FIGHTING CLIMATE CHANGE:
INTERNATIONAL ATTITUDES TOWARD CLIMATE POLICIES

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ABSTRACT

Using new surveys on more than 40,000 respondents in twenty countries that account for 72% of
global CO2 emissions, we study the understanding of and attitudes toward climate change and
climate policies. We show that, across countries, support for climate policies hinges on three key
perceptions centered around the effectiveness of the policies in reducing emissions (effectiveness
concerns), their distributional impacts on lower-income households (inequality concerns), and
their impact on the respondents' household (self-interest). We show experimentally that
information specifically ad-dressing these key concerns can substantially increase the support for
climate policies in many countries. Explaining how policies work and who can benefit from them
is critical to foster policy support, whereas simply informing people about the impacts of climate
change is not effective. Furthermore, we identify several socioeconomic and lifestyle factors –
most notably education, political leanings, and availability of public transportation – that are
significantly correlated with both policy views and overall reasoning and beliefs about climate
policies. However, it is difficult to predict beliefs or policy views based on these characteristics
only.

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A data appendix is available at http://www.nber.org/data-appendix/w30265

1 Introduction

Limiting the average temperature increase to less than 2°C above pre-industrial levels requires drastically reducing global emissions by 2050 (IPCC 2021). Judging by publicly announced long-term commitments and goals, policymakers appear to be taking this imperative seriously: Over 140 countries representing 90% of global greenhouse gas emissions have so far adopted or announced climate neutrality targets by mid-century (NPUC 2021). Yet, while climate mitigation ambitions are robust, bold policy measures to achieve them are lagging. Given current policies, scientists expect average temperatures to rise by about 2.7°C by 2100, increasing the likelihood of catastrophic impacts for societies and economies (Climate Action Tracker 2021; IPCC 2022).

Indeed, climate policies–and in particular carbon pricing mechanisms, which economists see as a key to reducing emissions (Stiglitz et al. 2017)–have often been difficult to implement, even when the objective of limiting global warming is broadly accepted. As our new large-scale international survey across 20 countries reveals, at least three-quarters of respondents in each country agree that "climate change is an important problem" and that their country "should take measures to fight" it (see Figure 2), but this often does not translate into an agreement on which climate policies to support.

In this paper, we seek to understand what drives support for or opposition to important climate policies across the world. Does resistance to new climate policies simply stem from a lack of knowledge about the impacts of climate change? Are citizens worried about the effects of policies on their own budget and lifestyle? Do they hold broader concerns about the effects of climate policies on others and on the economy? Or do they struggle to assess how any given policy will influence climate change? Our goal is to offer new cross-country evidence on people's perceptions of, understanding of, and attitudes toward climate change and climate policies. Climate change is a global problem with disparate impacts across countries and people (Carleton et al. 2022), and it is thus necessary to study these issues internationally in both developed and developing economies.

We conduct large-scale international surveys on over 40,000 respondents in the twenty countries depicted in Figure 1. These countries span different income levels and social and economic contexts. Taken together, they account for 72% of global 2017 CO_2 emissions (JRC 2018) and include 18 out of the 21 largest emitters of greenhouse gases (GHG).[1] We elicit respondents' knowledge and understanding of climate change and their views on a broad range of climate mitigation policies. Importantly, we ask specific questions about their understanding and perceptions of how these policies work in terms of their effectiveness, economic impacts, distributional consequences, and effects on their household. In addition, we show a random sub-sample of respondents pedagogical videos on the impacts of climate change in their country and/or on how three key climate policies – a ban on combustion-engine cars, a carbon tax with cash transfers, and a green infrastructure program – work, allowing us to measure the causal effect of specific information provision on policy views.

Our main findings are as follows. First, we shed light on the factors that foster peo-

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[1]The three large emitters that we do not have in our sample are Russia, Iran, and Saudi Arabia.

Figure 1: The 20 countries covered in the survey
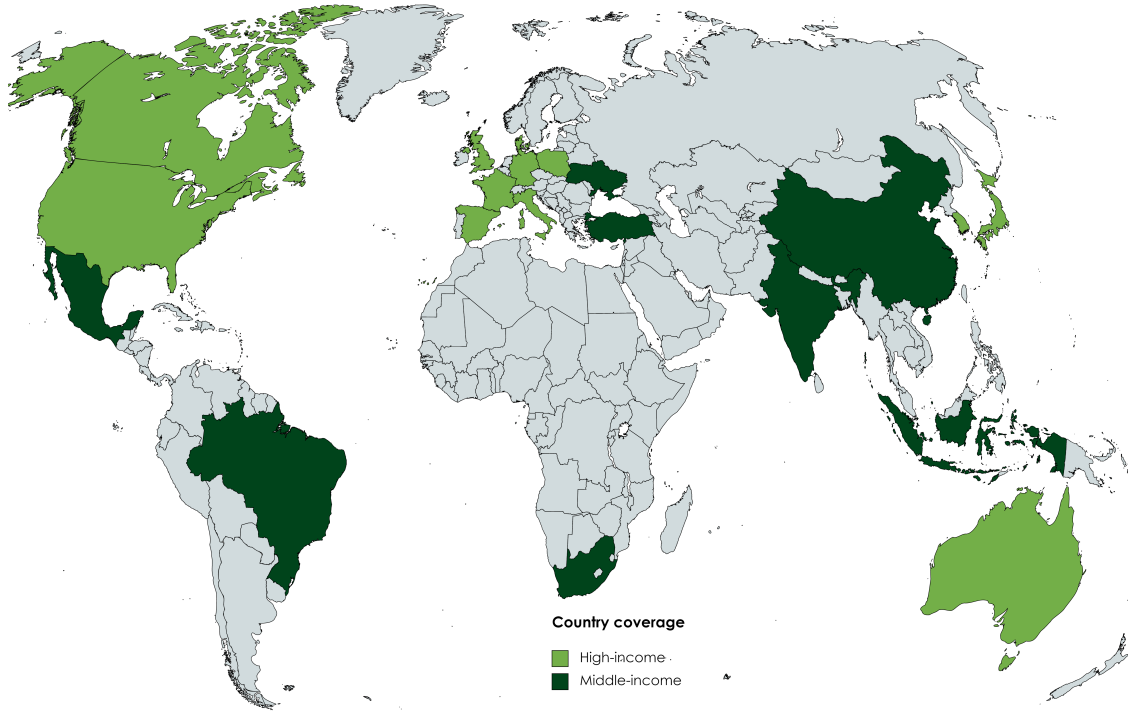
ple's support for more climate action. Three fundamental beliefs are major predictors of whether people support a given climate policy: i) its perceived ability to reduce emissions (effectiveness), ii) its perceived distributional impacts on lower-income households (inequality concerns), and iii) its perceived impact on people's household (self-interest). By contrast, while most respondents are already deeply concerned about climate change, these concerns are not significant predictors of their policy views. Similarly, even though respondents exhibit varying degrees of knowledge about the causes and consequences of climate change, this type of knowledge does not significantly correlate with their policy views.

Consequently, support for climate policies strongly depends on their specific modalities. There is more support for policy designs perceived to be more effective and progressive. These include targeted investment programs (e.g., in green infrastructure or low-carbon technologies) that are financed by progressive taxes or public debt, carbon taxes with strongly progressive use of revenues (such as cash transfers to the poorest or vulnerable households),[2] and regulations rather than corrective taxes in some settings (such as bans on polluting vehicles from city centers or dense areas and the mandatory insulation of buildings).

We confirm the importance of the three core beliefs experimentally. Compared with a control group who saw no video, respondents who saw the video documenting the impacts of climate change in the viewer's country did not significantly change their views on climate policies. On the contrary, respondents who see a video explaining how the three central poli-

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[2]Vulnerable households are defined as low-income or as being constrained, e.g., living in areas with little public transportation.

Figure 2: Share of respondents who agree (somewhat to strongly) that "Climate change is an important problem" or that their country "should take measures to fight climate change"
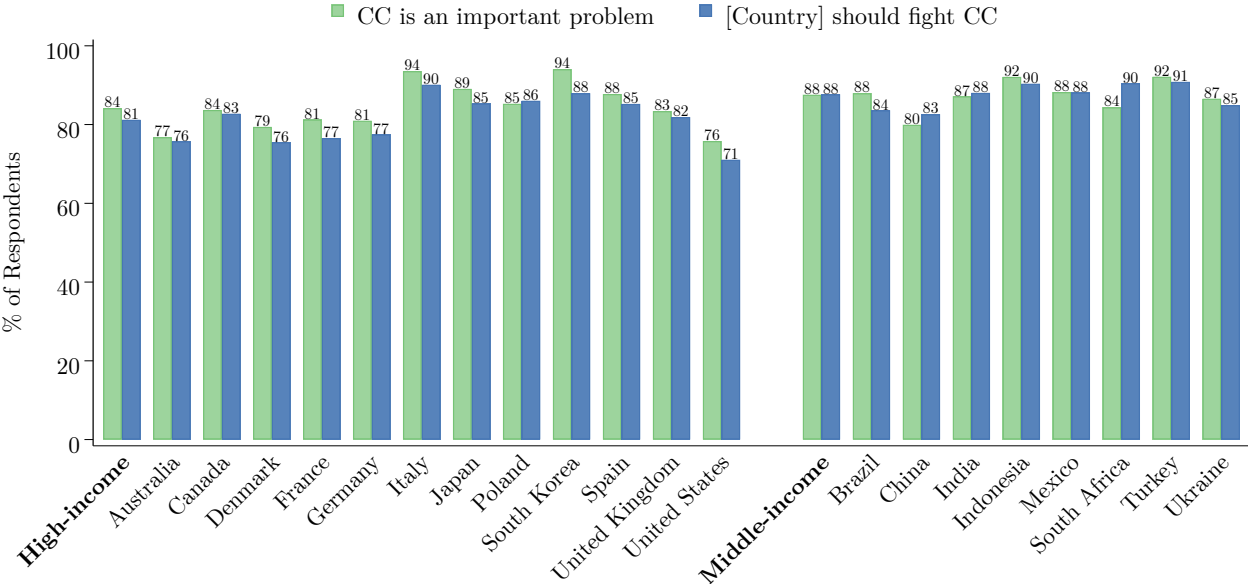
cies work and their distributional implications exhibit stronger support for these and related climate policies. The same goes for respondents who see both videos. Thus, information and explanations work, but only if they address people's main concerns.

We also explore how personal socioeconomic characteristics, lifestyle, and energy usage correlate with policy views. More educated and left-leaning respondents are generally more supportive of climate policies. Higher household income is only associated with stronger climate action support in some countries.[3] There are mixed patterns across countries for age; it is thus not the case that young respondents are systematically more favorable to climate policies. Opposition to climate policies is strongly correlated with lower availability of public transportation, greater reliance on cars, and, to a lesser extent, higher gas expenses. Furthermore, these respondent characteristics are also significantly correlated with beliefs about climate policy effectiveness and distributional impacts, not just the perceived impacts on one's household (self-interest). Yet, it is challenging to predict beliefs or policy views based on socioeconomic and lifestyle characteristics only. Put differently, we are not easily able to infer people's policy views or beliefs based on their age, country, gender, education, income, political leanings, or how much they rely on polluting sources of energy.

Related Literature. Our paper builds on the theoretical literature on the political economy of environmental and climate change policies, which focuses on the role of interest groups and other political obstacles to the implementation of new environmental regulations (see Hahn and Stavins (1992) and Anthoff and Hahn (2010), as well as Oates and Portney

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[3]Brazil, India, Indonesia, Italy, Poland, and Ukraine.

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(2003) and Aldy et al. (2010) for reviews). The global and diffuse nature of climate change complicates the political economy of climate policies. Absent international treaties or coordination, countries are tempted to pollute too much and invest too little in green technologies (Harstad (2016)). Furthermore, regulated sectors often face high economic costs like reduced employment (Dechezleprêtre and Sato 2017; Walker 2011). Battaglini and Harstad (2020) propose a theory of international environmental agreements in which political incumbents worry about reelections. They show that incumbents will tend to craft treaties that are at the same time overambitious and weak. Their theory also predicts that countries will rely on technology instead of sanctions – a finding that is coherent with our results that respondents tend to prefer green investment policies to taxation. Besley and Persson (2022) provide a new dynamic model to study the circumstances under which a green transition could happen, analyzing the roles of political and market forces. Across countries, Shapiro (2021) shows that import tariffs and non-tariff barriers are substantially lower on emissions-intensive industries than on clean sectors, which the author attributes to the more substantial lobbying power of energy-intensive industries (steel, glass, cement, chemicals, etc.) where companies are few and large and in which energy (and thus abatement) costs represent a significant share of production costs – a critical political economy barrier to efficient policies. Other papers within the theoretical literature focus on the forming of citizens' beliefs and perceptions and their consequences on demand for environmental regulation through political institutions. Millner and Ollivier (2016) synthesize this literature and show that biases in risk perception and informational distortions in the policy process are significant for global environmental problems. Due to these barriers, the literature has shown that some of the economically most efficient climate policies, such as comprehensive pricing of carbon emissions, often face political obstacles that can lead to less efficient and sometimes regressive policies. These include regulation, e.g., of the fuel efficiency of vehicles (Davis and Knittel 2019; Levinson 2019) or residential energy use(Fowlie, Greenstone and Wolfram 2018).

Our paper contributes to the empirical literature exploring the drivers of support for climate policies. Whitmarsh and Capstick (2018) provide an overview of work on public attitudes toward climate change, and Drews and van den Bergh (2016) summarize the research on what determines support for climate policies. Klenert et al. (2018), Maestre-Andrés, Drews and van den Bergh (2019) and Carattini, Carvalho and Fankhauser (2018) offer comprehensive reviews of work on attitudes towards carbon taxes and offer suggestions to improve its acceptability.

Fairbrother (2022) calls for more comprehensive studies that cover policies other than carbon taxes and in non-Western economies, which we do in this paper. By contrast, existing studies largely focus on Western economies, carbon taxes, and carbon pricing. They show that people often reject carbon pricing because they perceive it as ineffective (Sælen and Kallbekken (2011) for Norway), misunderstand its costs and benefits (e.g., Thalmann (2004) for Switzerland; Jagers and Hammar (2009) for Sweden), perceive it to be regressive and costly for them (Brannlund and Persson (2012) for Sweden), or care about its distributional impacts as much as about its effectiveness (Dietz and Atkinson (2010) for the U.K.; Sommer, Mattauch and Pahle (2022) for Germany). Douenne and Fabre (2022) show that opposition

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to carbon pricing in France during the Yellow Vest movement was driven by misperceptions about how the policy would impact people and its effectiveness. Bergquist, Mildenberger and Stokes (2020) find that, in the U.S., linking climate policy to other economic and social reforms can mitigate the concern for distributional impacts and increase the support for carbon pricing. D'Acunto et al. (2022) study support for alternative forms of financing of climate change policies in Germany. After being informed that the rich contribute more to climate change than the poor, respondents' support for carbon taxes increases. Umit and Schaffer (2020) leverage the European Social Survey to highlight a widespread aversion to carbon taxes, correlated with a respondent's reliance on fossil fuel energy and low political trust. Bechtel, Scheve and van Lieshout (2020) analyze public support for different carbon pricing trajectories in France, Germany, the U.K., and the U.S. They show that growing carbon price trajectories are less popular than stable carbon prices, which they link to respondents' time preferences and desire to smooth consumption.

Closely related to our paper is the work by Carattini et al. (2017) for Switzerland (see also Baranzini and Carattini (2017)). The authors study voting behavior in a large ballot on energy taxes and find, as we do, that concerns around distributional consequences and effectiveness are key determinants of voting. They also use a survey experiment to test the acceptability of alternative designs of the carbon tax. In general, respondents prefer earmarking of carbon taxes for environmental purposes – a pattern that we show to be consistent across many countries – but informing them about the effectiveness of the carbon tax reduces their demand for earmarking. In line with our experimental results, the authors also show that explaining that a carbon tax with lump-sum recycling is progressive increases support for it. Tarduno (2020) similarly leverages an information experiment around a real-world vote. He studies Nevada's renewable portfolio standard and finds that voting is relatively responsive to perceived policy effectiveness. Bernauer and Gampfer (2015), McEvoy and Cherry (2016) and McGrath and Bernauer (2017) study how support for climate policies depends on internationally coordinated action. Overall, people support even unilateral action by their country.[4]

Our paper builds on this existing empirical work and makes several contributions. We investigate preferences across a comprehensive set of distinct and varied climate policies with different characteristics. We cover 20 countries with varying levels of income across several continents. Our aim is to provide standardized and detailed survey questions to elicit not only policy views but also the underlying reasoning of respondents. Thanks to our questionnaire, we can identify which individual characteristics and beliefs are associated with policy preferences. We also design pedagogical video treatments to test the causal impact of providing explanations–not only factual information–about climate change impacts and policies.

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[4]Furthermore, there have been several recent initiatives for data collection across multiple countries, by the United Nations (UNDP 2021), Electricite de France (EDF) and Ipsos (Ipsos 2020), the Pew Research center Stokes, Wike and Carle (2015), and by researchers surveying Facebook users in 30 countries (Leiserowitz et al. 2021). Unlike our paper, they do not focus on policies.

While not the core focus of our paper, we do also study willingness to adopt climate-friendly behaviors (at the individual level), which is conceptually distinct from supporting public climate policies. Related work by Bernard, Tzamourani and Weber (2022) shows that receiving information about ways to reduce CO_2 emissions increases individuals' willingness to pay for voluntary CO_2 offsetting. Andre et al. (2021) study the behavioral determinants of the willingness to fight climate change – as measured through an incentivized donation decision – in a large representative sample of U.S. adults. Predictors of climate change behavior are beliefs about social norms, patience and altruism, and universal moral values. An experiment shows that correcting the underestimation that many respondents have about the extent to which fellow citizens exhibit climate-friendly behaviors and norms improves their willingness to adopt climate-friendly behaviors. The importance of higher-order beliefs (beliefs about others' beliefs) and social norms is also emphasized in Mildenberger and Tingley (2019) and Bolsen, Leeper and Shapiro (2014).[5] Allcott (2011) uses a randomized field experiment in the United States, in which treated households were told how their electricity usage compared to that of their neighbors and finds important effects. We do not study norms directly, but we also find that citizens are more willing to adopt climate-friendly behaviors if others – particularly the rich – adopt them (and if they receive sufficient financial help).

Methodologically, our paper builds on Stantcheva (2021) and Stantcheva (2022*b*) which analyze how people understand tax and trade policy in the U.S. Bursztyn and Yang (2021) provide a meta-analysis of the literature aimed at correcting misperceptions, and Haaland, Roth and Wohlfart (2020) offer an overview of the methodology. Beyond information experiments and provision of facts, our aim is to provide *explanations* using pedagogical materials (e.g., videos).

The rest of the paper is organized as follows. Section 2 describes the data collection, the sample, and the questionnaires. The subsequent sections present our main results: Section 3 focuses on knowledge about and attitudes toward climate change; Section 4 describes the support for policies across respondents and countries; Section 5 analyzes the beliefs and reasoning about the main climate policies covered; and Section 6 studies the factors that shape support for climate change action. The Online Appendix provides additional information on the survey and results. In addition, we replicate the complete analysis separately for each country in country-specific Online Appendices available on a dedicated website (https://www.oecd.org/climate-change/international-attitudes-toward-climate-policies/).

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[5]Johansson, Berggren and Nilsson (2022) find an association between intolerance and climate skepticism.

2 The survey

2.1 Survey data collection and sample

Data collection. We collected our survey data between March 2021 and March 2022 using the survey companies *Dynata* and *Respondi*. The survey companies maintain panels of respondents and send survey links to panelists with targeted socioeconomic characteristics. The companies also reward the respondents who fully complete the survey and compensation takes various forms, ranging from cash, donations to charities, frequent flyer points, or hotel points at partner companies. Excluding inattentive respondents that failed our attention check questions or who completed the survey too fast (as explained below), our main analysis sample has 40,680 respondents (between 1,465 and 2,488 respondents per country).

We first channel respondents through screening questions that ensure that the final sample is nationally representative along the dimensions of gender, age, income, region, and area of residence (urban versus rural). Appendix A-2.1 provides more details on our sampling procedure. For more information on online surveys, including recruitment, rewarding, and comparisons of online samples to other types of samples, see Stantcheva (2022a).

Sample. Tables 1-5 show that our sample is relatively representative in high-income countries. One dimension in which our sample differs from the population in some countries is education: In Italy, Japan, South Korea, and Spain, the share of college-educated respondents in our sample is 15 to 25 percentage points higher than in the population. This is common in online survey samples (see Alsan et al. (2021), Stantcheva (2021), and Stantcheva (2022a)).

In middle-income countries (Brazil, China, India, Indonesia, Mexico, South Africa, Turkey, and Ukraine), we faced constraints due to the online nature of the survey and the pandemic-related restrictions on door-to-door surveys. College-educated people are overrepresented, and respondents aged 50 and older or living in rural areas tend to be underrepresented. Indeed, these types of respondents are always hard to reach in countries with similar characteristics. For these countries, the results should therefore be interpreted with caution, as they do not accurately reflect the attitudes of the population at large but rather those of the "online population," which tends to be skewed toward the middle and upper classes, residing mainly in urban areas.

Throughout the paper, we re-weighted the samples within each country along the dimensions of gender, age, income, region, urbanity, education, and employment.[6]

Data quality. We took several steps to ensure the best possible data quality. Native speakers translated and reviewed the survey into the main national languages of each country and ensured that it was in line with local context and understanding.

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[6]We trim weights so that no respondent receives a weight below 0.25 or above 4. Overall, trimming changes the weights for 3% of the respondents in high-income countries and 19% in middle-income countries.

On the introductory consent page, we appeal to people's social responsibility by asking them to answer carefully and honestly. We also warn them that we would withhold monetary compensation if their answers did not pass our quality checks, which is reinforced by the quality checks of the survey companies (of which respondents are aware). We record the time spent on different blocks and the survey overall. The median completion time is 28 minutes (see Appendix A-2 for the entire distribution of survey times).

We also added a question to screen out inattentive respondents. The representative samples (as shown in Tables 1-5) are obtained after excluding inattentive respondents who failed the attention check question (N=8,123, i.e. 15% of respondents) and those who rushed to complete the survey in less than 11 minutes (N=8,595, 16% of respondents). In total, because there is an overlap between those who rushed and those who failed the attention question, we end up excluding 25% of all respondents (N=13,274) who started the survey. We show in Appendix A-6.2 that our results are robust to the inclusion of these 25% of respondents and robust to dropping respondents who took less than 20 minutes to complete the survey (a more stringent cutoff).

We test for differential attrition in Table A20. 12% of respondents (N = 8,689) drop out during the socioeconomic background questions, i.e., very early on, before they know anything about the topic of the survey. Hence, they are not dropping out differentially based on their interest in and views on climate change. 11% of respondents (N = 7,123) drop out at some point during the actual survey. Female, younger, lower-income, and less educated respondents are more likely to drop out, but the differences in attrition rates are not large.

Ex post, we checked that there were only a few careless response patterns (such as choosing the same answer for all items in a matrix of questions; see Appendix A-2.2). At the end of the survey, we ask whether respondents thought that our survey was politically biased and provide some feedback. 74% of the respondents found the survey unbiased. 15% found it left-wing biased, and 11% found it right-wing biased.

2.2 The questionnaire

As shown in Figure 3, the questionnaire is structured in four parts, described below: questions on household characteristics, pedagogical video treatments, questions on climate change, and questions about views on climate policies. We kept the questionnaires as similar as possible across countries while allowing for some appropriate variations. For example, in some countries, we added questions about specific policies of relevance (e.g., a ban on deforestation in Brazil and Indonesia). We omit some inappropriate questions (e.g., heating expenses in tropical countries or cattle-related policies in India). Finally, necessary adjustments were made to country-specific figures and examples (e.g., the gasoline price increase implied by a carbon tax). Appendix A-5 provides the full questionnaire as well as links to each country's questionnaire in the original language.

Household characteristics. We ask the respondents about their basic socioeconomic and demographic information, including their age, income, gender, zip code, type of area

Figure 3: Survey outline

Background of respondent
Socio-economic characteristics, political views, energy use, consumption habits

Video information treatment

Control group	Climate impacts	Climate policies	Both treatments
No video information provided	Local impacts of climate change	• Ban on combustion-engine cars • Carbon tax w/ cash transfers • Green infrastructure program	Climate impacts + climate policies

Knowledge and understanding of climate change
- Climate change is real, anthropogenic, climate dynamics
- Factors causing climate change: gases, activities
- Impacts of climate change, prospects for the future

Views on climate policies
- **Three main policies**: ban on combustion-engine cars, green infrastructure program, carbon tax with cash transfers:
  - Policies' effectiveness: will the policies reduce emissions/pollution?
  - Distributional impacts: which groups will win or lose?
  - Self-interest concerns: will your household win or lose?
  - Perceived fairness
  - Support for policy (and variations of it)
- **Support for a range of other climate policies:** carbon taxes, emission standards, subsidies, mandatory insulation of buildings, policies to reduce beef consumption, global policies
- **Real-stake questions**: willingness to donate to reforestation cause, willingness to sign a petition for climate action

of residence (i.e., size of their city), household composition, the highest level of education achieved, occupation, wealth, and whether they are homeowners. We measure political leanings through several questions: voting behavior in the latest national election, general interest in politics, leaning on economic policy issues, and interest and participation in environmental causes.

An important set of questions centers around energy usage and lifestyle as related to climate change. The answers to these questions allow us to assess how respondents may personally be affected by climate policies. We ask households about their housing characteristics (heating source and expenses and the quality of their home insulation), transportation (fuel expenditures, modes of transport used, availability of public transportation, frequency of flying), and beef consumption.

Information and Pedagogical Video Experiments. In the experimental part of the paper, we show respondents in randomly selected subsamples one or both of two videos. The "control group" sees no video. The *Climate impacts* video, which is 2-3 minutes long, centers on the impacts of climate change, with information that is tailored to the country of the respondent. The *Climate policies* video (5 minutes long) focuses on three major climate

policies and is also adapted to each country's specifics.[7] The objective of these treatments is to understand how perceptions change after receiving salient information on the effects of climate change or climate policies and how these perceptions and beliefs causally translate into policy support. Appendix A-5 contains the scripts and links to the videos; Appendix A-7 contains the data sources used. Table A21 shows that our treatment assignment is balanced across socioeconomic and energy usage characteristics.

The video on *Climate impacts* starts by explaining that climate change is anthropogenic and is likely to have adverse impacts on the country of the respondent if nothing is done to reduce it. Some of the impacts presented include more severe heatwaves, frequent forest fires, and growing number of areas at risk of being permanently flooded due to sea-level rise (see Panel A in Figure 4).[8] The video concludes that it is necessary to reduce greenhouse gas (GHG) emissions to tackle climate change.

The video on *Climate policies* focuses on three significant climate policies implemented in many countries over the past years. It describes both some of their advantages and drawbacks. First, it presents a ban on the production and sale of new combustion-engine cars that emit more than a given (time-varying) threshold of CO_2 per kilometer.[9] The threshold is progressively lowered so that only electric (or hydrogen) vehicles can be sold by 2030. The video also alerts respondents that electric vehicles may have a lower range and be more expensive.

Second, the video describes a carbon tax with cash transfers that taxes all products that emit greenhouse gases. We directly tell the respondents about the increase in the implied price of gasoline in local currency (e.g., \$0.40 per gallon in the U.S. and €0.10 per liter in France).[10] The video explains that the tax makes fossil fuels more expensive. Hence, companies and individuals are likely to reduce their fossil fuel consumption and, thus, CO_2 emissions. It also informs the respondents about the cash transfer per adult that can be financed by the tax revenues (see Appendix A-7.1.1 for the computations). Furthermore, the video explains that equally redistributing the revenues across all people means that low-income earners will, on average, receive more cash transfers than they pay in taxes. The reverse holds for high-income earners (see Panel B in Figure 4).

Third, the video discusses the effects of an extensive public investment program in green infrastructure in transportation, energy, insulation, and agriculture financed by additional public debt. It provides estimates of the number of jobs created in non-polluting sectors and jobs lost in polluting sectors.[11] Finally, the video reminds the respondents that although we

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[7]Because we compute all descriptive statistics using the control group, we chose to make it 25% larger than the other groups. It contains 29.4% of the sample, while the three treatment branches each contain 23.5% of the sample.

[8]In Canada and Denmark, we also mention potential positive effects on crop production.

[9]This policy is similar to fuel economy standards that have been implemented in many countries, including the U.S., the European Union, China, and India (Anderson and Sallee 2016)

[10]Implicitly, we use a price of carbon \$45 per ton of CO_2, close to estimates of the social cost of carbon in Marron and Maag (2018), as explained in Appendix A-7.1.1

[11]Economists have advocated for green infrastructure investment programs for many years to accelerate the transition towards a low-carbon economy (Hepburn et al. 2020; High Level Commission on Carbon Prices 2017). Over the past years, many governments have started to launch such programs, including the E.U.'s

Figure 4: Treatment videos

(A) Climate impacts video

(B) Climate policies video

Today, the concentration of CO2 in the atmosphere is higher than any time over the last 800,000 years.
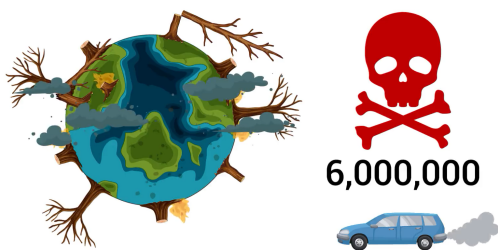
Air pollution caused by the burning of fossil fuels is already responsible for 6 million annual deaths worldwide.

In the North-East, the risk of heavy rain has already increased by 55%.

For example, the price of gasoline would increase by 40 cents per gallon.

To compensate people for the higher prices, the revenues of the carbon tax would be redistributed to all households, regardless of their income.
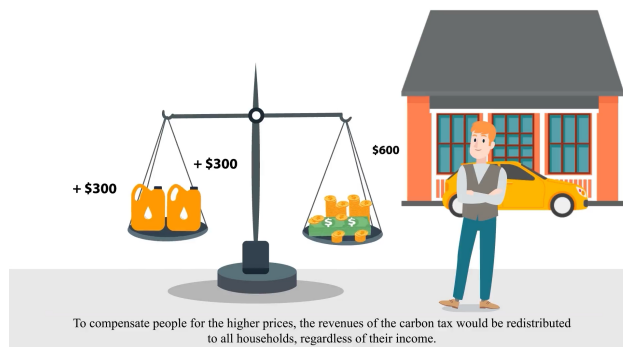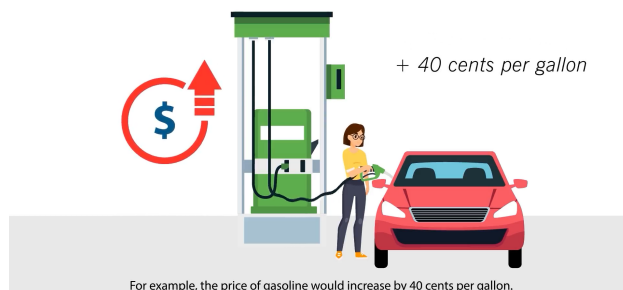
Does this policy work? Yes! The Canadian province of British Columbia has a carbon tax with cash transfers since 2008.

have focused on three essential policies, many others will be useful and needed to combat climate change and provide a few examples.

Knowledge of and attitudes toward climate change. We measure the respondent's knowledge and understanding of climate change by asking a series of general and more technical questions. These include whether climate change is human-caused, which greenhouse gases (GHGs) contribute to it, and its possible impacts. We also ask respondents to rank different activities, modes of transportation, types of food, and world regions regarding GHG emissions.

Furthermore, we elicit respondents' attitudes on private climate action by asking how climate change affects their lifestyle, the extent to which they are willing to adopt different climate-friendly behaviors, and what factors would facilitate this adoption.

Views on climate policies. One of our core contributions is to elicit detailed reasoning about climate change policies. In the final block of the survey, we explore how respondents think about the three main climate policies explained in the videos (a ban on combustion-engine cars, an investment program in green infrastructure, and a carbon tax with cash transfers) and a range of other climate policies.

Importantly, rather than only asking respondents about their support for the main policies, we also elicit their perceptions about the policy's effectiveness in reducing emissions and changing behaviors, effects on the economy and employment, distributional impacts (which groups will lose or win?), impacts on their household (will they lose or win?), and fairness. We further ask them about variations related to the sources of funding (in the case of the green infrastructure program), how the revenue is spent (in the case of the carbon tax), and policy bundles (e.g., a ban on combustion-engine cars combined with public provision of alternative modes of transportation).

The set of policies we test is informed by the literature and the policy discussions. We intentionally do not limit the policies to only cover first-best instruments because of potential trade-offs between efficiency and social acceptability or political economy. In addition to the three main policies described above, we test several other policies.

First, we assess support for several variants of carbon taxes, which differ in how the revenues are earmarked. Second, we include several variants of bans on polluting cars, motivated by existing bans or restrictions for combustion-engine cars, for example, in Mexico City (Davis 2008), or cities across Germany (Wolff 2014). The third group of policies includes support for investments in low-carbon technologies and green infrastructures. Fourth, we elicit support for policies to reduce emissions from residential energy use.[12] Fifth, we test support for policies to reduce emissions from the agricultural sector, particularly cattle

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Green Deal (EC 2019) and programs adopted in the aftermath of the COVID-19 pandemic, such as the Next Generation E.U. fund (EC 2020) and the U.S. Infrastructure Investment and Jobs Act (US Congress 2021).

[12]In the U.S. (Goldstein, Gounaridis and Newell 2020) and the E.U. (Eurostat 2020), households account for about 20% of total greenhouse gas emissions.

farming.[13] Furthermore, we also assess support for a tax on flights (increasing ticket prices by 20%).

In addition to self-reported policy support, we also ask two "real-stakes" questions requiring the respondent to incur a cost to express their support for climate action: a donation and a petition question. In the donation question, we inform respondents that they are automatically entered into a lottery to win $100 (or the equivalent in their local currency). Before they know whether they have won the lottery, they have to decide which share of their potential win, if any, to donate to the non-profit *Gold Standard*, which fights deforestation. The respondent can also choose to sign a petition for climate action (expressing the view that *"immediate action for climate change is critical"*) and is told that we will share information about the share of respondents who signed this petition with the government of their country.

2.3   Outline of the analysis

We define all variables used and constructed in Appendix A-1. The descriptive statistics shown in Sections 3, 4, 5, and appendices are based on the control group sample only, i.e., respondents who see no pedagogical video. In the analysis, we usually correlate individual views and reasoning with two sets of individual covariates: i) individual socioeconomic characteristics (e.g., age, gender, or income) and ii) lifestyle and energy usage characteristics (e.g., car usage or heating source), "energy usage" for short. Whenever the effects of these covariates are relatively homogeneous across countries, we show only the coefficient on the pooled country sample (always including country fixed effects) and discuss possible heterogeneities. If patterns are heterogeneous, we directly show the coefficients in different countries. Our main results are shown separately for each country in Appendix A-4. Furthermore, we repeat the entire analysis for each country in the country-specific Online Appendices.

3   Knowledge and attitudes on climate change

This section describes respondents' knowledge and understanding of climate change.

3.1   Knowledge across countries

Few people outright deny the existence of climate change: the share is below 10% in most countries and around 12 or 13% in Australia, France, and the U.S. Most people believe that climate change is anthropogenic: one-third know that "most" (if not all) of it is due

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[13]Globally, livestock accounts for nearly 15% of greenhouse gas emissions, with beef and cattle milk production accounting for the majority of livestock emissions, contributing 41% and 20% respectively (Gerber et al. 2013).

to human activity, and, depending on the country, 60% to 90% of respondents believe that human activity causes "a lot" or "most" of climate change.

Consequences of climate change. Most respondents (75-94%) correctly foresee some of the consequences of unabated climate change, such as severe sea-level rise or droughts and heatwaves (see Figure 5). At the same time, people do not seem to make a sufficient distinction between different types of disasters. For instance, most also believe that climate change will entail more frequent volcanic eruptions.

Greenhouse gas emissions. Respondents are generally too optimistic about the level of decarbonization needed. One-half of respondents in high-income countries and more than two-thirds of respondents in middle-income countries incorrectly believe that cutting GHG emissions by half would suffice to stop global warming. Respondents are relatively well aware of the factors that cause climate change, especially in high-income countries. 80% correctly recognize that CO_2 is a greenhouse gas, 56% that methane is one, and 67% that particulate matter is not. Most of the classifications for different types of food and power generation in terms of GHG footprint are also correct. However, a non-trivial share of respondents, especially in middle-income countries, believe that nuclear power has a higher footprint than gas or coal.

The answers about transportation modes are less accurate, especially in countries where the difference in emissions between trains and cars is smaller because of the lack of electrified railways. We ask respondents to imagine a family journey between two large cities in their country and rank the possible modes of transportation according to their greenhouse gas emissions. The options are *Plane*, *Car*, and *Train* (or *Bus*, depending on whether bus or train is the most commonly used option for such journeys).[14] Respondents rank options more accurately in countries like Denmark or Germany, where trains are very low-carbon. They are less accurate in countries such as Indonesia or India, where trains are not unambiguously less carbon-intensive than the other options.

Ranking regions of the world by emissions. We also ask respondents to rank China, the U.S., the E.U., and India by total and per capita emissions.[15] Respondents rank regions and countries quite accurately in terms of total emissions. However, many overestimate the footprint of the average Chinese resident and underestimate that of the average European.[16]

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[14]In countries such as Indonesia, where trains rely on coal, the environmental advantage of trains over cars is less clear. Respondents are thus asked about a family of two traveling 800 km from Surabaya to Jakarta instead of a family of four since a fully occupied car would be more efficient than the train. Featuring two passengers instead of four also blurs the comparison between the GHG footprint per passenger of a plane versus a car, as the two are comparable when there is only one passenger in the car.

[15]The respondent's country was also added for the GHG footprint, except for E.U. countries.

[16]The actual ranking for total emissions is China, the U.S., the E.U., and India. The true ranking for the per capita GHG footprint is as follows: U.S., E.U., China, and India. To avoid any systematic priming, we randomized the order in which countries/regions were displayed.

Figure 5: Knowledge about climate change across countries: Share of correct answers

	High-income	Australia	Canada	Denmark	France	Germany	Italy	Japan	Poland	South Korea	Spain	United Kingdom	United States	Middle-income	Brazil	China	India	Indonesia	Mexico	South Africa	Turkey	Ukraine
CC is real, human-made, & its dynamics																						
CC exists, is anthropogenic	70	63	69	63	57	71	84	65	74	80	80	67	61	81	84	73	81	81	87	81	82	76
Cutting emissions by half insufficient to stop global warming	52	52	53	63	54	69	51	59	40	34	56	53	44	27	28	15	15	13	37	33	38	44
GHG emission ranking																						
GHG footprint of beef/meat is higher than chicken or pasta	80	82	82	86	72	86	82	73	77	85	74	84	74	58	65	50	51	52	56	74	60	58
GHG footprint of nuclear is lower than gas or coal	64	67	62	73	50	56	65	73	71	71	50	70	57	47	43	51	47	54	43	55	32	58
GHG footprint of plane is higher than car or train/bus	55	56	56	70	62	73	51	37	55	30	62	66	41	29	25	37	23	18	36	38	32	28
Total emissions of China are higher than other regions	71	71	68	66	61	70	81	82	65	86	73	69	60	58	64	33	57	43	69	62	71	62
Per capita emissions of the US are higher than other regions	49	36	48	64	50	58	60	36	54	27	52	44	54	44	53	34	42	33	49	44	55	45
CC gases																						
CO_2 is a greenhouse gas	83	69	78	93	78	86	87	94	88	77	87	84	75	75	78	86	82	82	72	70	50	77
Methane is a greenhouse gas	59	76	71	61	45	62	35	42	49	68	67	74	63	51	58	42	40	34	59	61	71	49
CC impacts if CC goes unabated																						
Severe droughts and heatwaves are likely	86	84	90	86	84	89	90	89	89	90	87	85	75	87	81	89	84	94	80	89	91	86
Sea-level rise is likely	86	83	85	92	82	87	89	92	86	89	85	89	75	84	78	86	84	93	82	85	82	78
More frequent volcanic eruptions are unlikely	44	41	37	62	37	60	49	52	31	31	41	41	43	26	33	23	20	19	33	26	21	36

Note: Share of respondents who agree with the statements listed on the left. The statements represent the correct answer, according to the current scientific literature (see the sources in Appendix A-7). This figure only includes respondents in the control group only (who did not see any pedagogical videos). For the exact phrasing of each question, see Appendix A-5.

3.2 Who has better knowledge?

To summarize a respondent's knowledge about climate change, we construct a *Knowledge index* that summarizes the variables mentioned above and increases the more accurate a respondent's answers are (see Appendix A-1). We construct all indices in the paper in the following three steps. First, we transform each underlying variable into a z-score (subtracting the control group mean and dividing by the control group standard deviation). Second, we take the average of the z-scores. Third, we standardize that average again by dividing it by its standard deviation. In Figure 6, we regress the *Knowledge index* on respondents' socioeconomic characteristics and variables that proxy for their energy usage.

Across most countries, having a college degree is significantly associated with more accurate knowledge. Also consistent across many countries is that respondents with left-leaning economic views have more accurate perceptions than those with right-leaning views. On the other hand, female respondents are generally less accurate, except in Australia, South Korea, Turkey, the U.K., Ukraine, and the U.S. (where there are no apparent differences by gender), in particular, because they tend to perceive more negative potential impacts of cli-

mate change (which are not always accurate, such as more frequent volcanic eruptions). The association between income and knowledge, conditional on education, is either significantly positive or insignificant, except in China (see Table A1).

The effect of age varies across countries (see Figure 6): age is positively correlated with knowledge in most countries (Australia, Canada, Denmark, Germany, Spain, Poland, India, Turkey, Ukraine, the U.K., and the U.S.), but the correlation is negative in South Korea, and insignificant in the remaining countries. Finally, respondents living with young children are somewhat less accurate too.

3.3   Expectations about climate change

Overall, expectations about the future are relatively bleak in high-income countries (see Panel A of Figure A3). Typically, less than 40% of respondents think that it is technically feasible to stop GHG emissions by the end of the century while maintaining satisfactory living standards or that it is likely that humans will halt climate change by the end of the century. Less than one-fifth of respondents in high-income countries think the world will be more prosperous than today in a hundred years. A substantial share of respondents feels that climate change, if nothing is done to limit it, could cause the extinction of humankind. Respondents in middle-income countries are more worried about the effects of unfettered climate change overall and on themselves; however, they are also more optimistic about humans' ability to halt climate change and the technical skills to do so while sustaining reasonable living standards.

The share of people who think climate change will affect their own life and humankind, in general, is systematically higher in countries that are more vulnerable to climate change, e.g., 72% in India compared to 16% in Denmark. Both these perceptions are positively correlated (conditional on a high-income country dummy variable) with the University of Notre Dame index of vulnerability to climate change (Chen et al. 2015). Thus, subjective beliefs about the impacts of climate change are related to the country's actual vulnerability (see Figure A2). These perceptions are also positively correlated with exposure to local air pollution (PM2.5), as reported by the OECD, suggesting that current exposure to low environmental quality could negatively affect perceptions of impacts of other environmental issues (Figure A2, panels C and D).

Within countries, certain groups tend to be more worried about unabated climate change: female, younger, more educated, and left-leaning respondents (see Panel B of Figure A3). Higher-income, college-educated, older, or left-leaning respondents are significantly more optimistic about humans' technical ability to halt climate change.

3.4   Willingness to adopt climate-friendly behaviors

Our paper focuses on people's understanding of and support for climate policies. However, climate action can also take the form of individual behavior changes, which are conceptually different. Indices of "*Willingness to change behaviors*" and "*Support for climate policies*" (which we describe in more detail later) are positively but not perfectly correlated (0.6). It is

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Figure 6: Who has better knowledge about climate change?

(A) Correlation between knowledge (*Knowledge index*) and socioeconomic characteristics
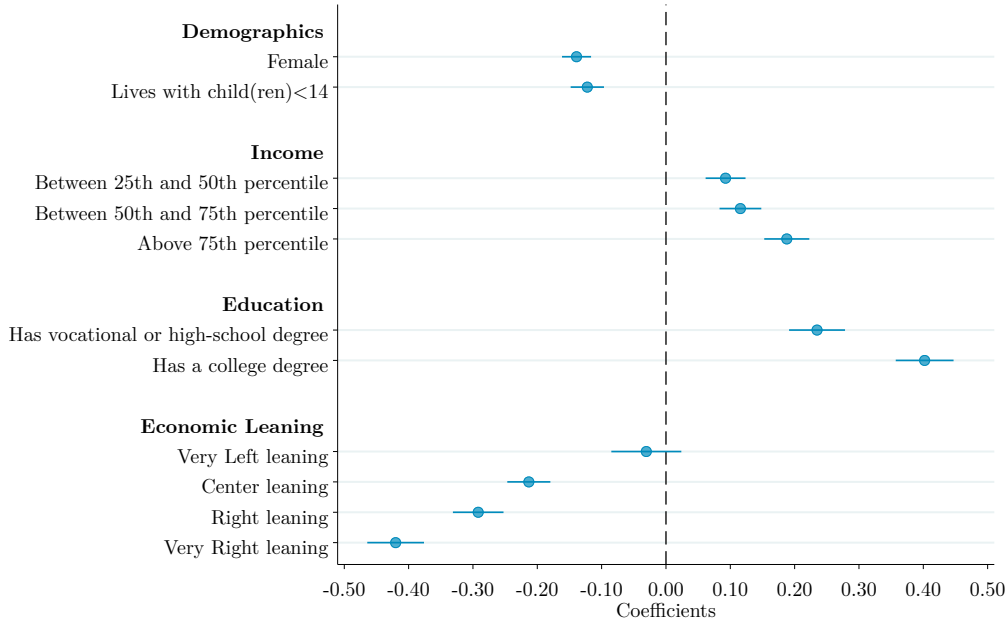
(B) Heterogeneous effects of age across countries
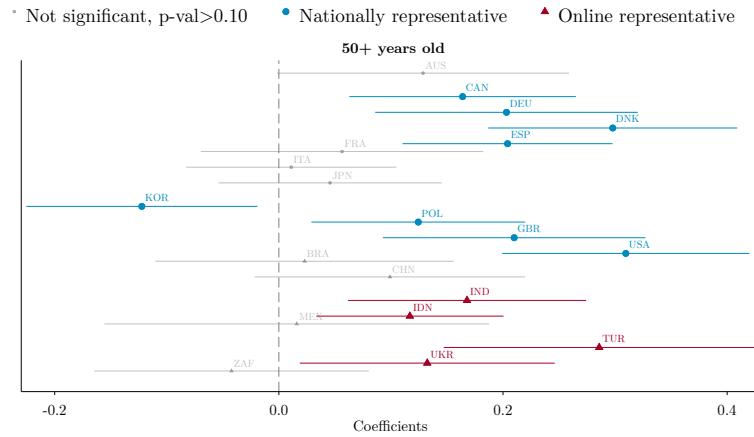
Note: Panel A shows the coefficients from an OLS regression of the *Knowledge index* on indicators for individual socioeconomic characteristics. Country fixed effects, treatment indicators, and age are included. The coefficients on age are displayed separately in Panel B for each country to highlight the heterogeneity. The omitted categories in Panel A are "male" for *gender* (*gender:* "other" is not displayed), lowest income quartile for *income*, "no schooling, or highest level achieved is primary or lower secondary education" for *education*; "left-leaning" for *economic leaning*. In Panel B, the omitted category is "18-34 years old" for *age*. The R^2 is 0.16. See Appendix A-1 for variable definitions.

thus interesting to compare and contrast respondents' willingness to adopt climate-friendly behaviors with their support of public policies.

Around half of the respondents say they are willing to purchase a fuel-efficient car or electric vehicle or to limit flying, given current incentives (see Figure 7). Furthermore, except in Italy and India, respondents are generally unwilling to significantly limit their beef or meat consumption. Few are willing to limit driving or heating or cooling their homes by a lot.

We also asked people about their willingness to adopt these behaviors under different circumstances. The most important factors that would encourage people to adopt more climate-friendly behaviors are that they receive enough financial support to make these changes and that others, especially the most well-off, also change their behaviors.

Figure 7: Share of people willing to adopt climate-friendly behaviors

	High-income	Australia	Canada	Denmark	France	Germany	Italy	Japan	Poland	South Korea	Spain	United Kingdom	United States	Middle-income	Brazil	China	India	Indonesia	Mexico	South Africa	Turkey	Ukraine
Willingness to adopt climate-friendly behaviors																						
Have a fuel-efficient or electric vehicle	54	45	52	60	45	45	78	48	53	57	60	51	50		69	78	65	74	67	70	60	73	62
Limit flying	51	37	53	49	56	64	64	37	58	43	62	46	39		55	52	59	66	56	59	48	44	49
Limit beef/meat consumption	40	31	38	33	38	45	62	24	49	36	44	44	36		44	44	48	62	49	40	33	35	35
Limit driving	37	26	35	33	32	41	57	37	41	36	47	37	29		49	41	62	66	54	47	38	46	25
Limit heating or cooling your home	34	25	27	33	39	36	55	26	37	29	46	30	28		48	46	56	68	60	59	39	34	9
Factors that would encourage behavior adoption																						
The well-off also changing their behavior	61	54	60	58	58	62	81	57	58	60	65	62	53		67	71	53	71	71	60	71	76	59
Having enough financial support	58	49	58	49	45	64	71	47	64	63	68	61	52		66	65	53	67	68	63	72	67	68
One's community also changing behaviors	55	45	52	56	40	55	80	51	56	68	63	50	47		66	69	53	70	72	63	72	72	46
Country adopting ambitious climate policies	49	40	43	45	42	54	72	47	50	61	59	40	32		58	57	68	71	64	52	51	60	30
Real-stakes																						
Willing to donate to reforestation cause	77	71	74	69	73	72	85	83	83	86	76	75	82		91	85	99	92	96	86	90	85	92
Willing to sign petition supporting climate action	69	54	70	59	66	66	77	72	81	83	85	67	51		90	75	96	96	96	90	88	87	84

Note: *Willingness to adopt climate-friendly behaviors* are answers to the question "*To what extent would you be willing to adopt the following behaviors?*" and *Factors that would encourage behavior adoption* correspond to answers to the question "*How important are the factors below in order for you to adopt a sustainable lifestyle (i.e. limit driving, flying, and consumption, cycle more, etc.)?*". Both questions use a 5-point scale: "*Not at all*", "*A little*", "*Moderately*", "*A lot*", and "*A great deal*". Depicted are the shares of respondents who answer "A lot" or "A great deal." Real-stakes questions include the signature of a petition to "stand up for real action" and an indicator equal to one if the respondents forfeit a share of their survey lottery prize of $100 in case they win the lottery. The shares represented are based only on respondents in the control group (who did not see any pedagogical videos).

4 Support for climate action across and within countries

This section describes support for climate policies across countries and respondents. One aspect that complicates such an analysis is that a given policy (e.g., a carbon tax) may generate different levels of support based on the bundle it is part of (e.g., a carbon tax with revenues used to fund low-carbon technologies). While it would be convenient to consider the tax side as separate from the revenue side, respondents' views on tax-based policies depend on the use of the revenue: Vice-versa, the source of revenues matters for policies requiring funding. Policy bundles are complicated to study because there are many different combinations. Our approach is, therefore, as follows. First, we provide evidence on several key policies. Second, we shed light on the possible uses of revenue in the case of carbon taxes, the sources of funding for the green infrastructure program, and policy bundles in the case of combustion-engine car bans. Third, in Section 5, we analyze the fundamental factors shaping support for policies. This analysis can guide the evaluation and predict support for other combinations and types of policies.

4.1 Support for different types of policies

Support for subsidies to low-carbon technology adoption and infrastructure policies. Figure 8 shows marked differences in the support for distinct policies. Subsidies for low-carbon technologies and public investments in green technologies and infrastructures (financed by public debt) receive more than 55% support in high-income countries and more than 65% support in middle-income countries. There is equally high support for the mandatory and subsidized insulation of residential buildings across countries.

The source of funding clearly matters. Figure A6 shows the answers to the question about which sources of funding respondents would consider appropriate for public investments in green infrastructures. Respondents tend to agree that appropriate funding sources are higher taxes on the wealthiest and a carbon tax. They are much less likely to support additional public debt, reductions in social spending, reductions in military spending, or increases in sales taxes as appropriate sources of funding. These views are consistent with our results below that people care about policies' progressivity and effectiveness.

Bans on polluting vehicles. Many respondents also support banning polluting vehicles in city centers or dense areas (60% in high-income countries and 71% in middle-income ones). In high-income countries, support is 20% lower (12 percentage points) for a ban on the sale of combustion-engine cars (even if alternatives such as public transportation would be made available) and 28% lower for an outright ban on combustion-engine cars (with no improvement in alternatives specified). We highlight the importance of respondents' alternative transportation modes for supporting climate policies in Section 6. Furthermore, in EU countries, we also asked about an alternative policy, namely support for a monetary penalty

(of either €10,000 or €100,000) for the purchase of combustion-engine cars.[17] Generalized bans generate consistently higher support than penalties (see Figure A5). Preference for bans and regulation over price mechanisms highlights some of the limits of the "polluters pay" principle, which people may deem unfair, as the richest can pay their way out of it. Bans, on the contrary, affect everyone.

Carbon taxes. At first glance, carbon taxes and especially taxes on fossil fuels appear to be among the least popular policies. Taxes on fossil fuels and carbon taxes with revenues used to fund equal transfers to everyone only generate 36-38% support in high-income countries and 48-61% support in middle-income ones. However, the use of revenue matters substantially. Carbon taxes with revenues used to fund environmental infrastructures, subsidize low-carbon technologies, or reduce income taxes benefit from around 70% higher support in high-income countries (for a level of support of around 55%) and 25% higher support in middle-income countries (70%), compared with a carbon tax with equal cash transfers. Similarly, we observe majority support for carbon taxes with transfers to the poorest or the most constrained households. On the contrary, carbon taxes used to reduce corporate taxes generate similarly low support as carbon taxes with equal transfers or as taxes on fossil fuels (for which the use of revenues is not specified).

Agriculture-targeted policies. Finally, policies that reduce cattle farming are ranked among the least popular in all countries. Bans on intensive cattle farming enjoy somewhat higher support than either the removal of subsidies for cattle farming or a high tax on cattle products overall (so that the price of beef doubles).

Support and opposition versus indifference. An important point when trying to map these survey findings to real-world support for a policy is that across the range of policies we test, around one-third of respondents state that they neither support nor oppose it. Figure A4 shows the share of respondents who support a policy out of all respondents who express either support or opposition (but not indifference). Although the ranking of policies and the relative cross-country patterns are unchanged, among non-indifferent respondents, a majority is in favor rather than against most policies. Figure A10 shows that respondents who are female, lower-income, with a lower degree of education completed, or politically center-leaning are more likely to be indifferent.

These patterns suggest that indifference to climate policies may be a critical aspect to consider. It is important to recognize that many citizens express a lack of opinion on these issues. This expression may reflect a lack of interest in the topic, lack of knowledge, or actual ambiguity and hesitation about climate action. In that sense, indifferent respondents may be akin to "swing voters" and those whose views are most malleable. Their views could change if a policy is actually proposed or discussed, and they are asked to vote on it. Section 6 highlights the factors shaping people's support for various policies, which can be informative about what pieces of information are needed to sway people's views on average.

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[17]The €10,000 penalty is in line with the current EU levels. We did not ask these questions in Denmark and France, where the survey was completed slightly earlier.

4.2 Cross-country comparisons

We have to be cautious about comparing *absolute* levels of support between high-income and middle-income countries, given the differences in sampling highlighted before.[18]

Overall, support for the three central policies considered is lowest in Germany, France, and Australia, followed by Denmark, Japan, the U.S., and, to some extent, the U.K and Poland. Italy, South Korea, Spain, and Canada stand out as having overall higher support and are on par with Brazil, South Africa, Turkey, and Ukraine (with the lowest support among middle-income countries). Mexico and Indonesia have higher levels of support, and support is almost consistently highest in India and China.

Support for the carbon tax (and its variations) is particularly low in Australia, Poland, Denmark, Germany, the U.K., and the U.S. Bans on combustion-engine cars see their lowest support in Denmark, France, Germany, and the U.S., and their highest support in India and China.

Cattle-related policies are unpopular in Japan, Turkey, Ukraine, South Africa, Australia, and Denmark. Support for green infrastructure programs, and carbon taxes used to fund environmental infrastructures or low-carbon technologies, are highest in Italy and middle-income countries, especially in Brazil, China, Indonesia, Mexico, and South Africa. In Brazil and Indonesia, 75 to 79% of respondents support a complete ban on deforestation enforced by strong sanctions.

Furthermore, although we focus on climate policies at the national level, when asked about the level at which climate policies should ideally be put in place, 73% to 93% of people choose the global level. Less than half of all respondents think that policies should be enacted mainly at the federal (or European), national (or state), or local levels.

4.3 Individual characteristics correlated with support for climate policies

To summarize support for climate policies, we construct a *Support for Main Climate Policies index* based on the three main policies studied (see Appendix A-1 for details). In Figure 9, we regress the *Support for Main Climate Policies index* on the complete set of individual socioeconomic and energy usage characteristics and country fixed effects (results for each of the three main policies separately are in Figure A7). Whenever the average effects are relatively homogeneous across countries, we do not discuss country heterogeneity specifically (all results are in Tables A5-A6). For unconditional shares of support for the three main policies broken down by respondent characteristics, see Figures A8 and A9.

Individual characteristics. Figure 9 shows that political leaning is one of the strongest predictors of views on climate action: in most countries, left-leaning respondents are more supportive of climate action. The exceptions are China, Indonesia, Mexico, and Ukraine.

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[18]Although we control for country fixed effects, differences in context and other policies already in place may influence views heterogeneously among different groups of people. For instance, the *status quo* level of taxes may heterogeneously influence how much appetite there is for more taxation across different groups.

Figure 8: Share of respondents who support climate change policies (somewhat to strongly)

	High-income	Australia	Canada	Denmark	France	Germany	Italy	Japan	Poland	South Korea	Spain	United Kingdom	United States	Middle-income	Brazil	China	India	Indonesia	Mexico	South Africa	Turkey	Ukraine
Main Policies Studied																						
Green infrastructure program	57	49	56	53	57	42	78	48	58	68	71	54	50	78	77	82	80	80	84	73	76	69
Ban on combustion-engine cars	43	35	47	41	28	32	54	41	44	52	54	45	39	65	60	72	77	65	67	53	62	58
Carbon tax with cash transfers	37	34	41	30	29	28	47	35	36	53	44	34	33	59	47	80	71	67	55	52	55	39
Transportation Policies																						
Ban on polluting cars in city centers	60	53	60	66	57	50	76	64	61	52	64	65	49	71	65	73	74	85	72	66	60	67
Ban on combustion-engine vehicles w. alternatives available	48	38	47	42	42	41	58	51	48	58	57	52	44	68	60	78	77	72	66	62	64	63
Tax on flying (+20%)	45	35	44	60	46	53	41	47	44	42	44	46	33	52	39	61	64	68	51	43	45	36
Energy Policies																						
Subsidies to low-carbon technologies	67	62	65	67	56	64	79	69	75	71	73	65	57	73	77	75	68	79	66	75	75	68
Mandatory and subsidized insulation of buildings	66	70	64	70	64	60	73	59	72	72	71	70	53	75		80				73	75	75
Funding clean energy in low-income countries	54	49	50	53	48	48	76	53	55	57	65	51	50	73	63	71	75	81	74	76	66	78
Tax on fossil fuels ($45/tCO2)	36	36	40	43	31	31	38	35	27	42	39	38	34	48	35	58	64	58	41	38	52	28
Food Policies																						
Subsidies on organic and local vegetables	56	42	50	59	52	56	71	46	73	62	65	49	43	68	62	79		77	58	59	80	58
Ban of intensive cattle farming	42	32	41	31	55	49	64	17	44	44	43	50	36	39	38	50		45	46	28	32	25
Removal of subsidies for cattle farming	34	31	33	32	28	38	42	16	34	31	42	37	38	39	43	47		51	47	27	31	22
A high tax on cattle products, doubling beef prices	30	24	27	31	29	40	37	19	30	26	31	31	31	36	33	48		49	37	30	26	24
Support for Carbon Tax With:																						
Funding environmental infrastructures	63	60	48	60	65	60	76	56	68	78	69	63	56	75	78	76	71	81	73	79	73	69
Subsidies to low-carbon tech.	63	58	49	52	57	66	76	68	71	79	69	59	53	73	74	79	68	79	71	78	66	65
Reduction in personal income taxes	57	52	48	38	62	54	72	64	69	62	67	52	49	69	69	74	68	74	69	68	66	64
Cash transfers to the poorest households	53	51	48	41	55	47	68	54	50	59	63	57	46	73	67	82	69	86	66	65	82	62
Cash transfers to constrained households	50	50	42	36	55	47	62	47	39	62	61	52	44	64	59	69	63	74	59	60	65	61
Tax rebates for the most affected firms	48	41	41	38	52	34	66	49	61	59	55	41	43	62	59	72	65	68	54	63	55	56
Reduction in the public deficit	48	40	39	34	49	39	66	50	56	48	62	44	48	63	62	72	65	70	61	62	57	52
Progressive transfers	47	40	54			45	66	56	40	44	40	43		58	64	84	67	61	44	45	51	49
Equal cash transfers to all households	38	37	38	27	45	31	42	43	37	42	44	33	38	61	45	70	64	76	62	57	59	53
Reduction in corporate income taxes	37	29	32	24	37	25	55	38	48	48	50	26	29	58	54	67	60	67	61	50	60	42

Note: Policy views are elicited on a 5-point scale "Strongly oppose," "Somewhat oppose," "Neither support nor oppose," "Somewhat support," and "Strongly support." The figure shows the share of respondents to answer "Somewhat support" or "Strongly support." The shares represented are based on respondents in the control group only (who did not see any pedagogical videos). For the exact phrasing of each question, see Appendix A-5.

In most countries, college-educated respondents are more likely to support climate action (Australia, Brazil, China, Denmark, Indonesia, India, Italy, Mexico, Spain, Turkey, the U.K., and the U.S.). Income has mixed effects, as illustrated in Panel B. Higher-income respondents are more supportive of climate action in Brazil, India, Indonesia, Italy, Poland, and Ukraine. There are no clear patterns by income for the other countries. Age also has mixed effects. Older respondents in China, India, Indonesia, Japan, Mexico, Poland, South Korea, and Turkey are more supportive of climate action. However, in the online-representative samples, older respondents (especially those above 65 years old) represent only a small and possibly selected share of the population. Younger respondents are more likely to support climate policies in some high-income countries such as Australia, France, and the U.S. There is no significant heterogeneity by age in other E.U. countries or the U.K. In addition, respondents who live with children below the age of 14 are more supportive of climate policies.

**Lifestyle and energy usage factors.** Access to public transportation exhibits one of

the strongest correlations with support for climate policy; the correlation is insignificant only in China, Japan, Mexico, and Ukraine. Conditional on access to public transportation, those who live in a large urban area have higher policy support only in Denmark, the U.K., and the U.S., but not in most countries. Thus, the availability of public transport seems to be the first-order concern related to the area of residence. For all high-income countries except the U.S., using a car regularly is associated with lower support for climate action. However, in China, India, and Indonesia, car usage is positively associated with policy support, conditional on income (see Figure A7 for detailed cross-country heterogeneity in the effect of car usage). Conditional on car usage, high gas expenses matter only marginally in Canada, Denmark, Germany, Italy, and Mexico. Frequent flyers tend to support more climate action overall, except for a tax on flying (see Figure A11). Respondents who consume beef at least weekly are less likely to support climate policies in Australia, Canada, Denmark, France, Germany, and Spain.

Figure A11 shows the correlations between support for a range of other climate policies and individual characteristics. They are overall similar to the ones described for the main policies. Car-dependent respondents are less supportive of bans on polluting cars (whether those are overall bans, with enhanced alternatives, or limited to densely populated areas). They also exhibit lower support for taxes on fossil fuels and carbon taxes with cash transfers (only in Australia, France, Japan, Poland, and the U.K., see Figure A7). They do not have different views on taxes on flying, green infrastructure programs, subsidies for low-carbon technologies, or mandatory and subsidized insulation of buildings. Homeowners and landlords are less supportive of mandatory insulation but not less supportive of other climate change actions.

Can policy views be explained by socioeconomic and lifestyle characteristics? An important question is how much of the variation in policy views we can predict using these observable socioeconomic and energy usage characteristics. The R^2 from the regression in Figure 9 is 0.18, and would be 0.09 omitting country fixed effects. It increases to 0.24 if we add a large set of interactions between the covariates (0.12 without country fixed effects). Thus, while there are meaningful differences within countries, it is difficult to predict policy views from observable socioeconomic and energy usage characteristics only. Put differently, based on observables, it is difficult to delineate specific groups for or against climate policies. We next turn to the beliefs that shape views on climate action.
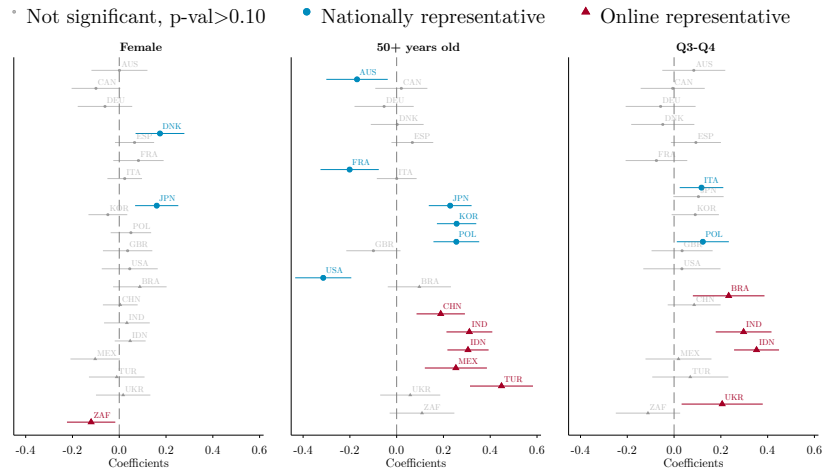
Figure 9: Which respondents support climate action?

(A) Correlation between *"Support for main climate policies index"* and socioeconomic and energy usage characteristics
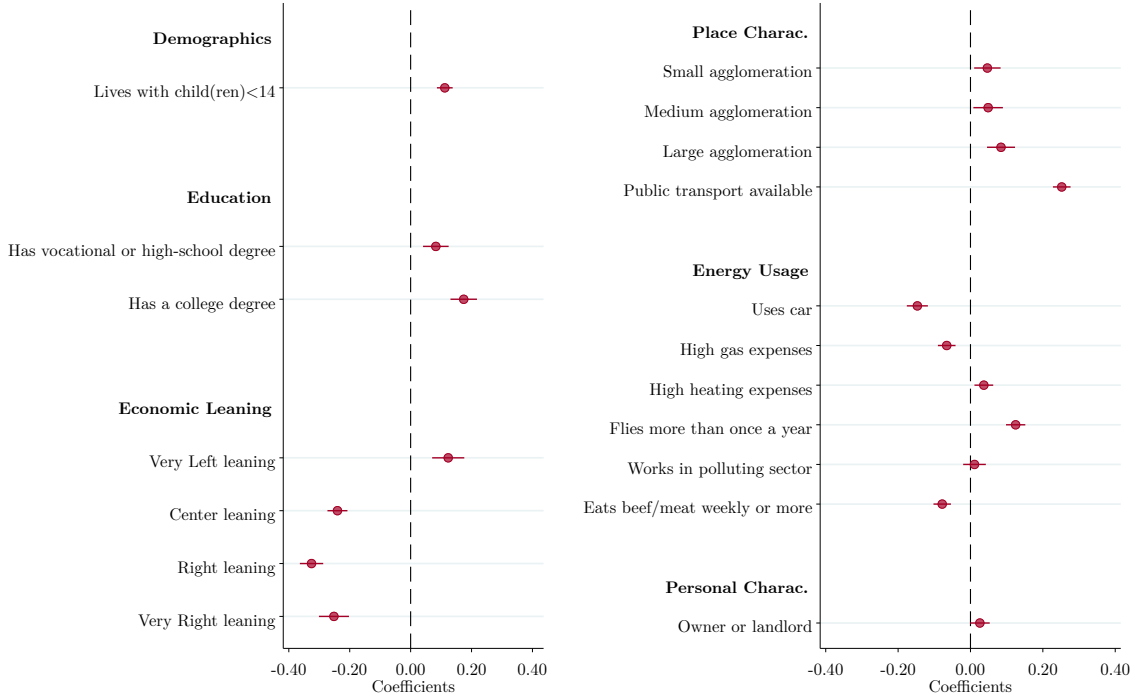
(B) Heterogeneous effects of gender, age, and income across countries

Note: Panel A shows the coefficients from a regression of the *Support for main climate policies* index on socioeconomic indicators (left panel) and energy usage indicators (right panel). In the right panel, we control for but do not display the coefficients on socioeconomic indicators. Country fixed effects, age, gender, income, and treatment indicators are included but not displayed. The R^2 is 0.18. The omitted category for *Place characteristics* is "Rural or very small agglomeration." See the notes in Figure 6 for a list of all omitted categories. Panel B reports the coefficients on being 50 years and older (relative to being aged between 18 and 34 years), being female (relative to being male), and being in the top two quartiles of the income distribution (relative to being in the first quartile). See Appendix A-1 for more precise definitions of the variables.

5 Reasoning about climate policies

In this section, we study respondents' understanding of climate policies, in particular, how they perceive the policies' effectiveness, economic effects, distributional consequences, and impacts on themselves.

5.1 Perceived distributional and efficiency impacts across countries

Figure 10 summarizes how respondents think about the effects of the three main policies. We distinguish between high-income countries and middle-income countries and also consider China, India, and Indonesia separately because they exhibit significantly different patterns (for a country-by-country plot, see Figures A12 - A14).

Perceived environmental benefits. The environmental benefits of climate policies are largely acknowledged: in both high-income and middle-income countries, a majority of respondents agree that the three policies would reduce air pollution and GHG emissions. France ranks as the most pessimistic country regarding perceived effectiveness, followed closely by Germany and the U.S., and Denmark to a lesser extent. Most optimistic about effectiveness are respondents in India, Indonesia, Japan, and South Africa.

Respondents in high-income countries are somewhat divided about the behavioral effects of the policies, such as encouraging people to drive less or making greater use of public transportation. For instance, in Poland, South Korea, and Spain, more than 55% of respondents believe that a carbon tax would encourage people to drive less, but this share is only around 40% in France or Germany. By contrast, respondents in middle-income countries tend to believe in these behavioral effects.

Perceived economic effects. Few respondents think that climate policies will have positive impacts on the economy and employment, although this share is somewhat higher in middle-income countries. When asked about whether each of the policies is a cost-effective versus costly way to fight climate change, respondents rank a carbon tax as the most costly, followed by the green infrastructure program and the ban on combustion-engine cars. Perceived costs and negative economic impacts of the carbon tax are particularly high in the U.S., France, Denmark, the U.K., and Germany (in this order).

Perceived distributional impacts. In most countries, the three main policies are often considered regressive. In high-income countries, at most one-quarter of respondents believe that low-income earners, the middle class, and those living in rural areas would gain from a green infrastructure program or from a carbon tax with transfers. In contrast, around 40% of respondents believe that high-income earners will experience a net positive gain from these three policies. Note that we do not attribute too much importance to the absolute share of respondents who believe that a given group will benefit from climate policies but rather to the relative shares who think poorer versus richer people will gain.

In middle-income countries (other than China, India, and Indonesia), respondents perceive the distributional impacts of the green infrastructure program more positively, but they are still wary of the possible effects of a carbon tax and combustion-engine bans on low-income, rural, and middle-class households. In India, Indonesia, and China, these patterns are quite different, and respondents are substantially less likely to consider the three main policies as regressive. The share of respondents who think that policies will benefit high-income households is generally smaller than the share who think they will benefit lower-income households, especially for the carbon tax with transfers.

Perceived impacts on one's household. Overall, respondents are similarly pessimistic about the financial effects of the three policies on their households as they are about their impact on middle-class or rural families. Less than one-fifth of respondents in high-income countries think their household would financially gain from these policies. Respondents in middle-income countries are somewhat more optimistic about the effects on their households, and respondents in China, India, and Indonesia are significantly more optimistic.

In summary, many respondents see these three key policies as environmentally effective but regressive and against their financial interests.

5.2 How do different groups of respondents reason about climate policies?

Figure 11 regresses the perceived effectiveness, distributional impacts, and own impacts of the main policies on individual socioeconomic and lifestyle indicators and country fixed effects.[19]

Higher-income respondents are more optimistic about the policies' effectiveness in reducing emissions. Respondents with young children are less likely to think that they will personally lose from these policies or that the policies are regressive.

Age has mixed effects. In middle-income countries, older respondents tend to be more likely to believe that policies reduce emissions and less likely to think that they or low-income earners will lose. In some high-income countries (Australia, Canada, Denmark, France, Germany, the U.K., and the U.S.), older respondents are more likely to think they or low-income earners will lose. Gender typically has small and insignificant effects.

Although not consistently significant, having a college degree is associated with more optimism about the effectiveness of policies in reducing emissions and less pessimism about the impact on oneself and lower-income households.

In high-income countries, there is a clear political gradient for most perceptions: Left-leaning respondents are likelier to believe that policies will have positive economic impacts and reduce emissions and less likely to believe that high-income or low-income earners would lose. Differences by political leaning are usually not significant in middle-income countries.

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[19]For unconditional average perceptions by socioeconomic group, see Figures A15-A16.

Figure 10: Perceived characteristics of the main policies

|	Green Infrastructure Program			Carbon Tax w. Cash Transfers			Ban on Combustion-Engine Cars		
	High Income	Indonesia India China	Other Middle Income	High Income	Indonesia India China	Other Middle Income	High Income	Indonesia India China	Other Middle Income
Effectiveness of Main Climate Policies									
Reduce air pollution	76	84	82	68	84	77	79	85	83
Reduce GHG emissions/Reduce CO$_2$ emissions from cars				64	80	71	73	80	77
Make electricity production greener	70	80	77						
Encourage insulation of buildings				64	72	67			
Increase the use of public transport/Encourage less driving	60	77	67	51	75	64			
Positive effect on economy and employment	37	45	45	31	41	41	35	41	39
Costless way to fight climate change	30	39	38	27	37	34	39	38	37
Distributional Impacts of Main Climate Policies									
Believes the following groups would gain									
Those living in rural areas	25	62	41	21	58	32	16	51	24
Low-income earners	21	57	40	22	57	31	12	51	24
The middle class	22	54	43	21	51	31	15	47	26
High-income earners	39	52	50	33	45	37	40	50	47
Self-Interest									
Believes own household would gain	23	62	40	20	58	28	15	51	24
Perceived Fairness and Support									
Support main climate policies	57	81	76	37	73	50	43	72	60
Main climate policies are fair	51	77	67	35	67	47	39	68	53

Note: The questions on effectiveness and fairness have answer options *Strongly disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Strongly agree.* We report the share of respondents who answer "Somewhat agree" or "Strongly agree." Questions on the distributional impacts and self-interest have answer options *Lose a lot/Mostly lose/Neither win nor lose/Mostly win/Win a lot.* Depicted is the share of respondents who say "Mostly win" or "Win a lot." "Support main climate policies" has answer options *Strongly oppose/Somewhat oppose/Neither support nor oppose/Somewhat support/Strongly support.* We show the share of respondents who "Somewhat support" or "Strongly support." The shares represented are based only on respondents in the control group (who did not see any pedagogical videos). For the exact phrasing of each question, see the Questionnaire in Appendix A-5.

Some lifestyle and energy usage characteristics are strongly correlated with a more positive outlook on the policies' effectiveness, progressivity, and own financial impacts. These include having public transportation available, being a frequent flyer, not being car-dependent, and not having high gas expenses (conditional on car usage).[20]

As was the case for policy views, the set of socioeconomic and energy usage characteristics and country fixed effects (including a large set of interactions of these variables) can only explain around 16% of the variation in perceptions about policies' effectiveness, 26% of perceived impact on low-income households, and 25% of the own perceived impact, with country fixed effects accounting for about half of all the variation explained. Therefore, these individual characteristics are important in shaping reasoning but are not the whole story.

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[20]We define having high gas expenses as expenses above the median of the respondent's income group. However, the results are not sensitive to this definition.

Figure 11: How different groups perceive the effectiveness and distributional effects of the three main climate policies
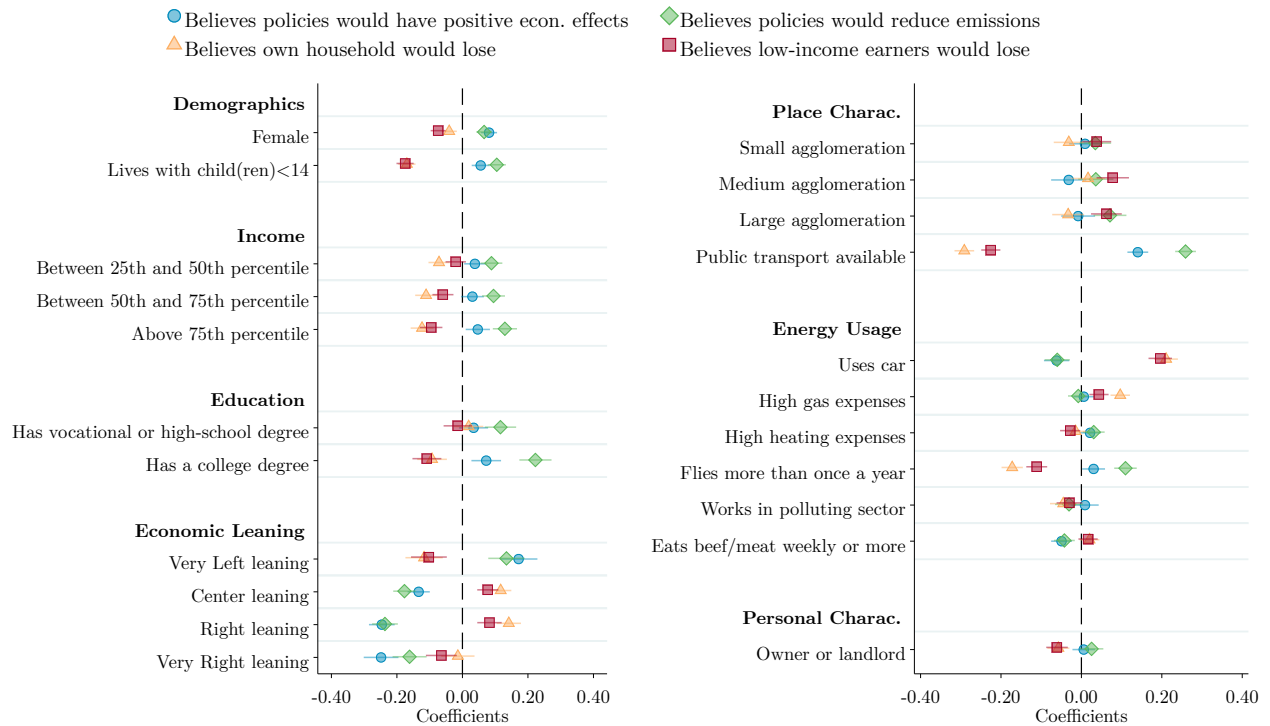
Note: The figure shows the coefficients from two regressions. In the left panel, the indices listed along the vertical axis are regressed on indicator variables for socioeconomic characteristics and country fixed effects and treatment indicators (not shown). In the right panel, the same indices are regressed on energy usage indicators, country fixed effects, treatment indicators, and socioeconomic characteristics (not shown). Each index is constructed by averaging the z-scores of the answers to a given question (e.g., "believes policies would have economic effects") across all three main policies and standardizing again. See Appendix A-1 for more detailed variable definitions. See the notes to Figure 9 for a list of the omitted categories.

Interestingly, respondents' perceptions of their own gains and losses are significantly correlated with and predicted by socioeconomic and energy usage characteristics, but the prediction is imperfect. Thus, respondents' perceived threat from climate policies depends on more than just these factors.

6 Which factors shape support for climate policies?

6.1 Factors correlated with policy support

To determine which beliefs are correlated with support for climate policy, we regress support for each of the three main climate policies on the respondents' socioeconomic characteristics and on a set of standardized variables and indices measuring beliefs about climate

change and climate policies. The results are shown in Panel A of Figure 12.[21] Panel B reports the share of the variance in support for the three policies (as summarized by the *Support for Climate Policies index*) that is explained by each variable.[22] Overall, 70% of policy views are explained by these beliefs and socioeconomic and lifestyle characteristics, compared to 24% explained by individual characteristics only.

The perceived distributional impacts of climate policies are strongly correlated with policy support. Most important (in terms of the share of variation explained) is the perceived effectiveness of a policy, as measured by the belief that it will reduce emissions and the belief that it will reduce pollution. Beliefs in the effectiveness of policies to reduce emissions and pollution together account for 24% of differences in policy support.

Second, self-interest is also important: those who think they will themselves lose from a given policy are much less likely to support it. This belief alone explains 15% of the variation in policy views. Related to self-interest, the belief that one will suffer from climate change accounts for 4% of differences in policy support.

Third, the perceived progressivity of a policy also matters substantially: respondents who believe that low-income earners will lose are less supportive of the policy. In a few countries (France, India, Indonesia, Spain, Turkey, and Ukraine) the belief that the high-income earners will lose is even positively associated with support for it (see Tables A8-A9). Across countries, the belief that poor people will lose from climate policies accounts for 8% of the variation in policy views. Furthermore, there is a close connection between the respondent believing that a policy is "fair" and supporting it (the raw correlation between these variables is 0.89).

Broader perceived economic effects or concerns about the impacts of climate change overall are not as strongly correlated with policy support. Believing that a policy will positively impact the economy is associated with slightly higher policy support. Similarly, knowledge about climate change is a weak predictor of support for climate policies, although there is a small significant effect of the belief that climate change is human-made.[23]

Support for climate policies and individual willingness to change behavior are not driven by the same beliefs. Compared to support for public policy action, respondents' willingness to privately adopt climate-friendly behaviors is much more driven by concerns about the consequences of climate change and that they would suffer from the main climate policies (see Figure A17). It is less correlated with perceptions of the efficiency or distributional impacts of those policies.

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[21]For country-by-country results, see Tables A8 and A9.

[22]We follow Grömping (2007) and Lindeman, Merenda and Gold (1980). To overcome the dependency of a simple ANOVA on the order of the covariates in the regression, this method averages ANOVAs over all permutations of the covariates.

[23]Overall, our results across 20 countries confirm some of the patterns observed for specific countries, as discussed in the introduction, where the importance of perceived fairness, effectiveness, and self-interest has been highlighted (Carattini, Carvalho and Fankhauser 2018; Douenne and Fabre 2022; Klenert et al. 2018).

Figure 12: Beliefs underlying support for the main climate policies

(A) Correlation between support for the three main policies and beliefs
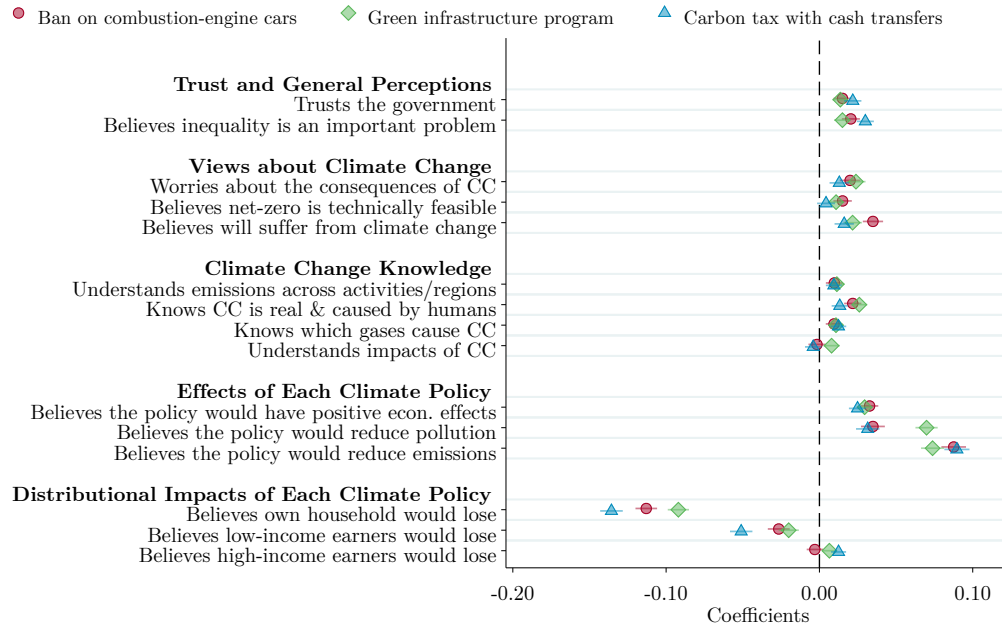
(B) Share of the variation in *Support for main policies* explained by different beliefs
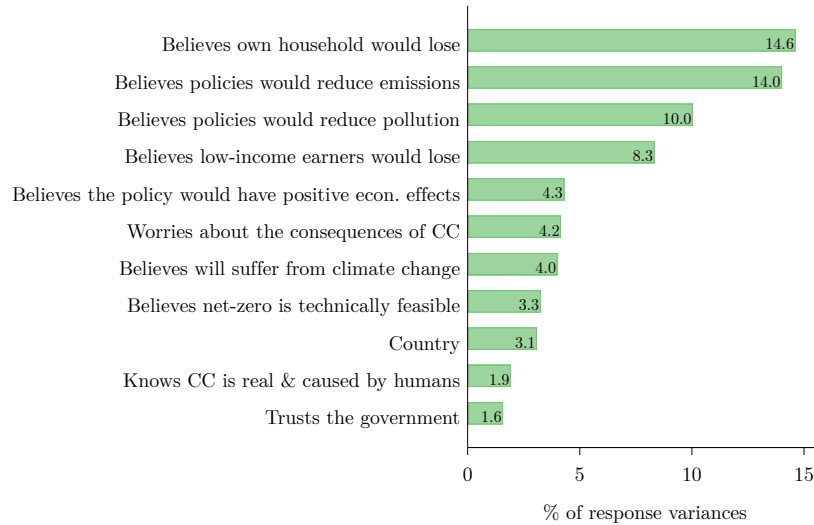
Note: Panel A shows the coefficients from a regression of support for each policy (indicator variable equal to 1 if the respondent supports the policy somewhat or strongly) on standardized variables measuring respondents' beliefs and perceptions. Country fixed effects, treatment indicators, and individual socioeconomic characteristics are included but not displayed. The R^2 is 0.7. Panel B depicts the share of the variance in the *Support for main policies* index that is explained by each belief and perception, conditional on country fixed effects. We use the LMG method (see Grömping 2007) for the variance decomposition. See Appendix A-1 for detailed variable definitions.

6.2 Information and pedagogical treatments

Treatment effects on support for the main policies. The correlations outlined before are confirmed experimentally by the effects of the information and pedagogical video treatments. These are depicted in Figure 13 on the pooled (all countries) sample. For treatment effects by country, see Tables A11-A12. For the shares of support for all policies by treatment group, see Figure A18.

In the cross-country pooled data, the *Climate impacts* treatment has the smallest effects on support for each of the policies. It is statistically significant in very few individual countries. The effects of the *Climate policies* treatment are much stronger, especially on support for the carbon tax with cash transfers and, to a lesser extent, for the ban on combustion-engine cars. The strongest impacts are found for the combination of the *Climate impacts* and *Climate policies* treatments, which are roughly equal to the sum of the two treatments' impacts. The treatment effects are largest for the carbon tax with cash transfers, followed by the ban on combustion-engine cars and the green infrastructure program. All three treatments have significant and large effects on the perceived fairness of the three policies.

Support for the green infrastructure program has the highest baseline level and sees the smallest treatment effects among the three policies. The combination of the *Climate impacts* and *Climate policies* treatments increases support for it in Australia, Canada, Denmark, India, Spain, and the U.K., and the treatment effect represents on average 14% of the control group's support in these countries. However, because baseline support is high, the apparently small treatment effect is equivalent to 54% of the share of those who oppose the program in the control group.

Turning to the ban on combustion-engine cars, the *Climate policies* treatment alone is significant only in a few countries (France, Italy, and South Africa). The combined treatment has significant effects in the pooled sample of all countries and in Australia, Brazil, China, Denmark, France, Italy, Japan, South Africa, Spain, and the U.K. In those countries, the effect of the combined treatment is equivalent to 24% of the control group mean on average, ranging from 14% in China (which starts with a high level of baseline support) to 43% in Australia. The treatment effect size is also equivalent to 60% of the share who oppose the policy in the control group and to 102% of the gap in support between left- and right-wing respondents in the above-listed countries.

Finally, regarding the carbon tax with transfers, the *Climate policies* treatment increases support significantly in all countries except India, Mexico, South Africa, and South Korea. The magnitudes correspond to 29% of the control group mean (ranging from 11% in China to 50% in Germany), 66% of the share who oppose this program, and on average to 40% of the gap between left- and right-wing respondents in countries where it is significant. The combination of the *Climate impacts* and *Climate policies* treatments have even stronger effects in all countries (except India and Turkey). The effects are equivalent to 35% of the control group mean (ranging from 9% in China to 65% in Denmark) and to 74% of the opposition in countries where the effect is significant.

We systematically explored potential heterogeneous treatment effects by socioeconomic

and lifestyle characteristics and did not find significant or systematic heterogeneity in treatment effects along these dimensions. Overall, the video treatments have a larger effect on policies that start with lower support and that have more room for improvement. They sway sizable shares of respondents as benchmarked against the share who oppose each policy in the control group. The effects of the combined treatment are the strongest.

Treatment effects on support for other policies. There are significant treatment effects on support for policies other than our main ones as well, especially those that are the most closely related. The *Climate policies* and the combined treatment both significantly increase support for carbon taxes under all revenue usage scenarios (see Figure A19). These two treatments also significantly increase support for the simple tax on fossil fuels without transfers (with an effect size equal to around 30% of the control group mean) and a tax on flying, presumably because it is also associated with reducing fuel usage (see Figure 13).

There are significant treatment effects on a ban on combustion-engine cars with alternatives made available and on a ban on polluting cars in city centers, which are more popular than the simple ban on combustion engine cars. However, policies that are not closely related to the ones presented in the video, such as mandatory building insulation, do not have significantly higher levels of support in the treatment group compared to the control group.

Interpretation of the treatment effects. To interpret these treatment effects, consider Figure 14, which shows the treatment effects on a range of beliefs. The *Climate impacts* treatment increases concerns about climate change and improves understanding of it (e.g., that it is real and caused by humans and which GHGs and activities contribute to it). However, these beliefs were shown not to be strong predictors of support for new climate policies (as described above). This treatment does not shift the key mechanisms that matter for policy support, namely their perceived effectiveness, distributional impacts, and impacts on one's household. The *Climate policies* and the combined treatment shift exactly the beliefs that are most predictive of policy support, namely, the perceived impacts on others and oneself and the effectiveness of the policies.

Thus, explaining how policies work and who can benefit from them (or how losers can be compensated) is critical to fostering policy support. Simply making people more concerned about climate change does not appear to be an effective strategy.

Furthermore, as can be seen from the weaker effects on support for policies other than the ones covered in the videos, it is important to provide information about and explain the workings of a specific or closely related policy. Respondents do not immediately extrapolate one policy's effect to another.

Private action versus public policy. The effects of the *Climate policies* treatment or of the combined treatment on willingness to change one's own behavior are marginally significant in the pooled sample, as well as in some individual countries (Australia, Japan, Mexico, Poland, South Africa, Spain, and the U.K., see Tables A11-A12). There is a small significant effect on the willingness to sign the petition supporting climate action, but no effect on donations. This suggests that simply informing people about *Climate impacts* is

not very effective in stimulating demand for private action, the same way it was not effective in generating more support for public policies. At the same time, explaining *Climate policies* generates demand for policies, not private action.[24] Recall from Section 4 that two of the most important factors for respondents to be willing to adapt their own behavior were if others adapted similar behaviors too and if they received financial support. Hence, without changing these two key factors, there is no reason to expect that private behaviors should change.

Figure 13: Effects of the treatments on support for climate action
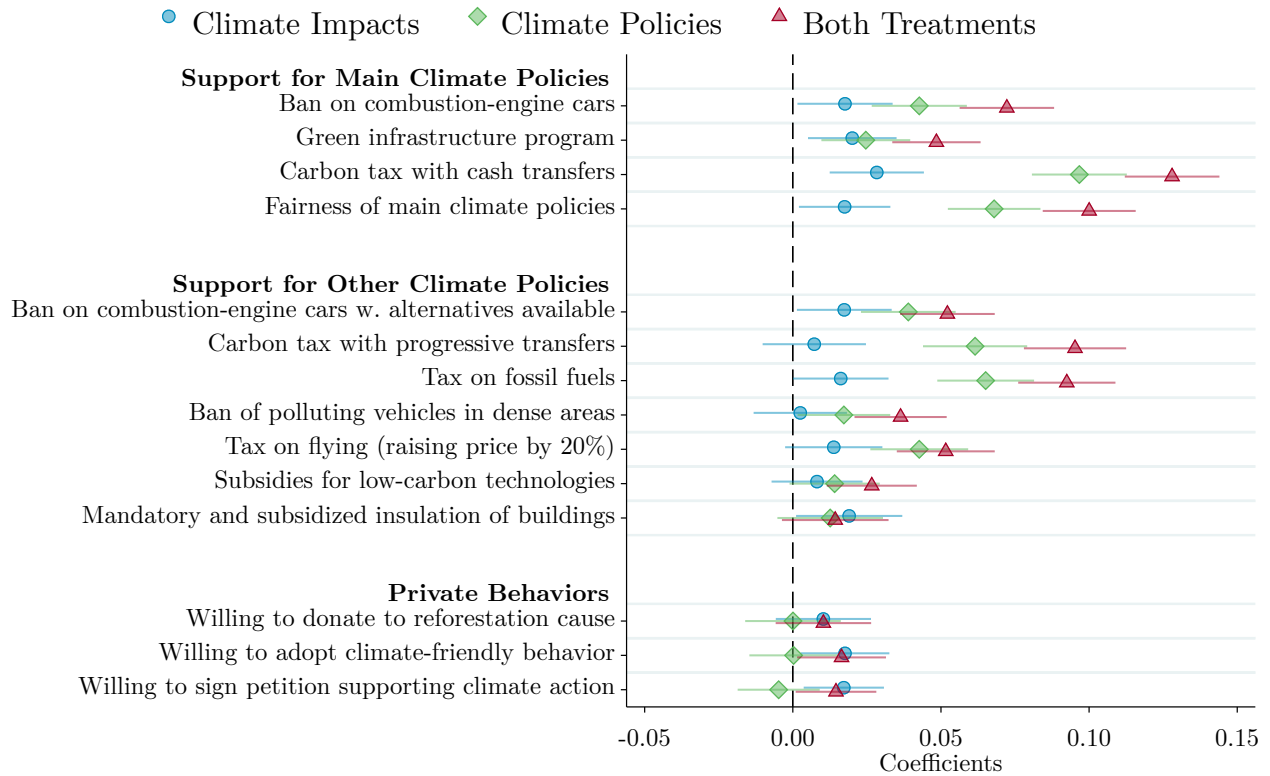
Note: The figure shows the coefficients from a regression of the indicator variables listed on the left, capturing support for various policies and willingness to change behaviors on indicators for each treatment, controlling for country fixed effects and socioeconomic characteristics (not shown). See Appendix A-1 for variable definitions.

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[24]The patterns of the effects of the videos suggest that the effects of the treatment are due to their specific information content rather than to experimenter demand or priming about climate change.

Figure 14: Effects of the treatments on beliefs

(A) Effects of the treatments on reasoning
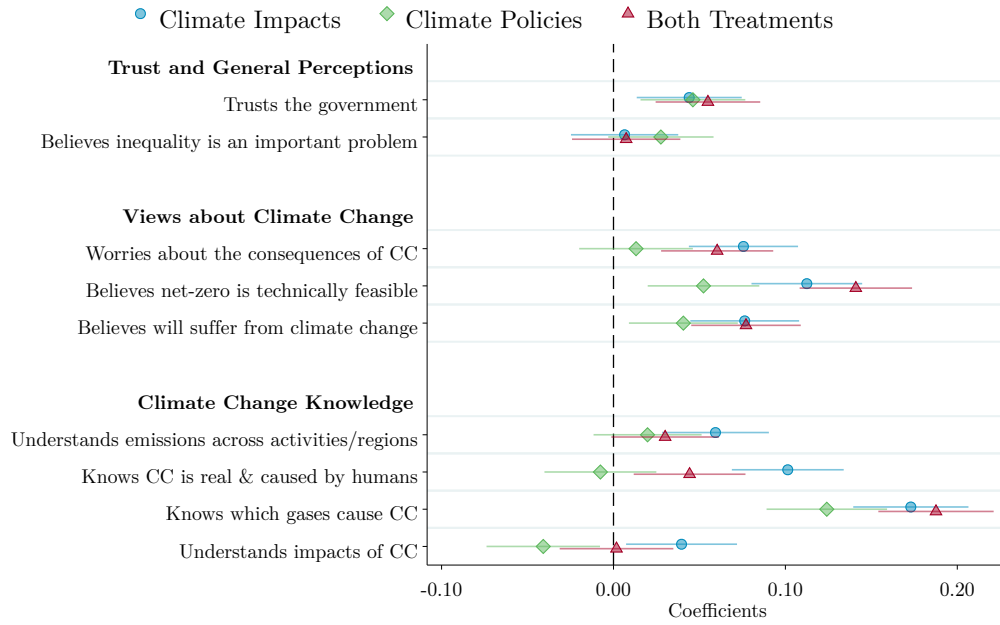
(B) Effects of the treatments on beliefs about properties of the main climate policies
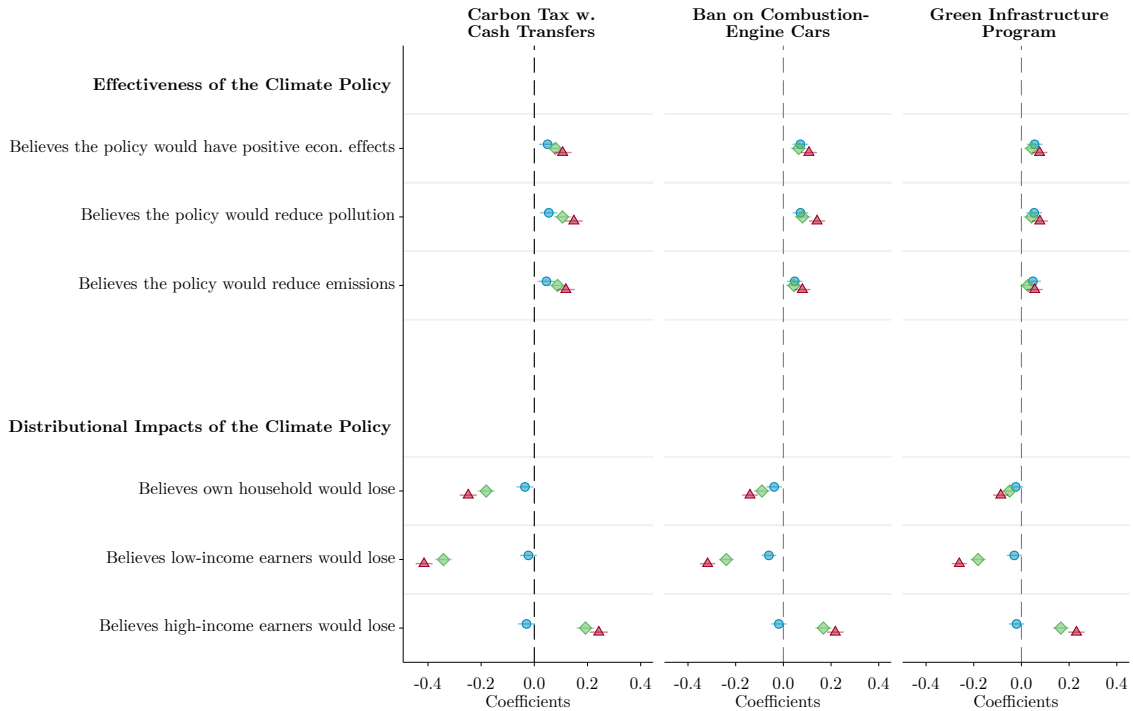
Note: The figure shows the coefficients from a regression of indices listed on the left, capturing respondents' beliefs and perceptions on indicators for each treatment, controlling for country fixed effects and socioeconomic characteristics (not shown). Panel A displays the coefficients from the regressions for reasoning, while panel B displays the coefficients from regressions of beliefs about the properties of each of the three policies. See Appendix A-1 for variable detailed definitions. 35

7 Conclusion

Our new large-scale international of 40,000 respondents across twenty high-emitting countries shows that an overwhelming majority of people understand that climate change is real and human-caused. However, respondents disagree about which measures should be taken to fight it. Although people have disparate levels of "technical" knowledge, such as about the major sources of greenhouse gas emissions or the consequences of climate change, such knowledge is not relevant for their views on what should be done about it.

Our major results center around the factors that make people support more climate action. We show that support for a given climate policy depends on three fundamental beliefs, namely that the policy is helpful in reducing emissions (effectiveness); ii) does not have adverse distributional impacts by hurting lower-income households (inequality concerns); and iii) does not financially hurt the respondents' household (self-interest). Stronger concerns or better knowledge about climate change are not strong predictors of support for climate action.

Accordingly, in many countries, there is strong majority support for policies perceived to be effective, progressive, or both, namely green infrastructure programs, subsidies for low-carbon technologies, carbon taxes with strongly progressive use of revenues (such as cash transfers to the poorest or most impacted households), and policies centered around regulations such as bans on polluting vehicles from city centers or dense areas, and the mandatory insulation of buildings.

These findings are confirmed experimentally. Respondents who see a video explaining the effectiveness and distributional implications of a policy (e.g. that it will not hurt poorer households) significantly increase their support for climate policies. Respondents who see a video on the impacts of climate change instead do not change their views by as much, and the effect is only significant in a few countries. The treatment effects for the three main policies covered in the information treatments – a green infrastructure program, a ban on combustion-engine cars, and a carbon tax with cash transfers – differ in magnitude. But for all three policies, a significant share of the baseline opposition can be swayed by explanations of how the policies work and who they impact.

Left-wing and college-educated respondents, as well as those with public transport availability, low car usage, and gas expenses, are more supportive of climate action. The differences between groups that support more climate change action and those that support less can also be traced back to the three core beliefs outlined. For instance, college-educated respondents are generally more supportive of climate action because they believe that it will be effective in reducing emissions and that they or lower-income households will not lose out as much. Nevertheless, socioeconomic and lifestyle characteristics alone do not explain a large share of the variation in policy views across respondents.

The policy lessons emerging from these international surveys and experiments are, first, that the specific policies proposed need to be (distributionally) progressive and that citizens need to be made aware of their distributional (progressive) impacts. A corollary is that how revenues from environmental taxes are spent critically influences citizens' support for them. Second, explanations and information are needed to improve support for climate

policies. They can be very effective in improving climate policies' support if they address the three key concerns outlined. Information on the dangers of climate change alone without a corresponding explanation of the policies has only limited impacts on policy support. Third, people have key concerns about their own potential losses from implementing climate action. Their own experience shapes their broader perceptions and beliefs about climate change and policies. This highlights the importance of making environmentally friendly alternatives, e.g., public transportation, more widely available before increasing environmental taxes.

Future research could shed light on the best way to convey information on how climate policies work. In addition, while our sample includes a substantial number of countries, many more are missing and would be valuable to survey in an expanded analysis. Our survey has focused on mitigation rather than adaptation policies (Barreca et al. 2016), which would be valuable to explore in future work.

Table 1: Sample representativeness – High-income countries 1

	Australia		Canada		Denmark		France	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
Sample size	NA	1,978	NA	2,022	NA	2,013	NA	2,006
Male	0.49	0.56	0.49	0.45	0.50	0.50	0.48	0.44
18-24 years old	0.11	0.10	0.10	0.09	0.11	0.09	0.12	0.10
25-34 years old	0.19	0.19	0.17	0.14	0.16	0.12	0.15	0.15
35-49 years old	0.26	0.27	0.24	0.25	0.23	0.25	0.24	0.25
More than 50 years old	0.44	0.44	0.48	0.52	0.50	0.54	0.49	0.50
Income Q1	0.25	0.45	0.25	0.25	0.26	0.29	0.25	0.31
Income Q2	0.25	0.31	0.25	0.28	0.23	0.25	0.25	0.31
Income Q3	0.25	0.17	0.25	0.28	0.28	0.26	0.25	0.23
Income Q4	0.25	0.07	0.25	0.20	0.22	0.19	0.25	0.14
Region 1	0.33	0.30	0.07	0.06	0.32	0.30	0.19	0.19
Region 2	0.20	0.23	0.06	0.07	0.23	0.23	0.22	0.24
Region 3	0.07	0.10	0.26	0.23	0.10	0.10	0.20	0.22
Region 4	0.28	0.28	0.39	0.39	0.14	0.16	0.25	0.20
Region 5	0.11	0.09	0.23	0.24	0.21	0.21	NA	NA
Urban	0.72	0.76	0.83	0.89	0.53	0.53	0.60	0.59
College education (25-64)	0.49	0.46	0.60	0.56	0.36	0.44	0.40	0.42
Share of voters	0.72	0.86	0.56	0.83	0.76	0.89	0.70	0.78
Voters: Left	0.44	0.44	0.60	0.65	0.44	0.48	0.28	0.24
Voters: Center	NA	NA	NA	NA	0.09	0.06	0.24	0.12
Voters: Right	0.41	0.41	0.39	0.30	0.43	0.37	0.47	0.53
Voters: Other	0.15	0.08	0.01	0.00	0.04	0.03	0.01	0.02
Voters: Not reported	NA	0.06	NA	0.05	NA	0.06	NA	0.08
Inactivity rate (15-64)	0.22	0.22	0.23	0.29	0.21	0.28	0.29	0.25
Unemployment rate (15-64)	0.07	0.12	0.10	0.12	0.06	0.12	0.08	0.10
Employment rate (15-64)	0.73	0.69	0.70	0.63	0.74	0.63	0.65	0.67

Note: This table displays summary statistics of the samples alongside nationally representative statistics. For *College education (25-64)*, the sample statistics are provided for respondents aged between 25 and 64 years old. For the *Share of voters*, the sample statistics include the share of people who indicated having voted. For the *Voters* variables, the sample statistics include the share of respondents who indicated voted for a party/candidate classified in each category, among respondents who indicated having voted. The *Voters: Not reported* category includes people who indicated having voted but did not report the candidate/party they voted for. For *Inactivity rate (15-64)*, the sample statistics include the share of respondents aged between 15 and 64 years old who indicated being either "*Inactive (not searching for a job)*," a "*Student*," or "*Retired*." For *Unemployment rate (15-64)*, the sample statistics include the share of respondents aged between 15 and 64 years old who indicated being "*Unemployed (searching for a job)*", ('*Unemployed (searching for a job)*," "*Full-time employed*," "*Part-time employed*," or "*Self-employed*"). For *Employment rate (15-64)*, the sample statistics include the share of respondents aged between 15 and 64 years old who indicated being either "*Full-time employed*," "*Part-time employed*," or "*Self-employed*." Detailed sources for each variable and country, as well as the definitions of regions, college education, urban, and voting categories are available in Appendix A-7.

Table 2: Sample representativeness – High-income countries 2

	Germany		Italy		Japan		Poland	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
Sample size	NA	2,006	NA	2,088	NA	1,990	NA	2,053
Male	0.49	0.48	0.48	0.49	0.48	0.54	0.48	0.44
18-24 years old	0.09	0.06	0.08	0.09	0.08	0.08	0.09	0.09
25-34 years old	0.15	0.16	0.12	0.13	0.12	0.13	0.17	0.18
35-49 years old	0.22	0.22	0.24	0.26	0.24	0.27	0.28	0.30
More than 50 years old	0.54	0.56	0.56	0.52	0.56	0.53	0.46	0.42
Income Q1	0.25	0.25	0.25	0.28	0.25	0.27	0.25	0.22
Income Q2	0.25	0.25	0.25	0.28	0.25	0.27	0.25	0.27
Income Q3	0.25	0.23	0.25	0.23	0.25	0.27	0.25	0.27
Income Q4	0.25	0.27	0.25	0.21	0.25	0.19	0.25	0.25
Region 1	0.10	0.10	0.20	0.20	0.17	0.18	0.12	0.10
Region 2	0.15	0.16	0.11	0.12	0.18	0.19	0.14	0.13
Region 3	0.18	0.16	0.19	0.17	0.35	0.38	0.23	0.21
Region 4	0.29	0.27	0.27	0.30	0.11	0.10	0.29	0.33
Region 5	0.28	0.31	0.23	0.21	0.20	0.16	0.22	0.23
Urban	0.80	0.76	0.83	0.89	0.70	0.76	0.57	0.66
College education (25-64)	0.31	0.32	0.20	0.38	0.53	0.72	0.33	0.46
Share of voters	0.67	0.86	0.59	0.87	0.54	0.79	0.63	0.87
Voters: Left	0.41	0.42	0.24	0.31	0.29	0.22	0.02	0.06
Voters: Center	0.07	0.07	0.36	0.20	0.31	0.15	0.16	0.13
Voters: Right	0.49	0.40	0.39	0.32	0.35	0.44	0.81	0.76
Voters: Other	0.03	0.04	0.02	0.07	0.05	0.05	0.00	NA
Voters: Not reported	NA	0.06	NA	0.10	NA	0.14	NA	0.05
Inactivity rate (15-64)	0.21	0.23	0.36	0.19	0.20	0.22	0.29	0.18
Unemployment rate (15-64)	0.04	0.07	0.09	0.17	0.03	0.05	0.03	0.09
Employment rate (15-64)	0.76	0.72	0.58	0.67	0.77	0.74	0.69	0.75

Note: This table displays summary statistics of the samples alongside nationally representative statistics. See notes to Table 1. Detailed sources for each variable and country, as well as the definitions of regions, college education, urban, and voting categories are available in Appendix A-7.

Table 3: Sample representativeness – High-income countries 3

	South Korea		Spain		U.K.		U.S.	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
Sample size	NA	1,932	NA	2,268	NA	2,025	NA	2,218
Male	0.50	0.56	0.49	0.49	0.50	0.52	0.50	0.47
18-24 years old	0.10	0.09	0.08	0.10	0.10	0.09	0.12	0.12
25-34 years old	0.16	0.19	0.12	0.14	0.17	0.19	0.18	0.18
35-49 years old	0.27	0.31	0.28	0.29	0.24	0.24	0.24	0.25
More than 50 years old	0.47	0.40	0.51	0.48	0.49	0.48	0.46	0.45
Income Q1	0.25	0.27	0.25	0.25	0.25	0.27	0.20	0.26
Income Q2	0.25	0.28	0.25	0.27	0.25	0.25	0.24	0.28
Income Q3	0.25	0.32	0.25	0.23	0.25	0.21	0.24	0.26
Income Q4	0.25	0.13	0.25	0.25	0.25	0.27	0.31	0.20
Region 1	0.25	0.24	0.19	0.21	0.21	0.21	0.21	0.20
Region 2	0.34	0.37	0.30	0.28	0.13	0.13	0.17	0.18
Region 3	0.19	0.23	0.11	0.10	0.24	0.23	0.38	0.39
Region 4	0.22	0.17	0.13	0.15	0.11	0.10	0.24	0.23
Region 5	NA	NA	0.28	0.26	0.31	0.33	NA	NA
Urban	0.92	0.95	0.70	0.75	0.82	0.84	0.73	0.72
College education (25-64)	0.51	0.74	0.40	0.57	0.49	0.62	0.61	0.60
Share of voters	0.75	0.87	0.63	0.85	0.60	0.82	0.62	0.82
Voters: Left	0.47	0.63	0.41	0.45	0.39	0.37	0.51	0.57
Voters: Center	0.21	0.11	0.07	0.09	0.12	0.11	NA	NA
Voters: Right	0.31	0.17	0.36	0.25	0.46	0.47	0.47	0.36
Voters: Other	0.01	NA	0.16	0.14	0.04	0.02	0.02	0.02
Voters: Not reported	NA	0.09	NA	0.07	NA	0.03	NA	0.05
Inactivity rate (15-64)	0.31	0.17	0.28	0.18	0.21	0.24	0.27	0.26
Unemployment rate (15-64)	0.04	0.08	0.16	0.14	0.05	0.09	0.08	0.13
Employment rate (15-64)	0.66	0.76	0.62	0.71	0.75	0.69	0.67	0.64

Note: This table displays summary statistics of the samples alongside nationally representative statistics. See notes to Table 1. For *College education (25-64)* in the U.S., the sample statistics is provided for all respondents and not only respondents aged between 25 and 64 years old. Detailed sources for each variable and country, as well as the definitions of regions, college education, urban, and voting categories are available in Appendix A-7.

Table 4: Sample representativeness – Middle-income countries 1

	Brazil		China		India		Indonesia	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
Sample size	NA	1,860	NA	1,717	NA	2,472	NA	2,488
Male	0.49	0.45	0.51	0.54	0.51	0.58	0.50	0.52
18-24 years old	0.15	0.16	0.10	0.12	0.18	0.23	0.17	0.19
25-34 years old	0.22	0.23	0.20	0.26	0.24	0.27	0.23	0.26
35-49 years old	0.30	0.32	0.28	0.35	0.29	0.24	0.31	0.31
More than 50 years old	0.34	0.29	0.42	0.27	0.28	0.26	0.29	0.24
Income Q1	0.25	0.24	0.25	0.13	0.25	0.27	0.25	0.28
Income Q2	0.25	0.30	0.25	0.25	0.25	0.24	0.25	0.24
Income Q3	0.25	0.24	0.25	0.29	0.25	0.25	0.25	0.23
Income Q4	0.25	0.22	0.25	0.32	0.25	0.24	0.25	0.25
Region 1	0.08	0.07	0.29	0.31	0.27	0.20	0.08	0.07
Region 2	0.09	0.04	0.12	0.17	0.26	0.25	0.30	0.31
Region 3	0.27	0.28	0.08	0.05	0.13	0.15	0.13	0.11
Region 4	0.14	0.15	0.29	0.23	0.20	0.24	0.21	0.20
Region 5	0.42	0.45	0.22	0.24	0.14	0.17	0.27	0.31
Urban	0.69	0.77	0.63	0.53	0.36	0.46	0.57	0.62
College education (25-64)	0.20	0.64	0.10	0.59	0.09	0.72	0.13	0.45
Share of voters	0.67	0.92	NA	NA	0.65	0.79	0.74	0.90
Voters: Left	0.30	0.24	NA	NA	0.39	0.27	0.19	0.42
Voters: Center	0.19	0.10	NA	NA	NA	NA	0.17	0.06
Voters: Right	0.50	0.52	NA	NA	0.46	0.61	0.54	0.39
Voters: Other	0.01	0.06	NA	NA	0.16	0.03	0.10	NA
Voters: Not reported	NA	0.08	NA	NA	NA	0.08	NA	0.13
Inactivity rate (15-64)	0.34	0.12	0.23	0.10	0.46	0.20	0.30	0.20
Unemployment rate (15-64)	0.14	0.11	0.03	0.01	0.09	0.04	0.06	0.05
Employment rate (15-64)	0.57	0.79	0.75	0.89	0.49	0.76	0.66	0.76

Note: This table displays summary statistics of the samples alongside nationally representative statistics. See notes to Table 1. Detailed sources for each variable and country, as well as the definitions of regions, college education, urban, and voting categories are available in Appendix A-7.

Table 5: Sample representativeness – Middle-income countries 2

	Mexico		Turkey		South Africa		Ukraine	
	Population	Sample	Population	Sample	Population	Sample	Population	Sample
Sample size	NA	2,045	NA	1,932	NA	2,003	NA	1,564
Male	0.48	0.49	0.49	0.43	0.49	0.46	0.45	0.61
18-24 years old	0.18	0.18	0.16	0.18	0.21	0.21	0.08	0.12
25-34 years old	0.23	0.24	0.21	0.24	0.28	0.29	0.18	0.25
35-49 years old	0.30	0.31	0.30	0.34	0.28	0.28	0.28	0.40
More than 50 years old	0.29	0.27	0.33	0.24	0.22	0.22	0.46	0.24
Income Q1	0.25	0.26	0.25	0.14	0.25	0.16	0.25	0.17
Income Q2	0.25	0.27	0.25	0.28	0.25	0.24	0.25	0.24
Income Q3	0.25	0.24	0.25	0.28	0.25	0.32	0.25	0.24
Income Q4	0.25	0.22	0.25	0.30	0.25	0.27	0.25	0.36
Region 1	0.33	0.38	0.25	0.28	0.12	0.09	0.31	0.37
Region 2	0.22	0.18	0.18	0.12	0.24	0.29	0.21	0.17
Region 3	0.10	0.10	0.30	0.34	0.18	0.17	0.22	0.26
Region 4	0.13	0.12	0.26	0.26	0.33	0.26	0.25	0.20
Region 5	0.23	0.22	NA	NA	0.13	0.18	NA	NA
Urban	0.64	0.81	0.87	0.96	0.49	0.63	0.70	0.88
College education (25-64)	0.19	0.66	0.16	0.65	0.16	0.49	NA	0.67
Share of voters	0.53	0.86	0.83	0.88	0.44	0.67	0.53	0.76
Voters: Left	0.56	0.54	0.35	0.30	0.68	0.45	0.16	0.19
Voters: Center	0.18	0.10	0.10	0.07	0.21	0.32	0.67	0.69
Voters: Right	0.19	0.20	0.55	0.50	0.06	0.04	0.13	0.03
Voters: Other	0.07	0.02	0.00	NA	0.05	0.04	0.03	NA
Voters: Not reported	NA	0.14	NA	0.14	NA	0.15	NA	0.10
Inactivity rate (15-64)	0.35	0.12	0.45	0.21	0.45	0.16	0.38	0.15
Unemployment rate (15-64)	0.04	0.07	0.13	0.12	0.29	0.16	0.10	0.10
Employment rate (15-64)	0.59	0.81	0.48	0.69	0.38	0.71	0.56	0.76

Note: This table displays summary statistics of the samples alongside nationally representative statistics. See notes to Table 1. Detailed sources for each variable and country, as well as the definitions of regions, college education, urban, and voting categories are available in Appendix A-7.

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