	-0.05***	-0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Others increase for sure × left-right	0.01	0.01	0.02**	0.02**	-0.000	0.01*	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
50% others increase × Left-Right	-0.01	-0.004	0.001	-0.01	0.004	0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
50% others reduce × left-right	-0.01	-0.004	-0.002	-0.01	0.01	-0.01	-0.001
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Others reduce for sure × left-right	-0.01	0.004	0.003	-0.004	-0.003	0.01	0.004
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
No. of observations	10915	10670	10670	10695	10375	10925	10585
No. of respondents	2183	2134	2134	2139	2075	2185	2117
Socioeconomic controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

In all countries, respondents identifying as left-wing on the political spectrum are more likely to support a policy where their own country leads by example than those identifying as right-wing. However, practically all interaction terms with political preferences are relatively small and not statistically significant, suggesting that the impact of political preferences on support for climate leadership does not depend on how other countries would react when the respondent's own country decreases its carbon emissions by an additional 10 percentage points.[10] Thus, although left-wing respondents are more likely to support domestic climate policies where their country takes the lead, and people are more likely to support taking the lead if they know that others will follow suit, we cannot conclude either that left-wing respondents will take the lead because they expect that others will follow suit or that right-wing respondents will not support the policy because they do not expect that others will follow suit.

3.3. Support for taking the lead based on beliefs

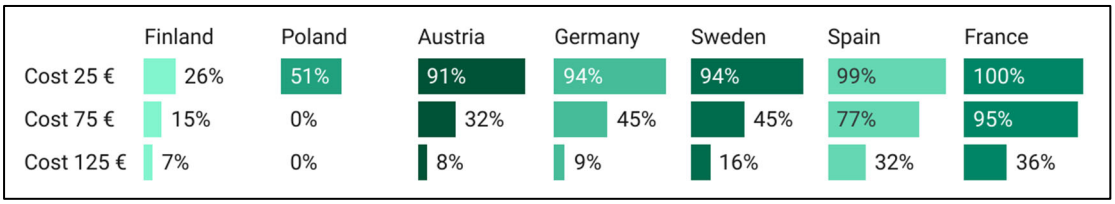
Finally, using the estimated parameters from the probit model (Appendix Table A4) and the individual beliefs regarding the reactions of other countries (Figure 3), we estimate the individual probabilities of support for taking the lead. We estimate the probability of support for three reactions of other countries: no reaction, increase with certainty, and decrease with certainty. Then we use the individual level beliefs for each of these reactions as weights. The overall predicted probability is thus a weighted average, where each response is weighted by the belief about the occurrence of other countries' responses.[11] In Appendix Table A7, we summarize the distribution of the predicted probabilities using a four-level categorization of the levels of probabilities:

[10] As discussed in the introduction, the argument that it is morally correct to take the lead could be another reason to become a leader. We therefore estimate an additional model where we interact the treatment dummies with a variable indicating how much a respondent agreed with the statement "It is morally correct to decrease above the EU agreement level." Respondents were asked to answer on a scale from 1 to 5, where 1 means "do not agree at all" and 5 means "totally agree." We find that while the variable capturing the moral argument is statistically significant in all the countries, practically all the interaction terms were insignificant (the exceptions being Sweden and Austria, where one and three interaction terms were statistically significant, respectively), indicating that the moral motivation is not dependent on what other countries do. The results are reported in Appendix Table A6.

[11] This is estimated as follows: P[Yes] = Stated probability other EU countries will follow × P[Yes | Other EU countries will follow] + Stated probability no effect × P[Yes | No reaction among other EU countries] + Stated probability other EU countries will increase × P]Yes | Other EU countries will increase].

against, *weakly against*, *weakly in favor*, and *in favor of taking the lead*. In Figure 5, we report the distribution of support for taking the lead based on an assumption that those with a probability equal to or above 50% would support their own country taking the lead.[12]

Figure 5. Predicted share of yes votes in support of leading by example, by country cost levels



As illustrated in Figure 5, support is drastically reduced with increased cost. Exact abatement costs with which we could compare our estimates are not available. However, we have estimated a reasonable order of magnitude of €125 per household to reduce emissions by an additional 10%.[13] At this cost level, there is not majority support in any of the seven countries, and only in Spain and France is the support at least moderate. It is important to note that a sizable fraction of respondents do not have very strong preferences against taking the lead (see Appendix Figure A1). The shares of yes votes could therefore easily be larger than the ones presented in Figure 5. At the same time, those that we predicted would vote yes do not have particularly strong preferences for taking the lead. There is thus much uncertainty in the share of yes votes. Another way to think about this is to say that a sizable fraction of the population in each country can be affected through information. At the same time, it is only at a very

[12] More fine-grained illustrations can be found in Appendix Figure A1. The pie charts illustrates the degree of support at the various cost levels.

[13] While detailed abatement cost curves are not available at either the EU or country level, we argue that expensive technologies that can drive down carbon emissions to zero, such as in industry, would have a marginal abatement cost of approximately US$100/ton (€98.15/ton) (see, e.g., Figure SPM.7 in IPCC, 2022). Average emissions in the EU are roughly 6.6 tons per capita. Thus, a 10% reduction corresponds to 0.65 tons per capita and, assuming that EU countries' targets would require more expensive technologies to reduce emissions, would therefore cost in order of magnitude US$65 (€63.8) per year. With a median household size of 2.4 and the exchange rate of dollars to euros at the time of our study (as of June 2021, US$1 = €0.982), this would translate to approximately US$125 per household per year. However, abatement costs for an additional 10 percentage points likely differ somewhat among member states, and the different cost levels used in our experiment correspond to a range of abatement costs spanning from cheaper abatement opportunities (fuel-efficient vehicles, public transport, and efficient lighting technologies) to more expensive technologies such as carbon capture and storage.

low cost (€25) that we find majority support in all countries except Finland. This suggests that the cost of the policy is the primary factor for support.

4. Conclusions

Why do nations fail at showing climate leadership? There are probably many explanations. It could be that the need is perceived as something distant, both in time and, for Europe, even in space. Moreover, knowing that one's lifestyle is a substantial part of the problem can trigger dissonance and denial. Our study finds, however, that a significant part of the explanation is that countries simply do not want to take costly measures or risk playing the sucker role while others take advantage as free riders. In our large-scale study in seven EU countries, we elicited citizens' beliefs about the probable reactions of other EU member states if their own country assumes a leadership role. Moreover, we also estimated, based on our survey experiment, the support for leading by example given various reactions by followers. The possible reactions of the other EU countries were to increase or decrease their carbon emissions or not react at all when the leader country decreases carbon emissions above its level of commitment in the current EU agreement. We find that citizens expect such leadership will most likely result in other countries not following suit or, even more extreme, increasing their emissions instead. The more optimistic view that other countries will follow the leader is more common among women and people with left-wing political views.

In our survey experiment, we identified the importance of followers' reactions to respondents' willingness to have their country take the lead (the degree of *conditional leadership*). We find that many citizens support *unconditional leadership* (i.e., their country taking the lead even if other countries do not follow suit), but only when the cost is low. Our main finding, however, is that a sizable number support *conditional leadership*: many citizens are more positive about taking the lead and decreasing emissions if informed that other countries will follow suit. For example, in Sweden and Austria, the probabilities are 19 and 14 percentage points higher, respectively, if other EU countries will follow their country's example with certainty than if there will be no reaction at all.

In all countries, respondents identifying as left-wing on the political spectrum are more likely to support a policy where their own country leads by example. However, practically all interaction terms concerning political preferences are insignificant, suggesting that although left-wing respondents are more likely to support domestic climate policies where their country takes the lead, and people are more likely to support taking the lead if they know that others will follow suit, we cannot conclude that left-wing respondents will take the lead because they expect that others will follow suit. We also find that support in general is sensitive to the cost of the policy and declines as the cost increases. Polish respondents are the most sensitive to the cost and almost three times more sensitive than Finnish respondents, who are the least sensitive. The fact that average incomes are much lower in Poland is likely an important explanatory factor.

Although abatement costs for an additional 10 percentage points differ among member states, it is likely that EU member states are at the higher end of the range of abatement costs to meet their targets. The different cost levels used in our experiment correspond to a range from cheaper abatement opportunities to more expensive technologies for those higher on the abatement cost curve. We find that at higher cost levels, there is not majority support in any of the countries for leading by example. We have to go down to the level of €25 per household per year to find majority support for leadership in all countries except Finland, where only 26% of citizens support their country taking the lead even at the lowest cost level. Moreover, there is ample evidence that individuals tend to overstate their economic valuation of a good when they do not have to back up their choices with real commitments in a survey like ours (see, e.g., Murphy et al., 2005; Carlsson and Martinsson, 2001; Vossler et al., 2012). Hence, this further strengthens the impression from our results about the weak support among countries for leading by example.

A quick read might give the impression that there is simply no support for more ambitious leadership in climate actions. It is important to note, however, that the reason for the lack of support is the expectation that such leadership will result in other countries behaving as free riders. The importance of expectations becomes very clear in Figure 4. At least for the cost level of €125 per household per year, there is in fact support for a more ambitious climate policy as long as the other EU nations will follow

this policy too. There is not, however, support for one's own country to go ahead with a policy without being certain what other countries will do. Perhaps not surprisingly, this highlights the importance of the current EU legislative process and negotiations of the Fit for 55 legislative package. This EU policy effectively provides a guarantee that other countries will follow suit and thus bridges the gap between higher willingness to pay if all countries contribute and lower willingness to be a leader when the extent to which others will follow is uncertain.

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References

Ahlquist, J. S., & Levi, M. (2011). Leadership: What it means, what it does, and what we want to know about it. *Annual Review of Political Science*, 14, 1-24.

Arce, M, D. G. (2001). Leadership and the aggregation of international collective action. *Oxford Economic Papers*, 53(1), 114-137.

Barrett, S., and A Dannenberg. (2014). Negotiating to avoid "gradual" versus "dangerous" climate change: An experimental test of two prisoners' dilemmas," in T. Cherry, J. Hovi, and D. M. McEvoy (eds.), *Towards a New Climate Agreement: Conflict, Resolution, and Governance*. London: Routledge.

Carlsson, F., & Martinsson, P. (2001). Do hypothetical and actual marginal willingness to pay differ in choice experiments?: Application to the valuation of the environment. *Journal of Environmental Economics and Management*, *41*(2), 179-192.

Dolphin, G. 2022. Evaluating National and Subnational Carbon Prices: A Harmonized Approach. Working Paper 22-4. Washington, DC: Resources for the Future.

Eichenseer, M. (2019). Leading by example in public goods experiments: What do we know? Working Paper University of Regensburg

European Climate Foundation. (2021). Roadmap 2050. https://www.roadmap2050.eu/, accessed 2021-12-19.

European Commission. (2021). 2030 climate & energy framework. https://ec.europa.eu/clima/eu-action/climate-strategies-targets/2030-climate-energy-framework_en, accessed 2021-12-19.

European Union. (2018). Binding annual greenhouse gas emission reductions by member states from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013. Regulation (EU) 2018/842 of the European Parliament and of the Council.

Fischbacher, U., Gächter, S., & Fehr, E. (2001). Are people conditionally cooperative? Evidence from a public goods experiment. *Economics Letters*, 71(3), 397-404.

Gächter, S. (2007). Conditional Cooperation: Behavioral Regularities from the Lab and the Field and Their Policy Implications. *Economics and Psychology: A Promising New Cross-Disciplinary Field*, CESifo Seminar Series, edited by B. S. Frey and A. Stutzer. Cambridge, MA: MIT Press.

Gächter, S., & Herrmann, B. (2009). Reciprocity, culture and human cooperation: Previous insights and a new cross-cultural experiment. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 364(1518), 791-806.

Gächter, S., & E. Renner. (2014). Leaders as role models for the voluntary provision of public goods. CESifo Working Paper no. 5049. Munich: Center for Economic Studies and Ifo Institute.

Gilovich, T. (1990). Differential construal and the false consensus effect. *Journal of Personality and Social Psychology*, *59*(4), 623.

Grünhage, T., & Reuter M. (2021). Tell me who you vote for, and I'll tell you who you are? The associations of political orientation with personality and prosocial behavior and the plausibility of evolutionary approaches. *Frontiers in Psychology*, 19 May 2021.

Güth, W., Levati, M. V., Sutter, M., & Van Der Heijden, E. (2007). Leading by example with and without exclusion power in voluntary contribution experiments. *Journal of Public Economics*, 91(5-6), 1023-1042.
Harring, N., Jagers, S. C., & Matti, S. (2017). Public support for pro-environmental policy measures: Examining the impact of personal values and ideology. *Sustainability*, 9(5), 679.
Helland, L., Hovi, J., & Sælen, H. (2018). Climate leadership by conditional commitments. *Oxford Economic Papers*, 70(2), 417-442.
Hermalin, B. E. (1998). Toward an economic theory of leadership: Leading by example. *American Economic Review*, 88(5), 1188-1206.
IPCC. (2022). *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [P. R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY. doi: 10.1017/9781009157926.
Kocher, M. G., Cherry, T., Kroll, S., Netzer, R. J., & Sutter, M. (2008). Conditional cooperation on three continents. *Economics Letters*, 101(3), 175-178.
Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin*, 108(3), 480.
Levati, M. V., Sutter, M., & Van der Heijden, E. (2007). Leading by example in a public goods experiment with heterogeneity and incomplete information. *Journal of Conflict Resolution*, 51(5), 793-818.
Murphy, J. J., Allen, P. G., Stevens, T. H., & Weatherhead, D. (2005). A meta-analysis of hypothetical bias in stated preference valuation. Environmental and Resource Economics, 30(3), 313-325.
Nickerson, R. S. (1998). Confirmation bias: A ubiquitous phenomenon in many guises. *Review of General Psychology*, 2(2), 175-220.
Nordhaus, W. (2015). Climate clubs: Overcoming free-riding in international climate policy. *American Economic Review*, 105(4), 1339-70.
OECD (Organisation for Economic Co-operation and Development). (2022). Greenhouse gas emission. https://stats.oecd.org/Index.aspx?DataSetCode=AIR_GHG, accessed 2022-2-21.
Potters, J., Sefton, M., & Vesterlund, L. (2007). Leading-by-example and signaling in voluntary contribution games: An experimental study. *Economic Theory*, 33(1), 169-182.
Reingewertz, Y. (2017). Will leading by example help in mitigating climate change? A comment on "The economics of leadership in climate change mitigation" by Gregor Schwerhoff. *Climate Policy*, 17(6), 814-816.
Schwerhoff, G. (2016). The economics of leadership in climate change mitigation. *Climate Policy*, 16(2), 196-214.
UNESCO (2011). International Standard Classification of Education 2011, UNESCO Institute for Statistics.
Vesterlund, L. (2003). The informational value of sequential fundraising. *Journal of Public Economics*, 87(3-4), 627-657.

Vossler, C. A., Doyon, M., & Rondeau, D. (2012). Truth in consequentiality: theory and field evidence on discrete choice experiments. *American Economic Journal: Microeconomics*, *4*(4), 145-71.

Zehnder, C., Herz, H., & Bonardi, J. P. (2017). A productive clash of cultures: Injecting economics into leadership research. *Leadership Quarterly*, 28(1), 65-85.

Table A1. Descriptive statistics: socioeconomic characteristics

	Sweden	Spain	Poland	Germany	France	Finland	Austria
Female	0.52	0.51	0.50	0.50	0.50	0.52	0.50
Age	45	46	47	49	49	45	48
	(16)	(15)	(16)	(15)	(15)	(17)	(16)
Less than high school	0.05	0.06	0.02	0.22	0.02	0.07	0.17
High school	0.46	0.60	0.50	0.42	0.53	0.57	0.62
University	0.50	0.35	0.48	0.36	0.44	0.36	0.21
No. of adults	1.87	2.41	2.28	1.90	1.93	1.76	2.02
	(0.75)	(1.05)	(1.12)	(0.90)	(0.87)	(0.69)	(1.04)
Kids in household	0.40	0.38	0.47	0.35	0.40	0.32	0.40
Income	3.96	2.10	0.87	2.84	2.70	3.26	2.38
	(1.74)	(1.34)	(0.36)	(1.50)	(1.38)	(1.73)	(1.71)
No response income	0.00	0.00	0.00	0.00	0.00	0.00	0.30
Left-right	5.36	4.31	4.93	4.71	5.20	5.10	4.79
	(2.51)	(2.41)	(2.32)	(1.70)	(2.44)	(2.23)	(1.77)
No. of observations	2183	2134	2134	2139	2075	2185	2117

Table A2. Descriptive statistics: attitudes toward climate change.

Variable	Sweden	Spain	Poland	Germany	France	Finland	Austria
Temperature has increased	0.94	0.96	0.91	0.92	0.95	0.92	0.91
Temperature increases mainly caused by humans	0.65	0.73	0.58	0.59	0.67	0.58	0.56
Can't stop climate change	0.05	0.07	0.09	0.07	0.10	0.05	0.09
Can only slow down climate change	0.79	0.73	0.76	0.76	0.79	0.82	0.79
Can stop climate change	0.15	0.18	0.13	0.14	0.10	0.10	0.10
There is no climate change	0.01	0.01	0.02	0.03	0.01	0.03	0.03
Information about own country's CO_2 impact on total EU emissions is new	0.68	0.83	0.67	0.64	0.70	0.56	0.69
No. of observations	2,183	2,134	2,134	2,139	2,075	2,185	2,117

Table A3. Percentage of respondents supporting their own country taking the lead for the five different reactions of other countries and the five different cost levels

	Cost to households in euros				
	€25	€75	€125	€200	All
			Sweden		
No reaction	56	47	40	33	44
50% others reduce	64	62	52	42	55
Others reduce for sure	73	65	59	54	63
50% others increase	54	45	38	34	43
Others increase for sure	43	40	38	30	38
			Spain		
No reaction	56	53	47	41	48
50% others reduce	59	55	50	45	51
Others reduce for sure	67	57	52	50	55
50% others increase	62	48	46	44	49
Others increase for sure	51	43	42	42	44
			Poland		
No reaction	50	47	41	38	43
50% others reduce	54	51	45	38	45
Others reduce for sure	60	55	49	45	51
50% others increase	45	44	40	40	41
Others increase for sure	50	45	36	31	39
			Germany		
No reaction	59	47	42	36	44
50% others reduce	62	51	50	43	50
Others reduce for sure	64	60	54	46	54
50% others increase	53	43	42	33	41
Others increase for sure	47	39	34	30	36
			France		
No reaction	60	48	44	42	47
50% others reduce	68	58	45	51	54
Others reduce for sure	65	62	56	53	58
50% others increase	60	49	42	42	47
Others increase for sure	53	44	42	38	43
			Finland		
No reaction	46	39	34	35	38
50% others reduce	57	50	43	43	48
Others reduce for sure	65	56	52	51	55
50% others increase	42	40	32	32	35
Others increase for sure	36	31	28	30	31
			Austria		
No reaction	51	43	38	38	42
50% others reduce	62	57	45	46	53
Others reduce for sure	62	57	55	48	55
50% others increase	54	46	40	34	44
Others increase for sure	48	40	39	38	38

Table A4. Marginal effects: probability that respondents would like their own country to lead by example

	Sweden	Spain	Poland	Germany	France	Finland	Austria
Others increase with certainty	-0.05***	-0.04*	-0.04**	-0.08***	-0.03	-0.08***	-0.05***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
50% others increase	-0.003	0.001	-0.01	-0.02	-0.01	-0.03*	0.01
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
50% others reduce	0.11***	0.02	0.03*	0.06***	0.07***	0.10***	0.11***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(04.01)
Others reduce with certainty	0.19***	0.08***	0.08***	0.11***	0.09***	0.17***	0.14***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Annual cost in 100 euros	-0.11***	-0.07***	-0.16***	-0.11***	-0.09***	-0.06***	-0.09***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
No. of observations	10915	10670	10670	10695	10375	10925	10585
No. of respondents	2183	2134	2134	2139	2075	2185	2117

Notes: Marginal effects of the binary probit model. Survey weights based on educational attainment. Standard errors in parentheses and clustered at individual level. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A5. Marginal effects: probability that respondents would like their own country to take the lead, using models that include socioeconomic variables

	Sweden	Spain	Poland	Germany	France	Finland	Austria
Others increase for sure	-0.06***	-0.04*	-0.04**	-0.08***	-0.03	-0.08***	-0.05***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
50% others increase	-0.00	0.00	-0.01	-0.02	-0.01	-0.03*	0.01
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
50% others reduce	0.11***	0.02	0.03*	0.06***	0.07***	0.10***	0.11***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Others reduce for sure	0.21***	0.08***	0.08***	0.11***	0.09***	0.18***	0.14***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Annual cost in 100 euros	-0.12***	-0.07***	-0.17***	-0.11***	-0.09***	-0.06***	-0.10***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Female	-0.02	-0.02	0.00	-0.02	-0.01	0.05**	-0.01
	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Age	-0.00***	-0.00**	-0.00*	-0.00***	-0.00***	-0.00***	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
High school	0.04	0.03	-0.03	0.03	0.02	-0.05	0.05
	(0.05)	(0.04)	(0.07)	(0.02)	(0.05)	(0.03)	(0.02)
University	0.11*	0.05	-0.02	0.12***	0.06	0.05	0.08**
	(0.05)	(0.04)	(0.07)	(0.02)	(0.06)	(0.04)	(0.03)
No. of adults	-0.04*	0.01	-0.00	-0.01	-0.01	-0.02	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
Kids in household	0.02	-0.01	0.01	0.00	0.05	-0.03	0.02
	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
Income	0.03***	0.02	0.01	0.01	0.00	0.01*	0.01
	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)
No response income							-0.01
							(0.03)
Left-right	-0.05***	-0.02***	-0.02***	-0.06***	-0.02**	-0.04***	-0.05***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
Observations	10915	10670	10670	10695	10375	10925	10585

Notes: Marginal effects of the binary probit model. Survey weights based on educational attainment. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A6. Marginal effects: probability that respondents would like their own country to take the lead, using models that include preferences for moral obligations, "It is morally correct to decrease above the EU agreement level"

	Sweden	Spain	Poland	Germany	France	Finland	Austria
Others increase for sure	0.09*	0.01	-0.03	-0.01	0.08	-0.03	0.05
	(0.05)	(0.06)	(0.05)	(0.05)	(0.07)	(0.04)	(0.04)
50% others increase	0.04	-0.03	-0.03	0.01	-0.06	0.01	0.04
	(0.05)	(0.07)	(0.04)	(0.05)	(0.07)	(0.04)	(0.04)
50% others reduce	0.05	0.03	0.00	0.01	-0.01	0.00	0.03
	(0.05)	(0.06)	(0.05)	(0.05)	(0.06)	(0.04)	(0.04)
Others reduce for sure	0.23***	0.06	0.06	0.10*	0.02	0.16***	0.06
	(0.04)	(0.08)	(0.05)	(0.04)	(0.08)	(0.04)	(0.04)
Annual cost in 100 euros	-0.13***	-0.07***	-0.17***	-0.12***	-0.09***	-0.07***	-0.10***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Others incr. for sure × moral	-0.04***	-0.01	-0.00	-0.02	-0.03	-0.02	-0.03**
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
50% others increase × moral	-0.01	0.01	0.01	-0.01	0.01	-0.01	-0.01
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
50% others reduce × moral	0.02	-0.00	0.01	0.01	0.02	0.03**	0.03*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Others red. for sure × moral	0.00	0.01	0.00	0.01	0.02	0.01	0.03*
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
Yes: morally right	0.20***	0.09***	0.08***	0.16***	0.09***	0.19***	0.15***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
No. of observations	10915	10670	10670	10695	10375	10925	10585
No. of respondents	2183	2134	2134	2139	2075	2185	2117

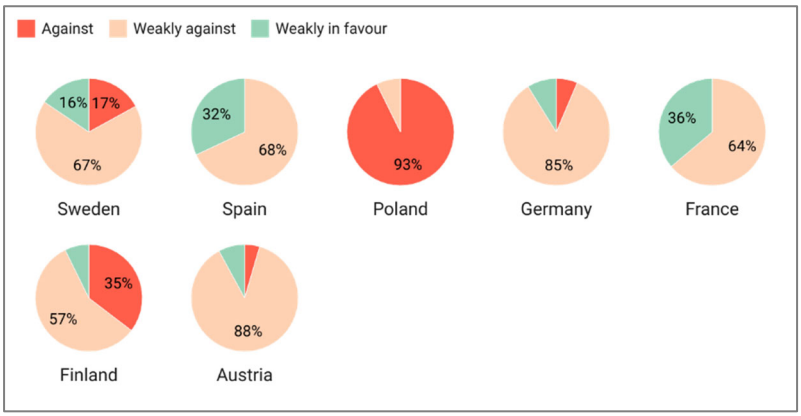
Notes: Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A7. Predicted support for leading by example at different cost levels (shares of respondents within each category)

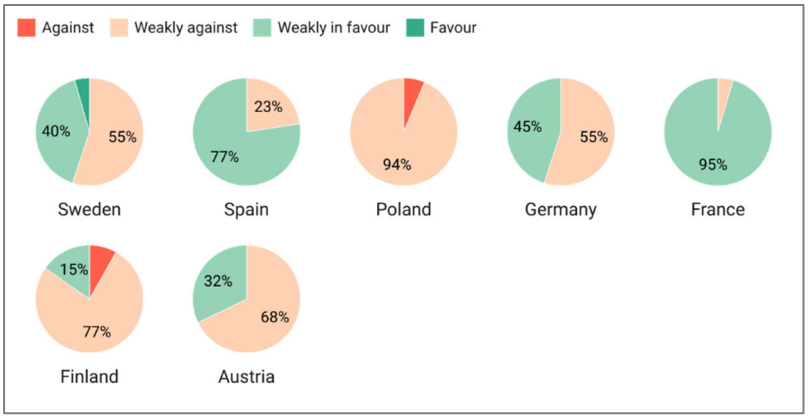
Country	Cost level	Strongly against	Against	Weakly against	Weakly in favor	In favor	Strongly in favor
Sweden	25 euros	0%	0%	6%	74%	21%	0%
	75 euros	0%	0%	55%	40%	4%	0%
	125 euros	0%	17%	67%	16%	0%	0%
Spain	25 euros	0%	0%	1%	92%	6%	0%
	75 euros	0%	0%	23%	77%	0%	0%
	125 euros	0%	0%	68%	32%	0%	0%
Poland	25 euros	0%	0%	49%	51%	0%	0%
	75 euros	0%	6%	94%	0%	0%	0%
	125 euros	0%	93%	7%	0%	0%	0%
Germany	25 euros	0%	0%	6%	85%	10%	0%
	75 euros	0%	0%	55%	45%	0%	0%
	125 euros	0%	6%	85%	9%	0%	0%
France	25 euros	0%	0%	0%	83%	17%	0%
	75 euros	0%	0%	5%	95%	0%	0%
	125 euros	0%	0%	64%	36%	0%	0%
Finland	25 euros	0%	3%	71%	24%	2%	0%
	75 euros	0%	8%	77%	15%	0%	0%
	125 euros	0%	35%	57%	7%	0%	0%
Austria	25 euros	0%	0%	9%	86%	5%	0%
	75 euros	0%	0%	68%	32%	0%	0%
	125 euros	0%	5%	88%	8%	0%	0%

Notes: Against: $P[Yes] < 0.4$. Weakly against $0.4 \leq P[Yes] < 0.5$. Weakly in favor: $0.5 \leq P[Yes] \leq 0.6$. In favor: $P[Yes] > 0.6$.

a) High cost (125€/year)



b) Medium cost (75€/year)



c) Low cost (25€/year)

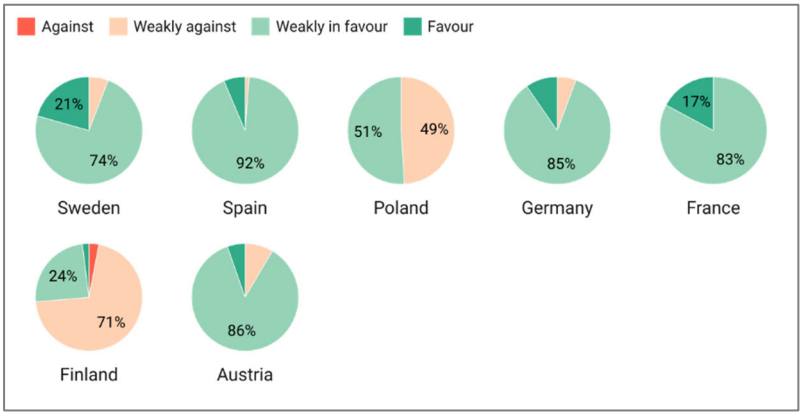


Figure A1. Predicting support at different cost levels for leading by example, using stated expectations of other countries' reactions and the estimated model from the experiment

Notes: Against: P[Yes] < 0.4. Weakly against: 0.4 ≤ P[Yes] < 0.5. Weakly in favor: 0.5 ≤ P[Yes] ≤ 0.6. In favor: P[Yes] > 0.6.