



Analysis

On the nexus between material and ideological determinants of climate policy support[☆]

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ABSTRACT

This study explores how rising economic costs of climate mitigation policies differentially shape climate policy support among the political left and right. To this end, we randomly manipulate how much consumption costs increase as a result of four different climate mitigation policies and study how different cost scenarios influence policy support among a sample of 1,597 Swedish adults. We find that more costly climate policies induce greater climate policy polarization, since right-leaning participants display both lower baseline and more cost-sensitive climate policy support. In addition, we investigate how policy costs affect participants' concerns about the climatic consequences of consumption. While inconclusive, the results indicate that right-leaning participants, in some instances, display less concern about the climatic consequences of consumption when policy costs rise. This pattern can be understood through the lens of motivated disbelief, which holds that people adjust their beliefs in order to support their preferred actions. The present study provides novel insights as to how and when material conditions influence climate policy preferences.

1. Introduction

In Western democracies, there is a strong divide between left and right in terms of preferences for climate mitigation policies, and the gap has widened over the past two decades (Dunlap and McCright, 2008; Kahan, 2012; Dunlap et al., 2016). This divide, or policy polarization, constitutes a challenge for the green transition since it implies that current environmental policy regimes hinge on unstable political coalitions (DeNicola and Subramaniam, 2014). In turn, political uncertainty translates into producer and consumer uncertainty regarding the economic incentives to “go green”. Accordingly, understanding the growing division over climate policies is imperative for fostering effective and sustainable environmental governance, promoting consensus-building efforts, and ensuring the successful implementation of long-term climate mitigation strategies.

In this paper, we investigate the causal effect of rising costs of climate mitigation policies on climate policy polarization. To this end, we randomly manipulate the costs associated with four different climate mitigation policies and study how rising costs influence policy support

among a sample of 1597 Swedish adults. In tackling carbon emissions from the aviation, food, car fuel, and apparel industries, the policy proposals would also entail greater financial burdens on consumers (that is, the participants of the survey). First, we show that experimentally increasing the private costs of climate policies reduces average policy support. Second, we document that ideology is a strong predictor of climate policy preferences, with right-leaning participants displaying substantially lower support of all four climate policies. Third, we demonstrate that higher costs of climate policies reduce support among right-leaning participants but not among left-leaning participants. As such, higher costs for climate mitigation policies further perpetuate climate polarization.

We then investigate a potential mechanism, namely the malleability of participants' worries about the climatic consequences of consumption (climatic impact worries). Climatic impact worries—the extent to which participants worry about how their own and others' consumption of carbon emitting goods may contribute to climate change—is highly predictive of climate policy support both among left- and right-leaning

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participants. But whereas climatic impact worries among left-leaning participants are high and unaffected by the cost conditions, we find that right-leaning participants' worries are low at baseline *and* potentially malleable by the cost scenarios. While the results are inconclusive—two out of four scenarios feature significant effects—right-leaning participants report *lower* levels of worries about the climatic impact of the aviation and apparel industries when exposed to experimentally higher policy costs.

The fact that right- but not left-leaning participants react to higher policy costs by reducing their support may reflect partisan differences in social norms. This conjecture is supported by Cole et al. (2022), who found that information about partisan ingroup preferences for climate action causally shaped private preferences. Similarly, Brick et al. (2017) showed that social identity correlated more strongly with high-visibility compared to low-visibility pro-environmental behavior, indicating that compliance with group norms matters for behavior. We argue that normative prescriptions allow the ideological right to trade off personal financial interests against environmental concerns, whereas such trade-off thinking is less accepted among the ideological left.

The present study adds to a growing literature on the psychology of climate policy support (see, for example, Clayton et al., 2015; Goldberg et al., 2019). Recent efforts have enhanced our knowledge of how psychological tendencies such as motivated reasoning (Hart and Nisbet, 2012; Campbell and Kay, 2014) and social identity (Mackay et al., 2021) contribute to climate policy support. But how such psychological tendencies shape the impact of material costs on climate policy polarization demands further scrutiny, especially in light of the current economic downturn. We know from previous studies that climate policy support is inversely related to private costs (Diekmann and Preisendörfer, 2003; Brannlund and Persson, 2012; Svenningsen and Thorsen, 2021; Dechezleprêtre et al., 2022), although the strength of this link has been questioned (see, e.g., Kallbekken and Sælen, 2011; Kachi et al., 2015). The fact that willingness to pay for climate mitigation policies varies significantly both between contexts and individuals (Kallbekken and Sælen, 2011; Krosnick and MacInnis, 2013; Douenne and Fabre, 2020; Carlsson et al., 2021) prompts the question: how do material and non-material motivations interact to shape climate policy support?

We make three distinct contributions to the study of climate policy preferences. First, our findings highlight the interaction between material and non-material sources of climate policy preferences. This interplay implies that preferences for ideologically charged policies (such as climate policies) cannot be reduced to simple cost-benefit analyses. Moreover, a research agenda on the nexus between material and non-material sources of climate policy preferences has potentially wider ramifications, *inter alia*, by highlighting how energy scarcity may influence (political) cooperation (Agneman et al., 2023; Muthukrishna, 2023). Second, the results regarding heterogeneous responses to rising climate policy costs provide robust evidence of an important source of climate policy polarization. This suggests that advocates for more stringent climate policies ought to consider differential voter motives in their communication. Third, the fact that rising policy costs reduce right-leaning participants' climatic impact worries in the aviation and apparel scenarios underscores the complex relationship between climate beliefs and preferences for climate action. This finding highlights reverse causation, from policy preferences to climate beliefs, and suggests that material motives may influence climate skepticism.

The paper proceeds as follows. In the next section, we discuss the underlying theory and derive hypotheses. After that, we present the empirical setting and describe the experimental design along with the main variables. We then present the results. Finally, we discuss the findings and conclude.

2. Theory and hypotheses

Much of what we consume, from apparel to foodstuffs, relies on carbon-intensive energy (Soytas et al., 2007). One way to reduce the emissions from carbon-intensive production is to tax carbon emissions directly or indirectly and, hence, incentivize energy efficiency and/or energy transition. But provided that producers pass the costs onto consumers, such measures lead to higher prices (at least in the short run) and may thus meet public resistance (Boyce, 2018).¹ Examples of opposition to policies that increase energy costs abound, including political pressure to temporarily suspend the federal gasoline tax during the 2008 U.S. presidential campaign (Bosman, 2008) and the French yellow vest movement's formation as a response to a proposed increase of the carbon tax (Douenne and Fabre, 2020, 2022).

Yet, the general willingness to pay for climate mitigation efforts appears to be high (Krosnick and MacInnis, 2013). Since the burden of climate change disproportionately falls on future generations (Agneman et al., 2024), widespread support for climate action today suggests that climate policy preferences cannot be reduced to private cost-benefit calculations. Rather, policy preferences are governed by a range of factors, including other-regarding preferences and norms (Gowdy, 2008). Even so, if other factors are held constant, both theoretical and empirical evidence suggest that support should be contingent upon the private costs and benefits (e.g., Diekmann and Preisendörfer, 2003). As such, we propose the following baseline hypothesis:

Hypothesis 1. Higher costs for climate mitigation policies reduce support.

As already noted, the general willingness to support costly climate policies is influenced by a range of factors other than personal costs, including demographic characteristics such as income, education, and gender (Bergquist et al., 2022). Moreover, a growing body of research has documented how support is contingent upon policy design and implementation (Klenert et al., 2018; Wang and Mangmeechai, 2021; Ewald et al., 2022; Dechezleprêtre et al., 2022) as well as on distributional concerns (e.g., Jagers and Hammar, 2009; Brannlund and Persson, 2012). Contextual factors, such as media coverage and weather shocks, can also causally shape policy preferences (Drews and Van den Bergh, 2016). Finally, social capital and preferences, including trust in politicians, political institutions, and scientists, have been shown to strongly predict climate policy support (e.g., Haring and Jagers, 2013).

Yet, the perhaps most reliable predictor of climate policy preferences is ideology (Dunlap et al., 2016). Left-leaning voters have recurrently been found to exhibit stronger concerns about the climatic consequences of consumption compared to right-leaning voters (see, e.g., Gregersen et al., 2020) and are more likely to believe in the effectiveness of taxation to solve market failures associated with carbon emissions (Campbell and Kay, 2014; Levi, 2021). As a consequence, those on the left of the political spectrum are typically more in favor of privately costly climate policies (Ding et al., 2011). In order to replicate previous research and to underpin the main thesis of the present paper, we test the following uncontroversial hypothesis:

Hypothesis 2. Right-leaning voters are less likely to support climate mitigation policies compared to left-leaning voters.

The presupposed statistical link between ideology and climate policy preferences may reflect reciprocal causation: people select into parties or political movements that promote their private preferences and are simultaneously affected by the prevalent social norms within those organizations (Cole et al., 2022). That social norms influence

¹ Although, as argued by Klenert et al. (2018), the revenues from carbon pricing could be distributed to offset some of the financial burden imposed on consumers.

environmental attitudes has been documented in a number of recent studies (see also [Bolsen et al., 2014](#); [Brick et al., 2017](#); [Goldberg et al., 2020](#)). We extend this line of research by considering how social norms *condition* behavioral responses to increased material costs.

According to [Zannakis \(2015\)](#), the social norm governing climate-related behaviors is stronger among the ideological left compared to the ideological right. In simple terms, the author argues that while the right is open to weighing climatic benefits against (personal) economic costs, such trade-off thinking is more stigmatized among the left. In other words, provided that a subject allows private material interests to dictate opposition to a climate mitigation policy, she would pay a larger *social cost* due to norm violation if she belongs to the ideological left compared to if she belongs to the ideological right. Even when norm violations are not visible to others, the social cost of breaking social conventions may be internalized ([Fischbacher and Föllmi-Heusi, 2013](#); [Agneman and Chevrot-Bianco, 2023](#)). If the ideological right has a weaker norm related to climate policy preferences ([Zannakis, 2015](#); [Cole et al., 2022](#))—and policy choices ultimately are shaped by a trade-off between material and immaterial costs and benefits ([Enke et al., 2022](#))—then right-leaning subjects should exhibit more malleable policy preferences. Taken together, the reviewed literature suggests that right-leaning voters should be more likely to emphasize the (personal) material consequences of climate policies and, therefore, be more likely to reduce their policy support as a result of policy cost inflation. Given that right-leaning voters are less supportive of climate policies at baseline, rising climate policy costs would thus lead to greater policy polarization. Our third hypothesis reads as follows:

Hypothesis 3. Climate policy support among right-leaning voters is more sensitive to private costs compared to climate policy support among left-leaning voters.

The malleability of climate policy preferences is, however, potentially constrained by individuals' beliefs about the climatic consequences of carbon-intensive goods consumption. A large body of research has shown that climate beliefs predict support for policies intended to mitigate emissions ([Hornsey et al., 2016](#)), and the association is apparent both among left-wing and right-wing voters ([Gregersen et al., 2020](#)). Accordingly, subjects who reduce their support of climate policies due to financial motives, *despite* worrying about human-driven climate change, may experience cognitive dissonance, i.e., mental discomfort caused by a disconnect between beliefs and behaviors ([Festinger, 1962](#)).

To alleviate distress caused by cognitive dissonance, people may adjust their beliefs to support their preferred action through so-called “motivated disbelief” ([Kahan, 2010](#); [Campbell and Kay, 2014](#)). That is, when the actions prescribed by climate concerns become more costly, people may—subconsciously or strategically—become less concerned about the climatic consequences of consumption. In line with this argument, motivated reasoning has been shown to result in avoidance (see, e.g., [Yang and Kahlor, 2013](#)) and to shape the processing ([Hart and Nisbet, 2012](#); [Luo and Zhao, 2019](#); [Mackay et al., 2021](#)) of climate-related information. According to [Fairbrother \(2022, page 4\)](#): “the ideological or partisan bias in climate denial is no doubt related to what psychologists call motivated reasoning”. In order to avoid cognitive dissonance, individuals who decrease their support for climate policies due to high personal costs might also display less concern about the climatic impact of consumption. In line with this reasoning, we propose a fourth hypothesis:

Hypothesis 4. If higher policy costs negatively affect climate policy support, they also reduce concerns about the climatic impact of consumption.

3. Empirical strategy

3.1. Empirical setting

We collect novel survey data in Sweden, a country that is often conceived as “pro-environment” and with less climate polarization. Political parties across the spectrum have shown comparatively strong support for costly climate action. According to [Zannakis \(2015\)](#), one reason is that both right- and left-wing parties have been able to justify steps toward a green transition, albeit based on different motives.² This context suggests that ideology in Sweden might be less predictive of climate policy support compared to other countries (see, for instance, [McCright et al., 2013](#), demonstrating substantial ideological polarization regarding climate policies in the United States). Yet, general climate policy support in Sweden has declined over the past decade ([The Swedish Environmental Protection Agency, 2021](#))³ and ideological polarization around climate mitigation policies has increased ([Harring et al., 2019](#)). Indicative of this shift, several parties have decided to withdraw their support of a mandatory fuel blending policy ([Näsman, 2022](#)). Recent surveys also demonstrate a strong divide between the left and right in Sweden in terms of climate attitudes. In comparison to left-leaning voters, right-leaning voters are less likely to view climate change as a problem ([Ewald et al., 2022](#)) and more likely to oppose costly solutions ([Holmberg and Persson, 2023](#)).

The polarization has coincided with increasingly ambitious climate goals as well as rising living costs, with party representatives explicitly blaming climate mitigation policies for contributing to inflation.⁴ Rising inflation leading up to the 2022 General Elections in Sweden further heightened the political salience of climate mitigation policies, with (primarily) right-wing parties campaigning on reducing the price of CO₂-emitting goods like fuel (see, e.g., [The Sweden Democrats' Election Manifesto, 2022](#)).

3.2. Climate policy scenarios and (experimental) cost inflation

Against this backdrop, we conducted a representative survey in the aftermath of the 2022 general elections, in which we elicited climate policy preferences by means of a vignette experiment. The survey presented each participant with four distinct policy proposals (shown in [Table 1](#)), each respectively aimed at reducing emissions from Swedes' consumption of flights (Aviation Policy), food (Food Policy), car fuel (Fuel Policy), and clothes (Apparel Policy). But while the policies would reduce consumption-related greenhouse gas emissions, they would also lead to inflated private consumption costs. To vary the private costs associated with each policy scenario, we randomly manipulated the cost inflation associated with each policy proposal. The cost scenarios (henceforth cost conditions) imply varying markups of participants' own consumption costs, which we elicit through budget questions (detailed in Appendix Table B1). The cost conditions entail a low (Y%), medium (2Y%), or high (4Y%) increase in annual consumption costs, with Y varying between the policy scenarios in order to reflect realistic cost inflation for each specific good. Note the exponential increase in

² Comparatively speaking, the political right has focused more on economic opportunities of the green transition, while the political left has highlighted obligations ([Zannakis, 2015](#)).

³ Specifically, the share of respondents who do not consider it important for Sweden to combat climate change has increased during the 2010s, albeit from low levels.

⁴ For instance, the leader of the left-wing party *Vänsterpartiet*, Nooshi Dadgostar, stated that “It is the mandatory fuel-blending policy that is driving the price hikes right now”, and the then economic policy spokesperson for the right-wing party *Moderaterna*, Elisabeth Svantesson, argued that: “We cannot have fuel prices continuing in this direction. It is completely unsustainable and unreasonable [...] The entire system needs to be revised” ([Dagens Industri, 2022](#)).

Table 1
Climate policy scenarios and cost conditions.

Aviation policy	Food policy
Emissions from Swedes' air travel amounted to 10 million metric tons of carbon dioxide equivalents in 2019, just over a tenth of Swedes' consumption emissions of greenhouse gases. Today, the aviation industry is heavily subsidized, pays no fuel, energy, or carbon taxes, is exempt from VAT, and operates at publicly subsidized airports.	Emissions from Swedes' food consumption amounted to 15 million metric tons of carbon dioxide equivalents in 2019, just over a seventh of Swedes' consumption emissions of greenhouse gases. Emissions occur in all stages: fertilizer production, animal husbandry, cultivation, harvest, food packaging, and transportation.
One day, you read about a bill that aims to remove these subsidies to reduce the impact of Swedish aviation on the climate. According to experts, the proposal could mean that the cost of air tickets increases by an average of [20/40/80] percent. Your personal annual cost for air travel would thus increase by approximately XXX SEK.	One day, you read about a climate tax on food that aims to reduce the impact of food consumption in Sweden on the climate. According to experts, the proposal could mean that the cost of food increases by approximately [4/8/16] percent, thus increasing your personal annual cost for food by approximately XXX SEK.
Fuel policy	Apparel policy
Emissions from Swedes' car transport were almost 10 million metric tons of carbon dioxide equivalents in 2020, just over a tenth of Swedes' consumption emissions of greenhouse gases. The reduction obligation means that the fuel that is used by cars in Sweden is mixed with biofuels, which reduces its climate impact.	Emissions from Swedes' apparel consumption were almost 4.2 million metric tons of carbon dioxide equivalents in 2020, or almost one twentieth of Swedes' consumption emissions of greenhouse gases. Emissions occur in all stages: material, production, and transportation.
One day you read about a bill that aims to reduce emissions from car traffic by further increasing the share of biofuels in fuel. According to experts, the proposal could mean that the cost of fuel increases by an average of [3/6/12] percent, thus increasing your personal annual cost for car transport by approximately XXX SEK.	One day, you read about a bill that aims to reduce emissions from textile consumption through a new framework that requires apparel companies to compensate for emissions. The proposal would mean a cost increase of [10/20/40] percent on the new apparel and shoes you buy. It would increase the cost of your apparel consumption by approximately XXX SEK per year.

Note: Table 1 displays the four climate policy scenarios. The order in which participants responded to vignettes was randomized. The increased consumption cost (XXX Swedish krona (SEK)) was calculated by multiplying participants' self-reported consumption costs of respective goods with the cost inflation implied by the randomized treatment (low, medium, or high cost scenario). The emissions for respective industry stated in each policy scenarios are retrieved from Nohren et al. (2022) (Aviation Policy), The Swedish Environmental Protection Agency (2023a) (Food Policy), The Swedish Environmental Protection Agency (2023b) (Fuel Policy), and The Swedish Environmental Protection Agency (2023c) (Apparel Policy).

consumption costs across the low, medium, and high cost conditions. A participant who was assigned the {low/medium/high} cost condition in the aviation policy scenario would see private consumption costs increase by {20/40/80}%—or {2000/4000/8000} Swedish Krona (SEK) for a reported annual aviation budget at 10,000 SEK (approximately \$1000). Given the larger absolute change in consumption costs from medium to high compared to low to medium, we expect the most pronounced behavioral differences to emerge between the high-cost condition and the other two conditions. The order in which participants were exposed to the different policy proposals was randomized.

After the survey, participants were debriefed and informed that the policies were hypothetical scenarios with the information that “In this survey, you have been asked to consider different policy proposals. While these policies have been discussed by various actors, it should be emphasized that the cost estimates presented in this survey are speculative and do not necessarily correspond to actual cost projections”.

3.3. Climate policy support and climatic impact worries

After each policy scenario, we asked participants about their support for the proposed policy. The questions read as follows:

Climate policy support

How likely are you to support the policy proposal regarding [removed aviation subsidies; a climate tax on food; a higher share of biofuels; apparel companies bear the costs of their emissions]? [0 (extremely unlikely) - 10 (extremely likely)]

The continuous scale, ranging from 0 to 10, ensures meaningful between-subject variation in policy support. Support for each policy proposal constitutes the primary variable of interest. We then elicited participants' worries about the climatic consequences of private consumption of respective goods. Specifically, we asked:

Climatic impact worries

How worried are you about the climatic impact of (1) yours and (2) others' [air travel; food consumption; car transportation; apparel consumption]? [0 (Not at all worried) - 10 (extremely worried)]

Participants provide separate responses for worries about the climatic consequences of their own and other Swedish citizens' consumption. In the next subsection, we describe how we capture political ideology (or *Ideological leanings*), which is used to evaluate Hypotheses 2–4.

3.4. Ideological leanings

We measure ideological leanings through a battery of questions gauging different dimensions of participants' political ideology. Participants are asked to rate policy proposals that concern both economic and social issues. In Table 2, we present the exact phrasing of the questions and the respective dimensions that they arguably tap into.

Next, we run a principal component analysis (PCA) on these eight survey items. The PCA computes a weighted average based on the inter-correlations of the items and thereby generates a proxy that we label *Ideological leanings*. This approach conveys two key advantages. First, compared to using a single indicator of ideology, collapsing information from multiple indicators reduces measurement error. Second, the data-driven approach avoids the arbitrary assumptions typical of manual index construction. In Table 3, we show the resulting factor loadings from the first component,⁵ which indicates how each variable feeds into the index of *Ideological leanings*.

We note that the signs of the factor loadings presented in Table 3 are in line with expectations: items where higher values represent more typical right-wing sentiments show positive factor loadings, while items where higher values represent more typical left-wing sentiments display negative factor loadings. While a couple of factor loadings fall short of the conventional threshold of 0.3 used in exploratory factor analysis (Williams et al., 2010), such a benchmark is less relevant for our purposes since we a priori claim that all survey items capture different, yet interrelated, aspects of political ideology. Therefore, we keep all variables in the index construction and note that each item correlates strongly with the final measure of ideological leanings.⁶

⁵ Using only one dimension of ideology is motivated both theoretically (the economic and social dimensions are closely intertwined) and empirically (the first component yielded an eigenvalue of 2.93, whereas the second component yielded a much smaller eigenvalue of 1.13). The differences in the magnitudes of eigenvalues indicate that the data can be represented by a single dimension.

⁶ Pearson correlation coefficients with ideological leanings. Public sector: 0.638; Privatize health care: 0.604; Education funding: -0.541; Government housing: -0.487; Criminal justice: 0.656; Immigration policy: 0.723; Food policy: -0.469; Diversity & inclusion: -0.674.

Table 2
Survey items on political ideology.

Question	Item	Label	Dimension
What is your opinion on the following policy proposals? (Very bad proposal (1) - Very good proposal (5))	Reduce the size of the public sector	Public sector	Economic
	More of the healthcare through private sector	Privatize health care	Economic
	Raise taxes to hire more teachers	Education funding	Economic
	More government construction of housing	Government housing	Economic
	Enforce much harsher prison terms	Criminal justice	Social
	Accept fewer refugees in Sweden	Immigration policy	Social
	Schools should only serve organic food	Food policy	Social
	State support for associations and activities that promote diversity (LGBTQ, multiculturalism)	Diversity and inclusion	Social

Note: Table 2 displays the survey items used to construct a measure of ideological leanings.

Table 3
Factor loadings derived from the principal component analysis.

Variable	Ideology	Factor loadings	Variable	Ideology	Factor loadings
Public sector	Right	0.3727	Privatize health care	Right	0.3528
Education funding	Left	-0.3159	Government housing	Left	-0.2847
Criminal justice	Right	0.3831	Immigration policy	Right	0.4226
Food policy	Left	-0.2743	Diversity & inclusion	Left	-0.3939

Note: Table 3 shows the factor loadings from the principal component analysis. The column *Ideology* indicates whether a survey question was phrased such that high values indicate right- or left-wing ideology.

In order to further corroborate the validity of the measure of ideology, we display variation in the index separately for participants' favored political parties (Fig. 1). The results largely align with alternative measures of Swedish parties' positioning along the left–right dimension (Oscarsson and Holmberg, 2016; Jolly et al., 2022); participants supporting the (left wing) opposition parties feature more left-wing ideological leanings, and participants supporting the (right wing) governing coalition feature more right-wing ideological leanings. As such, this exercise confirms the construct validity of the measure of ideological leanings. Yet, at the same time, the figure displays substantial ideological variation *within* parties. A key advantage of operationalizing ideology through issue-based instead of partisan preferences is that we are able to capture both inter- and intraparty variation in ideology (Mayer and Smith, 2023). To define participants as “left-leaning” or “right-leaning”, we simply use the median value of ideological leanings as the cutoff.⁷

3.5. Other data

The survey also contains a range of pre-determined variables that can be used as controls in the analyses. While the cost conditions were randomized, meaning that the identification of their parameters does not require us to condition on observable factors, political ideology is not random and therefore correlates with a range of other characteristics that could confound the analyses. The endogenous nature of political ideology prevents causal identification in models where ideology is used as an independent variable. Still, the models where ideology is merely used to separate sub-samples, i.e., where the independent variable is experimental assignment to a specific cost condition, allow for causal interpretations of the effects of cost conditions.

Moreover, in models that rely on non-experimental variation, we show estimates both without and with a set of control variables, namely: income, education, county of residence, city size, gender, and age. We also gauged participants' propensity to prioritize economic growth over climate. Finally, we asked participants to report their spending on the four consumption goods at which policy proposals are directed. The exact phrasing of survey questions is detailed in Appendix Table B1.

⁷ This way, we avoid the risk of arbitrary cutoffs influencing the findings and ensure balanced sub-samples.

3.6. Survey design and identification strategy

The sample comprised 1615 Swedish adults (1597 of whom answered all questions used to construct *Ideological Leanings*). Participants were randomly selected by means of a stratified sampling procedure (stratified by age, gender, and county) from an online (nationally representative) pool. As such, the age, gender, and residency profiles of participants are closely aligned with those of the general Swedish population (see Appendix Table A2). In Appendix Figure B1, we map average policy support across the Swedish counties.

The survey was administered online, and participants received a small remuneration for completing the survey. In order to enhance the perceived stakes of the policy questions, participants were informed that “the results will be reported in scientific articles and may also inform popular science”.

As previously outlined, we experimentally induce variation in the cost of different climate policies by randomly exposing each participant to a low, medium, or high cost condition, where the cost condition is randomized for each policy scenario. The randomization of cost conditions is done separately for each policy scenario in order to ensure that each treatment status is orthogonal to the treatment statuses in the other scenarios. Since the high-cost condition increases spending costs four (two) times more than the low (medium) cost conditions, the main specifications compare policy support in the high-cost condition with policy support in the other two cost conditions. By using these specifications, we achieve the highest statistical power and treatment strength. We test the hypotheses using data from four different policy scenarios in order to strengthen both the internal and external validity of the findings. The main specifications are variants of the following regression equation⁸:

$$\text{Outcome}_{ij} = \beta_{0j} + \beta_{1j} \times \text{HCC}_j + \varepsilon_{ij}$$

4. Results

In this section, we subsequently evaluate each of the following hypotheses:

1. Higher costs for climate mitigation policies reduce support.

⁸ Where participant *i*'s *j*th outcome is measured as a function of a constant (β_{0j}) and the high-cost condition ($\beta_{1j} \times \text{HCC}_j$). ε_{ij} denotes the error term.

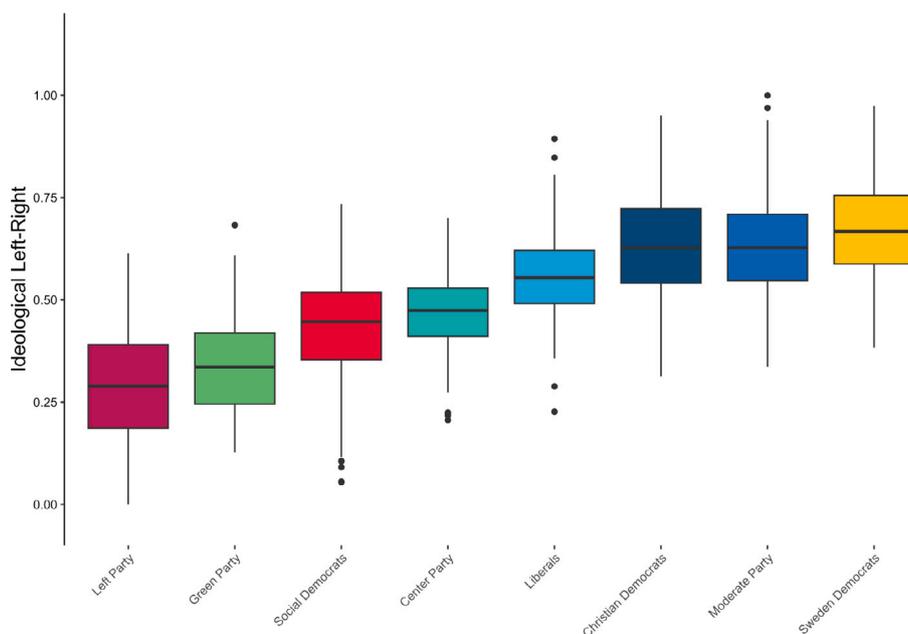


Fig. 1. Ideological leanings across parties. Note: Fig. 1 displays ideological leanings across parties in a boxplot. The first and third quartiles are represented by the lower and upper hinges, respectively. The whiskers extend to the maximum absolute values, but no further than $1.5 \times$ the interquartile range. Dots represent outliers.

2. Right-leaning voters are less likely to support climate mitigation policies compared to left-leaning voters.
3. Climate policy support among right-leaning voters is more sensitive to private costs compared to climate policy support among left-leaning voters.
4. If higher policy costs negatively affect climate policy support, they also reduce concerns about the climatic impact of consumption.

4.1. Policy costs and climate policy support

First, we study how experimentally varying the costs associated with the different climate policy proposals (outlined in Table 1) affects support. In Fig. 2, we demonstrate how assignment to the different cost conditions influences support for respective climate mitigation policies. The figure reveals a monotonic decline in policy support as implementation costs rise. The negative impact is formally tested and shown to be statistically significant in OLS regressions presented in Appendix Table C1, where we also control for the order of vignettes as well as a prime on the intergenerational aspect of climate mitigation.⁹ Since these other variations are orthogonal to the cost treatments by design, the estimated effects of the cost conditions are unchanged.

We further notice that the average support is higher for policies addressing emissions from non-essential consumption goods (aviation and apparel) compared to essential consumption goods (food and fuel). Yet, the negative effects of higher implementation costs are of similar magnitude for all four policies. The estimated coefficients of the high-cost condition fall in the range between -0.626 and -0.963 , or about 25% of a standard deviation.

In Section 2, we derived the empirical expectations that both baseline support and the influence of cost treatments should differ between the ideological camps. In what follows, we first investigate how policy support correlates with ideological leanings in Sweden and then turn to

how right- and left-leaning participants differentially react to the cost conditions. Together, these analyses will shed light on the link between changing material conditions and climate policy polarization.

4.2. Ideology and climate policy support

To what extent is variation in climate policy support accounted for by ideology? As outlined in Section 3.1, Sweden's comparatively ambitious climate policies have enjoyed relatively broad support from parties across the political spectrum, but climate mitigation policies have become increasingly polarized in recent years. In order to investigate the statistical association between ideology and climate policy support in Sweden, we correlate the index of political ideology (which is standardized between 0 (most left-leaning) and 1 (most right-leaning)) with support for the four different policy scenarios. In Fig. 3, the associations are visualized through binned scatter plots.

Fig. 3 demonstrates strong relationships between political ideology and support for the four climate policies, with policy support declining monotonically as political ideology becomes more right-oriented. In Appendix Table C2, we formally test the statistical associations between ideology and climate policy support. The bivariate specifications (Panel A) all show strong and statistically significant relationships (the t -value of Ideological Leanings is larger than 20 in all four policy scenarios). The estimated coefficients are of such magnitudes that a one-unit increase in Ideological Leanings—i.e., going from the most left-leaning (0) to the most right-leaning (1) participant—predicts a drop in climate policy support from near maximum (10) to near minimum support (0).

A causal interpretation of these results is not warranted due to the non-experimental nature of ideology, which means that both omitted variable bias and reverse causality might influence the relationship. In Panel B of Appendix Table C2, we mitigate worries about omitted variable bias by conditioning on a set of controls (fixed effects for gender, income, education, county of residence, city size, and a numeric control for age), which have been argued to shape climate policy support elsewhere (Bergquist et al., 2022). The inclusion of controls does not meaningfully change the estimates, further corroborating the conclusion that political ideology is one of the most prominent predictors of climate attitudes (Dunlap et al., 2016; Hornsey et al., 2016).

⁹ This prime exposes a random subset of participants to information about their descendants and engages subjects in an intergenerational resource allocation game. This prime was orthogonal with respect to the cost conditions by design and is the basis of a companion study that focuses on non-material determinants of climate policy preferences (Agneman et al., 2024).

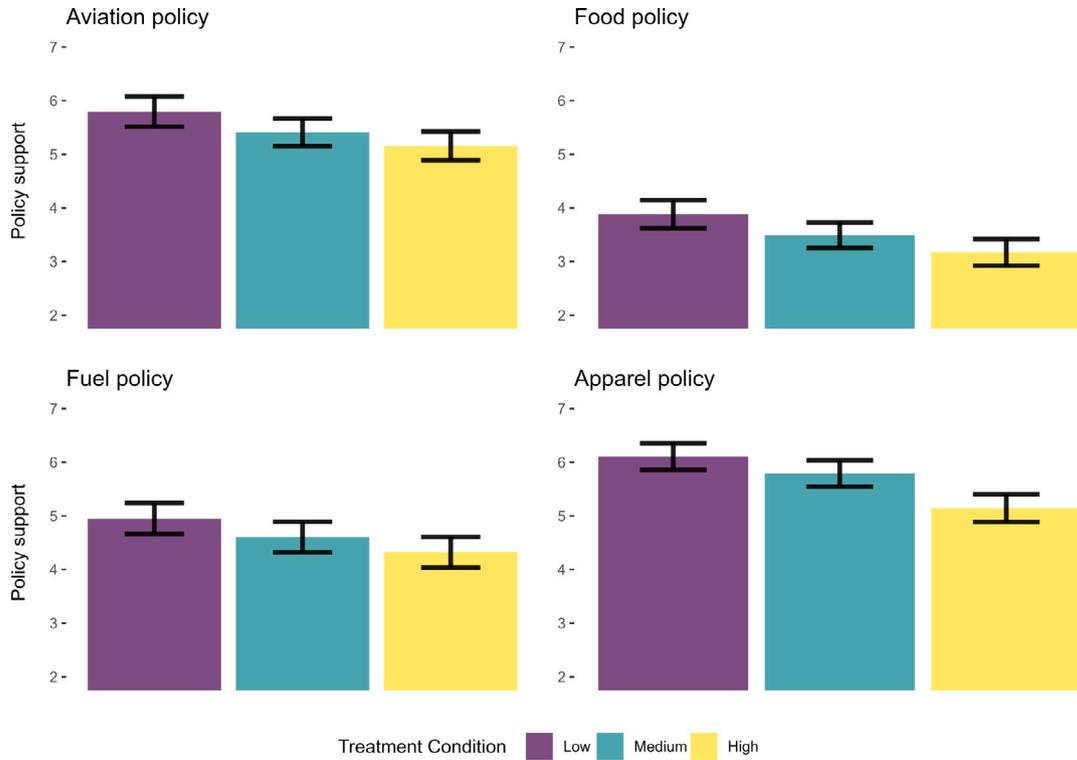


Fig. 2. Consumption costs and climate policy support. Note: Fig. 2 displays the impact of cost treatments on, respectively, aviation-, food-, fuel-, and apparel-policy support. The error bars represent 95% confidence intervals.

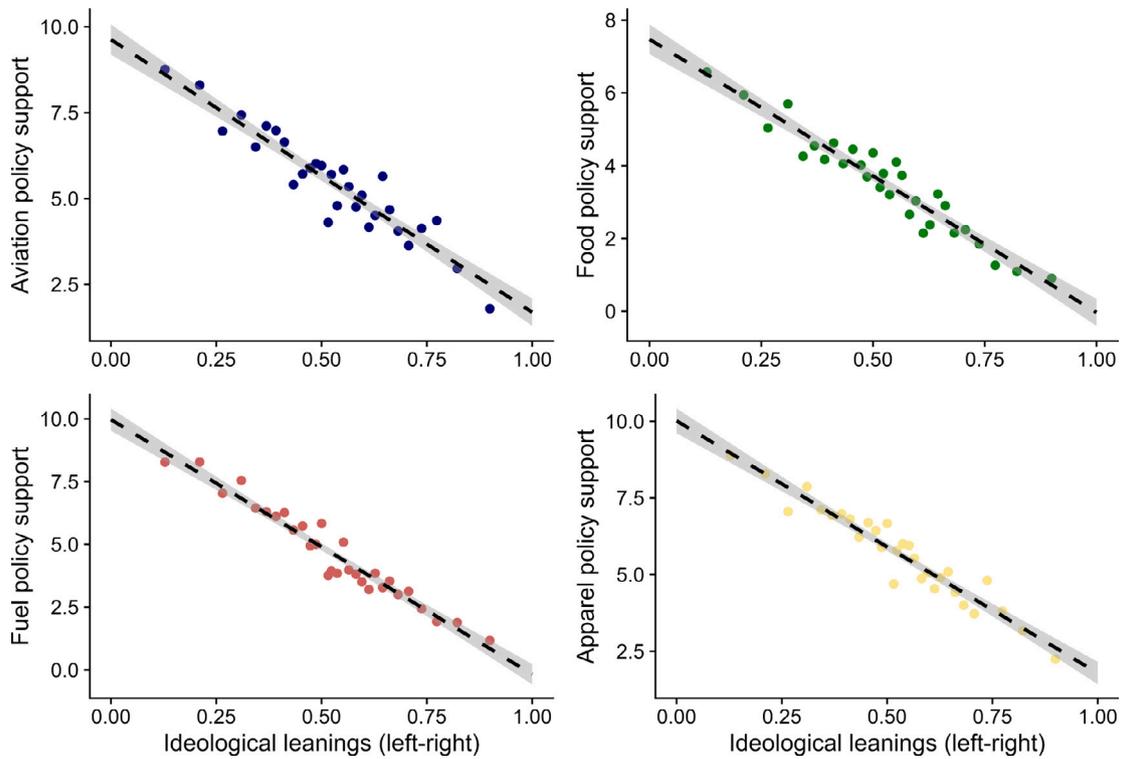


Fig. 3. Ideology and climate policy support. Note: Fig. 3 displays the associations between political ideology and, respectively, aviation-, food-, fuel-, and apparel-policy support in binned scatter plots.

In sum, the results indicate a gulf between the ideological left and the ideological right in terms of preferences for climate policies. But how do rising costs impact the degree of climate polarization? To investigate this, we analyze the impact of cost treatments on policy support separately for left-leaning and right-leaning participants.

4.3. Policy costs and climate policy polarization

As discussed in Section 3.1, climate policy polarization in Sweden has risen with, and potentially as a consequence of, higher perceived costs of the green transition. In order to test whether rising costs of climate mitigation policies increase climate policy polarization, we randomly manipulated the private costs of the policy scenarios. In Fig. 4, we display how the high-cost condition influences support for climate mitigation policies separately for right-leaning and left-leaning participants.¹⁰

First, we note the dramatic differences in baseline climate policy support: left-leaning participants display substantially higher support compared to right-leaning participants, even when they are exposed to the high cost scenarios. Second, Fig. 4 demonstrates that right-leaning participants are more cost-sensitive in their climate policy support. While the high-cost condition reduces climate policy support significantly among right-leaning participants, it has no statistical effect on policy support among left-leaning participants.

In Appendix Table C3, we corroborate this conclusion through OLS regressions. In Panel A, we show that the high-cost condition significantly reduces policy support among right-leaning participants across all four policies. Conversely, in Panel B, we find no statistically significant effects of higher policy costs on support for respective climate policies among left-leaning participants. Taken together, the results demonstrate that rising costs for policies designed to mitigate climate emissions causally reduce support among right-leaning participants but not among left-leaning participants. In other words, the ideological divide over climate policy widens as green transition policies become more expensive.

The fact that the ideological right, but not the ideological left, reacts to changes in material conditions might reflect ideological differences in social norms regarding the acceptability of trading off financial and environmental concerns (see, e.g., Zannakis, 2015; Cole et al., 2022). Indeed, in an OLS regression with agreement to the statement “Economic growth is something positive even if it affects the climate negatively” as the dependent variable and Ideological Leanings as the independent variable, the statistical association is remarkably strong (Ideological Leanings Coef. = 2.66; t-value = 21; p-value < 0.001; N = 1594; robust standard errors). Furthermore, Appendix Table C4 demonstrates a strong link between reported private consumption and climatic impact worries related to own consumption for left-wing participants. Conversely, the regressions reveal no link between consumption and worries among right-leaning participants. This differential pattern is reflective of a norm of “flight shame/climate shame” (*flygskam/klimatskam* in Swedish), referring to the shame that people experience because of their own consumption’s contribution to global warming (Becken et al., 2021), which appears stronger among the ideological left.

Yet, both left- and right-leaning participants who worry about the climatic consequences of consumption are more likely to support climate policies (Appendix Table C5). This, in turn, suggests that participants who reduce their support for climate policies despite worrying about the climatic consequences may experience cognitive dissonance. In what follows, we investigate whether right-leaning voters, who are less likely to support climate policies if they are more costly, also report lower levels of climatic impact worries so as to avoid the discomfort that might come from holding incongruent beliefs and attitudes.

¹⁰ The cut-off between *left-leaning* and *right-leaning* is at the median value of *Ideological Leanings*.

4.4. Policy costs and climatic impact worries

To investigate the fourth hypothesis, we first analyze the relative importance of worries about our own and others’ consumption for climate policy support. In OLS regressions with support for the four policies as dependent variables and worries about the climatic consequences of own and others’ consumption of respective goods as independent variables, we find that worries about others’ consumption are a substantially stronger predictor in all cases (Appendix Table C5). Since higher worries about the climatic consequences of others’ consumption appear to prescribe stronger climate policy support, it follows that right-leaning participants who lower their support for climate policies due to financial reasons might experience discomfort because of incongruent beliefs and attitudes. To avoid cognitive dissonance, Hypothesis 4 suggests that they might (subconsciously or strategically) report lower climatic impact worries as a reaction to higher climate policy costs. In Fig. 5, we show how climatic impact worries respond to the high-cost condition separately for left- and right-leaning participants.

Fig. 5 demonstrates a significant drop in right-leaning participants’ worries regarding others’ flights and clothing consumption in response to the high-cost condition. The effect is formally demonstrated in OLS regressions presented in Appendix Table C6.¹¹ Since cost conditions are randomized, the findings indicate that higher policy costs causally reduce right-leaning participants’ reported climate worries in two out of four policy scenarios. We find no corresponding effects among left-leaning participants, which is to be expected given that their policy support is unaffected by the cost conditions.

In sum, the findings weakly align with the fourth hypothesis, which holds that climatic impact worries might be adapted to ensure congruent beliefs and attitudes. However, the results are inconclusive. Right-leaning participants only report lower climatic impact worries as a response to the high-cost condition in two out of four policy scenarios (the non-essential consumption goods). We thus conclude by noting that empirical investigation lends some support to the fourth hypothesis, but that more research on the role of motivated disbelief in shaping climate policy preferences is needed.

5. Discussion and conclusion

The present study adds important insights about the formation of climate policy preferences. Specifically, we demonstrate that the way in which material costs map onto policy support is conditional upon ideological belonging, as right-leaning participants exhibit cost-sensitive policy support whereas left-leaning participants are unaffected by the experimental cost manipulations.

The empirical patterns uncovered in this study align with the notion that different social norms (or strength of norms) regulate climate-related behavior among the ideological right as compared to the ideological left. When norms and material interests conflict, not all people can afford to adhere to their moral principles (Enke et al., 2022). Yet, the non-material (social) cost of breaking a norm should vary between groups of people depending on the group-specific strength of the norm (Wilson and O’Gorman, 2003). According to Zannakis (2015), while the ideological right typically views climate policies through the lens of *economic trade-offs*, the ideological left is less willing to negotiate what they perceive as *climate responsibilities*. Our findings corroborate this argument by showing more malleable climate policy preferences among the ideological right.

Furthermore, notwithstanding the inconsistent findings with regards to the motivated disbelief hypothesis, our study further highlights the

¹¹ Meanwhile, there is no impact of higher policy costs on worries about own consumption (Appendix Table C7). This is to be expected since worries about own consumption appear not to prescribe climate policy support to the same extent as worries about others’ consumption (Appendix Table C5).

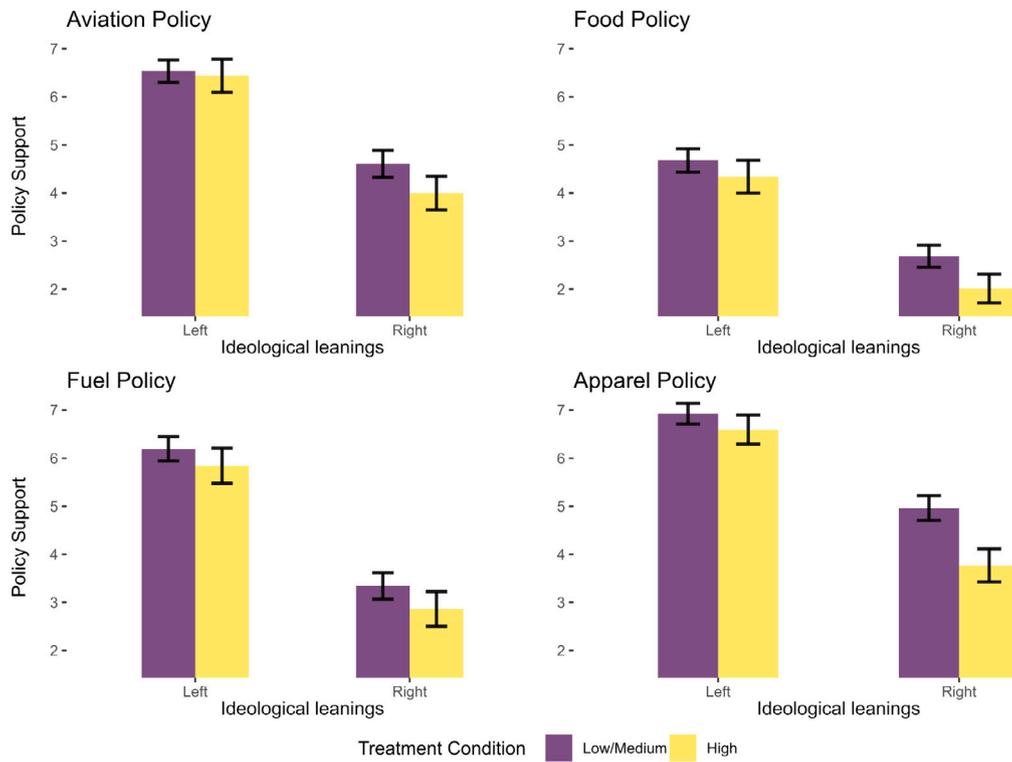


Fig. 4. Sub-sample analyses: experimental costs and climate policy support. Note: In Fig. 4, we present the impact of the high-cost condition on climate policy support, evaluated against support in the low and medium cost conditions. The analysis is presented separately for right-leaning and left-leaning participants. The error bars represent 95% confidence intervals.

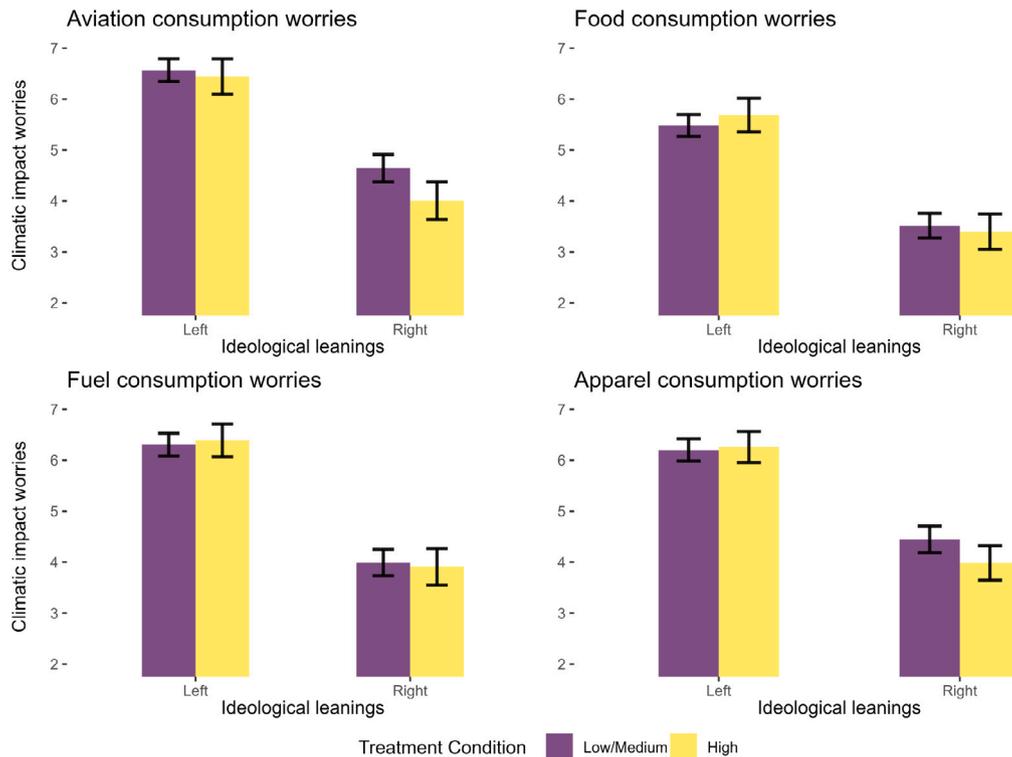


Fig. 5. Ideology and climate impact worries. Note: Fig. 5 displays worries about the climatic consequences of aviation-, food-, fuel-, and apparel-consumption, respectively, for left- and right-leaning participants and separately in the low-, medium-, and high-cost conditions. The error bars represent 95% confidence intervals.

complex relationship between climate worries and climate policy preferences. Motivated disbelief, the notion that beliefs may be strategically

adapted to support preferences, implies simultaneity in the relationship between beliefs and preferences. As a result, strong associations

between climate beliefs and preferences for climate action, as reported by a large body of research (e.g., Krosnick and MacInnis, 2013; Hornsey et al., 2016; Kácha et al., 2022), and replicated in the current study (Appendix Table C5), do not necessarily reflect a causal impact of climate beliefs on climate policy preferences. In order to provide for a richer understanding of the phenomenon, future experimental work should attempt to pin down the scope conditions for motivated disbelief in climate policy preference formation.

Moreover, our study carries relevance for how other factors that regulate personal economic incentives, such as education, might be expected to map onto climate policy preferences. According to Czarnek et al. (2021), ideology attenuates the effect of education on climate policy support. Our research suggests that to grasp why education shapes climate policy preferences differentially for the ideological left and right, we must first understand how specific fields of study shape personal economic incentives related to climate taxation and regulation. This notion finds support in Haring and Jagers (2018), who demonstrate that education has different impacts on climate policy preferences depending on the field of study.

Finally, the present study contributes to a growing body of research concerned with the increase in climate policy polarization (Kahan et al., 2012; Dunlap et al., 2016). From a green advocacy perspective, increasing ideological polarization around climate policies constitutes a challenge since it narrows the bargaining space in which the different ideological camps can agree on climate mitigating efforts. Our results indicate that higher costs of a green transition might further exacerbate climate polarization.

A number of limitations of our study create avenues for future research projects. First, while our experimental approach to the study of material conditions and climate policy support enables a strong causal claim, future studies could use time-series data to investigate the long-term effect of rising costs on climate policy preference formation. Such an approach would complement the experimental design underpinning the present paper and demonstrate the practical implications of our findings. Second, future experimental work should attempt to further unpack the underlying psychological and cognitive mechanisms that underpin the moderating role of ideology in the relationship between material costs and climate policy preferences. For instance, an interesting endeavor would be to elicit the social costs of breaking climate-related norms separately for the ideological left and the ideological right. Third, more work is needed on policy design, and in particular on how the perceived tension between (private) material and (collective) environmental resources can be lessened. This line of research is particularly pertinent since the current cost of living crisis might result in more myopic preferences. According to the findings presented in the present paper, this development could further polarize climate policy preferences and thereby weaken the political basis for ambitious climate policies.

CRediT authorship contribution statement

Gustav Agneman: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review & editing. **Sofia Henriks:** Conceptualization, Investigation, Validation, Writing – original draft, Methodology. **Hanna Bäck:** Conceptualization, Funding acquisition, Project administration, Investigation, Methodology. **Emma Renström:** Conceptualization, Funding acquisition, Investigation, Project administration, Methodology.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

We will share the data and code needed for replication through a Mendeley data repository.

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Appendix A. Supplementary material

Supplementary material related to this article can be found online at <https://doi.org/10.1016/j.ecolecon.2024.108119>.

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