Paycheck Preferences: How Sector of Employment Affects Support for Climate Policy

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Abstract

Stringent mitigation of greenhouse gas emissions imposes costs on emissions-intense businesses. People who work for these businesses face potentially greater economic risks from mitigation. Yet despite the large literature on climate opinions, few studies explore how sector of employment shapes attitudes towards climate policy. Building on efforts by Tvinnereim and Ivarsflaten (2016) and Bechtel et al. (2017), this paper offers the first study of sectors and climate opinion across many countries. The results show that emissions-intensity not only reduces individuals' support for strong climate policy, but also reduces the importance of other factors like income, education, and ideology for explaining support.

> "It is difficult to get a man to understand something, when his salary depends upon his not understanding it!"
>
> —Upton Sinclair
> *I, Candidate for Governor:*
> *And How I Got Licked*

1 Introduction

In this paper, I investigate the role of economic self-interest in shaping individual attitudes towards climate change mitigation. Specifically, I focus on the emissions intensity of people's sector of employment. To what extent do job-related emissions influence support for costly climate action?

There is a robust body of work describing climate attitudes, but the number of studies explaining such attitudes is relatively smaller (Kim and Wolinsky-Nahmias, 2014). This explanatory literature has generally focused on three broad categories of determinants: demographic factors (like age, sex, education, and income), value-based and ideological factors (like and political orientations), and climate-specific factors (such as weather experiences, local vulnerability to climate change, and communication effects).

While some work has also incorporated national affluence and emissions intensity as proxies for economic interests, individual measures of economic interests are scarce. Only a couple of studies have taken a disaggregated approach and examined how sector of employment affects attitudes (Bechtel et al., 2017; Tvinnereim and Ivarsflaten, 2016).

This paper builds on these efforts in several ways. I distinguish general concern about climate change from support for potentially costly domestic action, showing why sectoral emissions have a stronger negative impact on the latter. I show how the effect of other determinants of climate attitudes will be mediated by emissions intensity, with greater emissions diminishing the importance of income, education, and ideology. And I test these claims using the European Social Survey, a larger sample of people and countries that demonstrates the generalizability of sectoral effects.

The paper is structured as follows. I begin by discussing the literature on the determinants of climate attitudes. I show that, despite the wide range of factors analyzed in this literature, the role of sectoral interests have not received much attention. This omission may be caused by (or may be causing) a lack of sectorally-disaggregated questions in many climate opinion surveys. I discuss my theoretical expectations, offering three novel hypotheses. I then present results from the observational ESS data. The paper concludes

with a discussion of the implications of the results for both academics and the wider policy community.

2 The Role of Emissions in the Climate Attitudes Literature

Only a few years ago, a review of work on the comparative climate literature could still assert that "few studies seek to explain cross-national variation in climate opinions" (Kim and Wolinsky-Nahmias, 2014, p. 81). The number of studies seeking to explain rather than simply describe attitudes has grown since then. But there remain potentially important explanatory considerations which have been under-studied. In this section, I will show how one such factor—emissions—has received inconsistent attention and produced inconclusive findings. At the end I will discuss two works that point the way forward, by considering emissions intensity at the sectoral rather than national level (Bechtel et al., 2017; Tvinnereim and Ivarsflaten, 2016).

Studies that seek to explain levels of concern about climate change have sometimes included measures of national emissions, but with weak results. In one of the earlier efforts, an online poll of 46 developed and developing countries, Sandvik (2008) finds a negative relationship between CO_2 per capita and concern about global warming. But the relationship is only marginally significant (at the $p<0.10$ level). In an analysis of the 2005-2009 World Values Survey, Kvaløy et al. (2012) finds a positively signed but statistically insignificant relationship between national emissions intensity and concern. Lee et al. (2015) apply a novel statistical method to the results of a Gallup World Poll of 119 countries in 2007-2008. Using conditional inference trees to identify the most important factors on a country-by-country basis, they find that most national-level indices are poor predictors of concern, including carbon emissions per capita. Lo and Chow (2015) distinguish between perceived importance and perceived risk, and find that CO_2 emissions per capita are not significantly associated with perceived importance and only marginally associated with perceived risk.

In the wake of these weak findings, many recent works have eschewed the use of carbon emissions measures altogether. Kim and Wolinsky-Nahmias (2014) gather data from twelve different multi-national surveys between 2005 and 2009 with the explicit goal of examining "key national factors" at play, but carbon emissions are not among those factors. Knight (2016), in his analysis of the 2007–2008 and 2010 Gallup World Polls, similarly chooses to omit an emissions variable from his regressions.

Of course, concern about climate change is not the same as supporting action to prevent it. As Leiserowitz (2007, p. 6) notes, "stating that a problem is "very serious" is not the same as stating that it is an urgent or high priority". Support for climate policy proposals drops when questions explicitly mention costs (Bechtel and Scheve, 2013; Gampfer et al., 2014; Bernauer and Gampfer, 2015; Bakaki and Bernauer, 2017).[1] For a given level of policy stringency, the costs should be expected to fall more heavily on emissions-intense industries. So one would expect the emissions intensity of individuals' industry of employment to shape their willingness to pay for or support climate action. Yet emissions intensity is absent from many studies of action preferences.

In addition to looking at concern, Kim and Wolinsky-Nahmias (2014) also track responses to six survey questions about support for specific policies and four questions about willingness-to-pay, but as before the focus is on GDP per capita and vulnerability to climate change, not carbon emissions. Dienes (2015) uses data from the Life in Transition II survey, conducted in 35 countries in 2010. National CO_2 emissions are not included, presumably subsumed within country-level dummy variables.

Broader reviews of the policy support field also show that carbon emissions have either not been a major focus of investigation or have not proven significant. Johnson and Nemet (2010) review estimates from twenty-seven studies of people's "willingness-to-pay" (WTP) for climate change action. They find eight "common and statistically significant variables," but personal energy use or carbon emissions are not among them.[2] Six years later, Drews and van den Bergh (2016) review forty-nine survey and experimental studies of willingness-to-pay and willingness-to-support (WTS). They find three categories of explanations: socio-psychological, climate policy perceptions, and contextual factors. The category of contextual factors includes "wider economic elements," but CO_2 is not mentioned among them: the main economic variables discussed are economic wealth, growth, and unemployment. There is also an especially rich literature on climate public opinion within the United States (Leiserowitz, 2007; McCright and Dunlap, 2011; Egan and Mullin, 2017), but emissions have not been a focus of this body of work either.

The simplest conclusion from this literature is that carbon emissions just do not have a substantial impact on individual climate opinions. Lo and Chow (2015, p. 339) expresses doubt that individuals even understand their CO_2 emissions: "it is hard to draw a link

[1] Bakaki and Bernauer (2017) emphasizes the distinction between "willingness to support" policy and "willingness to pay" for it. While this distinction is important, for my purposes I am bundling these concepts together. Support for increasing fossil fuel taxation implicitly involves willingness to pay for it, especially if one is working in an emissions-intense industry.

[2] These variables are personal environmental behavior, environmental values, education level, judgements about policy effectiveness, ideology, belief in climate change, expectations about future changes, and perceived reciprocity.

between personal CO2 emissions, as a proxy for present responsibility, and the low concern about climate change. Most people do not have or never seek information on the total amount of CO_2 emissions they produce from their everyday activities." But even if people do not have a good sense of their personal emissions, there are reasons to suspect that they may be influenced by the emissions at their place of work. Two recent studies have followed up this line of inquiry.

In a study of Norway, Tvinnereim and Ivarsflaten (2016) offer the first published analysis that uses individuals' sector of employment to represent their economic dependence on fossil fuels. Their data comes from the 2013-2014 Norwegian Citizen Panel, and depending on the question their sample size varies from 513 to 5190. They ask respondents whether they work in the oil and gas sector or a related field. This sector employs a high proportion of Norwegians (more than 10% of their sample) and is also clearly vulnerable to mitigation regulation. Respondents are also asked about support for a range of policies, which are then categorized by the authors into two groups: those that impose concentrated costs on fossil fuel production (an oil tax, reduction in drilling areas and production levels), and those whose costs are more diffuse (tightening the national CO_2 cap and investing in fossil fuel alternatives). The authors find that working in the oil and gas sector is associated with substantive and statistically significant reductions in support for the concentrated cost policies, but no significant differences for the diffuse policies.

Bechtel et al. (2017) conduct a similar study in four other rich, developed countries: the United Kingdom, the United States, France, and Germany. The data come from a YouGov-administered survey with an overall sample size of 8,500 respondents, of which 4,009 identified their sector of work. Respondents are asked about three kinds of environmental attitudes: their support for global climate cooperation, the importance of CO_2 reductions, and their willingness to pay for environmental protection in general. Instead of focusing on a single sector, Bechtel et al. distinguish between low-emissions and high-emissions sectors.[3] The results of the surveys, indicate that people working in high-emissions sectors are less likely to support climate co-operation, less likely to believe in the importance of CO_2 reduction, and are less willing to pay for environmental protection.

These two studies offer important evidence that emissions linked to sector of employment can affect climate attitudes. That said, this area of inquiry is still new and there remains a good deal of work to be done. Bechtel et al. do not include an explicit question about domestic climate policy, since their focus is more on global co-ordination and reciprocity. Their study also only includes a few very rich countries. Tvinnereim and Ivarsflaten include several questions on domestic policy, but the study is limited to one

[3]Robustness checks include continuous measures of emissions, with substantively similar results.

industry and one country.

In the rest of this paper I will expand on this promising initial work. Like Tvinnereim and Ivarsflaten (2016), I focus specifically on support for domestic policy action. I build on Bechtel et al. (2017) by comparing multiple countries, but expand on their work by employing a much larger sample of countries and respondents to test how far the results generalize. This larger sample also allows me to test whether the results for sector of employment are robust to controls for national wealth and carbon intensity. And for the first time, I theorize and test how sectoral carbon intensity changes the impact of other individual-level determinants of climate attitudes.

3 Theory of Sectoral Opinion Formation

To what extent do workers in high-emissions industries think differently about stringent mitigation policy than workers in low-emissions industries? In this section, I will make three claims about the kinds of differences I expect to find. First, in line with the findings of Tvinnereim and Ivarsflaten (2016); Bechtel et al. (2017), I argue that higher carbon intensity in an individual's sector of employment will reduce their support for costly mitigation policy. Second, I emphasize that this effect will apply more strongly to people's support for action than their concern about climate change generally. Third, I claim that carbon intensity will dampen the effect of other key variables like income, education, and ideology.

3.1 Carbon Intensity

Some economic sectors are more vulnerable to climate mitigation policy than others. The most basic source of vulnerability is emissions intensity.[4] Workers are unlikely to know the precise amount of greenhouse gasses that are emitted by their employers (even managers are unlikely to know this, unless their firm is already subject to emissions regulation or has made a special effort to calculate emissions). But even without precise knowledge, many workers will still be able to classify their industries as relatively "clean" or "dirty." If a worker drives a truck, goes to work in a factory with smokestacks, mines fossil fuels, or operates heavy machinery, they have opportunities to observe emissive activity first-hand.

[4]There are other sources of vulnerability, such as export intensity, elasticities of supply and demand, and the cost of mitigation opportunities. But emissions intensity is the most straightforward and general, and therefore more likely to be perceived and internalized by workers.

If a worker perceives their work as emissions-intense, they have a "pocketbook" incentive to oppose regulation of those emissions. Any policy that threatens to raise production costs for firms on the basis of their emissions could spark resistance among workers in those firms. Such measures could include market mechanisms like taxes or cap-and-trade programs, or command-and-control regulations like forbidding or phasing out particular industrial activities. Workers may fear that regulatory costs will reduce demand for their labor, dampening their wages and leading to layoffs.[5]

It may not matter whether the ultimate costs to workers will in fact be substantial. Not all the costs of regulation are passed to workers: some may go to consumers or investors instead. Some carbon tax designs, like the tax implemented in British Columbia and the plan proposed in Washington State, rebate money collected to businesses and households through other tax reductions. Policy design details are crucial in determining who actually ends up bearing the cost of regulation. But in terms of determining attitudes, detailed economic projections of distributional impacts may be outweighed by more vivid and pressing fears of job losses or wage freezes.

Even if workers do not independently perceive emissions-intensity, they may be subject to elite cueing from management. Hertel-Fernandez (2016, p. 415) presents evidence that firm managers attempt to use employees to achieve political goals, with 46% of the 513 managers they interviewed saying their firms "engaged in at least one form of worker mobilization." Babenko et al. (2018) find that executives influence their employees' political contributions and turnout rates "in a manner consistent with firm value maximization." Whether workers are directly influenced by the emissions-intensity of their jobs or indirectly by management lobbying, the end result will be similar. Workers in high-emissions industries will be less supportive of mitigation policies that they think will threaten their jobs.

Hypothesis 1 (Sectoral Intensity Effect) *Working in a sector with a higher emissions intensity will reduce individuals' support for costly mitigation policy.*

3.2 Cost Concentration

Climate change has created an "apparent contradiction in public attitudes" (Akter and Bennett, 2011, p. 737): there are many people around the world who express concern about climate change but do not support mitigation action to prevent it (Kim and Wolinsky-

[5]This hypothesis and the ones that follow do not assume that mitigation regulation actually involves big risks to employees in high-emissions sectors, only that people in such industries are more likely to perceive such regulation as threatening their jobs.

Nahmias, 2014). As Leiserowitz (2007, p. 6) points out, "stating that a problem is 'very serious' is not the same as stating that it is an urgent or high priority."[6]

The simplest explanation for this divergence is that people can be worried about a problem without wanting to bear the costs of solving it. When people are allowed to freely describe their reasons for supporting or opposing climate policy, cost considerations dominate other responses (Shwom et al., 2010).[7] Framing experiments with surveys show that cost references generally reduce support for climate action (Gampfer et al., 2014; Bechtel and Scheve, 2013; Bernauer and McGrath, 2016). Tobler et al. (2012) finds that "perceived costs" are one of the two most important predictors of support for different climate change approaches (the other being perceived benefits). Perception may be misleading: people are especially likely to associate taxation-based policies with higher burdens (Jagers and Hammar, 2009; Brannlund and Persson, 2012), even though other forms of regulation may impose similar costs indirectly. When respondents are presented with explicit price tags for policies, differences in support levels are markedly reduced (Kotchen et al., 2013).

The relationship between sectoral emissions and opinion is theorized as being driven by fears of increased personal costs. The literature discussed above suggests that some climate attitude questions prompt cost concerns more strongly than others. Therefore, the effect of emissions on attitudes should depend on the extent to which a climate question emphasizes higher costs for people in emissions-intense sectors. General questions about concern should not prompt as much resistance from employees in emissions-intense sectors as policy questions, and non-taxation policies should prompt less resistance than taxation.

Hypothesis 2 (Cost Concentration Effect) *Working in a sector with a higher emissions intensity will have a greater effect on support for costly mitigation policy than on support for non-costly policy or general concern about climate change.*

[6]Questions about "worry" and "concern" are often represented as expressing similar concepts, but they can elicit different reactions in surveys, with "worry" being a more significant and active sentiment than "concern" (Leiserowitz, 2007). I use the terms interchangeably, but as discussed earlier the particular measure I employ is based on a survey question with "worry" language.

[7]Shwom et al. (2010) code free-text responses from surveys in Virginia and Michigan that ask people to explain their stance on climate policies. Generic language about costs is by far the most common response ("Consideration of costs in general or to themselves and their family"). More specific economic impact language related to the effect of policies on "job creation and destruction", "national/regional economy", and "a specific industry or businesses in general" is also common. Industry-specific language is mentioned by 6.9% of respondents, more than the number who mention skepticism about climate change, concern for future generations, health impacts, or religion as driving their policy stances.

3.3 Moderating Effects

The comparative literature on climate attitudes has identified a number of individual-level factors which affect support for climate action. Income, education, and ideology are among the most prominent. But their impact is contested. And since these variables have rarely been analyzed alongside sector-level CO_2, it is not yet known how their effects might change in the presence of emissions measures.

Stern (2002, p. 285) observes that "psychological variables such as attitudes and personal norms appear to have more effect on relatively inexpensive, easy-to-perform energy-saving actions." This suggests that personal characteristics and the costs of actions do not influence behavior independently, but interactively: rising costs change which factors influence people's environmental behavior. When costs are low, non-cost considerations govern action. When perceived costs are high, the importance of non-cost considerations for predicting action diminish. I propose that employment-related emissions may have a similar "crowding-out" effect on support for climate change policy, dampening the importance of factors beyond costs.

For workers in low-emissions sectors, questions about emissions regulation do not involve a threat to their livelihoods. They are thus free to interpret the problem through other lenses. Can they weather marginal increases in consumer prices? Can they understand how the regulation will help the climate problem? How do they feel about government regulation generally? How worried are they about climate change?

For workers in high-emissions sectors, however, emissions regulation could represent a personal risk. Asking someone whether they are willing to hazard job losses in general is very different from asking if they're willing to risk their own job. If you think your livelihood is at stake, other considerations may well become less salient.

Hypothesis 3 (Dampening Effect) *Working in a sector with a higher emissions intensity will reduce the effect of other key variables on support for costly mitigation policy.*

Specifically, I argue that the effect of income, education, and ideology will diminish as sector-level carbon intensity increases. I will discuss each of these briefly in turn, starting with income.

Income

There is an active and ongoing debate over whether personal income increase support for climate change action. Some studies find that people with higher incomes are more supportive of mitigation (Fairbrother, 2013; Carlsson et al., 2015; Dienes, 2015). This fits

with the post-materialist values hypothesis, which suggests that prosperity relieves people from worrying about their basic needs, freeing them to prioritize things like environmental quality (Inglehart, 1997; Franzen and Meyer, 2010).

There are also a range of studies that find higher incomes are not associated with greater support for climate action (Kachi et al., 2015; Bakaki and Bernauer, 2017; Mildenberger and Leiserowitz, 2017a). Poorer people are more likely to face the problems of climate change, and have fewer investments that might be threatened by mitigation action. These effects might counter-act the positive role of income. In the study by Kachi et al. (2015) of Germany and the US, "income is not statistically significant in any specifications." Income shows no significant relationship with either WTP or WTS in Brazil (Bakaki and Bernauer, 2017). Mildenberger and Leiserowitz (2017a) find that drops in income are actually associated with more support for climate action in the US. How to resolve this conflict?

By analyzing income without taking into account people's sector of employment, these studies are effectively assuming that the source of one's income does not matter. They are assuming that rising income for a chef or nurse will have the same effect as rising income for a coal miner or a factory worker. But if a worker perceives regulation as threatening their job, their income itself is at risk. This risk could undermine or eliminate the positive association between income and environmentalism. Instead of a high income providing insulation from the threat of regulation, it becomes a source of potential opposition. The positive relationship between income and support for regulation should only be expected to hold as long as that income itself is not threatened by regulation.

Hypothesis 3a (Income-Dampening Effect) *Working in sectors with higher carbon dioxide intensities will reduce the effect of income on support for costly mitigation policy.*

Education

Education is another common factor explored in the literature, included in most studies either as an independent variable of interest or as a control. But its importance, and indeed the direction of its effects, are contested.

Some find a strong positive relationship between education and concern or knowledge about climate change (Tjernström and Tietenberg, 2007; Kvaløy et al., 2012; Lee et al., 2015). Lee et al. (2015) goes so far as to say that "educational attainment is the single strongest predictor of climate change awareness." But others find a negative relationship between education and climate concern (Wood and Vedlitz, 2007; Malka et al.,

2009; McCright, 2010).[8]

Moving from concern to willingness to support or pay for policy action, education plays a statistically significant role in more than half of the studies reviewed by Johnson and Nemet (2010). Many scholars have found positive relationships between education and willingness-to-pay, in countries like Australia (Akter and Bennett, 2011), the United States (O'Connor et al., 1999; Kotchen et al., 2013), Sweden and China (Carlsson et al., 2015). Dienes (2015) finds a positive effect of education on intention to pay for climate change mitigation across 35 countries from the Life in Transition Survey. But findings in the US indicate the relationship may not always be positive: finds no statistically significant relationship between education and willingness-to-pay there.[9]

Scholars in the United States have also found increasing evidence that the effect of education is conditional on ideology and partisan affiliation, with higher education actually making conservatives and Republicans less concerned about climate change (Hamilton, 2011; McCright and Dunlap, 2011). The finding that "[e]ducation no longer has a simple positive effect on concern" (Hamilton, 2011, p. 233) is important, because it suggests that the role of education is dependent on other individual factors. Ideology seems to be one such factor. But why should material interests, represented by sector of employment, not play a similar role?

More educated people are likely to be better informed (Tjernström and Tietenberg, 2007) and have greater cognitive resources (Kvaløy et al., 2012), helping them to understand the problem of climate change. They are also more likely to understand how mitigation policies work, and how to take advantage of programs like subsidies that reward knowledge and preparation.

However, if people are predisposed to think of mitigation regulation as personally costly, education may end up reinforcing that belief. Even if Lo and Chow (2015) are right to say that "[m]ost people do not have or never seek information on the total amount of CO_2 emissions they produce," education should plausibly increase the chance that people have a relative sense of the carbon intensity of their work. Educated people may be better able to draw the connection between mitigation policies and risks to their jobs. Once that connection is drawn, education may also help people rationalize and find information channels to support their opposition. I argue that these cost-attribution and rationalization effects will be stronger for people who are both educated and working in emissions-intense sectors.

[8]Education is also of interest to the literature on environmental concern, and the relationship between the two appears to be more consistently positive (Marquart-Pyatt, 2012).

[9]See Longo et al. (2012, p. 128) for a review of similarly mixed findings on willingness to pay for environmental protection generally.

Hypothesis 3b (Education-Dampening Effect) *Working in sectors with higher carbon dioxide intensities will reduce the effect of education on support for costly mitigation policy.*

Ideology

In the previous hypothesis, I discussed political ideology and partisanship as an intervening factor that can change the impact of education. But political beliefs also appear to have an effect on their own.

Right-wing ideology is generally thought to be skeptical of government intervention in the economy. Right parties tend to be more sympathetic to the concerns of business, and more worried about the economic cost of policies. It seems natural, therefore, to expect that people opposed to government regulation and worried about costs to businesses would be more likely to oppose climate regulation as well.

Empirically, holding conservative or right-wing political views is associated with weaker concern about climate change and less support for mitigation policy (McCright and Dunlap, 2011; Running, 2012; Kvaløy et al., 2012; Tobler et al., 2012; McCright et al., 2016).[10] In the study by Running (2012, p. 12), "[o]f all of the factors considered, political ideology appears to have the strongest effect on attitudes about global warming" and Tobler et al. (2012) writes that "[a]mong the sociodemographic variables, political affiliation was the most influential determinant" of policy support. This effect might be due to explicit political cues from elites (Mildenberger and Leiserowitz, 2017b), or it could come from broader worldviews that are slowly shaped by ideology (Dietz et al., 2007; Smith and Leiserowitz, 2014). But either way, the relationship appears across many different national contexts.[11]

There is no conflict between the idea that conservatives and people employed in emissions-intense sectors will both be more likely to oppose climate change mitigation. But the two effects may overlap with each other, creating a ceiling on mitigation opposition. If someone is working in an emissions-intense sector, regardless of their political ideology, they have more incentive to think in stereotypically "right-wing" terms about regulation that threatens them. If someone is normally left-wing, this may represent a departure from how they normally feel about regulation. But if they are usually conservative, then there may be less room for them to become more skeptical. Thus, for people working in emissions-intense sectors, a ceiling effect may dampen the relationship between political ideology and policy support.

[10] For the purpose of this paper I will use the terms "conservative" and "right-wing" interchangeably.

[11] There is evidence for a similar relationship with environmental concern (Hamilton (2011); Franzen and Vogl (2013); Marquart-Pyatt (2012)). Nawrotzki (2012), however, finds that right-wing views are actually associated with more concern in developing countries (which may be partially due to differences in the meaning of left and right outside Western nations).

Hypothesis 3c (Ideology-Dampening Effect) *Working in sectors with higher carbon dioxide intensities will reduce the effect of ideology on support for costly mitigation policy.*

4 Observational Approach

4.1 Data

The key difficulty in studying the influence of sectoral characteristics on climate opinion is that many opinion datasets do not include information on respondents' sector of employment. Without such information, one can make inferences about the effect of national sectoral composition on opinion, but it is not possible to assess individual-level relationships. Datasets that include occupational information contain some sectoral information: people coded as farmers are almost certainly working in agriculture, for example. But for other occupations, like 'manual laborer' or 'manager', the sector of employment is unclear. And datasets that do include occupational information do not necessarily include the necessary questions about climate opinion.

Tvinnereim and Ivarsflaten (2016) added custom questions to the Norwegian Citizen Panel, and Bechtel et al. (2017) commissioned their own four-country survey. These methods guarantee the inclusion of relevant questions, but they become very costly when trying to cover many countries. Fortunately, the latest round of the European Social Survey (ESS) includes both climate-focused questions and disaggregated information on respondents' sector of employment. I will employ these data to test my hypotheses.[12]

The eighth round of the ESS covers 47,594 respondents from 23 countries.[13] The survey was administered via face-to-face interviews in late 2016. The mean country sample size was 2,069, with a standard deviation of 550. The target population includes "all persons aged 15 and over (no upper age limit) resident within private households in each country, regardless of their nationality, citizenship or language." This round was chosen because, beyond being the most recent version of the survey, it also contained a module on climate change and energy-related topics.

Respondents' sector of employment was recorded using codes from the second revision of NACE, the Statistical Classification of Economic Activities in the European Community.[14] 39,945 of the respondents have a NACE code recorded (approximately 84%).

[12]Summary statistics and correlations are available in Table A2 and Table A3, respectively.

[13]The countries include Austria, Belgium, Czechia, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Israel, Italy, Lithuania, the Netherlands, Norway, Poland, Portugal, Russia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.

[14]The acronym "NACE" comes from the French "Nomenclature générale des Activités économiques dans

There are 88 industry categories represented in the data. I aggregated these codes to match them with the 35 industries codes in the WIOD data, which are based on the first version of NACE.[15]

To measure the emissions-intensity of individuals' sectors of employment, I use sectors' logged and standardized carbon dioxide emissions per unit of output (converted to dollars using purchasing-power parity). The standardization was done prior to merging, and is therefore not affected by the number of individuals sampled from each industry in the ESS. Sectoral carbon intensity is weakly correlated with national carbon intensity (at 0.32) and GDP per capita (at -0.31), and it is not particularly correlated with any of the other explanatory or dependent variables.[16]

To measure income, I use the decile of the household's total income net of taxes and government payments.[17] To measure education, I use the highest level of education completed, based on the International Standard Classification of Education (ranging from less than lower secondary to higher tertiary). To measure political ideology, I use self-placement on an 11-point scale from "Left" to "Right". These variables have all been centered so the mean is 0. I also include standardized age, gender, and whether the respondent belongs to a religious denomination or a trade union as control variables.

In some models, I also employ national-level measures of GDP per capita and carbon intensity per unit of GDP, drawn from WIOD (Timmer et al., 2015) and the Penn World Tables (Feenstra et al., 2015). As with the sector variables, both measures are logged and standardized at the national level prior to merging.

The ESS data include several questions about support for climate mitigation policy. Respondents are asked "To what extent are you in favour or against the following policies in [country] to reduce climate change?" and then presented with three policy options: "Increasing taxes on fossil fuels, such as oil, gas and coal," "Using public money to subsidise renewable energy such as wind and solar power," and "A law banning the sale of the least energy efficient household appliances." Possible answers include "strongly in favour," "somewhat in favour," "neither in favour nor against," "somewhat against," "strongly against," "don't know," and a code for refusal to answer. I construct a dichotomous variable that is 1 if a respondent is "strongly" or "somewhat in favour" and 0 otherwise, dropping "don't know" and non-responses.

To represent support for costly climate mitigation policy, I rely on the question about

les Communautés Européennes."

[15]For a list of categories and their associated WIOD industries see Table A1.

[16]The correlations between sectoral carbon intensity and variables other than national carbon intensity and GDP per capita are between -0.2 and 0.2.

[17]Respondents select their from a card indicating the income ranges appropriate to their country.

fossil fuel taxation. Taxation language is much more clearly cost-oriented than subsidies for renewable energy or appliance efficiency regulation. As Tvinnereim and Ivarsflaten (2016) find, policies with concentrated costs are more likely to threaten workers in emissions-intense industries than policies with diffuse costs spread across the whole tax base.

The ESS also includes measures of respondents' concern and knowledge about climate change, both of which I re-coded to be dichotomous. For concern, respondents are asked "How worried are you about climate change?" and I coded responses as 1 if they replied that they were "very" or "extremely" worried. For knowledge, respondents are asked whether they "think that climate change is caused by natural processes, human activity, or both?" I coded responses as 1 if they said climate change was caused "mainly" or "entirely by human activity."

For robustness checks, I also included a series of control variables related to respondents' news consumption, values, and climate change awareness. To measure news consumption, I use the log of the number of minutes respondents claim to spend "watching, reading or listening to news about politics and current affairs" on a "typical day".

To measure values, I include support for redistribution, support for environmentalism, and a general measure of egalitarianism. For redistribution, I use agreement on a five-point Likert scale with the statement "The government should take measures to reduce differences in income levels." For environmentalism and egalitarianism, I use six-point measures expressing whether the respondent considers themselves similar to other people based on their values. For environmentalism, I use the person described thus: "He strongly believes that people should care for nature. Looking after the environment is important to him". For egalitarianism: 'She thinks it is important that every person in the world should be treated equally. She believes everyone should have equal opportunities in life." In the survey, the genders match the respondent's. I re-scale all three variables so higher values indicate greater support for redistribution, environmentalism, and egalitarianism.

To measure climate change awareness, I included whether respondents say they think about climate change a lot, whether they think climate change is bad for the world, and their response to the human causation question. For thinking about climate change, I used the question "How much have you thought about climate change before today?" and coded responses as 1 if they replied "A lot" or "A great deal". For an estimate of climate change's effects, I used the question "How good or bad do you think the impact of climate change will be on people across the world?" Respondents select a number on an eleven-point scale ranging from 0 ("extremely bad") to 10 ("extremely good"), which

I re-scaled so higher numbers indicate bad effects.

4.2 Regression Method

Classical logistic regression does not account for data that is divided into many cross-cutting groups. In the ESS data, standard regression methods would only permit clustering by country or sector, but not both. This is a problem, given that the main explanatory variable of interest is only available at a group level (sectoral emissions intensity). Based on work by Cameron et al. (2006), Petersen et al. (2014) have developed method of conducting logistic regressions with an arbitrary number of clustering variables. I employ their method for multi-way clustered logistic regression in all the following analysis.

The Petersen et al. implementation of logistic regression only allows for binary and not ordinal variables, which means that the dependent variables must be dichotomized.[18] I employ post-stratification weights, which adjust the data based on age, gender, and education to better reflect the distribution of these variables by region.

5 Observational Results

5.1 Support for Fossil Fuel Taxation

In the first series of models, displayed in Figure 1, I test whether the carbon intensity of individuals' sector of employment affects their support for costly mitigation policy. As discussed above, costly mitigation policy is represented by increasing taxes on fossil fuels in order to combat climate change. The coefficients are available in Table A4 and Table A5 in the Appendix.

The results appear consistent with Hypothesis 1, which predicted that workers in carbon-intense sectors would be less supportive of costly mitigation. These results are also consistent with those in Tvinnereim and Ivarsflaten (2016) and Bechtel et al. (2017), confirming that the relationships they found in a few countries are present across Europe. Coefficients in logistic regression represent the log of the odds of the dependent variable being 1, so to interpret the coefficients it is necessary to exponentiate them. In the base model, a one-standard deviation increase in the logged carbon intensity of a respondents' sector of employment is associated with a 10% lower chance of them supporting fossil

[18] An alternative model by Guan and Petersen (2008) implements ordinal logistic regression with multi-way clustered standard errors, but this method unfortunately does not allow for the necessary weighting of observations (European Social Survey, 2014). Multilevel mixed effects regression

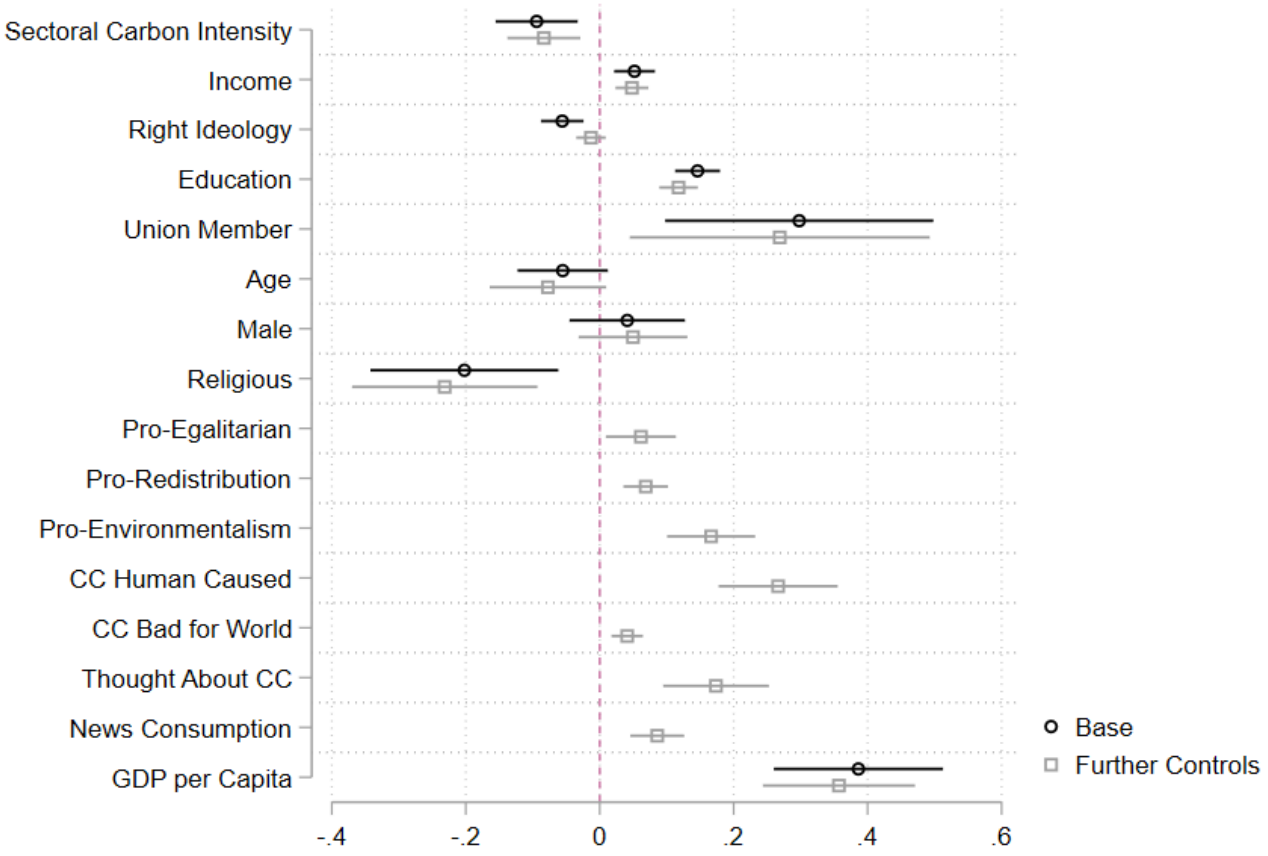


Figure 1: Effect of sectoral carbon intensity on support for fossil fuel taxation.

fuel taxation.[19]

The model includes a number of controls based on previous literature, which behave largely as expected. Right-wing ideology and belonging to a religious denomination are associated with weaker support for mitigation. Higher levels of income, education, and belonging to a union are associated with higher support. Being male also appears to have a positive effect on support, which is surprising given previous findings, but the effect is only marginally statistically significant and is not robust across later regressions. Gross domestic product per capita appears to have a large and statistically significant positive association with support for fossil fuel taxation across the sampled countries.[20]

In the model with further controls, the added variables all have a statistically significant positive association with support for fossil fuel taxation. People who support redistribution, environmentalism, and egalitarianism are more likely to support costly mitigation policy. People who are more aware of the climate change problem are more likely to support mitigation policy, as are people who spend more time consuming news media. Their inclusion does not substantially reduce the magnitude or statistical significance of sectoral carbon intensity.

5.2 Cost-Concentration

In the second set of models, displayed in Figure 2, I test whether the effect of carbon intensity is stronger for fossil fuel taxation compared with other less "costly" opinions. The results appear consistent with Hypothesis 2, which predicts that CO_2 would have its greatest impact on support for costly mitigation policy and weaker impacts on less expensive, less targeted options. For simplicity, I have not plotted the control variables for these models. But the full models can be reviewed in Table A6 and Table A7 in the Appendix.

The first model tests the effect of sectoral emissions on respondents' general concern about climate change. Though the relationship is negatively signed, sectoral emissions have no statistically significant effect on respondents' concern about climate change or their understanding of it as human-caused. This helps deal with a potential concern about selection bias. It is possible that people who are more concerned or knowledgeable about climate change would be less likely to look for jobs in emissions-intense sectors. But if this

[19] As shown in Table A4, sector carbon intensity has an even larger and statistically significant negative association with taxation support in a model without covariates or with only individual covariates. I focus here on models with national covariates for wealth. Since the effect of carbon intensity is smallest in the plotted models, it also represents a more conservative estimate of its importance.

[20] National carbon intensity has a strong negative correlation with wealth in the sample (below -0.9). It produces a similar coefficient with the opposite sign when included in the model instead of wealth.

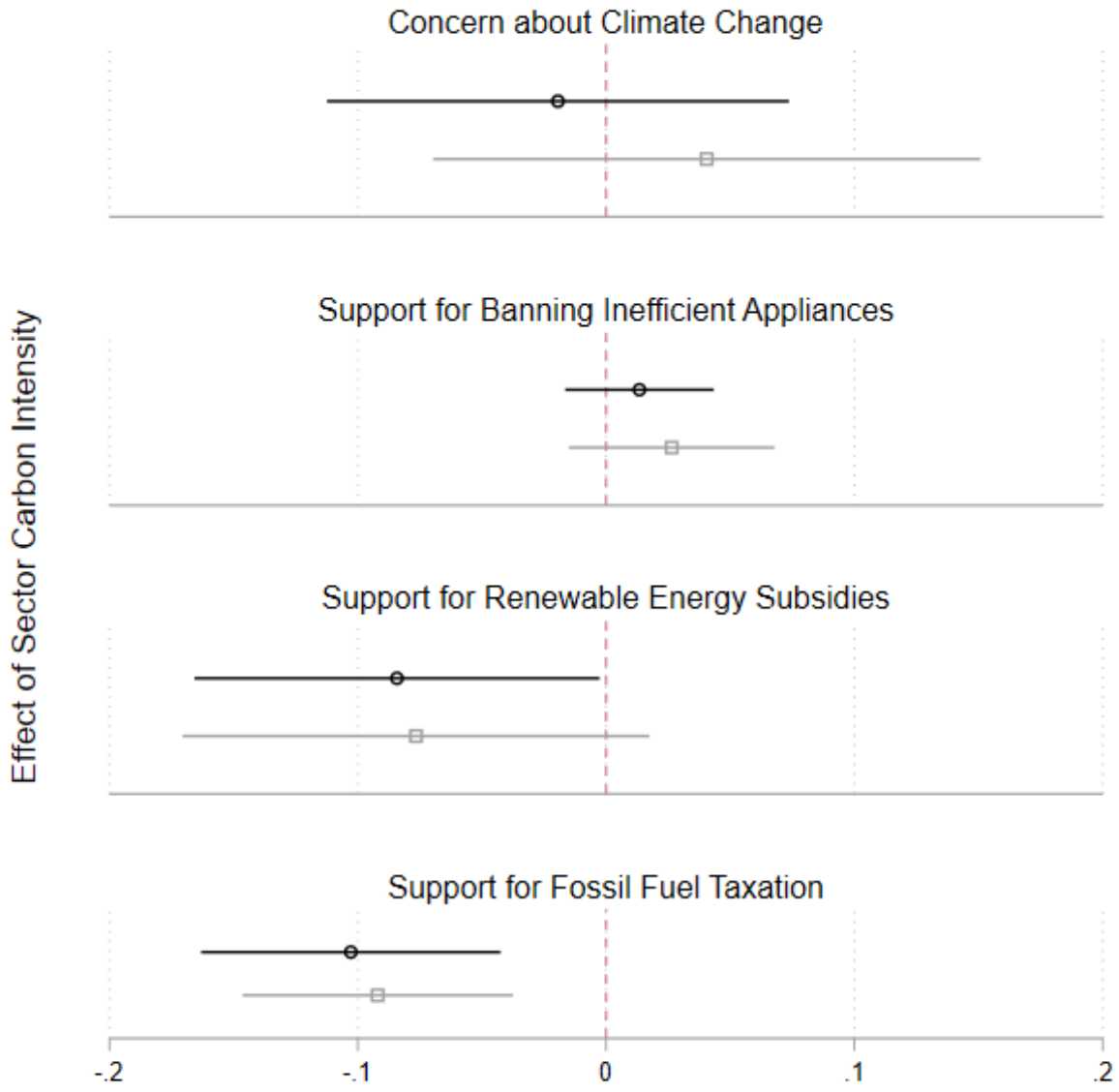


Figure 2: Effect of sectoral carbon intensity on concern about climate change and support for various policy measures. Whiskers represent the 95% confidence intervals. Black models include controls for income, ideology, education, union membership, gender, and religiosity. Grey models add controls for values, climate change opinion, and news consumption.

were driving the results, one would expect emissions-intensity of employment to predict concern or knowledge, which is not the case.

The second and third models test the impact of sectoral emissions on support for two policy options that are less targeted at emissions-intense sectors than fossil fuel taxation: appliance efficiency mandates and renewable energy subsidies. These models add a control for concern about climate change (the dependent variable in the first model).

The second model finds no statistically significant relationship between sectoral emissions and support for appliance mandates. This policy option does not involve costs targeted at people in most high-emissions industries, so it makes sense that there is no strong relationship here.

The third model finds a negative relationship between sectoral emissions and support for renewable subsidies, but the confidence intervals are wider and when the further controls are included, the relationship drops below significance at the p=0.05 level. Government renewable subsidies spread the costs of their policy across the tax base, so their impact on emissions-intense sectors should be weaker. The effect is still substantively large, however, which might be explained by emissions-intense sectors also being energy-intense, and therefore concerned about rising energy prices.[21]

The fourth model reproduces the coefficients from the models in Figure 1. In line with Hypothesis 2, sectoral emissions have their strongest effect on support for the emissions policy with the strongest cost-concentration, fossil fuel taxes. The negative relationship between sectoral emissions and support for taxation persists when a control for concern is added to the model. This suggests that the emissions-opinion relationship is driven by cost considerations and not selection effects. If working in an emissions-intense sector reduce support for costly policy by making workers skeptical about climate change generally, then the concern measure would be expected to reduce the effect of the emissions measure.

5.3 Dampening Effects

In the third set of regressions, I test whether sector-level carbon emissions moderate the effects of other variables of interest in the literature. The results of the multi-way clustered logistic regressions are presented in Figure 3. The black lines represent results from the base model and the grey lines represent results from the model with controls for values, climate change awareness, and news consumption. The control variables have been omitted for clarity, but the full results are available in Table A8 and Table A9 in the Appendix.

[21] This would be a worthwhile subject for future research.

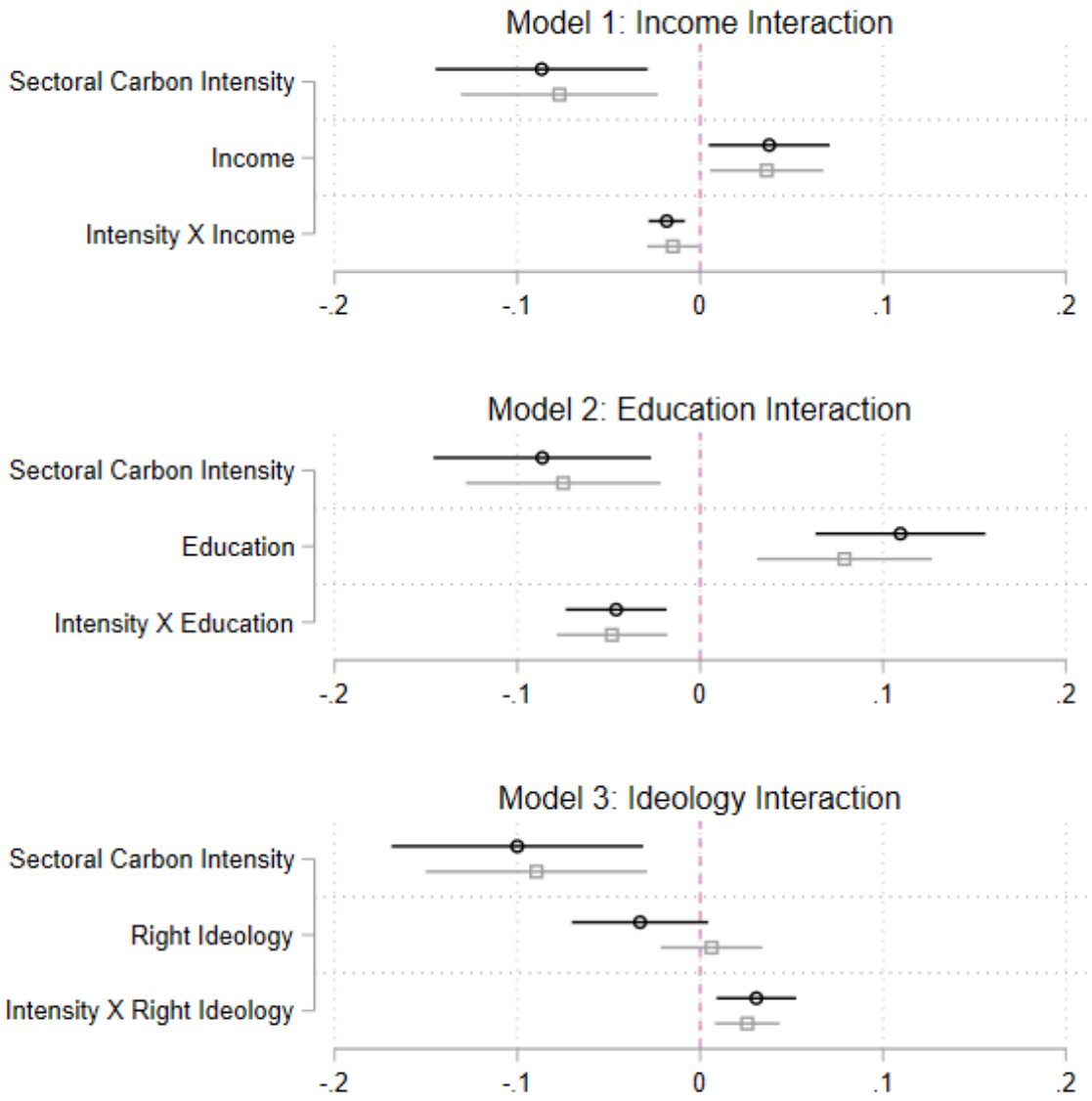


Figure 3: Moderating effect of sectoral carbon intensity on the relationship between income, education, and ideology on support for fossil fuel taxataion. Whiskers represent the 95% confidence intervals. Black models include controls for income, ideology, education, union membership, gender, and religiosity. Grey models add controls for values, climate change opinion, and news consumption.

Models 1, 2, and 3 test the interaction between carbon emissions and income, education, and right-wing ideology, respectively. Recall that these variables have been centered, so a value of 0 represents being in the middle of the income distribution, having completed secondary education, and identifying with the political center.

The results are consistent with Hypothesis 3 and its three sub-hypotheses. In each model, the interaction effect moderates the impact of income, education, or ideology. In all three interacted models, the main effect of CO_2 retains its size and statistical significance. The main effects for income and education remain positive and statistically significant, and the main effect for right-wing ideology remains negative and statistically significant.

A more intuitive way of displaying these results is through marginal effects plots. For technical reasons the plots displayed below are based on a standard logistic regression rather than the one with multi-way clustered standard errors. But this has no material impact on the coefficients or the conclusions.[22]

In all three marginal effects plots, the interaction of carbon intensity can be seen to moderate the impact of the other variables. In describing these interactions, I will calculate the predicted probabilities of two workers in the same sector supporting fossil fuel taxation. I will consider how this predicted support differs depending on whether they are employed in a low-emissions sector, with CO_2 intensity one standard deviation below the mean, or a high-emissions sector, with CO_2 intensity one standard deviation above the mean. In all cases the values of the other control variables are held at their means.

Figure 4 shows how the effect of income varies at different levels of carbon intensity. Consider two workers, one with a household income in the bottom 10% and one in the top 10%, who are employed in the same sector. If they work in a low emissions sector, the predicted probability that the low-income worker supports taxation is 28%, but the probability that the high-income worker supports it is predicted to be 39%. If they are employed in a sector with emissions one standard deviation above the mean, however, then there is no statistically significant difference in their likelihood of supporting taxation (28% versus 31%). This is consistent with Hypothesis 3a, which argued that income will be less influential for people who work in high-emissions sectors.

A similar relationship is observed between education and emissions in Figure 5. In a

[22]The Petersen et al. (2014) implementation of logistic regression with multi-way clustering in Stata does not support factor-based interaction terms, which are required for calculating marginal effects. Fortunately, a standard logistic regression clustered on sectors produces the same coefficient sizes at similar levels of statistical significance (the only noticeable difference being that the interaction between income and CO_2 is significant at the $p<0.05$ level rather than $p<0.01$. The logistic regressions underlying the marginal effects are available in Table A10 in the Appendix.

Figure 4: Marginal Effects of Income, 95% CIs

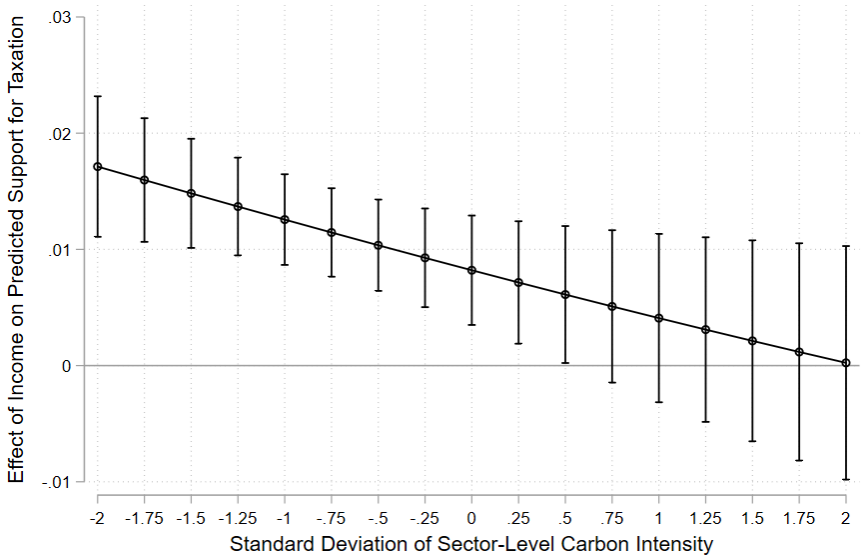


Figure 5: Marginal Effects of Education, 95% CIs

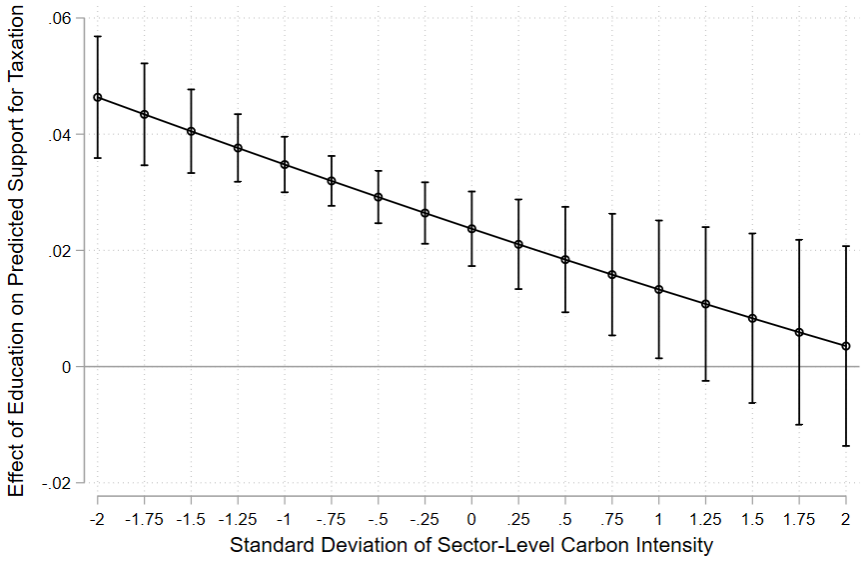
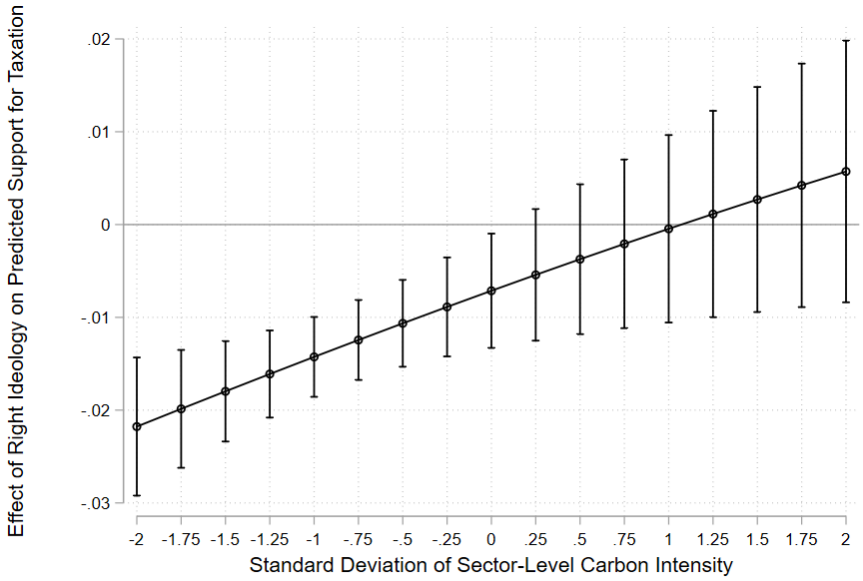


Figure 6: Marginal Effects of Right-Wing Ideology, 95% CIs



low emissions sector, a worker whose highest level of education is secondary school has a 33% predicted probability of supporting taxation. A worker in the same sector with a tertiary education (equivalent to a bachelor's degree in the United Kingdom) is predicted to have a 40% chance of supporting taxation. Again, were both of them working in a high-emissions sector, the difference between them (29% versus 32%) is not statistically significant. This is consistent with Hypothesis 3b, which suggested that the effect of income on support for taxation will weaken for people in emissions-intense industries.

Finally, in Figure 6 the relationship between political views and support for fossil fuel taxation is plotted. Consider two workers in the same industry, one of whom has right-wing views (8 on a scale of 0 to 10) and one who has left-wing views (2 on the same scale). If they work in a low emissions sector, the left-wing person is predicted to be 9 percentage points more likely to support fossil fuel taxation than their right-wing counterpart (39% versus 30%). But if they are employed in a high-emission sector, there is no predicted difference in their likelihood of supporting taxation (29% for both). This is consistent with Hypothesis 3c, which claimed that ideology would be less salient for workers in high-emissions sectors.

6 Conclusion

At the outset of this paper I asked whether individual workers' opinions about climate policy were affected by the emissions intensity of their sector of employment. All the

findings in this analysis suggests that they are.

The effect of greenhouse gas emissions on climate attitudes cannot fully be accounted for using national measures. The emissions intensity of peoples' sector of employment has a substantial and statistically significant effect on their predicted likelihood of supporting costly climate change mitigation policy. This finding is not only robust to the inclusion of standard controls, but also to other prominent explanations of climate attitudes like concern, values, and awareness.

The results show that the findings of Tvinnereim and Ivarsflaten (2016) and Bechtel et al. (2017) are not confined to a few countries, but are applicable across a range of national contexts. The results also show that the effect of sectoral emissions is specific for support for costly policy action. This reinforces the lesson that concern about climate change and support for mitigation policy have distinct determinants. It also provides more evidence that policies which use cost language may provoke more opposition than those whose costs appear more diffuse.

Perhaps the most striking finding is that sectoral carbon emissions appear to moderate the effect of other variables previously found to be important. Income, education, and ideology have all received frequent attention from scholars and are thought to be important predictors of climate attitudes. But their effects may be reduced or even eliminated by working in emissions-intense industries.

What broader lessons can be drawn from these results?

The first is that the debate about material interests in climate attitudes needs to move beyond general measures of wealth or pollution. The role of material interests in climate opinion is more specific and disaggregated than national measures can capture. As the rest of this dissertation has shown, more sectoral work is needed. Future work should explore how people in different sectors respond differently to climate change communication efforts. More should also be done to compare the "production" emissions explored in this paper with "consumption" emissions that people in all sectors depend on.

Second, for those trying to influence public opinion on climate change, whether politicians or lobbyists or activists, the results of this paper suggest that there may be value in sectorally-targeted outreach. If workers in emissions-intense industries are aware of their vulnerability, then policymakers may need to put more emphasis on policies that explicitly protect workers from the costs of transition.

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Table A1: List of Sectors and ISIC Revision 3 Codes

Code	Name
A-B	Agriculture, Hunting, Forestry and Fishing
C	Mining and Quarrying
15-16	Food, Beverages and Tobacco
17-18	Textiles and Textile Products
19	Leather, Leather and Footwear
20	Wood and Products of Wood and Cork
21-22	Pulp, Paper, Paper, Printing and Publishing
23	Coke, Refined Petroleum and Nuclear Fuel
24	Chemicals and Chemical Products
25	Rubber and Plastics
26	Other Non-Metallic Mineral
27-28	Basic Metals and Fabricated Metal
29	Machinery, Not Elsewhere Classified
30-33	Electrical and Optical Equipment
34-35	Transport Equipment
36-37	Manufacturing, Not Elsewhere Classified; Recycling
E	Electricity, Gas and Water Supply
F	Construction
50	Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Fuel
51	Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles
52	Retail Trade, Except of Motor Vehicles and Motorcycles; Repair of Household Goods
H	Hotels and Restaurants
60	Inland Transport
61	Water Transport
62	Air Transport
63	Other Supporting and Auxiliary Transport Activities; Activities of Travel Agencies
64	Post and Telecommunications
J	Financial Intermediation
70	Real Estate Activities
71-74	Renting of Movables and Equipment and Other Business Activities
L	Public Admin and Defence; Compulsory Social Security
M	Education
N	Health and Social Work
O	Other Community, Social and Personal Services

Table A2: Summary Statistics

	Mean	S.D.	Min	Max	Count	Unit
Support Fossil Fuel Taxation	.33	.47	0	1	24288	Binary
Support Inefficient Appliance Ban	.59	.49	0	1	24403	Binary
Support Renewable Subsidies	.76	.43	0	1	24515	Binary
Worried About CC	.72	.45	0	1	24184	Binary
Sectoral Carbon Intensity	-.68	.78	-4.5	2.6	24998	Std. Log Tons CO_2 / $ Output
National Carbon Intensity	-.87	.9	-1.9	1.1	24998	Std. Log Tons CO_2 / $ GDP
GDP per Capita	.008	1	-1.8	1.3	24998	Std. Log $ / Person
Income	-.12	2.7	-4.5	4.5	21615	Centered Decile
Right Ideology	.14	2.1	-5	5	22424	Centered Ordinal
Education	.18	1.8	-3	3	24911	Centered Ordinal
Union Member	.18	.38	0	1	24929	Binary
Age	.066	.95	-1.8	2.7	24934	Std. Years
Male	.48	.5	0	1	24998	Binary
Religious	.52	.5	0	1	24871	Binary
Pro-Egalitarian	4.8	1.1	1	6	24812	Ordinal
Pro-Redistribution	3.8	1	1	5	24704	Ordinal
Pro-Environmentalism	4.8	1	1	6	24838	Ordinal
CC Human Caused	3.4	.84	0	5	24092	Ordinal
CC Bad for World	6.6	2.1	0	10	23546	Ordinal
Thought About CC	3	1.1	1	5	24462	Ordinal
News Consumption	-.065	.95	-4.1	3.4	23683	Std. Log Minutes

Table A3: Pairwise Correlations

		1	2	3	4	5	6	7	8	9	10
1	Support F.F. Taxation	1.00									
2	Support Ineff. App. Ban	0.18	1.00								
3	Support R.E. Subsidies	0.19	0.24	1.00							
4	Worried About CC	0.14	0.17	0.15	1.00						
5	Sectoral CO_2 Intensity	-0.09	-0.04	-0.06	-0.07	1.00					
6	National CO_2 Intensity	-0.11	-0.08	-0.08	-0.11	0.32	1.00				
7	GDP per Capita	0.14	0.07	0.07	0.12	-0.31	-0.92	1.00			
8	Income	0.13	0.06	0.09	0.07	-0.07	-0.01	0.03	1.00		
9	Right Ideology	-0.06	-0.05	-0.06	-0.09	0.03	0.04	-0.05	0.07	1.00	
10	Education	0.15	0.06	0.07	0.09	-0.11	0.12	-0.08	0.38	-0.02	1.00
11	Union Member	0.10	0.04	0.06	0.05	-0.09	-0.14	0.16	0.17	-0.04	0.13
12	Age	-0.06	0.02	-0.04	-0.05	0.06	-0.05	0.04	-0.23	0.04	-0.19
13	Male	0.01	-0.04	-0.02	-0.06	0.17	-0.03	0.03	0.08	0.04	-0.04
14	Religious	-0.06	0.01	0.01	0.03	0.03	-0.05	0.03	-0.05	0.11	-0.05
15	Pro-Egalitarian	0.10	0.09	0.12	0.13	-0.08	-0.16	0.14	-0.01	-0.13	0.02
16	Pro-Redistribution	0.03	0.08	0.07	0.08	0.00	-0.01	-0.01	-0.17	-0.19	-0.10
17	Pro-Environmentalism	0.11	0.15	0.14	0.19	-0.01	0.01	-0.01	-0.02	-0.04	0.05
18	CC Human Caused	0.15	0.14	0.15	0.26	-0.08	-0.14	0.13	0.07	-0.09	0.07
19	CC Bad for World	0.11	0.12	0.12	0.21	-0.03	-0.05	0.02	0.05	-0.12	0.11
20	Thought About CC	0.19	0.17	0.16	0.41	-0.12	-0.19	0.18	0.14	-0.12	0.21
21	News Consumption	0.01	-0.02	-0.03	-0.01	0.04	0.07	-0.06	-0.06	0.01	0.01

		11	12	13	14	15	16	17	18	19	20	21
11	Union Member	1.00										
12	Age	-0.06	1.00									
13	Male	0.02	-0.03	1.00								
14	Religious	0.00	0.15	-0.07	1.00							
15	Pro-Egalitarian	0.05	0.01	-0.07	0.05	1.00						
16	Pro-Redistribution	0.05	0.09	-0.05	0.04	0.16	1.00					
17	Pro-Environmentalism	0.04	0.16	-0.06	0.06	0.29	0.11	1.00				
18	CC Human Caused	0.06	-0.11	-0.01	-0.01	0.09	0.03	0.09	1.00			
19	CC Bad for World	0.02	-0.08	-0.00	-0.01	0.12	0.06	0.14	0.26	1.00		
20	Thought About CC	0.08	-0.04	0.00	-0.03	0.16	0.02	0.24	0.24	0.25	1.00	
21	News Consumption	-0.05	0.29	0.06	0.01	0.01	0.02	0.06	-0.07	-0.04	0.03	1.00

Table A4: Support for Fossil Fuel Taxation

	(1)	(2)	(3)	(4)
CO_2 Intensity	-0.27***	-0.20***	-0.11***	-0.09***
	(0.08)	(0.07)	(0.03)	(0.03)
Right-Wing Ideology		-0.06***	-0.06***	-0.06***
		(0.02)	(0.02)	(0.02)
Income Decile		0.06***	0.06***	0.05***
		(0.01)	(0.01)	(0.02)
Education Level		0.13***	0.14***	0.15***
		(0.02)	(0.01)	(0.02)
Union Member		0.41***	0.33***	0.30***
		(0.12)	(0.10)	(0.10)
Religion		-0.16*	-0.20**	-0.20***
		(0.09)	(0.08)	(0.07)
Male		0.08*	0.05	0.04
		(0.05)	(0.04)	(0.04)
Age		-0.05	-0.05	-0.06
		(0.03)	(0.03)	(0.03)
National CO_2 Intensity			-0.33***	
			(0.13)	
GDP per Capita				0.39***
				(0.06)
Constant	-0.91***	-0.89***	-1.09***	-0.79***
	(0.14)	(0.15)	(0.12)	(0.08)
N	24,288	19,228	19,228	19,228
Pseudo R^2	0.01	0.04	0.05	0.06

Logistic Regression with Multi-Way Clustering
*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$
S = Standardized, L = Logged

Table A5: Support for Fossil Fuel Taxation Further Controls

	(1)	(2)
CO_2 Intensity	-0.10***	-0.08***
	(0.03)	(0.03)
Right-Wing Ideology	-0.02	-0.01
	(0.01)	(0.01)
Income Decile	0.05***	0.05***
	(0.01)	(0.01)
Education Level	0.11***	0.12***
	(0.01)	(0.01)
Union Member	0.30***	0.27**
	(0.12)	(0.11)
Religion	-0.22***	-0.23***
	(0.08)	(0.07)
Male	0.06	0.05
	(0.04)	(0.04)
Age	-0.07*	-0.08*
	(0.04)	(0.04)
Thought About Climate Change a Lot	0.18***	0.17***
	(0.04)	(0.04)
Support for Redistribution	0.06***	0.07***
	(0.01)	(0.02)
Support for Environmentalism	0.16***	0.17***
	(0.03)	(0.03)
News Consumption	0.08***	0.09***
	(0.02)	(0.02)
Egalitarian Values	0.07***	0.06**
	(0.02)	(0.03)
Climate Change Human-Caused	0.27***	0.27***
	(0.05)	(0.05)
Climate Change Bad for the World	0.04***	0.04***
	(0.01)	(0.01)
National CO_2 Intensity	-0.28**	
	(0.14)	
GDP per Capita		0.36***
		(0.06)
Constant	-4.11***	-3.86***
	(0.41)	(0.41)
N	17,568	17,568
Pseudo R^2	0.08	0.08

Logistic Regression with Multi-Way Clustering
*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$
S = Standardized, L = Logged

Table A6: Cost Targeting

	(1) Worry	(2) Appliances	(3) Renewables	(4) Taxes
CO_2 Intensity	-0.02	0.01	-0.08**	-0.10***
	(0.05)	(0.02)	(0.04)	(0.03)
Right-Wing Ideology	-0.09***	-0.03**	-0.05**	-0.03**
	(0.02)	(0.01)	(0.02)	(0.01)
Income Decile	0.04***	0.04***	0.05***	0.05***
	(0.01)	(0.01)	(0.02)	(0.01)
Education Level	0.05***	0.04***	0.03	0.14***
	(0.02)	(0.01)	(0.03)	(0.02)
Concern about Climate Change		0.44***	0.42***	0.42***
		(0.04)	(0.05)	(0.06)
Union Member	0.01	0.02	0.23*	0.31***
	(0.12)	(0.07)	(0.14)	(0.12)
Religion	0.25**	0.04	0.10	-0.23***
	(0.10)	(0.08)	(0.12)	(0.07)
Male	-0.30***	-0.14***	-0.05	0.10**
	(0.06)	(0.03)	(0.10)	(0.05)
Age	-0.09**	0.16***	-0.05	-0.03
	(0.04)	(0.03)	(0.07)	(0.04)
GDP per Capita	0.28***	0.05	0.09	0.34***
	(0.10)	(0.08)	(0.12)	(0.06)
Constant	1.06***	-0.83***	-0.01	-2.11***
	(0.17)	(0.14)	(0.24)	(0.23)
N	19,076	18,865	18,918	18,794
Pseudo R^2	0.03	0.04	0.04	0.08

Logistic Regression with Multi-Way Clustering
*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$
S = Standardized, L = Logged

Table A7: Cost Targeting Models with Further Controls

	(1) Worry	(2) Appliances	(3) Renewables	(4) Taxes
CO_2 Intensity	0.04	0.03	-0.08	-0.09***
	(0.06)	(0.02)	(0.05)	(0.03)
Right-Wing Ideology	-0.02	-0.00	-0.02	-0.01
	(0.02)	(0.01)	(0.02)	(0.01)
Income Decile	0.01	0.04***	0.05***	0.05***
	(0.01)	(0.01)	(0.02)	(0.01)
Education Level	-0.05***	0.03***	0.02	0.12***
	(0.01)	(0.01)	(0.03)	(0.02)
Concern about Climate Change		0.25***	0.20***	0.25***
		(0.04)	(0.03)	(0.05)
Union Member	-0.08	-0.04	0.16	0.28**
	(0.09)	(0.07)	(0.14)	(0.12)
Religion	0.20**	0.04	0.08	-0.24***
	(0.08)	(0.07)	(0.10)	(0.07)
Male	-0.37***	-0.14***	-0.06	0.08*
	(0.08)	(0.05)	(0.10)	(0.04)
Age	-0.13***	0.14***	-0.08	-0.06
	(0.04)	(0.03)	(0.07)	(0.04)
Thought About Climate Change a Lot	0.82***	0.08***	0.08***	0.10***
	(0.08)	(0.03)	(0.03)	(0.04)
Support for Redistribution	0.14***	0.14***	0.10**	0.06***
	(0.03)	(0.01)	(0.04)	(0.02)
Support for Environmentalism	0.28***	0.20***	0.18***	0.13***
	(0.06)	(0.03)	(0.01)	(0.03)
News Consumption	0.06*	-0.04	-0.03	0.08***
	(0.03)	(0.03)	(0.03)	(0.02)
Egalitarian Values	0.03	0.02	0.11***	0.06**
	(0.03)	(0.03)	(0.02)	(0.03)
Climate Change Human-Caused	0.60***	0.19***	0.22***	0.22***
	(0.05)	(0.03)	(0.04)	(0.04)
Climate Change Bad for the World	0.13***	0.05***	0.08***	0.02*
	(0.02)	(0.01)	(0.02)	(0.01)
GDP per Capita	0.19**	0.05	0.10	0.35***
	(0.08)	(0.08)	(0.11)	(0.06)
Constant	-5.91***	-3.09***	-2.54***	-3.91***
	(0.40)	(0.21)	(0.38)	(0.41)
N	17,754	17,620	17,659	17,553
Pseudo R^2	0.20	0.05	0.06	0.09

Logistic Regression with Multi-Way Clustering
*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$
S = Standardized, L = Logged

Table A8: Moderating Effects

	(1)	(2)	(3)
CO_2 Intensity	-0.09***	-0.09***	-0.10***
	(0.03)	(0.03)	(0.04)
CO_2 Intensity × Income	-0.02***		
	(0.01)		
CO_2 Intensity × Education		-0.05***	
		(0.01)	
CO_2 Intensity × Right Ideology			0.03***
			(0.01)
Right-Wing Ideology	-0.06***	-0.06***	-0.03*
	(0.02)	(0.02)	(0.02)
Income Decile	0.04**	0.05***	0.05***
	(0.02)	(0.02)	(0.02)
Education Level	0.15***	0.11***	0.15***
	(0.02)	(0.02)	(0.02)
Union Member	0.30***	0.29***	0.30***
	(0.10)	(0.10)	(0.10)
Religion	-0.20***	-0.20***	-0.20***
	(0.07)	(0.07)	(0.07)
Male	0.04	0.04	0.04
	(0.04)	(0.04)	(0.04)
Age	-0.06*	-0.06*	-0.05
	(0.03)	(0.03)	(0.04)
GDP per Capita	0.39***	0.38***	0.39***
	(0.06)	(0.06)	(0.06)
Constant	-0.79***	-0.79***	-0.80***
	(0.08)	(0.08)	(0.08)
N	19,228	19,228	19,228
Pseudo R^2	0.06	0.06	0.06

Logistic Regression with Multi-Way Clustering
*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$
S = Standardized, L = Logged

Table A9: Moderating Effects Further Controls

	(1)	(2)	(3)
CO_2 Intensity	-0.08***	-0.07***	-0.09***
	(0.03)	(0.03)	(0.03)
CO_2 Intensity × Income	-0.01**		
	(0.01)		
CO_2 Intensity × Education		-0.05***	
		(0.02)	
CO_2 Intensity × Right Ideology			0.03***
			(0.01)
Right-Wing Ideology	-0.01	-0.01	0.01
	(0.01)	(0.01)	(0.01)
Income Decile	0.04**	0.05***	0.05***
	(0.02)	(0.01)	(0.01)
Education Level	0.12***	0.08***	0.12***
	(0.01)	(0.02)	(0.01)
Union Member	0.27**	0.26**	0.27**
	(0.11)	(0.11)	(0.11)
Religion	-0.23***	-0.23***	-0.23***
	(0.07)	(0.07)	(0.07)
Male	0.05	0.04	0.05
	(0.04)	(0.04)	(0.04)
Age	-0.08*	-0.08*	-0.08*
	(0.04)	(0.04)	(0.04)
Thought About Climate Change a Lot	0.17***	0.17***	0.17***
	(0.04)	(0.04)	(0.04)
Support for Redistribution	0.07***	0.07***	0.07***
	(0.02)	(0.02)	(0.02)
Support for Environmentalism	0.17***	0.17***	0.17***
	(0.03)	(0.03)	(0.03)
News Consumption	0.09***	0.09***	0.09***
	(0.02)	(0.02)	(0.02)
Egalitarian Values	0.06**	0.06**	0.06**
	(0.03)	(0.03)	(0.03)
Climate Change Human-Caused	0.27***	0.27***	0.27***
	(0.05)	(0.05)	(0.05)
Climate Change Bad for the World	0.04***	0.04***	0.04***
	(0.01)	(0.01)	(0.01)
GDP per Capita	0.36***	0.36***	0.36***
	(0.06)	(0.06)	(0.06)
Constant	-3.85***	-3.85***	-3.85***
	(0.41)	(0.42)	(0.42)
N	17,568	17,568	17,568
Pseudo R^2	0.08	0.08	0.08

Logistic Regression with Multi-Way Clustering
*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$
S = Standardized, L = Logged

Table A10: Moderating Effects Factor Specification

	(1)	(2)	(3)
CO_2 Intensity	-0.09***	-0.09***	-0.10***
	(0.03)	(0.03)	(0.03)
CO_2 Intensity × Income	-0.02**		
	(0.01)		
CO_2 Intensity × Education		-0.05***	
		(0.02)	
CO_2 Intensity × Right-Wing			0.03**
			(0.01)
Right-Wing Ideology	-0.06***	-0.06***	-0.03**
	(0.01)	(0.01)	(0.01)
Income Decile	0.04***	0.05***	0.05***
	(0.01)	(0.01)	(0.01)
Education Level	0.15***	0.11***	0.15***
	(0.01)	(0.01)	(0.01)
Union Member	0.30***	0.29***	0.30***
	(0.04)	(0.04)	(0.04)
Religion	-0.20***	-0.20***	-0.20***
	(0.04)	(0.04)	(0.04)
Male	0.04	0.04	0.04
	(0.04)	(0.04)	(0.04)
Age	-0.06**	-0.06**	-0.05**
	(0.02)	(0.02)	(0.02)
GDP per Capita	0.39***	0.38***	0.39***
	(0.02)	(0.02)	(0.02)
Constant	-0.79***	-0.79***	-0.80***
	(0.03)	(0.03)	(0.03)
N	19,228	19,228	19,228
Pseudo R^2	0.06	0.06	0.06

Logistic Regression
*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$
S = Standardized, L = Logged