

Literature Review – OECD Climate surveys

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1. Preferred policies and policy characteristics

The literature has identified several trends regarding people's preferences over climate change mitigation policies¹. First, it appears that the actual attributes of a given policy can explain those preferences.

1.1 Coercive dimension

Results from social psychology point that people usually prefer policies perceived as less coercive (i.e. restrictive). The literature usually distinguishes "pull" measures, that are noncoercive and reward pro-environmental behaviors (e.g., subsidies), from "push" measures, that are coercive and punish environmentally unfriendly behaviors (e.g., taxes). For instance, when asked directly people usually support subsidies over taxes (Cherry et al. (2012); de Groot and Schuitema (2012); Kallbekken and Aasen (2010); Steg et al. (2006)). Steg et al. (2006)

¹ For other reviews see for instance Brechin (2010); Ziegler (2017); Maestre-Andrés, Drews, and van den Bergh (2019); Drews and van den Bergh (2016).

find push measures to be more acceptable if revenues are allocated to energy-related measures, while the funding of pull measures does not affect their acceptability. Similarly, in a U.S. survey Attari et al. (2009) find that for transports behavior "soft regulations" (e.g., tax break for compact cars) were preferred over voluntary changes, while "hard regulations" (e.g., restricting the purchase of SUV) were the less preferred measures. People opposed to these measures mentioned the loss of "personal freedom" and "need for choice." Moreover, de Groot and Schuitema (2012) find that if push measures target high-cost behavior (e.g., driving less) or if the policy is seen to be accepted by a minority of the public, public support will be lower. However, Kotchen et al. (2013), using randomized treatment within a survey, find that the willingness-to-pay (WTP) does not vary substantially for a cap-and-trade program, a carbon tax, or a GHG regulation (although sociodemographic characteristics do vary).

Fischer et al. (2011) can provide an interesting explanation for this fact. They use qualitative interviews from five European countries to show that people back up their argument with generalized characteristics of human kind. In particular, people think other people are selfish and consumption-oriented and therefore that only strict regulations can achieve widespread behavioral change and that voluntary behavioral changes are insufficient.

1.2 Perceived costs and effectiveness

Jagers and Hammar (2009) study the Swedish carbon tax and show that people associate carbon taxes with high personal costs. More interestingly, those high personal costs are often related to misperceptions, for instance the costs of a carbon tax are often overestimated while its benefits underestimated (Carattini et al. (2018); Odeck and Bråthen (2002); Schuitema, Steg et al. (2010)).

Depending on the policy, people may either overestimate or underestimate the costs. In particular, Jagers and Hammar (2009) show that people tend to overestimate the costs of taxes, while underestimating the costs of subsidies or investments in public transport. Douenne and Fabre (2019) show that French people overestimate the negative impact of a carbon tax on their purchasing power, and at the same time do not perceive this policy to be effective.

Kallbekken and Sælen (2011) show that, in Norway, support for a fuel tax increases if people believe that the tax is going to limit driving and will have a positive effect on climate change. Moreover, experiencing the effectiveness of a measure can help quickly update one's beliefs and increase support for the policy. Eliasson and Jonsson (2011) study the congestion price implemented in Stockholm and show that the evolution of the perceived effectiveness was a major determinant for the acceptability of the policy: Before the trial implementation, 30% of the population supported the congestion price, whereas 70% supported it at the end of the trial as they had experienced its effectiveness. Heres et al. (2017) in a laboratory experiment ask participants about Pigouvian taxes and subsidies that theoretically should produce identical outcomes, they find that the greater support for subsidies can be explained because people expect subsidies to increase their payoffs more than a tax. Moreover, when adding uncertainty on how the tax revenues would be used the results are even stronger.

More importantly, people often reject a policy because they perceive it as ineffective. This is particularly the case for carbon tax as noted by Hsu et al. (2008) in North America or Baranzini and Carattini (2017) in Switzerland. Finally, carbon taxes are often perceived as ineffective to discourage carbon-intensive activities (Klok et al. (2006); Steg et al. (2006)) and this is often one of the main reasons why carbon taxes are rejected by people (Baranzini and Carattini (2017); Hsu et al. (2008)).

1.3 Fairness of the policy/Distribution of costs

When a policy is implemented nationally or locally, justice considerations within a country or a region (e.g., concerns for regressivity and negative effects on low-income households) affect the acceptability of a given policy and often need to be counterbalanced to increase the acceptability of a carbon tax. Therefore, the perceived fairness of the policy plays an important role for its support. Brannlund and Persson (2012) show that in Sweden, people preferred an instrument with progressive cost distribution rather than a regressive one. Regarding international burden-sharing, Klinsky et al. (2012) with a qualitative study show that the most frequent arguments are the causality of emissions, the ability to bear costs, punishing bad behaviors, equality of burdens, relationship with other stakeholders, and the cost effectiveness. Cai et al. (2010) study, with respondents from the U.S. and Canada, the distribution of costs among different subgroups of the population. They show that the WTP decreases if greater responsibility is assigned to taxpayers, while it increases if industry (investors) and energy users are targeted. However, when Baranzini and Carattini (2017) ask directly about preferences between redistribution towards affected household, tax rebates or revenue recycling for environmental purposes, 60% of the respondents prefer the third option.

Regarding international burden-sharing, Gampfer (2014) insists on aspects such as vulnerability, historical responsibility or ability to pay. Bechtel and Scheve (2013) ask people in the U.S., UK, Germany, and France about international burden sharing and show that an agreement where only rich countries would pay is mainly rejected. Meilland (2020), using surveys in both the U.S. and France, shows that respondents favor an equal distribution of per capita emissions between countries (rather than a territorial distribution) and that emissions since 1990 should be taken into account. Moreover respondents disagree that China and India are taking their fair share.

1.4 Effect on economy as a whole

The impact on the economy as a whole can also undermine the support for a carbon tax. People are often concerned about the impact on competitiveness and employment Carattini et al. (2017). It also appears that those concerns can be overestimated by people. Focusing on Switzerland, Thalmann (2004) sees that respondents to his survey express concern for unemployment while people in the survey were not subject to unemployment risks, which leads Carattini et al. (2018) to interpret this as an "overreaction". Spash and Lo (2012), in a study on Australia, underline that campaigns by companies from the energy sector could increase fears for those concerns.

2. Personal views

Apart from the policy's characteristics, people's own views are also a main factor regarding the support of climate mitigation policies.

2.1 Political orientation and cultural views

Drews and van den Bergh (2016) underline the role of socioeconomic and psychological factors on the support or not of climate policies. Studies in Switzerland Tobler et al. (2012) or Sweden (Harring and Jagers (2013); Hammar and Jagers (2007)) underline the positive effect of left-wing orientation on positive attitudes toward climate policies. In the U.S. context Leiserowitz et al. (2013) uses a large-scale survey (conducted from November 2002 to February 2003) and finds that an identification to the Democrat and a liberal political ideology lead to stronger support for climate policies. Furthermore, Kotchen et al. (2013) find that Democrats express a higher WTP than Republicans in regard to climate change mitigation. Moreover, McCright

(2008) finds that Democrats and liberals express more scientifically accurate beliefs about climate change than conservatives and Republican.

However, Drews and van den Bergh (2016) underline that the driving factor might not be political orientation but rather the personal views of people. Dietz et al. (2007) with a survey on 316 people from Michigan and Virginia find that the strong effect of political orientation is only indirect as it relates to people's values and worldviews. Leiserowitz (2006) finds that egalitarian values have a strong positive effect while individualists people are more likely to oppose climate policies as they fear more restrictions on their autonomy. Therefore, individualists will rather favor market-based strategies and technology. Cherry et al. (2017) underline the importance of cultural worldviews, in particular individualist or communitarian views affect the most support for coercive policy instruments in their laboratory market study, while hierarchical or egalitarian views strongly affect support for redistributive tools. Moreover, Kahan et al. (2011) show, with a large sample size survey ($N = 1,540$), that being scientifically literate or able to engage in technical reasoning does not lead to consider climate change more as a serious threat than other people but is rather associated with an even greater "cultural polarization": People do not converge more on climate risks supported by scientific evidence but form risk perceptions that are in line with their own cultural values.

In addition to those factors, the literature has also studied the role of emotions. Smith and Leiserowitz (2014) find that (self-reported) "discrete emotions" (e.g., worry, interest, hope) are stronger predictors than cultural worldviews when it comes to support for climate policies. Sundblad et al. (2014) focus on worry and find, using data from Sweden, that concern for the consequences of climate change increases the intention to change personal behavior to reduce GHG emissions.

2.2 Beliefs and knowledge

Beliefs about climate change are also key determinants for policy support. Sibley and Kurz (2013) with data from New Zealand, show that beliefs about the existence of climate change are more predictive than beliefs about the role of humans in causing climate change or self-reported pro-environmental behavior. Although there is an effective interaction effect between beliefs about the existence of climate change and the role of humans in it. Clearly, the perception of the negative consequences of climate change is an important factor as well. DeBono et al. (2012) using data from a telephone survey in Malta show that perceptions about the negative effects of climate change on health and well-being (e.g., disease, standard of living, water shortages) are a very strong driver for supporting climate change mitigation policy. However, Krosnick et al. (2006) point out that increasing knowledge about climate change will not necessarily translates into a broader support for policies, and that it will do so only if the required beliefs and attitudes about climate change are in place. According to Stoutenborough and Vedlitz (2014), it is also important to distinguish between the subjective perception of knowledge and objectively assessed knowledge. McCright (2008) finds that self-reported knowledge of global warming has no robust effect on support for climate policies. On the other hand, Adaman et al. (2011) in Turkey and Park and Vedlitz (2013) and Zahran et al. (2006) in the U.S. find that higher objective knowledge is correlated with greater policy support. Absent of personal knowledge, Ding et al. (2011) and McCright et al. (2013), using representative survey data from the U.S., find that heuristics such as (mis)perception about scientific agreement are determinant for supporting climate policy. However Funk and Kennedy (2016), with a U.S. survey on 1,534 adults, insist on the major partisan divides in the way people interpret the scientific consensus on climate change. Finally, Sunstein et al. (2016) underline the existence of asymmetrical updating when confronted to new information on

climate policies: People not sure about the human causation of climate change update their beliefs in response to unexpected good news but will not update them if they are presented unexpected bad news. On the other hand, people who strongly believe in the human causation of climate change update their beliefs far more in response to unexpected bad news than in response to unexpected good news. However their sample size is quite small ($N = 302$)

2.3 Government motives

Finally, government motives are often questioned as people perceive carbon taxes as just another way for the government to raise more revenue. This concern must be linked to the previous one about the belief that carbon taxes are not effective at reducing emissions. Additionally, this lack of trust is also related to broader concerns about tax policy and government intervention (Baranzini and Carattini (2017); Beuermann and Santarius (2006); Dietz et al. (2007)).

Lack of trust in government plays an important role in public approval in particular in the U.S. Zahran et al. (2006).

Regarding those last points, it is interesting to note that people usually oppose double-dividend propositions (i.e. using the revenue from carbon tax to reduce other distortionary taxes). Some studies (Klok et al. (2006); Beuermann and Santarius (2006); Dresner et al. (2006)) hint toward the fact that people do not link the goals of reducing greenhouse gas emissions and reducing taxes in other areas. Moreover, the lack of trust in policy-makers also lead people to believe that this kind of policy would not be implemented correctly. As noted by Klok et al. (2006) they can suspect that the goal of the tax is not to really reduce GHG but to increase government revenues. Fairbrother (2017) indicates that generalized distrust of scientists is rare and distinguishes several types of distrusters. On one hand there are hard core distrusters who do not believe in all elite social institutions (including experts), while on the other hand there are distrusters who believe in experts and scientists but not in policymakers which might explain why they do not ask for better climate policies.

On a more quantitative aspect, Rafaty (2018) tests the causal-relationship between the public perception of political corruption and the strength of national climate change mitigation policies through a cross-country time-series cross-section analysis. While he does not establish a direct causal relationship, his results show that when controlling for trust or corruption, most other structural and political variables become insignificant.

3. Along which margins do people react

It is also important to understand which factors directly affect the support for a given policy. For instance, Shwom et al. (2010) try to elucidate the reasons people invoke after voting for specific policies. They identify four groups of rationales: economic rationale, political rationales, technological rationales, and moral rationales. They identify personal costs as the biggest reason for policy support, while positive rationales are often associated with positive policy support.

3.1 Earmarking

Bristow et al. (2010), in a study in the UK, underline the role of earmarking revenues to increase support for a carbon tax (which can increase support up to 20 percentage points). Hsu et al. (2008) show that in Canada revenue recycling (e.g., reducing income tax) increases policy support. Kallbekken and Aasen (2010) insist on the destination of the revenue earmarked. They show that Norwegians prefer revenue to be earmarked to environmental projects. Lachapelle

et al. (2012) show that in the U.S. and Canada, people prefer the revenue collected from carbon pricing policies to be used for R&D for renewable energy and that only a smaller share favors tax rebates. Earmarking also allows to address the lack of trust in government highlighted above, as well as perceived effectiveness if used to finance other climate-related policies. Interestingly, Carattini et al. (2017) find, in the Swiss context, that providing information on the effectiveness of a carbon tax reduces the demand for revenue recycling.

3.2 Offer alternatives

Kallbekken and Aasen (2010) also underline the need to offer alternatives to fossil fuel in order to increase public acceptance of a carbon tax. This kind of barrier is also identified by Douenne and Fabre (2020) in the French context, who also insist on the need to supplement a carbon tax with complementary policies in order to alleviate the main reasons of opposition.

3.3 Communication and Media Exposure

Akter and Bennett (2011) find that in Australia willingness to take action against climate change is significantly influenced by mass-media exposure (e.g., watching *An Inconvenient Truth*). On the other hand, Morrison and Hatfield-Dodds (2011) identify that exposure to media coverage of *An Inconvenient Truth* and the *Stern Report* might have a negative effect on low to medium impact policies because of the complexity of the information. Krosnick et al. (2000) examine the effect of the campaign to build support for the Kyoto treaty and see no changes in public opinion at the national level and only political affiliation effects (strong Democrats endorsed the positions of the Clinton administration, while strong Republicans were less inclined to do so). Source of information also appears to matter, Zhao et al. (2011) show that people paying more attention to political news express less support, while people following scientific and environmental news express more support. Spash and Lo (2012) also underline how emissions-intensive industries led information campaigns to exploit concerns about economic recession when the Australian Government proposed a CO_2 -equivalent tax.

The framing of the information is also an important component. Hardisty et al. (2010) show that in the U.S., Republicans are willing to pay more for a carbon price if it is named a 'carbon offset' rather than a 'carbon tax.'

3.4 Involve civil society

Bernauer and Gampfer (2013) identify the importance of civil society involvement on public support for global environmental governance. Lo et al. (2013) study the importance of public deliberation in Australia for reaching a consensus on fundamental principles for climate policies such as trusted sources of information or transparent accountability. van der Linden et al. (2015) find that increasing the public perception of scientific consensus is causally associated with an increase belief in the existence of climate change, human causation and worrisome threats. These beliefs result in increased support for climate policies.

Finally, it should be noted that opposition to climate change mitigation policies does not always come from citizens. For instance, Oates and Portney (2003) offer a review of the role of various interest groups in the choice of environmental regulatory instruments.

4. Cross-country comparisons

Few studies have focused on cross-country comparisons, yet it is worth mentioning some of them. Ipsos (2020) has created a barometer of the public opinion on climate change in 30 countries, with a sample size around 24,000 respondents (500 or 1,000 per country) with people age 16+. The study also took place in 2019 (Ipsos (2019)). They show that most concerned

countries about climate change are some European countries, Canada, Australia, China and India. This barometer covers topics such as the link between the COVID-19 pandemic and climate change, preferences between giving priority to the environment or economic growth and jobs, concerns about climate change, knowledge about climate change, its causes and consequences, as well as attitudes regarding solutions to fight climate changes. A recent survey from the UNDP (UNDP (2021)) with 1.2 million respondents from 50 countries aims to provide reliable information to policymakers on people's considerations about climate change and how they would like their countries to respond. The survey identifies the most popular policies (e.g., conservation of forests and land, investing more in green business and jobs) and socio-demographic drivers of belief in climate emergency (e.g., educational background, age). Stokes et al. (2015) study regional differences in the perceptions of climate change problems over 40 countries. Umit and Schaffer (2020) use data from the European Social Survey ($N = 44,387$) to study public attitudes towards carbon taxes and observe a widespread aversion to them. They also show that higher political trust leads to higher support for carbon taxes, while people who depend highly on energy or live in rural areas have a lower level of support. They interpret those results as an evidence of the importance of self-interest for the attitudes to carbon taxes. Leiserowitz et al. (2021) using Facebook data study climate change beliefs, attitudes and policy differences in 31 countries and territories.

5. Local treatment

The literature seems inconclusive regarding the impact of psychological distance (i.e. the extent to which an object is distant from someone, either geographically, socially, or in time) on support for climate change mitigation policies. McDonald et al. (2015) propose a review of studies that examine psychological distance and their results suggest that reducing psychological distance is not always beneficial. They underline the need to carefully frame this psychological distance, as factors such as values, beliefs, and the need to avoid provoking fear play a major role. Furthermore, if climate change is too psychologically close, it is likely to be associated with intense emotional reactions, which have the potential to provoke avoidance, as noted by Brügger (2013) for instance.

Manning et al. (2018) find no significant effect for spatial distance when assigning Minnesotans to read a short scenario about the effects of climate change in Minnesota or Kenya. However the sample size remains low ($N = 160$) and the variable of interest is only the willingness to donate.

Owen et al. (2012) show that experiencing extreme weather events immediately affect supports for environmental policies. However, Park and Vedlitz (2013) find no evidence for this hypothesis in the U.S. for people who live in areas that suffered from Hurricanes Katrina and Rita, and that it is rather the information about risks that contributes to fostering proactive climate responses.

Some studies such as Chu and Yang (2018) find a significant effect on policy support of framing with local impact of climate change on an important sample ($N = 1,086$). However, to test global effect they only provide information about Indonesia (either on the effects of climate change on Babesiosis, a tick-born disease or coffee) to test for the global framing (while the other groups receive information about the U.S.).

Brügger (2013) demonstrates, with surveys in the UK and Switzerland, that the spatial perception of the effects of climate change might be related to the type of climate actions to undertake. He shows that perceptions of local climate risks are often associated with individual behavior changes, while the perception of global risks is associated with climate policies.

However, as Spence and Pidgeon (2010) underline this might be related to the fact that people often perceive distant impacts of climate change as more severe than local impacts.

Hart and Nisbet (2012) focus on the political dimension of spatial distance. They find that conservatives tend to express more support for action when exposed to socially near victims, whereas the opposite tends to be true for liberals. Indeed, to increase the willingness to act on climate change among conservatives, it may be beneficial to decrease the perceived social distance of climate change by focusing on impacts on similar others. There is empirical support for the notion that framing climate change impacts in terms of increasing consideration for others, is associated with increased willingness to act pro-environmentally among climate change deniers (Bain et al. (2012)).

6. Areas to explore and contributions of our study

From this review, it appears that several topics could be explored to complement the knowledge of those issues.

First, support for policies is often tested for one policy at a time, but as indicated by Stiglitz et al. (2017) a single price instrument might not be the best solution to tackle climate change, therefore testing preferences for different bundles of policies might be worth investigating. Moreover, a lot of attention has been drawn on carbon pricing, while few studies focus on other climate policies. Furthermore, few studies have tried to frame the same policy differently and therefore it could be interesting to better know the implication of different communication strategies. In line with this, it also appears we lack evidence on which population to target and how to adapt communication strategies to different populations. There is also a need as to better understanding the conditions under which information asymmetry can be addressed. Additionally, the relative effects of each factor is also a topic that needs further investigation.

The key contributions of our study to this literature will be to offer comparable cross-country evidence covering at the same time OECD and non-OECD countries. Previous work has mostly focused on single countries, making it less clear how generalizable the evidence is for other countries. This study aims to identify country-specific preferences for matters such as policy design, compensation mechanisms or level of ambition, as well as the effect of information treatments on them. Moreover, the study will also include an incentive compatible payment element (in the form of a lottery). Most previous studies do not have such item, therefore our study will be more credible in expressing people's willingness to support climate change mitigation policies.

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