A Warming World's Disparity:

How Perceptions of Inequality Affect Climate-Related Behavior and Policy Support

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Abstract

Climate change and inequality are closely interconnected. Global negotiations have long been shaped by disparities in historical emissions between the Global North and South, while generational inequality has gained visibility as younger and future generations face a disproportionate share of climate impacts. Economic inequality also plays a central role, with many climate mitigation policies triggering backlash due to regressive effects and the fact that low-income households are often more burdened despite contributing less to emissions. Inequalities within countries can also be regional, for example, when rural populations perceive climate policies as unfairly disadvantaging them due to greater reliance on fossil fuels.

However, despite research pointing to the potential influence of moral concerns, fairness norms, and justice perceptions on climate action, little is known about how citizens perceive such inequalities and whether these perceptions influence their willingness to act or support related policies. This dissertation addresses this gap through three research papers that compare the effects of economic, generational, and regional inequality on climate-friendly behavior and public support for climate mitigation policies.

The first research paper investigates the effects of perceived economic, generational, and global inequality on individuals' willingness to adopt climate-friendly behaviors in lifestyle domains with high emission reduction potential. Using a representative online survey of the German population, it combines a priming experiment with a factorial vignette design to reduce social desirability bias. Results show that respondents are most open to changing air travel behavior, while limiting car use and meat consumption face the greatest resistance. Although economic inequality is perceived as most unfair, generational and global inequality frames have stronger effects on willingness to act. However, these effects are limited, indicating that inequality framing alone is insufficient to motivate widespread change without broader structural transformations.

The second research paper shifts focus to policy support, examining how economic and generational inequality concerns interact in the context of domestic climate policy. Using a module of the Inequality Barometer survey in Germany, it implements an information-provision experiment on the perceived economic burdens of carbon taxation and the unequal generational consequences of climate change, with an additional treatment highlighting the 2021 German Constitutional Court ruling in favor of protecting future generations. Findings show that information about the economic inequality of carbon taxes reduces support, while generational inequality increases it. When presented together, the negative economic effect

outweighs the generational one. The court ruling partly offsets the negative effect, especially among politically right-leaning respondents, although it does not fully reverse opposition. The study is the first to examine the impact of climate litigation on public opinion, highlighting both opportunities and limits of legal cues in increasing policy support.

The third research paper examines regional versus economic inequality in the distributional impacts of carbon taxation, focusing on Austria's unique regionally differentiated carbon tax rebate. A representative online survey experiment provides information about the rebate's regional differentiation, its benefits for low-income households, both, or neither. Results show that regional framing reduces perceptions of regional inequality but does not increase overall support, and neither does economic framing. Nonetheless, regional framing yields the highest support among rural and right-leaning respondents, although gaps with other subgroups remain. Longitudinal analysis of panel data from the Austrian Corona Panel Project confirm that carbon tax support varies significantly by political alignment and trust in government, with no evidence of increased support after the rebate's introduction.

Together, the three studies provide a comparative perspective on the role of inequality perceptions in shaping climate action. They show that while inequality framing can influence both behavior and policy support, effects are context-dependent, vary across dimensions, and are often mediated by political orientation and trust. Political alignments emerge as one of the most consistent predictors, often outweighing inequality perceptions themselves. While perceptions of inequality play an important role in how individuals evaluate climate action, they appear to matter more in terms of concerns about new inequalities from climate policies than in motivating action out of concern for existing inequalities in climate change. Generational and global inequality frames appear more effective than economic ones in motivating behavior, while economic concerns can strongly reduce policy support, even when balanced by compensation mechanisms. Regional fairness concerns, though salient, do not necessarily translate into higher acceptance of mitigation measures, emphasizing the complexity of designing effective compensation mechanisms.

By systematically comparing multiple inequality dimensions across behavior and policy support, this dissertation advances our understanding of the psychological and political pathways linking inequality perceptions to climate action. It provides experimental evidence, examines high-emission behaviors, and offers policy-relevant insights into the potential and limits of fairness-based framing and compensation mechanisms in addressing public concerns over inequality in climate mitigation costs and benefits.

Zusammenfassung

Klimawandel und Ungleichheit sind eng miteinander verknüpft. In den internationalen Verhandlungen prägen seit jeher Unterschiede in den historischen Emissionen zwischen dem Globalen Norden und Süden die Debatten. Zudem ist generationelle Ungleichheit kürzlich stärker ins öffentliche Bewusstsein gerückt, da jüngere und zukünftige Generationen den größten Teil der Klimafolgen tragen müssen. Auch ökonomische Ungleichheit spielt eine zentrale Rolle: Viele Klimaschutzmaßnahmen stoßen aufgrund ihrer regressiven Wirkungen auf Widerstand, da einkommensschwache Haushalte oft stärker belastet werden, obwohl sie weniger zu den Emissionen beitragen. Innerhalb von Ländern können Ungleichheiten zudem regionaler Natur sein, etwa wenn ländliche Bevölkerungen CO_2-Steuern als Benachteiligung empfinden, weil sie stärker auf fossile Brennstoffe angewiesen sind.

Obwohl frühere Forschung auf den möglichen Einfluss moralischer Überzeugungen, Fairnessnormen und Gerechtigkeitsvorstellungen auf Klimahandeln hinweist, ist bislang wenig darüber bekannt, wie Bürgerinnen und Bürger solche Ungleichheiten wahrnehmen und ob diese Wahrnehmungen ihre Bereitschaft zu klimafreundlichem Verhalten oder ihre Unterstützung für Klimapolitik beeinflussen. Diese Dissertation setzt hier an und untersucht in drei Studien, wie ökonomische, generationelle und regionale Ungleichheiten klimafreundliches Verhalten und die Unterstützung politischer Klimaschutzmaßnahmen beeinflussen.

Die erste Studie analysiert den Einfluss wahrgenommener ökonomischer, generationeller und globaler Ungleichheit auf die Bereitschaft zu klimafreundlichem Verhalten in Lebensbereichen mit hohem Emissionsminderungspotenzial. Grundlage ist eine repräsentative Onlinebefragung der deutschen Bevölkerung, die ein Priming-Experiment mit einem faktoriellen Vignetten-Design kombiniert, um soziale Erwünschtheit zu verringern. Die Ergebnisse zeigen: Die größte Änderungsbereitschaft besteht im Bereich Flugreisen, während die Einschränkung von Autonutzung und Fleischkonsum am stärksten abgelehnt wird. Zwar wird ökonomische Ungleichheit als am meisten unfair empfunden, doch wirken generationelle und globale Ungleichheits-Frames stärker auf die Handlungsbereitschaft. Die Effekte bleiben jedoch begrenzt, was darauf hinweist, dass Ungleichheits-Frames allein ohne tiefgreifende strukturelle Veränderungen keine umfassenden Verhaltensänderungen auslösen.

Die zweite Studie verlagert den Fokus auf die Unterstützung von Klimapolitik und untersucht, wie ökonomische und generationelle Ungleichheitswahrnehmungen im Kontext nationaler Klimamaßnahmen zusammenwirken. Datengrundlage ist ein Modul des „Inequality Barometer“ in Deutschland, in dem ein Informationsexperiment zu den ökonomischen

Belastungen einer CO_2-Steuer und zu den ungleichen generationellen Folgen des Klimawandels durchgeführt wurde. Ein weiteres Treatment wies auf das Urteil des Deutschen Bundesverfassungsgerichts von 2021 hin, welches stärkere Klimamaßnahmen zum Schutz künftiger Generationen betonte. Die Ergebnisse zeigen: Informationen zu ökonomischer Ungleichheit senken die Unterstützung für eine CO_2-Steuer, während Hinweise auf generationelle Ungleichheit diese erhöhen. Werden beide Dimensionen kombiniert, überwiegt der negative ökonomische Effekt. Informationen über das Gerichtsurteil können diesen Effekt teilweise abmildern, insbesondere bei politisch rechts orientierten Befragten, kehren die Ablehnung jedoch nicht vollständig um. Die Studie ist die erste, die den Einfluss von Klimaklagen auf die öffentliche Meinung untersucht, und verdeutlicht sowohl Potenziale als auch Grenzen rechtlicher Signale zur Erhöhung der Unterstützung.

Die dritte Studie vergleicht regionale und ökonomische Ungleichheit in den Verteilungswirkungen einer CO_2-Bepreisung am Beispiel des österreichischen, regional differenzierten Klimabonus. In einem repräsentativen Onlineexperiment wurden Teilnehmende wahlweise über die regionale Differenzierung, die Vorteile für einkommensschwache Haushalte, über beides oder über keines von beiden informiert. Die Ergebnisse zeigen, dass das regionale Treatment die Wahrnehmung regionaler Ungleichheit deutlich verringert, jedoch keine höhere Gesamtunterstützung für die CO_2-Bepreisung bewirkt – ebenso wenig wie das ökonomische Treatment. Gleichwohl erzielt das regionale Treatment die höchste Zustimmung unter ländlichen und politisch rechts orientierten Befragten, auch wenn Unterschiede zu anderen Subgruppen bestehen bleiben. Eine Längsschnittanalyse von Paneldaten des Austrian Corona Panel Project belegt zudem, dass die Unterstützung für eine CO_2-Bepreisung stark von politischer Orientierung und Vertrauen in die Regierung abhängt, ohne dass nach Einführung des Klimabonus ein Anstieg der Unterstützung erkennbar ist.

Insgesamt bieten die drei Studien eine vergleichende Perspektive auf die Rolle von Ungleichheitswahrnehmungen im Klimahandeln. Sie zeigen, dass Ungleichheits-Frames sowohl Verhalten als auch politische Unterstützung beeinflussen können, ihre Wirkung jedoch kontextabhängig ist, sich zwischen den Dimensionen unterscheidet und häufig durch politische Orientierung und Vertrauen vermittelt wird. Politische Einstellungen erweisen sich dabei als einer der konstantesten und stärksten Prädiktoren – oft gewichtiger als die Ungleichheitswahrnehmungen selbst. Ungleichheitswahrnehmungen spielen zwar eine wichtige Rolle bei der Bewertung von Klimaschutz, sind jedoch vor allem im Hinblick auf neue, durch Klimapolitik entstehende Ungleichheiten relevant, die Unterstützung untergraben können, weniger hingegen als Motivation, um bestehende Ungleichheiten zu verringern.

Generationelle und globale Ungleichheits-Frames erweisen sich als wirksamer als ökonomische, um Verhalten zu fördern, während ökonomische Bedenken die politische Unterstützung deutlich senken können. Regionale Fairnessbedenken, so präsent sie auch sind, führen nicht zwingend zu höherer Akzeptanz, was die Komplexität der Ausgestaltung wirksamer Ausgleichsmechanismen verdeutlicht.

Durch den systematischen Vergleich mehrerer Ungleichheitsdimensionen in Bezug auf Verhalten und politische Unterstützung leistet diese Dissertation einen Beitrag zum Verständnis der psychologischen und politischen Mechanismen, die Ungleichheitswahrnehmungen mit Klimahandeln verbinden. Sie liefert experimentelle Evidenz, untersucht emissionsintensive Verhaltensweisen und bietet praxisrelevante Einblicke in Potenziale und Grenzen von Fairness-basiertem Framing und Kompensationsmechanismen, um öffentliche Bedenken bezüglich Ungleichheiten bei den Kosten und Nutzen des Klimaschutzes zu adressieren.

Contents

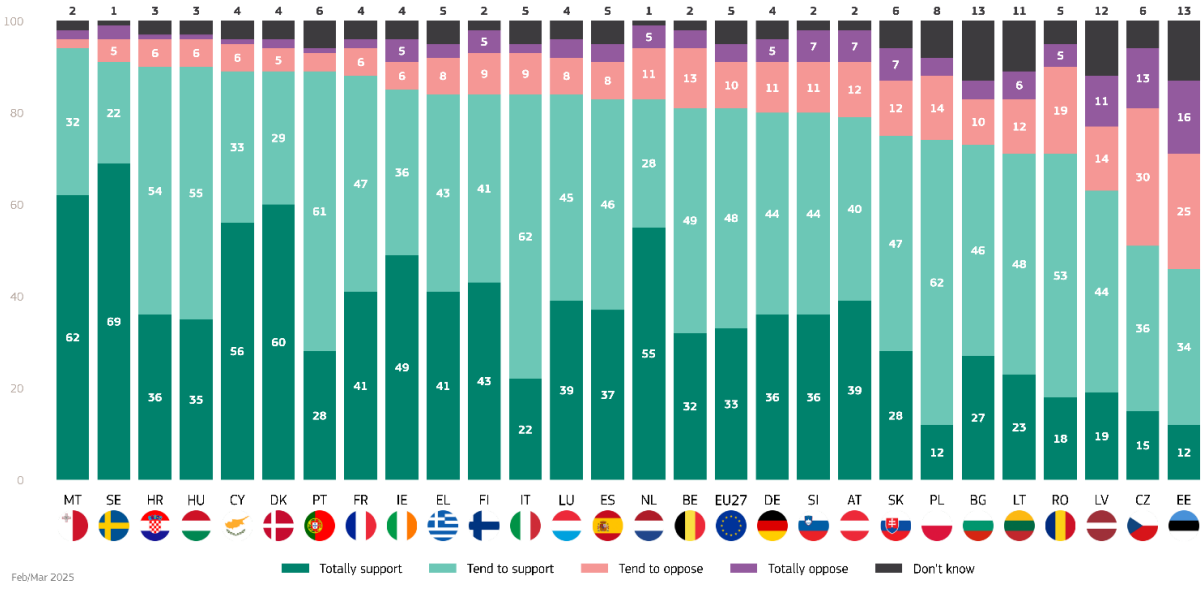
1 Introductory Chapter

1.1 Background

Climate change poses one of the most pressing global challenges of the 21st century. Its consequences extend far beyond environmental degradation, affecting living conditions, social stability, and economic systems worldwide (Ripple et al. 2024). While the scientific consensus on the need for greenhouse gas emission reductions and mitigation measures has long been established (Cook et al. 2016; Ripple et al. 2020), effective action continues to lag behind. Bridging this gap requires large-scale transformations across political, industrial, and individual domains (Rockström et al. 2017). On the political level, ambitious policies are necessary to promote climate-friendly structures, dismantle emission-intensive systems, and guide consumer behavior toward sustainability. Industrial change is equally indispensable, particularly given that a significant share of global emissions is attributable to a relatively small number of corporations (Folke et al. 2019). However, these companies do not operate in a vacuum: their capacity to pollute relies on public and political acceptance. The individual level is therefore of central importance, as it underpins three interconnected dynamics: public support is essential for enacting ambitious climate policies (Bromley-Trujillo and Poe 2020; Schaffer, Oehl and Bernauer 2022); public demand helps initiate and legitimize industrial transitions (Sullivan and Gouldson 2020; Claydon 2011); and individual behavior itself contributes directly to emissions through everyday choices (Dietz et al. 2009; Moran et al. 2018; van de Ven, González-Eguino and Arto 2018). In light of this, this dissertation focuses on the individual level, examining how people perceive and respond to climate change mitigation – and which social and structural factors influence these perceptions.

When examining the literature on public attitudes toward climate change, a strikingly consistent picture emerges: many citizens express strong concern about the issue and high levels of support for climate action. Recent data from Flash Eurobarometer 565, conducted in February and March 2025 across 28 European countries, reflects this pattern. The survey shows that a clear majority of respondents perceive climate change as a serious problem, and that a growing number feel personally exposed to environmental and climate-related risks (Eurobarometer 2025). Support for political action also appears widespread: participants were asked whether they endorse the European Union’s objective of becoming climate-neutral by 2050, and in nearly all countries, the vast majority either “totally support” or “tend to support”

Figure 1.1: Support of the EU's objective to be climate-neutral by 2025



Note: Data and Figure from Special Eurobarometer 565, fielded in Feb. – March 2025, N = 26,319

this goal. Figure 1.1 illustrates these results, with the green bars indicating broad approval for the EU's net-zero emissions target.

Taken together, the data reinforce a well-documented trend in the literature. A recent global study, for example, found that public support for climate action is internationally widespread, the majority of people are willing to contribute some of their income to it, and most citizens believe that their governments should do more to fight global warming (Andre et al. 2024). Further supporting this picture, a large-scale survey by the United Nations Development Programme and the University of Oxford, conducted across 77 countries, found that 80 % of respondents globally want their country to strengthen its commitments to address climate change (UNDP and University of Oxford 2024).

Yet if public concern and support for climate action are so widespread, how can it be that real-world developments continue to fall short? Despite decades of warnings from the scientific community, policy responses remain insufficient, and the world is currently on track to miss the Paris Agreement target of limiting global warming to 1.5 °C (UNEP 2023). After a temporary dip in emissions and mobility behavior due to the COVID-19 pandemic, air travel has rebounded strongly, with passenger numbers reaching record highs (IATA 2025). Major oil companies have largely continued business as usual, expanding exploration and fossil fuel production (Global Witness 2022). On the political level, many governments face significant public and political backlash when implementing ambitious climate policies such as carbon taxes or bans on internal combustion engines. One widely cited example is the *gilets jaunes*

(Yellow Vest) protests in France, which were initially triggered by a proposed fuel tax. Most recently, Canada's newly elected prime minister responded to mounting opposition by taking steps that effectively abolished the Canadian federal consumer carbon tax in April 2025.

This disconnect between widespread concern and limited action reflects a well-documented gap in environmental social science, the so-called attitude-behavior gap. It appears across many domains of pro-environmental behavior, but is particularly pronounced in areas involving high personal costs (Diekmann and Preisendörfer 2003; Steg and Vlek 2009; Keuschnigg and Kratz 2017; Thiel 2020; Wyss, Knoch and Berger 2022). Given that most meaningful climate mitigation measures entail substantial lifestyle or financial trade-offs, it is not surprising that this gap emerges so clearly in the context of climate change. While the attitude-behavior gap is widely recognized, its underlying causes remain complex and only partially understood, particularly when it comes to identifying effective ways to close it. Previous research has explored psychological, informational, and structural barriers (see following chapters), yet fewer studies have considered how individuals' broader social and normative perceptions – such as their sense of inequality or fairness – may influence their willingness to act.

This limited attention to perceptions of inequality is especially striking given how deeply intertwined climate change and inequality have been from the very beginning. International climate negotiations have long been shaped by *global inequality*, particularly regional disparities in historical emissions between the Global North and South, which are reflected in longstanding debates over common but differentiated responsibilities. The freerider problem, rooted in unequal incentives between countries, has further complicated collective action (Aklin and Mildenberger 2020; Taconet, Méjean and Guivarch 2020). More recently, concerns over *generational inequality* have gained prominence, with movements like Fridays for Future bringing attention to the unfair burden placed on younger and future generations (Gardiner 2006; Grasso and Giugni 2022). At the same time, *economic inequality* has become increasingly salient: Many climate mitigation policies have triggered political backlash due to their unintended regressive effects, since these policies often place a disproportionate burden on lower-income households or, conversely, benefit primarily high-income groups (Gough 2013; Dolšak and Prakash 2022). This is further exacerbated by the fact that low-income populations, both within and across countries, are the ones least responsible for greenhouse gas emissions (Oswald, Owen and Steinberger 2020), and the richest 10% around the world are responsible for around half of global carbon emissions (Oxfam 2020). And at a more local scale, climate change mitigation measures can also give rise to *regional inequality*, as they are often perceived as unfairly disadvantaging rural populations, whose greater reliance on private vehicles makes

them more dependent on fossil fuels (Maestre-Andrés, Drews and van den Bergh 2019; Beck, Rivers and Yonezawa 2016). Despite these multiple points of connection between climate change and various forms of inequality, little is known about how ordinary people perceive these dynamics – and how such perceptions might shape their willingness to act on climate change.

This dissertation, therefore, explores one potentially important but underexamined factor: individuals' perceptions of inequality in the context of climate change. It focuses on three key dimensions where such inequality arises: *regional*, *generational*, and *economic*. These perceptions, whether related to responsibility, vulnerability, or the distribution of costs, may influence not only how willing people are to support ambitious climate policies, but also whether they feel a personal responsibility to change their behavior. This inequality perspective offers a promising lens through which to better understand variation in individual engagement with climate mitigation – an angle that has not yet received much attention in the literature. Moreover, by taking an interdisciplinary approach that considers both individual behavioral choices and policy support, rather than focusing exclusively on one or the other, I am able to explore potentially important differences in what drives individual action versus public support for political measures. In doing so, the dissertation bridges two streams of literature, drawing from both sociological research on behavior and attitudes and political science perspectives on policy support and climate governance. Accordingly, this dissertation addresses the following overarching research question: *How do different perceptions of inequality shape individual climate-friendly behavior and climate policy support?*

In the remainder of this chapter, I first provide an overview of the existing literature on the determinants of climate-friendly behavior and support for climate mitigation policies, including what is known about the attitude-behavior gap and commonly identified barriers to closing it. I then outline the theoretical framework of the dissertation, discussing how perceptions of inequality may influence individual behavior and policy support, and situate the work within its broader theoretical context. This is followed by a description of the empirical approach and the survey data used for the analyses. Finally, the chapter concludes with a brief summary of the three research papers, explaining how they build on one another and outlining their individual contributions to the overall research question.

1.2 Literature review and research gaps

To situate the research of this thesis within the broader literature, this section begins by outlining existing findings on climate-friendly attitudes. It then addresses where and why these attitudes diverge from actual individual behavior and public support for climate policies. Building on this, I examine which factors influence behavior and policy support beyond attitudes alone, and highlight areas where further research is needed. I review the existing literature for indications that perceptions of inequality might play a role in shaping individual climate action and discuss the empirical gaps that remain in this regard. Finally, to introduce inequality as a potential explanatory factor, I turn to the broader literature on climate change and inequality perceptions and explain how these concepts will be approached in this dissertation.

Before delving into the literature, it is important to clarify the terminology used in this field. Scholars investigating individual environmental or climate-related action have used a variety of dependent variables, including pro-environmental attitudes, environmental concern, climate-friendly attitudes, and climate worry. These terms are often used interchangeably, even though they can refer to different behavioral domains and differ in how they are operationalized. While pro-environmental behavior is typically understood more broadly (encompassing actions such as recycling or biodiversity protection), climate-friendly behavior usually refers to actions with a direct effect on greenhouse gas emissions, such as reducing air travel or limiting car use. However, the emission impact of certain behaviors operationalized as climate-friendly can itself be contested (Wynes and Nicholas 2017), and some actions (e.g., mobility choices) can be simultaneously framed as environmentally and climatically beneficial. Moreover, earlier research tended to emphasize environmental concerns more broadly, whereas more recent studies often focus more explicitly on climate change. In practice, the two dimensions frequently overlap and tend to be driven by similar psychological and contextual factors. Accordingly, this literature review includes both environmental and climate-focused studies, and any meaningful differences will be explicitly noted.

1.2.1 Climate-friendly attitudes

Despite the well-documented gap between attitudes and behavior in pro-environmental and climate-related domains, individuals' underlying attitudes remain a crucial starting point for understanding climate action. While behavior is difficult to predict and shaped by a wide range

of contextual and structural factors, attitudes often provide an important indication of individuals' general orientations and can influence behavior in multiple ways.

Among the many factors that shape environmental attitudes, values are considered especially important. Although values and attitudes are often discussed together in the literature, they are distinct concepts: values are typically broader, more abstract, and more stable over time, while attitudes refer to more specific evaluations, such as toward climate protection or environmental policies (Schwartz 1992; Gifford and Sussman 2012). Values are usually assumed to precede attitudes and shape how individuals perceive and respond to environmental issues. In the context of pro-environmental attitudes, two major value traditions have been particularly influential. The first draws on Inglehart's theory of post-materialism, which argues that individuals develop post-materialist values (such as political freedom or environmental protection) when their basic material needs are largely secured (Inglehart 1977). The second builds on Schwartz's theory of basic human values, identifying self-transcendence values – particularly altruistic (people-oriented) and biospheric (nature-oriented) values – as positive predictors of environmental concern (Schwartz 1992). Both value frameworks have consistently been found to be positively associated with environmental attitudes (Stern et al. 1995; Collins, Steg and Koning 2007; Jakovcevic and Steg 2013; Franzen and Vogl 2013).

Importantly, these values are not developed in isolation. Post-materialist and self-transcendence values are themselves shaped by broader socio-demographic factors such as education, income, and early-life socialization. For example, higher levels of education and income are often associated with stronger environmental concern, but they also tend to correlate with post-materialist or self-transcendence values (Ma and Lee 2012; Doyle and Richardson 2025). Similarly, gender differences are often observed: women tend to express stronger environmental attitudes, a finding frequently linked to differences in socialization and value orientation (Blocker and Eckberg 1997). Values thus represent an important moderating factor in the formation of environmental attitudes, although they are not explicitly measured in all studies.

While much of the earlier research has focused on environmental attitudes more broadly, similar patterns emerge for climate-related attitudes: individuals with higher levels of education, income, or who identify as female tend to express greater concern about climate change (Smith, Kim and Son 2017; Poortinga et al. 2019). Age also plays a role, with younger people generally reporting higher concern about both the environment and climate change (Smith, Kim and Son 2017; Skeirytė, Krikštolaitis and Liobikienė 2022).

Within the literature focusing on climate, several constructs have become central to the operationalization of climate-friendly attitudes, particularly belief in climate change and climate concern (Beiser-McGrath and Huber 2018). This is especially evident in the case of climate denial: individuals who deny the existence of climate change naturally do not develop supportive attitudes toward climate mitigation. However, such denial remains a marginal phenomenon in most European countries (Poortinga et al. 2019). In contrast, belief in anthropogenic climate change has been shown to positively influence climate concern. Individuals who acknowledge that human activity is driving climate change tend to express greater worry about its consequences (Lee et al. 2015; Shi et al. 2016).

Importantly, a key finding that sets the climate-related literature apart from broader environmental research is the extent to which climate-specific attitudes are shaped by individuals' ideological orientations. Hornsey et al. (2016) show in a meta-analysis on climate change belief that many socio-demographic predictors, such as education, sex, subjective knowledge, and personal experiences of extreme weather events, are overshadowed in predictive power by ideologies, worldviews, and political orientation. Similar results are reported by Beiser-McGrath and Huber (2018), who use machine learning methods. This ideological influence is now widely recognized in the literature and marks a key distinction between attitudes toward environmental issues in general and those specifically related to climate change. Climate change has become an increasingly politicized and ideologically charged topic, especially in the Western world.[1] The most pronounced example is the United States, where views on climate change have become deeply intertwined with partisan identity (McCright and Dunlap 2011; Ballew et al. 2019).

However, recent international studies have also documented this trend: for instance, Berkebile-Weinberg et al. (2024) show in a survey across 60 countries that individuals who identify as liberal are significantly more likely to believe in climate change than those who identify as conservative. In Europe, Fisher et al. (2022) find that in Western countries, left–right self-placement correlates with climate attitudes in ways that cannot be fully explained by underlying values such as egalitarianism. This suggests that political ideology exerts an independent effect on climate change perceptions, one that goes beyond the influence of personal values. Some scholars even link this trend to the rise of right-wing populism (Lockwood 2018; Huber 2020). These findings are particularly relevant in the context of this

[1] While this dynamic may differ across global contexts, it is particularly relevant in Europe, which is the focus of this dissertation (Lee et al. 2015).

dissertation, as perceptions of climate policies – just like beliefs in climate change – are likely to be filtered through political and ideological lenses.

1.2.2 Climate-friendly behavior

In the literature on individual behavior, two broad strands can be distinguished: one focusing on whether people generally engage in pro-environmental or climate-friendly behavior, and the other examining what influences people to adopt more sustainable behaviors. The latter often overlaps with psychological research on behavioral interventions and economic studies on nudges.

As previously discussed, individuals' attitudes do appear to have some effect on their behavior. For instance, a meta-analysis by Bamberg and Möser (2007) shows that attitudes play a role in shaping pro-environmental actions. More recent studies specifically focused on climate change also suggest that worry about climate change, risk perception, and awareness are positively associated with climate-friendly behavior (van Valkengoed and Steg 2019; Bouman et al. 2020; Bradley et al. 2020). However, a meta-analysis by Hornsey et al. (2016) finds that the strength of these associations is only small to moderate. In a similar vein, Rüttenauer (2024) finds that although exposure to extreme weather events increases belief in climate change, it does not significantly influence climate-friendly behavior. Comparable results are reported in the literature on behavioral change. Andersen and Mayerl (2022), for example, find no effect of environmental attitudes on behavior after controlling for unobserved confounders. Similarly, Büchs et al. (2018) show that raising awareness about climate change and informing respondents about emission reduction strategies does not lead to meaningful behavioral changes.

If attitudes alone only weakly predict behavior, what other factors matter? One of the most frequently mentioned explanations in the literature is the importance of opportunities and costs. Here, it is assumed that individuals make reasoned choices, weighing benefits and costs – whether financial, social, or effort-related – before deciding on a course of action (Steg and Vlek 2009; Steg et al. 2014). The logic is straightforward: if an individual lacks the opportunity to behave in a climate-friendly way (e.g., due to inadequate infrastructure), or if the behavior is too costly in terms of time, money, or effort, they are unlikely to adopt it.

In line with this, multiple studies have found that the influence of attitudes on pro-environmental behavior decreases as the costs associated with the behavior increase (Diekmann and Preisendörfer 2003; Steg and Vlek 2009; Keuschnigg and Kratz 2017; Thiel 2020; Wyss,

Knoch and Berger 2022). Moreover, research shows that the consistency between environmental attitudes and pro-environmental behavioral intentions is higher in countries with greater national wealth (Mayerl and Best 2019). Similarly, the likelihood of engaging in environmentally friendly behavior or being willing to contribute financially to environmental protection increases with a country's GDP per capita (Lo 2016; Gelissen 2007). These findings point to the importance of available resources in enabling individuals to act in line with their environmental attitudes.

The constraining role of opportunities is also a starting point for much of the literature on behavioral interventions or "nudges" (Thaler and Sunstein 2008). While these approaches do not necessarily aim to reduce financial costs, they seek to make pro-environmental or climate-friendly behavior easier to perform or establish it as the default, thereby altering the available opportunities. Research in this field shows some promising effects (e.g., Liebe, Gewinner and Diekmann 2021). Although a variety of nudges and intervention types exist, their detailed discussion goes beyond the scope of this section; for an overview, see van Valkengoed, Abrahamse and Steg (2022). Interestingly, a recent meta-analysis shows that, also here, low-cost behaviors such as littering or recycling are more easily influenced by interventions than high-cost behaviors like transportation choices (Bergquist et al. 2023), further highlighting the central role of costs and opportunities.

Other important determinants of climate-friendly behavior identified in the literature include habits (Steg and Vlek 2009; Graves and Roelich 2021) and perceived efficacy. This refers either to self-efficacy, the belief that one's own actions can make a difference in climate mitigation (Lee et al. 2014; Hanss et al. 2016; Huang 2016; Innocenti et al. 2023) or to collective efficacy, which describes the belief that society as a whole can achieve goals (Homburg and Stolberg 2006; van Zomeren, Spears and Leach 2010; Reese and Junge 2017). For instance, a study investigating which factors drive individuals with high climate concern to act found that perceived efficacy and social norms are central predictors of public-sphere behaviors such as volunteering or donating (Doherty and Webler 2016). Similarly, a meta-analysis by van Valkengoed and Steg (2019) identifies social norms and efficacy as among the strongest drivers of climate change adaptation behavior.

The importance of perceived social norms has also been confirmed in other studies (Goldstein, Cialdini and Griskevicius 2008; Gadenne et al. 2011). The underlying idea is that individuals tend to align their behavior with what they perceive to be the socially accepted course of action. Accordingly, perceived norms have been identified as key determinants of

collective climate action (Rees and Bamberg 2014). Some authors even consider social norms as one of the most powerful levers for climate change mitigation (Nyborg et al. 2016; Otto et al. 2020).

Closely related to social norms, though operating through a different mechanism, are moral considerations. Both rely on individuals' internal sense of doing what is "right" – either because others behave in a certain way, or because an action is perceived as morally appropriate. Some research suggests that moral emotions significantly influence pro-environmental behavior (Rees, Klug and Bamberg 2015). Others argue that green behavior is commonly perceived as moral, and that acting accordingly therefore elicits positive emotions (Venhoeven, Bolderdijk and Steg 2020). Moreover, the feeling of personal responsibility has been found to moderate the link between climate worry and individual climate action (Bouman et al. 2020).

Taken together, this body of research highlights that beyond opportunities and costs, individuals' perceptions of what is morally right or socially expected – as well as their feelings of responsibility – are crucial in shaping climate-friendly behavior. From this perspective, perceptions of inequality and fairness may also play a role in motivating individual climate action, especially if people are made aware of aspects of inequality in climate change. As laid out in the previous chapter, climate change is entangled with multiple dimensions of inequality. However, how individuals perceive these aspects and how such perceptions influence their own behavior remains insufficiently understood. This research gap will be addressed more explicitly in section 1.2.4, along with a more detailed rationale for why this relationship merits closer attention.

1.2.3 Climate policy support

Although some studies operationalize climate-related voting intentions as a form of climate-friendly behavior (Doherty and Webler 2016), the factors influencing support for climate policies go beyond those typically discussed in the behavioral literature. In general, many of the drivers of climate-friendly behavior also play a role in shaping support for climate policy. For example, worry about climate change and belief that global warming is human-caused are both positively associated with behavioral engagement *and* policy support (Goldberg et al. 2021; Tschötschel et al. 2021; Bouman et al. 2020), as is education (Dechezleprêtre et al. 2025). Similarly, an "attitude–policy gap" can also be observed: while survey respondents often express support for more stringent political action on climate change, actual policies frequently face public resistance once proposed or implemented. However, the reasons identified for this

discrepancy are not necessarily the same as those that explain the gap between attitudes and individual behavior. These specific factors will therefore be the focus of the following section (for an overview, see Drews and van den Bergh 2016).

Before turning to the individual-level factors that influence policy support, it is important to acknowledge that climate change policy is not determined solely by public opinion. The role of powerful actors such as fossil fuel companies, industrial lobbies, and other organized interests must also be considered (Basseches et al. 2022; Bruycker and Colli 2023). Moreover, broader structural factors, including the political system and country-specific contexts such as the level of economic development or the predominant industrial sectors, are also highly relevant (Bailer and Weiler 2015; Povitkina 2018). At the same time, studies have shown that public opinion – though it can be shaped by elite cues, country context, and framing – still plays a significant role in influencing which policies are ultimately implemented (Bromley-Trujillo and Poe 2020; Schaffer, Oehl and Bernauer 2022). To stay within the scope of this dissertation, the focus here remains on support for climate policies at the level of individual citizens.

Comparative studies suggest that climate-friendly attitudes may have an even stronger effect on policy support than on behavior. For instance, Bouman et al. (2020) find that climate change worry is more strongly associated with support for mitigation policies than with individual climate-friendly behavior. The authors suggest that individuals may view policy interventions as having a greater collective impact and thus being a more effective response to climate-related concerns. Policies also provide a potential solution to the free-rider problem: individuals may be reluctant to change their behavior unless they are assured that others will do the same. Dechezleprêtre et al. (2025) confirm this in finding that knowing others will also act is one of the most important prerequisites for individuals to adopt climate-friendly behavior. Moreover, it is widely argued that meaningful reductions in greenhouse gas emissions will require political action and structural change. While behavioral interventions or nudges may help in specific contexts, they are unlikely to be sufficient on their own (Preisendörfer and Diekmann 2021; Streimikiene 2023).

A crucial factor for the success of such political measures is trust – both in other people and in political institutions. Trust plays a role in several ways: First, generalized social trust matters, as individuals need to believe that others will also comply with or follow through on the policy. Second, and often more critically, trust in politicians and public institutions is essential. People need to be confident that policies will be implemented as promised and that revenues, particularly from instruments like carbon taxes, will be used to achieve climate goals rather

than to bolster the general state budget. Especially in the case of carbon taxation, institutional trust appears to be more influential than social trust (Hammar and Jagers 2006; Fairbrother, Johansson Sevä and Kulin 2019; Levi 2021). One possible reason is that carbon taxes are relatively difficult to evade, making compliance less dependent on the perceived behavior of others (Hammar and Jagers 2006).

In this context, how political messages are framed and who delivers them becomes crucial. Effective communication and framing can enhance public trust and improve acceptance of climate policies (Drews and van den Bergh 2016). However, climate politics – like climate change beliefs more broadly – have become increasingly politicized. Public support for policies is now closely aligned with individuals' political ideology and party affiliation. In general, left-leaning individuals tend to be more supportive of climate policies, while right-leaning individuals are more skeptical or resistant. This pattern is especially pronounced in the United States (Ballew et al. 2019; Gustafson et al. 2019), but it has also been observed in comparative international research (Berkebile-Weinberg et al. 2024; Dechezleprêtre et al. 2025) and in studies focused specifically on Western Europe (McCright, Dunlap and Marquart-Pyatt 2016). Fremstad et al. (2022), for instance, find that the positive effect of an information treatment on carbon tax support disappears when the message is presented in a politically charged frame.

A possible explanation for this lies in the perceived social norms within one's political ingroup. Research has shown that perceived social norms among supporters of one's own political party significantly influence climate policy prioritization, beyond an individual's personal belief in climate change (Cole et al. 2022). This is further supported by findings that ingroup messaging – such as stating that a policy was proposed by members of the respondent's preferred party – can significantly increase policy support (Fielding et al. 2020). Interestingly, this effect appears to be primarily driven by individuals' orientation towards elite cues: Framing a policy in alignment with values associated with respondents' political ideology does not consistently influence support (Fielding et al. 2020; Bolte et al. 2024), unless such framing is combined with ingroup messaging (Hurst and Stern 2020).

These findings suggest that while climate policy support may, in some cases, be more responsive to targeted messaging than individual behavior, it is also subject to significant ideological and partisan polarization. However, just as in the case of individual behavior, moral considerations and perceived fairness also play a substantial role in shaping support for climate policy. For instance, Doran et al. (2019) find in a comparative study across the UK, France, Germany, and Norway that the degree of policy support depends more strongly on moral

concern than on evaluations of the consequences of climate change. Similarly, in reviews of determinants of climate policy support, perceived fairness has emerged as a key factor (Drews and van den Bergh 2016). In fact, a recent meta-analysis finds that perceived fairness has a stronger influence on policy support than perceived policy effectiveness, climate change beliefs, or even political ideology (Bergquist et al. 2022). This emphasis on fairness is particularly relevant in the case of carbon taxes, which are often criticized for disproportionately affecting low-income households and those dependent on car travel, such as rural populations (Maestre-Andrés, Drews and van den Bergh 2019; Povitkina et al. 2021). These fairness concerns therefore go beyond narrow self-interest or "pocketbook" considerations and reflect broader concerns about social justice and the equitable distribution of burdens in climate policy (but see Beiser-McGrath and Bernauer 2024).

One proposed solution to address these concerns is the inclusion of compensation mechanisms within climate policy designs. In the case of carbon taxation, this often takes the form of redistributing revenues back to the general population or to specific groups disproportionately affected by the tax (mostly low-income households). Several studies have shown that such compensation mechanisms can increase public support for carbon pricing (Carattini et al. 2017; Beiser-McGrath and Bernauer 2019; Bürgisser, Stadelmann-Steffen and Armingeon 2024). However, findings on which types of compensation are most effective remain mixed, and public preferences for different mechanisms are still debated (Klenert et al. 2018; Mohammadzadeh Valencia et al. 2024).

Moreover, while the literature has extensively explored economic inequality in the context of climate mitigation policies, other dimensions of inequality – such as generational or regional disparities – are rarely addressed. This is surprising given the widespread emphasis on fairness in climate policy debates. It raises the question of whether perceptions of these other forms of inequality might also influence support for climate policies, how they interact with each other, and whether the public distinguishes between fairness in policy outcomes and fairness in the broader causes and consequences of climate change. Additionally, since concerns about redistribution have traditionally been more prominent among left-leaning individuals (Alesina and Giuliano 2010), it is plausible that different political subgroups respond differently to specific dimensions of inequality. It is therefore especially relevant to investigate whether such variation extends to perceptions of other inequality dimensions. Understanding these dynamics may offer promising avenues for increasing public support for climate policy across different segments of the population. The following section will elaborate on these research gaps and outline how this dissertation seeks to address them.

1.2.4 Climate change and inequality perceptions

The existence of inequality in the context of climate change has long been addressed in the academic literature: Environmental and climate justice scholarship, in particular, has focused on the unequal burden of exposure to extreme weather events, food insecurity, and other consequences of climate change faced by certain population groups. It has explored the structural causes of these disparities and discussed potential pathways to dismantle them (Walker 2012; Schlosberg and Collins 2014). More recent work connects how socioeconomic inequalities are intertwined with climate change and can even exacerbate it (Green and Healy 2022; Avtar et al. 2023). How ordinary citizens perceive inequality in climate change, and how these perceptions might influence behavior and policy support, has rarely been studied, however. This is surprising, given that, as outlined in the preceding sections, existing research suggests that perceptions of inequality and fairness can influence both behavioral and policy-related responses to climate change. To my knowledge, the only paper that explicitly addresses the role of such perceptions – referred to there as "justice perceptions" – is the recent review by Pearson, Tsai and Clayton (2021), who synthesize existing findings similarly and highlight the potential of empirical research in this area, calling for further investigation. This dissertation addresses this gap by focusing on how people perceive inequality in the context of climate change, and how such perceptions influence individual climate action and support for political measures.

Even in the few studies that do address inequality in climate change, the focus is typically limited to one dimension – for instance, the distributive effects of carbon taxation (Gough 2013; Flues and Thomas 2015), or how global inequalities complicate international climate negotiations (Bernauer 2013; Aklin 2016). However, climate change involves multiple intersecting dimensions of inequality. This thesis, therefore, goes one step further by analyzing how individuals perceive several of these dimensions, and how such perceptions may relate to each other, differ from one another, or even come into conflict. The focus is placed on three key dimensions: generational, regional, and economic inequality. These three dimensions are reflected in various stages of the climate change process: in responsibilities for emissions, in vulnerability to climate impacts (e.g., exposure to extreme weather), and in the distributive consequences of mitigation policies (Menard et al. 2021).

But why would individuals care about these inequalities? While the previous sections outlined several mechanisms that may be relevant, such as moral concern, social norms, or fairness considerations, they do not directly investigate the role of inequality perceptions in

climate action. Nonetheless, they suggest that such perceptions could be an important factor. Supporting this idea, recent research has explicitly shown that individuals who agree with core principles of climate justice – for example, the belief that those least responsible for climate change suffer its most severe impacts – are significantly more likely to engage in climate-friendly behavior and to support climate policies (Ogunbode et al. 2024). This suggests that perceiving climate-related inequalities may foster stronger engagement. However, literature also finds that the concept of climate justice remains relatively unfamiliar to the broader public in many countries (Ogunbode et al. 2024; Schuldt and Pearson 2023). These findings indicate that increasing awareness and recognition of climate-related inequalities could be a promising pathway to strengthening public support for climate action.

Such increased awareness of the disproportionate burdens faced by certain groups may raise empathy, which has been shown to be positively associated with pro-environmental behavior (Berenguer 2007). It may also evoke moral concern, another factor identified as a potential driver of climate action (Rees, Klug and Bamberg 2015). One study even suggests that moral appeals can, under certain conditions, be more effective than economic arguments in motivating green behavior (Bolderdijk et al. 2013). While most of this literature focuses on present-day conditions, thereby primarily relating to economic and regional inequality, there is also evidence that concern for future generations can be influential. This is hypothesized to be driven by feelings of responsibility to future generations or the desire to leave a positive legacy (Hurlstone et al. 2020; Syropoulos et al. 2020).

Overall, it can be summarized that perceptions of inequality in climate change may exert influence through perceptions of fairness, justice, what is morally right, or what social norms would command to do. However, an important caveat must be noted: notions of fairness and morality are not universally shared or objectively defined. Equality does not necessarily equate to fairness, and individuals draw on different justice principles to assess what constitutes a “fair” outcome (Liebe et al. 2024). Moreover, research suggests that the preference for equal distribution tends to matter more in the allocation of environmental benefits than in the distribution of environmental harms (Makov, Newman and Zauberman 2020). Crucially, how people respond to the salience of inequality also depends on their position within it: if individuals learn that they are contributing less to climate change but are more burdened by its consequences, this may provoke resentment or disengagement rather than motivating further climate action (Beiser-McGrath and Busemeyer 2023). In other words, the same dimension of inequality can lead to differing perceptions and behavioral responses. Relatedly, some scholars caution against over-moralizing climate change, arguing that this may trigger defensive

reactions and less climate action (Täuber, van Zomeren and Kutlaca 2015). This is particularly relevant in politically polarized contexts: emphasizing inequality may be perceived as aligned with liberal values and thereby alienate more conservative individuals (Whitmarsh and Corner 2017).

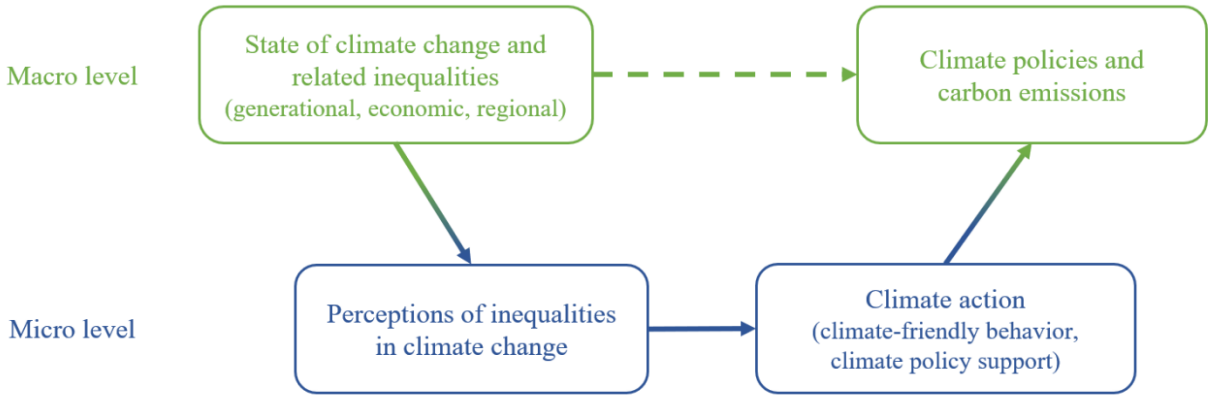
In conclusion, there are multiple possible mechanisms through which inequality perceptions might influence climate-related behavior and policy support, and these mechanisms may differ across individuals and social groups. As such, the aim of this thesis is not to develop a detailed theoretical model specifying how particular justice principles translate into climate action. Rather, it seeks to empirically examine how different dimensions of inequality in climate change are perceived, and whether those perceptions influence individuals' climate-friendly behavior and support for climate policies. The central research gaps this dissertation addresses can therefore be summarized as follows: Do individuals perceive some dimensions of inequality in climate change as more important than others? Do such perceptions influence behavior differently than policy support? And do these effects vary across subgroups?

This thesis contributes to the limited existing literature on the relationship between inequality perceptions and climate action. It goes a step further by contrasting the perceived salience of multiple inequality dimensions and examining their potentially divergent effects on behavior and policy support. The aim is to provide an initial empirical foundation for assessing whether such perceptions influence climate-related behavior and policy support. If a relationship can be established, future research may build on these findings to investigate the underlying mechanisms in greater detail.

1.3 Theoretical framework

The assumptions underlying this dissertation can be effectively represented within Coleman's macro–micro–macro model (1990), a model for the sociological explanation of social phenomena that highlights how individual behavior is key to understanding macro-level outcomes and thus underpins this dissertation's focus on individuals. It explains phenomena on the macro level through individual behavior on the micro level through three steps: First, it is assumed that the structures on the macro level influence the perceptions, attitudes, opportunities, and restrictions of individuals. Second, these factors inform individual decision-making processes, leading to specific behavioral choices. Third, the aggregation of these

Figure 1.2: Macro-micro-macro model



Note: Assumed model behind the dissertation. Own illustration, based on Coleman (1990)

individual behaviors reproduces or transforms macro-level structures. In the context of this thesis, the model is illustrated in simplified form in Figure 1.2: It assumes that inequalities on the macro-level (top left) influence individual perceptions (bottom left), which in turn influence climate-related behavior – either in the private sphere or in the political domain through voting and policy preferences (bottom right). These behaviors collectively contribute to the current state of climate policies and carbon emissions (top right).

As laid out in the previous sections, socioeconomic characteristics, values, (political) ideologies, and contextual opportunities and constraints are also known to influence climate-relevant perceptions and behavior. However, since the primary focus of this thesis lies on individuals' perceptions of inequality and their impact on climate-friendly behavior and policy support, these additional factors are intentionally excluded. This is because the aim of the model is not to offer a complete overview of climate-relevant behavior, but rather to illustrate the specific focus of the thesis: the role of inequality perceptions. Nevertheless, these additional influences are considered and controlled for in the empirical analyses wherever possible.

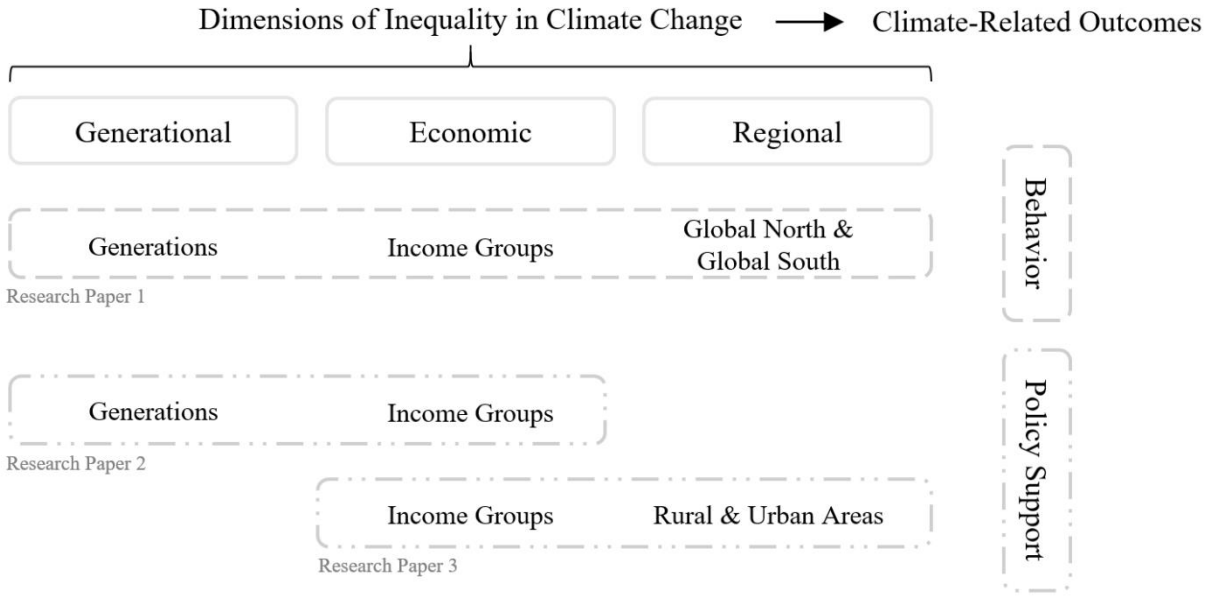
This overarching model can be linked to multiple action theories on the micro level, connecting inequality perceptions to climate action and thus explaining individual behavior. Coleman's own application of the model draws on Rational Choice Theory, which assumes that individuals seek to maximize self-interest given their preferences and constraints (Coleman 1990). However, this strict version of rational choice has faced substantial criticism for being overly abstract, tautological, and empirically limited (Green and Shapiro 1994; Boudon 1998). Numerous examples have demonstrated that the assumption of individuals behaving rationally to maximize gains often fails to adequately explain actual behavior (Thaler 1992). Moreover, it has been proposed that people operate under conditions of bounded rationality, relying on

satisficing strategies rather than maximizing (Simon 1955). As a result, contemporary scholarship often adopts a more flexible or "soft" version of rational choice theory, in which preferences may include non-economic factors such as social approval, moral norms, or identity-related motivations. In the context of environmental behavior, theoretical approaches from social psychology have proven particularly valuable for incorporating such expanded understandings of individual decision-making.

One theory frequently applied in this context is the Theory of Planned Behavior (TPB) (Ajzen 1991). Here, individuals are expected to form behavioral intentions based on their attitudes toward the behavior, perceived social norms, and perceived behavioral control – meaning that behavior is reasoned, but influenced by psychological and social factors, not just economic self-interest. This theory is particularly suitable for the purposes of this thesis, as it explicitly incorporates subjective social norms as one of its main components. If individuals perceive inequality in climate change, this might activate social norms in the sense that the "socially desirable" or morally expected course of action is to behave in a way that reduces harm. Nonetheless, attitudes and perceived behavioral control continue to play a critical role. It is unlikely that individuals will engage in behaviors they evaluate negatively or consider to have harmful consequences. Similarly, perceived behavioral control is essential: If someone believes they are unable to perform a certain action (e.g., commuting by bicycle during winter), they are unlikely to do so, regardless of their attitudes or perceived social pressure. The Theory of Planned Behavior is therefore well-suited to explain both climate-friendly behavior that does not offer direct personal benefit and the frequently observed gap between attitudes and actual behavior.

Another widely used framework in environmental psychology is the Value-Belief-Norm (VBN) theory (Stern et al. 1999), which places particular emphasis on the role of personal values and moral norms. It explains pro-environmental behavior as the outcome of a psychological chain that begins with individuals' core values (such as altruistic or biospheric values), which influence their environmental beliefs, including their awareness of the consequences of environmental harm and their perceived personal responsibility for contributing to or mitigating that harm. These beliefs then activate personal moral norms, which in turn guide behavior. This theoretical framework also lends itself well to the study of how inequality perceptions influence climate action. Perceptions of inequality – like who is most

Figure 1.3: Dissertation framework and thematic focus of the Research Papers



responsible for causing climate change, who is most affected by its impacts, or who bears the costs of mitigation – can shape both individuals' awareness of consequences and their sense of moral responsibility. In doing so, they may contribute to the activation of personal norms that motivate climate-friendly behavior or support for political measures. The VBN model thus provides a useful lens through which to conceptually integrate socially embedded perceptions, such as fairness or inequality concerns, into explanations of individual engagement with climate mitigation.

Importantly, while both the Theory of Planned Behavior and the Value-Belief-Norm theory offer useful conceptual tools for understanding how perceptions of inequality in the context of climate change might influence individual behavior or policy support, the aim of this dissertation is not to test or confirm one theoretical model over the other. Given the limited research on how such perceptions operate in this context, the goal of this thesis is to take an exploratory first step: to investigate whether such inequality perceptions matter at all, and if so, to what extent they affect different types of climate-related engagement – such as individual behavior versus policy support.

To this end, the three papers examine the perceptions of different dimensions of inequality in climate change and their effect on climate-related behavior and policy support. Figure 1.3 summarizes the conceptual placement of each paper within the dissertation framework. All three papers address economic inequality, a dimension highly salient in the literature both in

terms of responsibility for emissions, exposure to climate impacts, and the distributional burdens of mitigation measures such as carbon taxes.

The first paper contrasts economic inequality with inequalities between the Global North and South and between generations, focusing on disparities in emissions responsibility versus exposure to climate impacts. The central assumption is that highlighting these inequalities will activate moral or justice-based considerations, which have been shown to motivate climate-friendly behavior. Consistent with both TPB and VBN, such activation may strengthen the perception that climate action is "the right thing to do," although individual opportunities and constraints remain influential.

The second and third papers also address economic inequality, but from the perspective of disparities in the distributional impacts of costly climate mitigation measures, specifically carbon taxation. The second paper contrasts this with generational inequality in the consequences of climate change, thereby examining the trade-off between inequities arising from policy implementation and inequities arising from the impacts of climate change itself. Awareness of generational inequality in the impacts of climate change is likely to enhance support for climate policies by activating moral considerations and a perceived responsibility toward future generations, consistent with mechanisms posited in the first paper and prior literature. At the same time, awareness of the regressive effects of carbon taxes may decrease support, either because such unequal burdens violate fairness norms or because they trigger self-interested "pocketbook" concerns, particularly among lower-income households. This interplay again reflects the broader behavioral theories that point to the potentially competing influences of moral fairness beliefs and material constraints.

The third paper retains the focus on economic inequality in the distributional consequences of carbon taxation but contrasts it with regional inequality, investigating whether individuals are more responsive to one form than the other, and whether targeted compensation mechanisms can mitigate opposition. Here, the inequalities are framed in terms of disproportionate burdens on rural versus urban populations, alongside disproportionate burdens on lower-income groups. As in the second paper, awareness of such unequal distributions is expected to activate perceptions of fairness or justice and, in turn, moral concerns; however, self-interested "pocketbook" considerations are also likely to influence individual support for the tax. Policy compensation mechanisms may therefore increase support through two distinct pathways: by reducing perceptions of unfairness and thus alleviating distributional justice concerns, or by directly appealing to individuals through the financial benefits they stand to receive.

1.4 Empirical approach

To address the overarching research question of this thesis – H*ow do different perceptions of inequality shape individual climate-friendly behavior and climate policy support?* – I examine several dimensions of inequality and analyze their respective effects on both behavioral and political responses. Each of the three research papers draws on data from a distinct, novel survey, all of which incorporate some form of survey experimental design. To assess how individuals perceive various inequalities and respond to them, all surveys employ between-subjects designs, in which respondents are randomly assigned to receive different information treatments. This allows for a comparative analysis of the effects of distinct inequality dimensions and helps identify whether some forms of inequality elicit stronger reactions than others. Furthermore, to compare the influence of inequality perceptions on climate-friendly behavior versus climate policy support, the first survey experiment focuses on individual behavior, while the second and third experiments investigate aspects of climate policy support.

1.4.1 Data and Methods

All three surveys were specifically designed to gain deeper insights into perceptions of inequality in climate change. As such, this dissertation makes an important contribution to the current state of research by generating novel data from which new findings can be drawn. A common feature across all three surveys is the inclusion of a survey experiment aimed at examining how respondents react to information highlighting different dimensions of climate-related inequality.

The first research paper addresses all three selected dimensions of climate inequality and investigates whether perceiving these inequalities as unfair influences respondents' willingness to behave in a more climate-friendly manner. The underlying data stems from an online survey conducted in collaboration with colleagues at Ludwig Maximilian University of Munich. The survey was fielded in July 2022 in Germany and is representative of the German population in terms of age, education, gender, and federal state. Participants were recruited through an online access panel provider, yielding a total sample of 1,650 respondents.

The central element of the survey is a vignette experiment, designed by my co-author and me. Respondents were presented with short descriptions of hypothetical lifestyles, varying in their climate-friendliness across several high-emission domains such as meat consumption, car use, and flying. Participants were then asked whether they would be willing to adopt the lifestyle described, and this was compared to their self-reported current behavior. This setup

allows us to determine in which domains respondents are more willing to change and where behavioral change appears less likely. To assess the effect of inequality perceptions, we combined the vignette experiment with an inequality priming question. Just before presenting the lifestyle descriptions, respondents were asked whether they consider a specific form of climate-related inequality to be unfair, thereby subtly directing respondents' attention towards a particular inequality dimension. Respondents were randomly assigned to one of four groups: one control group and three treatment groups primed with inequality between generations, between income groups, or between the Global North and Global South.

This approach offers several advantages. First, comparing across the treatment groups allows us to analyze whether perceptions of unfairness differ by inequality dimension, and whether some types of inequality awareness are more likely to motivate behavioral change. Second, the use of vignettes – rather than direct behavioral questions – helps reduce social desirability bias, a well-documented issue in self-reports of pro-environmental behavior. Factorial vignette experiments have been shown to yield less biased results (Atzmüller and Steiner 2010; Auspurg et al. 2015). The empirical approach of this study thus contributes to the literature in several ways: (1) By focusing on behaviors with high emission-reduction potential, the study answers calls to prioritize climate-relevant actions in research, rather than commonly surveyed but less impactful behaviors such as recycling (Wynes and Nicholas 2017; Ivanova et al. 2020). (2) By distinguishing between behavioral domains, the study offers insights into which areas are more likely to be supported by the public, and where backlash is more likely. (3) By combining vignette and priming experiments, the study provides evidence on how awareness of inequality affects individuals' willingness to engage in climate-friendly behavior, while simultaneously mitigating social desirability bias.

The survey used for the second research paper focuses on climate policy support, specifically public support for carbon taxation in Germany, and examines how perceptions of economic and generational inequality interact in this context. The data stem from a module of the Inequality Barometer, a representative survey conducted by the Cluster of Excellence "The Politics of Inequality" at the University of Konstanz. The survey is representative of the adult German population in terms of age, gender, education, and administrative region (NUTS-2 level). Respondents were recruited via a commercial online access panel and surveyed through computer-assisted web interviewing (CAWI). After piloting in October 2022, the main fieldwork took place in November and December 2022, resulting in 6,319 complete responses.

The module for this research paper was developed by my co-authors and me. It includes an information-provision experiment designed to examine how respondents evaluate generational inequality in the causes and consequences of climate change in comparison to economic inequality in the distributional effects of mitigation policies, specifically, carbon taxation. In addition, we incorporate the 2021 ruling by the German Federal Constitutional Court, which declared that insufficient climate action violates the constitutional rights of future generations, meaning more extensive measures need to be taken by the German government. This legal decision introduces a novel angle to the generational inequality discourse, and our study is the first to examine whether such a legal cue influences public support for carbon taxation. To this end, we use a between-subjects design with 2×4 randomization groups. Respondents were randomly assigned to receive no information, information about economic inequality, generational inequality, or both. Each of these four groups was further split: half received additional information about the constitutional court ruling, while the other half did not. Following these treatments, we measured support for carbon taxation. This design allows us to assess whether highlighting different dimensions of inequality affects policy support, and whether information about the court ruling modifies this effect.

This approach has several strengths. First, it allows for a direct comparison of how different dimensions of climate-related inequality affect policy support. Second, by including a treatment condition that combines both economic and generational inequality cues, we can assess how individuals weigh these competing concerns – a trade-off that mirrors real-world policy dilemmas. Third, and most importantly, we offer the first empirical investigation of how a legal decision in favor of climate mitigation affects public support for carbon taxes. This is a timely contribution in light of the global rise in climate litigation (Setzer and Higham 2022). By combining legal cues with inequality treatments, we can also explore whether the court ruling strengthens the generational justice message and shifts individuals' trade-offs between economic and generational concerns. This constitutes the paper's most significant contribution, offering insights for political science, environmental psychology, legal scholarship, and climate policy-making alike.

The third research paper again focuses on climate policy support, this time examining compensation mechanisms in greater depth and investigating whether citizens are more concerned about economic or regional inequality in the distribution of burdens. The analysis draws on data from an original online survey I designed and fielded in Austria in April 2025, using a regional online access panel provider. A total of 1,210 individuals residing in Austria participated. The sample is representative of the adult Austrian population in terms of gender,

age, education, and municipality size. Because the survey explores urban–rural differences in perceptions of climate policy, the smallest and most rural municipalities were slightly oversampled.

The core of the study is an information provision experiment focusing on various aspects of the Austrian carbon tax's compensation mechanism. This mechanism is unique in explicitly addressing regional disparities: it redistributes revenues in a way that provides greater benefits to residents of rural areas. In the experiment, respondents are randomly assigned to receive information about either (a) the regional focus of the compensation mechanism, (b) its benefits for low-income households, (c) both, or (d) neither. Following the treatment, they are asked about their support for the Austrian carbon tax and their views on the compensation scheme. This allows me to investigate whether regional or economic inequality perceptions have a stronger influence on the public's assessment of climate policies and whether these perceptions can be shaped through targeted information about mitigation mechanisms.

In addition to the experimental data, the paper incorporates panel data from three waves of the Austrian Corona Panel Project (Kittel et al. 2020), in which respondents were asked about their willingness to pay higher taxes for climate change mitigation. Since the waves span three key stages of the Austrian carbon tax rollout – before the announcement, after the announcement, and after implementation – this allows for an analysis of how support evolved over time. With additional information on respondents' socioeconomic characteristics, attitudes, and rurality of their place of residence, I examine whether support trajectories differ across subgroups, and in particular, whether support in rural areas increased following the introduction of a compensation mechanism that explicitly targets rural communities.

This approach combines longitudinal data with experimental evidence, providing a comprehensive picture of how support for the Austrian carbon tax has evolved, whether emphasizing the rebate's regional focus increases support, and how this compares to highlighting its economic benefits. By including a treatment group exposed to both messages, the design also allows for an examination of potential reinforcing effects. Beyond these methodological contributions, the study offers practical relevance by evaluating whether compensation mechanisms focused on regional equity can help maintain or increase public support for carbon taxation at a time when many countries face political backlash against climate policy implementation.

1.5 Summary of the three papers and contributions

The **1st Research Paper** opens this dissertation by connecting research on climate-friendly behavior, behavioral interventions, and findings from climate policy that fairness plays an important role in how individuals evaluate climate action. Responding to calls to focus on behaviors with high emission reduction potential (Wynes and Nicholas 2017), the paper differentiates between various lifestyle domains and expands the literature on climate inequality perceptions. Specifically, it examines the impact of three forms of perceived inequality – economic, generational, and global – on individuals' willingness to adopt climate-friendly behaviors. The paper therefore addresses two research questions: (1) *In which lifestyle dimensions with high emission reduction potential are respondents most willing to change to more climate-friendly behavior?* and (2) *Are people influenced by inequality perceptions when it comes to their own behavior?*

The research questions are answered by combining a priming experiment with a factorial survey experiment in an online survey representative of the German population. Results suggest that individuals are most open to behavioral change in the dimension of air travel, while limiting car use and meat consumption leads to the biggest rejection. Although respondents indicate the highest agreement with the perception that economic inequality in climate change is unfair, the dimensions of generational and global inequality exerted stronger effects on individuals' willingness to behave more climate-friendly. However, while these inequality frames reduced resistance in certain areas, they were not sufficient to motivate behavioral change across the board, highlighting the continued importance of broader structural transformations to enable meaningful climate action.

The **2nd Research Paper**[2] follows the behavioral perspective introduced in the first paper and builds on the finding that behavior alone is unlikely to change enough to achieve climate mitigation goals, making structural transformations necessary. It therefore focuses on climate change policy support. Once again, it examines whether dimensions of inequality in climate change affect people's climate action, this time by focusing on the trade-offs between economic and generational inequality embedded in domestic climate policies. The paper also draws on the recent ruling of the German Federal Constitutional Court, which stated that the German government must do more to mitigate climate change in order to protect the constitutional rights of future generations. It is the first study to analyze whether such litigation influences citizens'

[2] The 2nd Research Paper is written in British English to maintain consistency with the published version, while the rest of the dissertation follows American English conventions.

support for climate-related taxation. The paper formulates multiple research questions, which can be summed up as follows: (1) *How do generational and economic inequalities relate to support for climate change mitigation policies?* and (2) *Does public support for climate mitigation policy increase when people learn about the constitutional court ruling?*

To answer these questions, a between-subjects information treatment experiment was implemented in a module of the Inequality Barometer survey, informing respondents about the two types of inequality in carbon taxation and the court ruling. The findings show that information about the economic inequality sparked by carbon taxes without a mitigation mechanism reduces public support. In contrast, awareness of generational inequality increases support. When both types of inequality are presented simultaneously, the negative effect of the economic dimension outweighs the generational concerns. However, information about the positive signal from the court mitigates this negative effect to some extent and decreases opposition, particularly amongst politically right-leaning respondents – although it fails to fully convert opposition into support.

The 2nd Research Paper highlights that public concern about inequality triggered by carbon taxation plays a major role in reducing support. In response, the **3rd Research Paper** shifts focus to mitigation mechanisms, since literature suggests that they can reduce economic inequality in the policy's impact and thereby lower opposition. While many studies have examined the effects of compensating low-income households through economic rebates, the results have often been mixed (Carattini, Carvalho and Fankhauser 2018). This paper, therefore, turns to a different form of inequality that is commonly raised by citizens in the context of carbon taxes: regional inequality, particularly the disproportionate burden placed on rural populations, primarily driven by their greater reliance on cars. Despite the consistent presence of regional fairness concerns in the literature, no study has yet examined whether a mitigation mechanism specifically targeting regional inequality can reduce opposition to carbon taxes. This paper therefore investigates whether a regional mitigation mechanism can improve public support for carbon taxation, and how it compares to a standard lump-sum rebate. The paper proposes several hypotheses, which can be summarized as the following research questions: (1) *Does a regional mitigation mechanism increase carbon tax support?* and (2) *Does it increase support specifically among rural subgroups?*

To answer these questions, the study focuses on Austria, the first and so far only country to implement a regionally differentiated carbon tax rebate, explicitly acknowledging and addressing regional inequalities. A between-subjects online survey experiment was conducted

with a sample of Austrian adults, with treatment groups receiving information about either the regional differentiation of the rebate, its benefits for low-income households, both, or neither. The findings show that while highlighting the regional variation in the rebate significantly reduces perceptions of regional inequality, it does not increase support for the carbon tax – but neither does information about the economic benefits for low-income households. However, the regional information treatment yields the highest support among rural and politically right-leaning respondents, although not to the extent that it closes the gap with other subgroups. Further analysis reveals that while treatment condition, municipality population size, and public transport quality are largely non-significant predictors of carbon tax support, political alignment, party preference, and trust in government play a central role. These findings highlight the challenges of climate policy acceptance in politically polarized contexts, even when combining carbon taxes with a rebate.

Overall, this dissertation provides a comprehensive examination of how perceptions of inequality in climate change influence climate action, a relationship that has received limited attention in existing research. Across all three papers, it compares different dimensions of inequality, whereas most studies tend to focus on only one. This comparative approach yields novel insights into which dimensions of inequality matter most to individuals in different contexts. Moreover, the dissertation contributes to the literature on behavioral change with new results from a factorial survey experiment, decreasing social desirability in answers. It also focuses on several behavioral dimensions with high emission reduction potential, increasing the relevance of the findings and allowing for meaningful distinctions across types of behavior. In terms of climate policy support, the second study is the first to investigate how climate litigation influences public attitudes. It also provides original insights into how different subgroups in the population weigh generational and economic inequality when evaluating carbon taxation. The third study adds to the literature on compensation mechanisms by being the first to assess the effect of a regional compensation scheme on carbon tax support, using the case of Austria. Moreover, both the 2nd and 3rd papers further contribute to how right-leaning citizens' climate policy support might be increased, while simultaneously highlighting the growing problem of political polarization in climate politics and showing that current efforts have not succeeded in bridging this divide.

Although each study makes its own contribution, they are united by a shared focus on perceptions of inequality in climate change. This consistent framework allows for meaningful comparisons across the studies. Together, the three papers cover multiple dimensions of inequality – economic, generational, and regional – thereby offering a broader perspective than

most existing studies. This comparative scope makes it possible to consider not only which dimensions of inequality tend to resonate most strongly with individuals, but also how their effects may vary depending on whether the outcome of interest is individual behavior or support for structural policy measures. In doing so, the dissertation addresses both the mobilizing and constraining potential of inequality perceptions, highlighting that such perceptions can sometimes increase climate engagement, while in other contexts they may decrease it or fail to shift attitudes. These cross-paper linkages, and the broader societal and policy implications they suggest, are taken up in more detail in Chapter 5.

2 1st Research Paper: Increasing Individual-Level Climate Mitigation Action: The Role of Behavioral Dimensions and Inequality Perceptions

Theresa Wieland and Fabian Thiel

Published in Humanities & Social Sciences Communications[3]

Abstract

As behavioral change is an important part of climate change mitigation efforts, scholars have increasingly advocated for a targeted focus on behaviors with high emission reduction potential. This study follows up on this imperative by conducting a factorial survey experiment, analyzing the willingness to adapt climate-friendly behavior in lifestyle dimensions with high emission reduction potential in a representative sample of the adult population of Germany. Moreover, we are employing novel approaches to motivate behavioral change through the lens of perceived inequality in climate change, priming our respondents about economic, generational, or global inequality. Our results identify lifestyle dimensions where behavioral resistance is most pronounced, particularly in meat consumption and car use, and show which dimensions have higher potential for adaptation (e.g. reducing air travel). Our priming experiment reveals that the potential for motivating climate-friendly behavior differs between the three primes. However, while addressing inequality in climate change did dampen the opposition to behavioral change, it alone was insufficient to motivate people in most lifestyle dimensions, emphasizing the need for additional structural transformations in society. Our study sheds light on the complexity of motivating climate-friendly behavior by allowing to distinguish between different lifestyle dimensions with high emission reduction potential and offers new starting points for framing the necessity of behavioral change.

3 Full citation:
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2.1 Introduction

Many scientists consider climate change the biggest environmental problem of our time, requiring vast political and industrial transformations (Cook et al. 2016; Rockström et al. 2017). Moreover, scholars have argued that although the weight of individual behavior depends on how the origin of carbon emissions is calculated, the impact of household consumption on carbon emissions is not to be neglected (Hertwich and Peters 2009). This makes the lifestyle decisions of individuals an important component of reduction efforts, especially in developed countries (Dietz et al. 2009; Moran et al. 2018; van de Ven, González-Eguino and Arto 2018).

It thus comes as no surprise that climate-focused research in many disciplines has been striving to understand how to influence individual green behavior. An important strand of this literature are psychological studies centering on behavioral change through interventions. These can be rather simple tools, like informational campaigns and appeals, but also more complex measures, such as financial incentives and forms of social comparison. The targeted individual behaviors are numerous: examples include recycling, littering, energy consumption, and mobility behavior (Bergquist et al. 2023; Bernard, Tzamourani and Weber 2022; Liebe, Gewinner and Diekmann 2021; Maki et al. 2019; van Valkengoed, Abrahamse and Steg 2022; Whitmarsh, Poortinga and Capstick 2021). However, it has been pointed out that not all of these actions have the same (high) impact on carbon emissions and some researchers call for more specific studies focusing primarily on behavior with high emission reduction potential (e.g. Wynes et al. 2018; Nielsen et al. 2021; Whitmarsh, Poortinga and Capstick 2021).

Relatedly, another strand of recent climate research has been assessing the carbon emissions tied to different individual behaviors and calculating which of these dimensions have the highest emission reduction potential (Wynes and Nicholas 2017; Lacroix 2018; Ivanova et al. 2020). These analyses come to very similar results: individual behavior with a high impact on emissions can be mostly found in the dimensions of *mobility* (e.g. using the car less, less air travel), *diet* (vegetarian or vegan), and *household energy use* (e.g. shifting to green energy, reducing energy consumption).

Unfortunately, comparing the effectiveness of interventions also shows that precisely these dimensions are among the hardest to influence (Bergquist et al. 2023) – even when concern about climate change is generally prevalent (Huang and Warnier 2019; Rüttenauer 2024). One explanation for this could be the low-cost hypothesis, which postulates that the effect of such concerns on actual behavior decreases with increasing costs of the behavior (e.g. in terms of time, money, or other resources; (Diekmann and Preisendörfer 2003; Keuschnigg and Kratz

2017; Thiel 2020). Especially for mobility decisions, it can be argued that these costs can be quite high: switching to public transport can lead to a longer commute, especially in rural areas, and traveling by train to a destination often takes much longer than by plane. However, this attitude-behavior gap has also been found for less costly lifestyle dimensions (Büchs et al. 2018; Dechezleprêtre et al. 2022; Hornsey et al. 2016; Huang and Warnier 2019; Jacobs et al. 2018) and researchers have identified many further barriers to behavioral change.

Undoubtedly, climate concerns and pro-environmental attitudes have been identified as prerequisites to the decision to act climate-friendly in many cases (Bradley et al. 2020; Tobler, Visschers and Siegrist 2012; van Valkengoed, Abrahamse and Steg 2022). However, their influence is altered through a variety of other factors: In addition to the already mentioned individual cost-benefit calculations, researchers have found effects originating from social norms, climate knowledge, skepticism, and/or habits (Bouman et al. 2020; Bradley et al. 2020; Bruderer Enzler, Diekmann and Liebe 2019; Gadenne et al. 2011; Graves and Roelich 2021; Mayerl and Best 2019; Nyborg et al. 2016; Shi et al. 2016; Steg and Vlek 2009; van Valkengoed, Abrahamse and Steg 2022). Moreover, another branch of literature closely related to sustainability research has argued for the importance of self- and group-efficacy (Doherty and Webler 2016; Hanss et al. 2016; Homburg and Stolberg 2006; Huang 2016; Lee et al. 2014; van Valkengoed, Abrahamse and Steg 2022; van Zomeren, Spears and Leach 2010). Roughly summarized, the general assumption here is that individuals' probability to act environmentally or climate-friendly is tied to their perception of whether their own behavior can have an actual effect on the environment or climate change mitigation (self-efficacy) and whether humanity as a whole will be able to achieve the corresponding goals (group-efficacy). If they feel like their behavior has no effect in the grand scheme of things, or that humanity will not be able to significantly mitigate climate change, their motivation to act in a climate-friendly manner drops.

Overall, the research highlights that behavior is inert and hard to influence, even when individuals are aware of the issues and the need for action. Nevertheless, it is important to recognize that many people are just inherently opposed to change. This is also relevant for the political dimension since we currently observe backlash against climate mitigation policies in many countries – due to the worry of rising costs but also because citizens are concerned about changes in their lifestyles. The most commonly proposed policy is carbon taxation, since it is seen as a highly cost-efficient way of combating climate change (OECD 2013). However, a general tax as such neglects the fact that public support might be higher for behavioral changes in some dimensions than others. Other authors have already pointed out the potential of creating

policy bundles of highly accepted measures and identifying those in need of more effective explanation due to their low acceptance (Jenny and Betsch 2022) and combining broad carbon taxation with more targeted nudging approaches for specific behaviors (Gravert and Shreedhar 2022). Recognizing more (less) popular aspects may aid in the design of more fitted climate mitigation schemes with higher approval rates, which are essential for policy support and for its subsequent successful implementation (Anderson, Böhmelt and Ward 2017; Franzen and Meyer 2004; Schaffer, Oehl and Bernauer 2022; Tjernström and Tietenberg 2008). Identifying in which lifestyle dimensions with high emission reduction potential we can find the highest willingness to change behaviors is therefore crucial for climate change mitigation, as it not only facilitates habit transformation but also provides vital insights for political-scale transformations. This leads us to our first research question:

(1) In which lifestyle dimensions with high emission reduction potential are respondents most willing to change to more climate-friendly behavior?

2.1.1 Climate change and inequality perceptions

Delving deeper into the factors that can influence individuals' climate mitigation behaviors, we want to study another potential determinant closely aligned with political science literature: perceptions of inequality. Research on the factors underpinning public support for carbon tax policies has consistently highlighted the significance of fairness perceptions of citizens (Bergquist et al. 2022; Povitkina et al. 2021). Concerns center around the distributional consequences of such policies, particularly regarding their potential to create disproportionate burdens for socioeconomically disadvantaged groups. While these worries can undoubtedly be driven by egotropic concerns and personal loss aversion (Armingeon and Bürgisser 2021), the findings indicate that it is not just self-interest but also a broader sense of fairness and equality in society driving people’s opinions (Gampfer 2014; Maestre-Andrés, Drews and van den Bergh 2019).

However, while this topic relates to redistributive (in)equality, there are many other aspects of inequality connected to climate change: Socioeconomically disadvantaged households will generally be more burdened by higher temperatures and the accompanying changes like food prices or the costs associated with increasing occurrences of natural disasters (Hallegatte and Rozenberg 2017) while producing fewer emissions themselves (Gough 2013). This dynamic can also be found at the country level, with wealthier nations being responsible for the lion’s share of CO2 emissions (so far), while being less exposed to the immediate consequences of

global warming (Harrington et al. 2016; Jorgenson and Clark 2011; Oxfam 2020; Taconet, Méjean and Guivarch 2020; Ogunbode 2022). Furthermore, movements like Fridays for Future and similar groups recently brought another aspect of inequality in climate change to light: postponing climate mitigation now leads to increased expenses for addressing climate change in the future, further disadvantaging the already burdened future generations (Gardiner 2006; Grasso and Giugni 2022).

These examples show how climate change is connected to many different aspects of inequality, which can also have an effect on people's climate mitigation preferences through their fairness perceptions or moral concerns (Pearson, Tsai and Clayton 2021; Doran et al. 2019). Since such evaluations play a crucial role in shaping individuals' support for climate policies, it seems intriguing to examine whether perceptions of inequality in climate change might extend their influence to the private sphere as well, and impact individuals' readiness to act climate-friendly. Making citizens aware of such inequalities could activate moral values and social norms, which have been suggested as potential drivers of behavioral change toward a climate-friendly future (Otto et al. 2020; Nyborg et al. 2016; Rees, Klug and Bamberg 2015).

We are therefore choosing the before-mentioned examples of economic, global, and generational inequality in climate change and examine their influence on respondents' willingness to change their own behavior. In doing so, we can bridge two crucial threads of climate mitigation research, contributing to our understanding of the factors individuals take into account when making political versus private decisions. Moreover, since we are including three different aspects of inequality in climate change, we can differentiate between them, yielding valuable insights into which frames can effectively drive the essential changes required for climate mitigation. Our second research question therefore is:

(2) Are people influenced by inequality perceptions when it comes to their own behavior?

2.1.2 Current study

To answer our research questions, we fielded a factorial survey experiment with a representative sample of the German population (see Methods). Our study was conducted in Germany since it is one of the most influential countries in the EU concerning climate change policies (Knill 2003; Plehwe 2022). Furthermore, it is one of the countries with the highest CO2 emissions in total (Climate Watch 2023) and has an active public debate about climate mitigation measurements: movements such as Fridays for Future or the Last Generation are widely known to the public and – following the federal election in 2021 – the Green party is part of the

coalition government. However, backlash against climate policies or climate-friendly lifestyle change and doubts about how to achieve this transformation are prevalent in Germany, too (Quitzow et al. 2016; Tschötschel, Schuck and Wonneberger 2020). Thus, the country is well suited as an example for many other nations currently struggling with reaching their transformative goals to lower carbon emissions.

Moreover, choosing the German population as our research focus opens up the possibility to further distinguish between the three types of inequality in climate change: since we will have respondents from all age groups and various economic backgrounds, we will likely have participants classifying themselves as negatively as well as participants identifying as positively affected by generational and economic inequality. However, none of our respondents should be able to count themselves as negatively affected by global inequality in climate change, which allows us to analyze whether there are any differences in the effect of our primes between these more and less affected subgroups and across inequality types.

We contribute to the existing body of knowledge on climate mitigation by identifying lifestyle dimensions with higher acceptance rates of behavioral changes, and by examining the impact of perceptions of different types of inequality, therefore combining several strands of literature. This insight provides valuable knowledge, not only for future research but also for policymakers and various stakeholder groups.

By using a factorial survey experiment, we reduce potential social desirability bias in our respondents' answers due to the salience of climate mitigation topics in the public debate (Atzmüller and Steiner 2010; Auspurg et al. 2015). This is an advantage over traditional survey questions on climate-friendly behavior.

Moreover, we choose only lifestyle dimensions covering the most relevant domains for high individual emission reduction potential – diet, energy use, and mobility – as identified by the literature (Wynes and Nicholas 2017; Lacroix 2018; Ivanova et al. 2020).

2.2 Methods

Our analyses are based on a survey experiment fielded in Germany. Data collection took place in July 2022, using an online access panel. The sample is representative of the adult (18 years or older) German population across gender, age, federal state, and education. We use a factorial survey experiment (Auspurg and Hinz 2015) to examine those lifestyle dimensions in which our respondents are most likely to adapt their behavior. Each respondent is asked to subsequently rate three vignettes describing hypothetical lifestyles (see Appendix 1.F for a

vignette example). We vary the climate-friendliness of the lifestyles within seven dimensions that cover the most relevant domains for individual emission reduction in diet, energy use, and mobility as identified by the literature (Wynes and Nicholas 2017; Lacroix 2018; Ivanova et al. 2020). Table 2.1 shows an overview of all varied dimensions[4], resulting in a universe of 1620 possible combinations. We use a *D*-efficient design (Auspurg and Hinz 2015), which allows for maximum statistical power while at the same time utilizing a subset of only 180 vignettes that are then assigned randomly to respondents. By design, respondents are encouraged to weigh the dimensions describing the lifestyles they are confronted with to produce their general rating of the vignette. This is an important advantage of this approach over direct questioning, which might lead to biased results due to social desirability and the salience of our topic in public debates (Atzmüller and Steiner 2010; Auspurg et al. 2015).

For each of those vignettes, we measure two outcome variables on 11-point scales: a rating of how climate-friendly respondents estimate a specific lifestyle would be, and a rating of the willingness to adapt individual behavior to the described specific lifestyle. This allows us to ensure respondents' knowledge of effective adaptation potentials before analyzing their stated willingness to adapt such lifestyles themselves. In this paper, we focus on the respondents'

Table 2.1: Vignette dimensions and levels[5]

Diet	
Meat consumption (per week)	never / once / multiple times
(Other) animal product consumption (per week)	never / once / multiple times
Energy Use	
Heating in winter	18 °C / 21 °C
Showering	5 min. / 15 min.
Mobility	
Do not use car on…	1 / 3 / 5 day(s) a week
Non-business flights	4x a year / 1x a year / every two years

[4] Wynes and Nicholas actually find that having one fewer child has the biggest emission reduction potential (Wynes and Nicholas 2017. However, since this is a major life decision and very different from a resolution to use the car less (e.g.), it cannot be expected to be treated in the same way by respondents (see also: Greenwood 2019; Pickering et al. 2020). Therefore, we are not including this dimension in our study.

[5] Our original vignette design included a 7th dimension, describing the expected change in costs when switching to the presented lifestyle (-20% / -10% / same / +10% / +20%). This was to make it possible to analyze the willingness to pay of respondents or to calculate the monetary trade-off for a reduction in our lifestyle dimensions. Since the current paper focusses on identifying the willingness to adapt lifestyles voluntarily and in correlation with climate change inequality perceptions, we are not including this dimension in our discussion. Moreover, the

willingness to adapt a lifestyle, since this variable has more informative value for individual behavior change than their ratings of the vignettes' climate friendliness. [6]

Before the respondents are presented with the lifestyle vignettes, they are exposed to the priming part of our survey experiment. In this phase, they are provided with one of the aforementioned three aspects of inequality in climate change (generational, global, economic) or are assigned to the control group. We use a between-respondents design and formulate our primes as a question of whether our respondents agree with the statement, to ensure that respondents do not skip over our primes. The statements can be translated as follows: "It is unfair that future generations (countries in the Global South / poorer households) will be more affected by the consequences of climate change, although older generations (countries in the Global North / richer households) are mainly responsible for past CO2 emissions."

We further include questions to control for other important influences on climate-friendly behavior, like green attitudes, climate change worry, climate change knowledge as well as the perceived self- and group-efficacy for mitigating climate change (see Appendix 1.I for information about our questionnaire). Moreover, we are asking our respondents about their current habits in all of the lifestyle dimensions included in the vignettes, so we can compare the presented fictional lifestyles to each respondent's current individual lifestyle (see Appendix 1.G for descriptive statistics of respondent characteristics and their reported behavior).

We have opted to ask the respondents about their current lifestyle after the inequality primes and factorial survey part of the questionnaire to limit social desirability in the vignette ratings – our main outcome variable – due to a more obvious comparison with their own lifestyle, which could prime respondents. However, we are aware that measuring the self-reported behavior after our inequality primes and therefore avoiding unwanted priming effects can also lead to a posttreatment bias in our results (Klar, Leeper and Robison 2020; Sheagley and Clifford 2023 // 2025). To counteract this, we have taken several steps in the design of the survey to maximize the time between the inequality prime and the self-reported behavior and to formulate the corresponding questions as different as possible from how the behavior was presented in the vignette (see Appendix 1.H1 for a more in-depth discussion). Moreover, we

costs had a rather weak effect on our respondents, with them seemingly caring more about changes in their lifestyle than the somewhat abstract cost descriptions related to them (s. Appendix 1.B2 for the effect of the cost dimension).

[6] When analysing the climate friendliness ratings, we find that respondents' rate the levels with more emissions as less climate friendly throughout all lifestyle dimensions. This shows that our respondents' are able to correctly judge the presented lifestyles for their emission reduction potential when deciding between dimension levels (s. Appendix 1.A).

have added additional tests to ensure that our priming groups do not differ significantly in their self-reported behavior (see Appendix 1.H2). After excluding missing data, we are left with 1321 respondents rating 3952 vignettes.

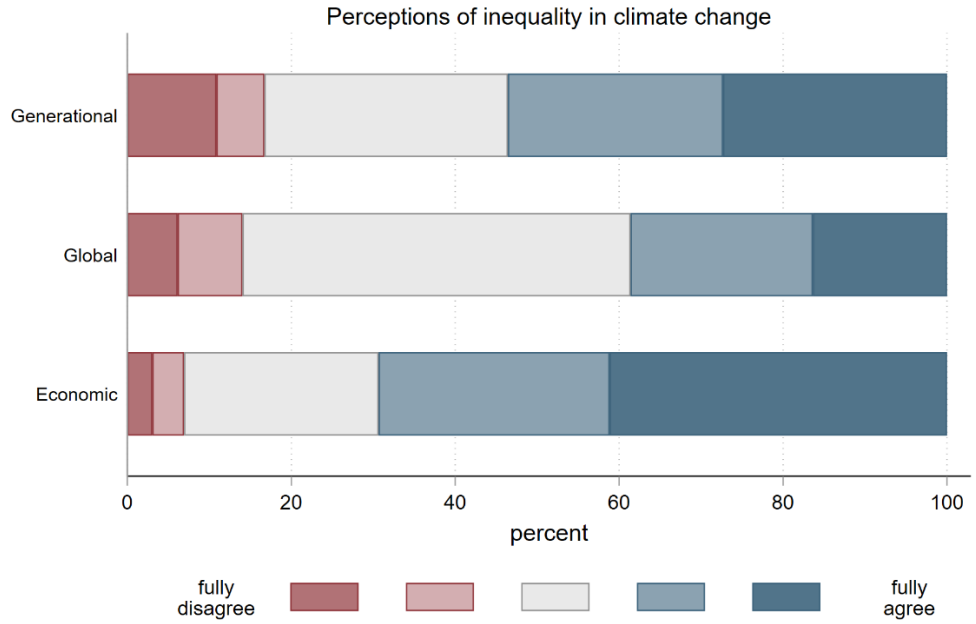
2.2.1 Statistical analyses

To identify the lifestyle dimensions with the highest potential for behavior change, we are using multi-level random intercept regressions with cluster-robust standard errors on the respondents' level. Our dependent variable is the respondents' willingness to adapt the lifestyle described in the vignette on an 11-point scale from -5 (definitely not) to 5 (definitely yes). Our independent variables are the characteristics of the dimensions shown in the vignette and the aforementioned control variables. To control for the current behavior of our respondents, we calculate the difference between the lifestyle dimensions described in the vignette and our respondents' stated behavior. For example, for a respondent who is currently using the car 5 times a week and is presented with a vignette that includes car use on only 2 days a week, the new dimension value is the difference of 3 days. The same principle is applied to all other dimensions. However, since we focus on emission reduction, we are only concerned with lifestyle changes that require our respondents to do less than before. Therefore, vignette dimensions that would result in the same behavior or even more are coded as zero (e.g. a vignette dimension that includes car use on 5, 6, or 7 days a week will be set to 0 if the respondent is already using the car only 5 days a week). Our results can therefore be interpreted as analyzing the effect of a behavioral reduction in a specific dimension on the respondents' willingness to adapt the lifestyle vignette. As this approach signifies that not all vignette dimensions will lead to a reduction of behavior for our respondents in all vignettes, information about the share of vignettes that would lead to such a reduction is added to the results for each dimension. In the following, we will call this the "reduction share".[7] Furthermore, the differences between lifestyles are z-standardized for every dimension to ensure comparability between dimensions and for ease of interpretation. The value of the standard deviations is included in the plots.

For our first research question, we examine whether respondents are more or less willing to adopt climate-friendly behavior in certain lifestyle dimensions, so we focus on the differences in effect sizes for a reduction across dimensions. To determine whether our respondents are influenced by their perceptions of different aspects of inequality in climate change (our second

[7] Robustness checks analyzing the opposite scenario (i.e. the effect of vignettes leading to an increase in behavior) find that respondents' willingness to adopt the lifestyle is largely unaffected (see Appendix 1.E1). This aligns with our expectation that the results are driven by respondents' aversion to behavioral reductions.

Figure 2.1: Agreement to the inequality priming statements



Note: Rated on a 5-point scale; average agreement: Economic (4.01) > Generational (3.53) > Global (3.35)

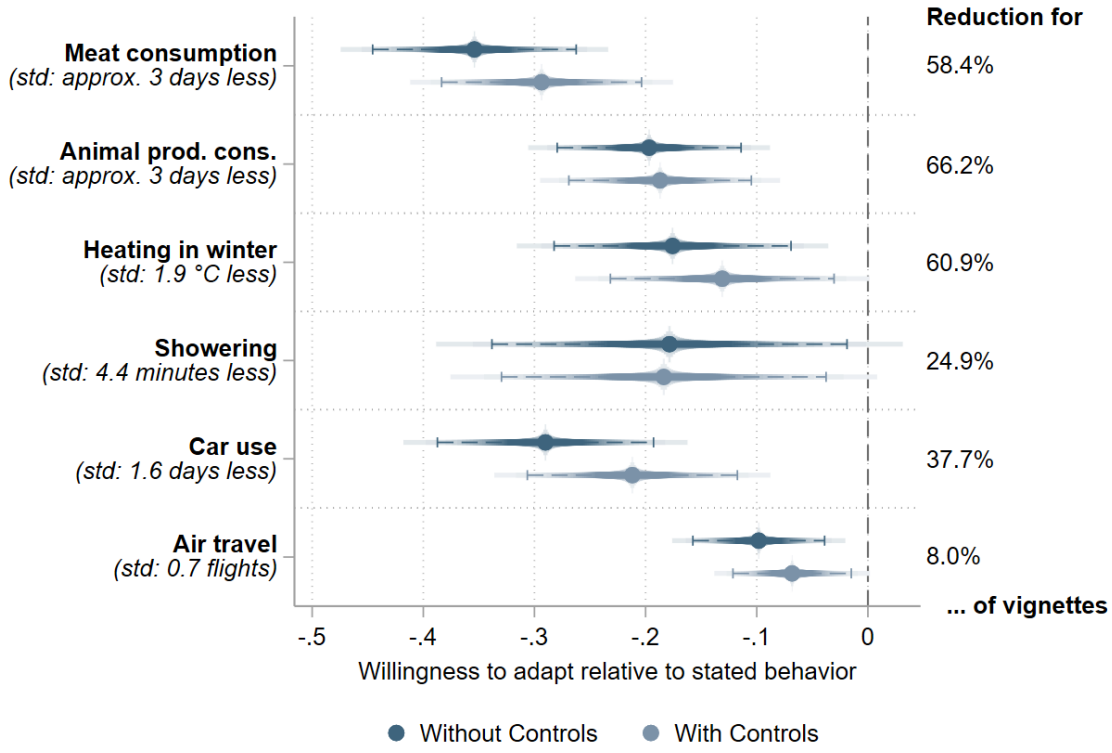
research question), we are calculating the same multi-level random intercept regressions, but separately for each priming group. We then analyze whether our priming groups differ compared to the control group and between each other in their willingness to adapt more climate-friendly lifestyles. If our primes have an effect on the respondents, the willingness to adapt more climate-friendly lifestyles should increase. Respondents, who have a value of 4 or 5 on the 5-point scale of agreement with the prime statement, are coded as "agreeing respondents".

2.3 Results

2.3.1 Inequality perceptions

Our first result concerns the respondents' inequality perceptions. Figure 2.1 shows the distribution of the agreement to our inequality priming statements. The average agreement is quite high for all types of inequality, but there are some differences between the different dimensions of inequality. Respondents seem to agree most with economic inequality being unfair, followed by generational inequality, and lastly global inequality.

Figure 2.2: General results of the FSE with converted relative values



Note: Linear random intercept regression using cluster-robust standard errors. Depicted are point estimates of the effect of behavioral reductions on the willingness to adapt to the lifestyle described in the vignette (rated on scales from −5 to 5) (with or without controlling for gender, age, education, income, climate change denial, climate change worry, climate attitudes, climate change knowledge, self-efficacy, group-efficacy, and the costs described in the vignette) and smoothed confidence intervals (vertical bar signifies 95% level). Estimation results are based on 3952 vignette ratings from 1321 respondents. Percentages on the right indicate the amount of vignettes that would demand behavioral changes from the respondent. For the exact estimates, see also the regression tables in Appendix 1.D2.

2.3.2 Climate friendly lifestyle dimensions

The first goal of our analysis is to find out in which dimensions respondents are most willing to change to more climate-friendly behavior. Figure 2.2 plots the first results of our Factorial Survey Experiment and shows the effect of a reduction in each lifestyle dimension on our respondents' willingness to adapt such behavior. Since not all behavioral dimensions signify a reduction for the respondents (in the case of individuals showing habits that are more climate-friendly than the description in the vignette), information about the reduction share of vignettes can be found to the right of each dimension. As the differences between lifestyles are z-standardized for each dimension to ensure comparability, the standard deviation of each dimension is added on the left for ease of interpretation. Therefore, the coefficients can be

interpreted as the effect of doing something one standard deviation less than before (e.g. using the car around one and a half days less).

Moving to our lifestyle dimensions, we can see that behavioral reduction negatively affects the willingness to adopt the behavior shown in the vignette for all dimensions. However, the number of vignettes that result in a reduction of behavior varies considerably across dimensions, ranging from a reduction share of almost two-thirds of vignettes for animal product consumption to just 8% for air travel. Controlling for other potential influences like self- and group- efficacy, climate change worries or knowledge does not significantly change these results.[8] However, there are differences in the strength of our respondents' opposition: While meat consumption and car use seem to be quite sensitive subjects, showering for a shorter time or reducing the heating temperature in winter have less negative effects on our respondents' willingness to change their behavior. Especially in the dimension of car use, our standard deviation is not very high – using the car for around one and a half days less – and the respondents' resistance to behavioral change is still very strong. Moreover, only 37.7% of vignettes even lead to a reduction in using the car, so our respondents seem to be particularly unwilling (or unable) to reduce their behavior further in this mobility dimension. This is different for air travel, where we see a less extreme reaction. On the one hand, the reduction share over all vignettes is clearly lower here. On the other hand, the weaker negative effect could also be driven by a difference in the willingness to change one's daily routine vs. changing less ordinary activities or because of discounting effects, since respondents might be more willing to agree to change behavior which is further in the future (air travel for the next vacation vs. taking the bus to work tomorrow). Moreover, we cannot rule out that dimensions, which are discussed more controversially in the public, might trigger more pronounced resistance effects primarily due to their ideological associations rather than their level of changeability: We find a stronger negative effect for meat consumption than for dairy and other animal products, although reducing meat consumption is often easier than eliminating all other animal products from one's diet. Moreover, the reduction share for meat consumption is also lower than for other animal product consumption, so many respondents are already eating less meat. It's possible that those who are open to behavioral change have already adjusted, leaving a group of remaining individuals who hold particularly strong views.

[8] When comparing between control variables, climate attitudes have the biggest effect on respondents' willingness to change to climate-friendly behavior, followed by their perceived self-efficacy. All other controls had no significant effect. For an overview of the influence of our control variables, see Appendix 1.B1.

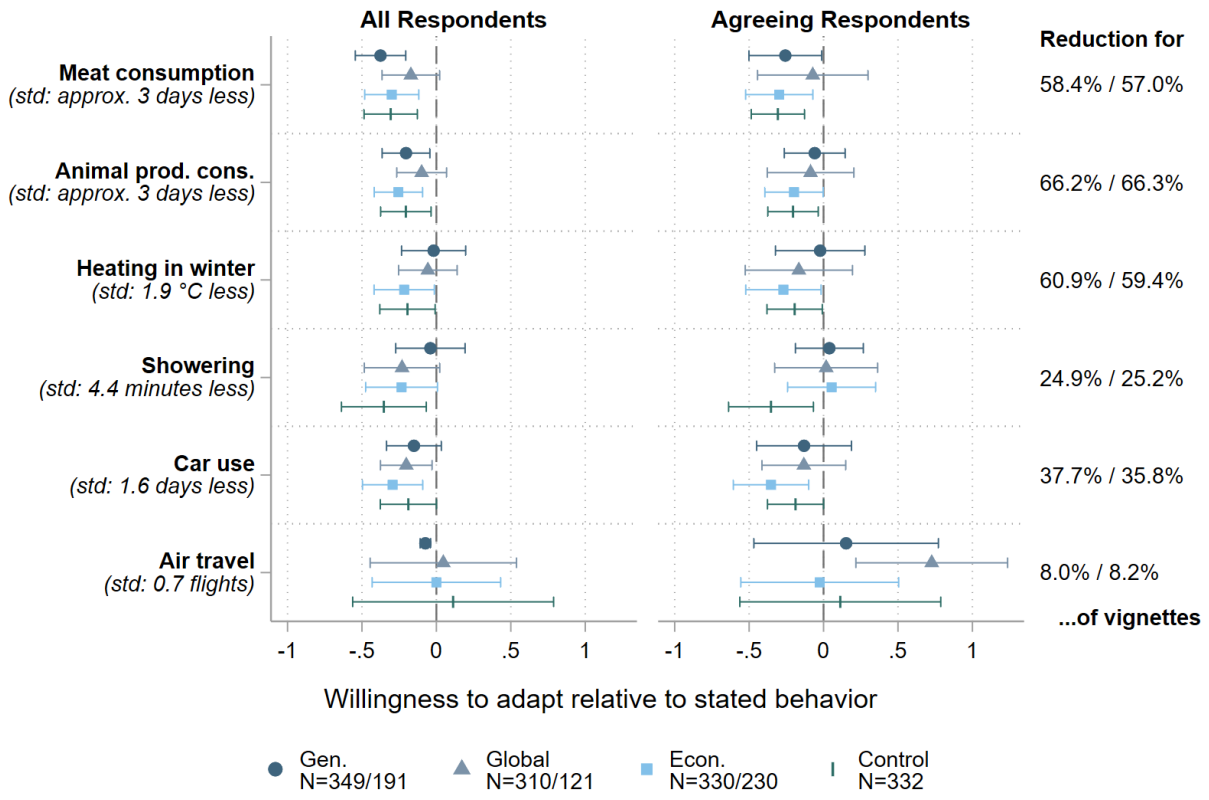
2.3.3 The effect of inequality perceptions on emission reduction behavior

The second goal of our analysis is to find out whether our respondents' willingness to adapt climate-friendly behavior is influenced by their perceptions of inequality in climate change. If our primes have an effect on the respondents, the willingness to adapt more climate-friendly lifestyles should increase. Looking at the results of our priming experiment, at first glance our respondents do not seem to be much affected by the inequality statements. The left part of Figure 2.3 plots the effects of the factorial survey experiment for all different priming groups and the control group. There are no significant differences between these groups, thus we cannot find an effect of making people aware of different aspects of inequality on their willingness to behave more climate-friendly. However, since this analysis does not take into consideration whether our respondents actually agreed with the inequality statements, we take a closer look.

The right part of Figure 2.3 shows the same analysis but only considers respondents who agreed with the statement they received.[9] Doing so moves our coefficients to the right in most dimensions. While behavioral reduction led to significantly negative effects in almost all lifestyle aspects before, many coefficients now shift over the zero line – the observed resistance seems to dampen. Interestingly enough, this tendency is somewhat stronger for respondents who got the global or the generational inequality statement, even though the economic inequality statement led to the highest average agreement. This is particularly noticeable for the dimension of air travel, with respondents who got the global inequality prime preferring lifestyles in which they fly less than they did before. Furthermore, the effect of a reduction in lifestyle habits ceases to be significantly negative even in the dimension of car use for respondents with the generational and the global statement. Even though this effect fails to shift to the positive side, it nonetheless shows detectable differences in the effects of our three inequality primes. Moreover, the comparison of the number of vignettes resulting in a behavioral reduction for all respondents and agreeing respondents shows no substantial variation within dimensions, so the effect changes cannot be ascribed to our respondents differing in their behavior ex-ante.

[9] The pictured analyses code respondents as „agreeing" if they have a value of 4 or 5 on the 5-point scale of agreement. Robustness checks (see Appendix 1.E2) indicate that the results do not change significantly when restricting 'agreeing' to only those with a score of 5. Additionally, including unsure respondents (i.e., scores of 3, 4, and 5) produces effects more consistent with the overall results. Thus, it appears that agreeing respondents drive the observed differences.

Figure 2.3: The effect of respondents' inequality perceptions



Note: Linear random intercept regressions using cluster-robust standard errors. Depicted are point estimates of the effect of behavioral reductions on the willingness to adapt to the lifestyle described in the vignette (rated on scales from −5 to 5) (controlling for gender, age, education, income, climate change denial, climate change worry, climate attitudes, climate change knowledge, self-efficacy ,group-efficacy, and the costs described in the vignette) and 95% confidence intervals for all respondents (left panel), and only for the subgroup of those respondents agreeing with the statement of the specific inequality prime they received (right panel). Estimation results are based on 3952 vignette ratings from 1321 respondents overall (number of respondents for each prime and agreeing to the priming statement is depicted in the legend). Percentages on the right indicate the amount of vignettes that would demand behavioral changes from the respondent (for all respondents/agreeing respondents). For the exact estimates, see also the regression tables in Appendix 1.D3.

To check whether our primes have different effects depending on whether the respondent can identify as negatively or positively affected by the type of inequality they were shown, we calculate additional models in which we look at the effect of the economic inequality prime for different income groups and the effect of the generational inequality prime for different age groups. Additionally, we compare the level of agreement to our primes by the same subgroups. While we do find our youngest respondents (aged 18 – 34) to agree slightly more with the generational inequality statement compared to the other age groups, we do not find a clear pattern for the economic inequality statement when comparing income quartiles (see Appendix

1.C1a & 1.C2a). Subsequently, we do not find any statistically significant differences or clear patterns for both age groups or income quartiles when analyzing our respondents' willingness to adapt climate-friendly lifestyles after being exposed to their respective prime (see Appendix 1.C1b & 1.C2b). Therefore, our respondents seem to either not identify themselves as differently affected by the type of inequality they were shown, or our primes have an effect regardless of whether people consider themselves as part of the affected group.

2.4 Discussion and conclusion

In our study, we observe several noteworthy findings. First, when it comes to the willingness to adapt one's lifestyle in the context of climate change, we found that a reduction of behaviors with high emission potential generally results in opposition across all dimensions we examine. The reduction of meat consumption and car usage seems to evoke the strongest resistance from respondents, although we cannot check whether this is due to the perceived costs of changing behavior, ideologies related to behavior, discounting bias from our respondents, or other reasons. The dimension in which we find the highest potential for behavioral change is air travel, which seems promising since it carries substantial reduction potential, but we also see that most of our respondents already show very low levels of air travel.

In terms of the aspects of inequality in climate change, our findings revealed that respondents agreed the most with the statement about economic inequality, followed by generational and global inequality. However, our study indicates that framing climate change in terms of the two later aspects – global and generational inequality – has more potential to mobilize individuals towards behavioral change compared to the economic inequality framing. This hints towards other factors playing into this effect. Although we do not find any significant differences in comparing the effect of the economic inequality prime for different income groups, it is a reoccurring finding in inequality literature that the majority of Germans consider themselves middle class at the most, independently of whether they actually earn well (Bellani et al. 2021). Therefore, this could decrease the effect of the economic inequality prime, since it gives our respondents the possibility to not identify themselves as the responsible group regardless of their actual earnings.

It is also worth noting that our measurement of respondents' self-reported behavior post-treatment (i.e. after the inequality primes) introduces certain limitations to interpreting our findings, as the joint effect of treatment on self-reported behavior and willingness to reduce behavior cannot be fully disentangled. However, our additional analyses show that the priming

groups do not differ significantly from the control group in their self-reported behavior, indicating that the inequality priming does not influence self-reported behavior. We have provided further details and discussion in the Methods section and Appendix 1.H to address this concern.

Nevertheless, priming people with information about climate change inequality alone – while being able to dampen the rejection of behavioral reductions for some of the primes – was insufficient to trigger substantial behavioral change in most dimensions, showing that structural transformations are indispensable for climate change mitigation. This goes in line with recent findings about reframing not being sufficient to increase citizens' policy support (Bernauer and McGrath 2016; Tschötschel et al. 2021) or climate-friendly behavioral intentions (Fesenfeld et al. 2021). Moreover, it is important to bear in mind that the willingness to change behavior will most likely not be sufficient for large-scale lifestyle transformations when necessary structural conditions are not met – even in the dimensions where respondents showed less resistance to behaving more climate-friendly. In the context of air travel for instance, this means that alternatives like better train connections between countries and high-speed rail networks need to be fostered in addition to all endeavors to motivate people through awareness campaigns and messaging. Furthermore, if citizens simply do not have an alternative to their current behavior, like many residents of rural areas when it comes to using their cars, behavioral change can be almost impossible for those who have not yet adapted – even when financial incentives for public transport are dramatically increased (Auspurg et al. 2023). This is emphasized by the strong negative effect of reducing car use despite the low number of vignettes leading to a reduction in this dimension.

In conclusion, while our study illustrates which lifestyle dimensions show the biggest potential for behavioral change without strong public resistance and thus provides starting points for new approaches to motivate people, it also highlights that it is indispensable to provide the necessary support on a political level to facilitate habit changes.

3 2nd Research Paper: Can the Court Bridge the Gap? Public Perception of Economic vs. Generational Inequalities in Climate Change Mitigation Policies

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Published in Environmental Research Letters[10]

Abstract

Climate change and most climate policies affect and reinforce different forms of inequalities. For instance, climate change policies that aim to change consumer behavior by increasing the price tag of goods and services that cause carbon emissions often carry a disproportionately higher burden (in terms of financial cost) to those with lower incomes. They can thereby either exacerbate existing income inequalities or contribute to generating new ones. Meanwhile, refraining from engaging with climate mitigation policies will incur other detrimental societal costs: the financial burden and the harmful consequences of climate change that future generations will have to bear if nothing is done. In this paper, we examine how the immediate economic inequality citizens face from climate mitigation policies (regarding carbon taxation) weighs against the long-term generational inequalities future generations will experience. We study how both types of inequality relate to policy support for climate change mitigation policies in the context of Germany. The German case is of special interest because a recent court ruling of the Federal Constitutional Court allows us to test whether making people aware of a new legal reality can bridge the gap between the economic and generational inequality. Our findings using a between-subjects survey experiment fielded among German citizens (N = 6,319) in 2022 show that immediate economic concerns trump future generational concerns, generally making citizens less supportive of the policy. This negative support is however somewhat mitigated by the supportive signal from the court ruling.

10 Full citation:
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3.1 Introduction

Few issues are as connected to inequality as climate change. While the inter-linkage between climate change and international inequality has been on full display for a long-time, as negotiations on climate cooperation have been hampered by the strong international inequalities and the related free-rider problem for decades (Aklin and Mildenberger 2020; Taconet, Méjean and Guivarch 2020), two other forms of inequality have moved to the center of scholarly attention more recently: generational as well as economic inequalities (Gardiner 2006; Dolšak and Prakash 2022). Moreover, these two types of inequality have already found their way from the scholarly ivory tower to the streets: movements, such as Fridays for Future or Extinction Rebellion, are examples of the generational conflict underlying climate change – an inequality that relates to the future impacts of climate change. Meanwhile the French Gilets Jaunes illustrate the potential for economic inequality protest – an inequality that relates to the implementation of climate change policies in the present. All these protests indicate the potential for societal polarization that could be triggered by enacting more stringent policies if politicians do not carefully consider the relationship between inequality and climate change. In this paper, we therefore make a novel contribution to the literature, by investigating how generational and economic inequalities relate to support for climate change mitigation policies.

We study this question in the context of Germany. Germany is a crucial actor within the EU when it comes to climate change policies (Knill 2013; Plehwe 2022) and its population is comparatively well informed about climate change and its consequences (Shi et al. 2016). Most importantly, however, the German case allows us to test an important additional layer to the generational inequality angle. In 2021, the German Federal Constitutional Court ruled that more extensive measures for climate change mitigation need to be taken by the government. The legal reasoning being that it would go against the constitutional rights of future generations if the German government does not do more to mitigate climate change. With this ruling, the court has reinforced the significance of the generational aspect of climate change policy and, more importantly, has provided a clear legal reasoning for why the German government needs to act against this form of inequality. We take this aspect into account and test whether individuals become more accepting of strict climate policy once they are made aware of the judicial cue and thus the new legal reality. This comes at a time of increasing climate litigation around the world (Setzer and Higham 2022), while there is very limited knowledge on how these cases might affect public opinion and related societal norms towards climate mitigation (Wonneberger 2024). To the best of our knowledge, the impact of a judicial cue of this

magnitude on public support for climate policy has not been examined before, and our study aims to fill this important research gap.

The aim of this paper is, therefore, twofold: first, we strive to better understand how generational and economic inequality interact in affecting support for climate change mitigation policies, which leads to the following research questions: Does public support for climate mitigation policy decrease when people learn about the potential negative effect on low-income earners? Does the opposite happen once people fully understand the implications for future generations? And how do individuals weigh one against the other? In answering these questions, we build on existing literature that shows that fairness considerations are in fact one of the most important aspects influencing support for stringent climate policies (Bergquist et al. 2022). Second, we investigate whether providing knowledge about a new legal reality affects how citizens evaluate more stringent climate policies. Research indicates that judicial decisions can work as cues that influence citizens' perceptions of what is considered ethical and legally 'correct' (Carattini, Carvalho and Fankhauser 2018). As such, the new changed legal reality can act as a judicial cue, which can in turn bolster citizens' support for carbon taxation. This prompts the final research question: whether public support for climate mitigation policy increases when people learn about the constitutional court ruling.

Empirically, we examine the influence of generational and economic inequality and the role of the German Federal Constitutional Court ruling using a survey experiment among German citizens (N = 6319) in 2022 on attitudes vis-à-vis CO2 taxation. The study centers on carbon taxation as a climate mitigation policy, given its capacity to comprehensively impact all sectors and actors within the economy by increasing the cost of carbon-intensive products. The implementation of carbon taxation across many countries underscores its significance as a potent policy tool and it is cited as the most cost-efficient in limiting carbon emissions (OECD 2013). In our between-subjects survey experiment, we presented respondents with varying information about either the economic or generational inequality aspects of carbon taxation as well as on the court ruling. By also providing information treatments that combine these inequality aspects, we assessed whether individuals prioritize one concern over the other. Our findings indicate that immediate economic concerns outweigh future generational concerns, generally reducing support for the policy. However, this negative impact is somewhat alleviated by the supportive signal from the court ruling.

Overall, our research contributes to existing literature by broadening the scope of research on climate policy attitudes (Kallbekken 2023). A better understanding of the climate policy's

effect on public opinion is crucial in light of the potential societal polarization that could be triggered by enacting more stringent climate change mitigation policies. Research has also shown that public opinion is important for policy implementation in general since politicians are more likely to go through with environmental policies (like green taxes) when it is favourable to the public (Elliott, Seldon and Regens 1997; Franzen and Meyer 2004; Tjernström and Tietenberg 2008; Anderson, Böhmelt and Ward 2017; Schaffer, Oehl and Bernauer 2022). In light of this, our emphasis on the Federal Constitutional Court ruling as a potential legal signal adds an important new perspective.

In the following section (Section 3.2), we review the existing literature, outline the theoretical arguments, and develop our hypotheses. Section 3.3 describes our methodological approach, details the main data source and how our research design addresses the hypotheses. Section 3.4 provides an overview over the main results of the paper, focusing first on the main hypotheses (concerning economic and generational inequality and the court ruling) before taking a closer look at heterogeneous effects across the treatment groups, specifically with regard to political preferences and judiciary trust. Section 3.5 provides a discussion and conclusion of the results.

3.2 Argument

We start from the premise that there is a strong economic inequality component to many climate change policies, especially to those that aim to change consumer behaviour by increasing the price of goods and services causing carbon emissions. Although such carbon taxation is often identified as one of the more cost-efficient ways of combating climate change (OECD 2013), this type of 'pay for your carbon footprint' policy comes with clear distributional consequences. Studies show that carbon taxation can be regressive, insomuch as poorer households are hit harder by carbon taxation (Gough 2013). The reason being that low-income earners are more strongly affected by increasing energy prices for heating and electricity because their demand for energy remains inelastic (Fouquet 2014; Schulte and Heindl 2017). As a consequence, and despite the overall smaller amount spent on energy costs, the lower-income deciles end up spending relatively more of their income on energy than higher income deciles (Flues and Thomas 2015). The corresponding inequality can lead to societal polarization when citizens object against these disadvantageous distributional consequences of carbon taxation as the protests of the Gilets jaunes in France in 2018 illustrate (Beiser-McGrath and Bernauer 2019; Fisher 2020; Douenne and Fabre 2022; Tatham and Peters 2022).

For this reason, many countries have implemented compensation mechanisms with the introduction of carbon taxation, where revenues are returned to households to soften the resulting inequality effects. However, the German government is lagging behind in this regard and at the time of designing and fielding our survey there was no clear consensus on how the CO2 compensation would work[11]. In our experiment we, therefore, refrained from providing information about compensation mechanisms since it would not have been in alignment with any actually proposed policies. In addition on a more theoretical note, experimental evidence exists showing that while compensating citizens through rebates can lead to a higher public support of carbon taxation, this effect is eliminated when respondents are additionally exposed to political messages about carbon pricing (Fremstad et al. 2022). This finding indicates that the framing of climate policies can be more important for individuals to make up their mind than the precise design of the respective policy. Therefore, our paper addresses this framing aspect.

A second important source of inequality arises from the intergenerational dynamics of climate change, which lead to skewed incentives against stringent climate policies: Since strong climate policies are typically associated with high present costs but with benefits that only occur in the future, governments seeking (re-)election tend to discount the benefits for future generations in favor of today's election chances (Congleton 1992; Bättig and Bernauer 2009; Bernauer et al. 2010). This suggests that there is a lack of supply of stringent climate policies. On the demand side, another perspective suggests why climate change action is not of (great) electoral importance to voters. Based on the widespread perception that climate change is a psychologically 'distant' problem, the argument contends that climate change policy demand is rather low, both because it will not affect everyone immediately, and because it is uncertain how large the consequences will be for different parts of society (Whitmarsh and Capstick 2018)[12]. There is, however, some criticism to the idea that psychological distance hinders climate change action. Recent research finds that most people do perceive climate change as psychologically close—occurring in the present, and close to home. Moreover, psychological

[11] Although the German government website promises that: *'there will not be an added burden on citizens in Germany as all the proceeds will be given back to them through funding measures and parallel relief measures [...]'* (German Federal Government 2020) and lists several measurements like reducing electricity prizes or a mobility premium, there was and – as of June 2024 – still is no formalized compensation mechanism in place nor has it been communicated to the public.

[12] Economists studying this 'distance' problem hypothesize that an additional element here is the increased complexity this temporal aspect adds to the decision-making process, which is what makes these carbon taxation policies unpopular (Tiezzi and Xiao 2016). In addressing this temporal issue and carbon taxation's unpopularity, research finds that giving people time to get used to the idea of carbon taxation policies (by moving forward the implementation by some years), and framing the policy objectives in more distant and ambitious terms improves public support (Silvi and Padilla Rosa 2023).

distance itself neither proves to be a consistent barrier to climate action, nor does its reduction increase it (van Valkengoed, Steg and Perlaviciute 2023).

Independent of these debates, the unfortunate incentive structure in electoral motivations has meant that most elected governments have supplied far too little and far too lenient climate policies (Bernauer 2013). At the same time however, delaying climate action implies more severe future consequences from—and higher costs of—fighting climate change, therefore, clearly disadvantaging the current young as well as future generations. The issue of climate change has always been most important among the youth and especially students, who have primarily made up the core of activists in climate movements (Grasso and Giugni 2022). Vice versa older generations may not perceive the risk as being great enough to act upon (Stevenson et al. 2014). With the emergence of the Fridays for Future movement in 2018, this generational inequality has found its way onto the streets of many countries and made this generational rift undeniable (Grasso and Giugni 2022).

Such youth activists were also pivotal in the lawsuit against the German government that led to the recent ruling by the German Federal Constitutional Court: In 2020, nine activists aged 15 to 32 brought their case to the court, seeking a review of the Federal Climate Protection Act. The 2021 ruling found the Act insufficient and sided with the young claimants, adding an interesting legal perspective to the economic vs. generational inequality debate. This is especially relevant, since over the past years youth have increasingly turned to climate litigation to advocate for climate policies worldwide (Parker et al. 2022). Thus, this court ruling allows us to test the impact of a successful pro-climate judicial ruling, particularly since many such cases are dismissed. Research about the effect of climate change litigation is—as of yet—scarce. Theoretically, researchers argue that it can be used as a tool by climate activists to favorably frame the topic in the public debate, therefore strengthening support for climate mitigation measures (Wonneberger 2024). Moreover, media coverage of such court cases can increase attention both by the public and by politicians (Wonneberger and Vliegenthart 2021). In addition, the court ruling could work as a judicial cue, influencing citizens' perceptions of what is 'right' to do and, therefore, strengthen support for climate mitigation policies by creating a new legal reality (Carattini, Carvalho and Fankhauser 2018).

The court ruling could also have an effect on how the social norm towards climate change mitigation is perceived by our respondents, and research has mentioned the possibility of changing norms as an influential factor for strengthening climate change support (Otto et al. 2020). Such an effect would be in line with existing literature that shows that comparable court

rulings can have a positive effect on citizens' acceptance of disputed issues (Stoutenborough, Haider-Markel and Allen 2006; Thompson 2022). Since citizens tend to orientate themselves towards elite cues (Hornsey and Lewandowsky 2022), the Federal Constitutional Court's ruling could thus send a positive signal, influencing respondents' views regardless of their political ideology. This may be especially the case in countries with high levels of judiciary trust (Caldeira and Gibson 1995; Gibson, Caldeira and Baird 1998; Gibson and Nelson 2014), like Germany (see Appendix 2.L) for an overview of the distribution of trust for various institutions). Moreover, such signals could boost citizens' trust, which is consistently cited as an important driver of tax support generally (Torgler 2003; Beuermann and Santarius 2006) and of green taxes and climate change policies in particular (Hammar and Jagers 2006; Drews and van den Bergh 2016; Maestre-Andrés, Drews and van den Bergh 2019; Levi 2021; Povitkina et al. 2021; Fairbrother 2022).

In our survey experiment, we investigate how individuals react to each of these different inequality aspects, economic and generational, separately and how they weigh off one against the other when they are primed with both types of inequality information. In addition, we test whether information about the court ruling reinforces the generational inequality aspect. More precisely, we provide respondents with either information about the generational inequality aspect of climate change, the economic inequality aspect or both. Based on above discussion, we theoretically expect that making individuals aware of the two different types of inequality will result in opposing effects: with respect to economic inequality, and tied to our first research question on the effect of learning about unequally distributed economic burdens, we argue that priming people about the economic strains of carbon taxation should result in less support for this policy instrument. This should be because of a combination of both an aversion to being personally affected by the economic costs (Brannlund and Persson 2012; Armingeon and Bürgisser 2021), and the important role of distributional fairness concerns highlighted in existing research (Gampfer 2014; Maestre-Andrés, Drews and van den Bergh 2019; Jagers et al. 2021; Povitkina et al. 2021; Bergquist et al. 2022; Douenne and Fabre 2022; Sommer, Mattauch and Pahle 2022)[13]. Therefore, our first hypothesis states:

Hypothesis 1*: Information about the economic inequality aspect of carbon taxation should decrease support for carbon taxation.*

[13] This opposition to carbon taxation policies is often tied to the perceived effectiveness of the policy in addressing climate change (Dietz and Atkinson 2010; Dechezleprêtre et al. 2022; Douenne and Fabre 2022).

In contrast, if respondents are primed to consider the generational inequality associated with climate change, they should increase their support for carbon taxation. Again, we expect this because of people's fairness concerns, in this case, however, with regard to future generations and the young. When respondents are primed exclusively on generational inequality, we thus expect support for carbon taxation to increase, leading to our second hypothesis:

Hypothesis 2*: Information about the generational inequality aspect of climate change should increase support for carbon taxation.*

When combining the two types of information, we expect the effect of economic inequality to weigh stronger because of its immediate effect and because it more clearly connects to a material loss frame (Kahneman and Tversky 2013). Theoretically, it is likely that negativity bias induces respondents to process negative information systematically different, and to put more weight on this information compared to positive information (Cacioppo and Berntson 1994; Rozin and Royzman 2001). We thus expect individuals to be more responsive to the losses, i.e. costs, compared to future benefits, and that the impact of the generational treatment might be diminished. Our third hypothesis is, therefore, as follows:

Hypothesis 3: *Information about both economic and generational inequality should decrease support for carbon taxation.*

Finally, making people aware of the court ruling should reinforce the generational inequality information and thus result in more support for carbon taxation. Additionally, it could (at least partially) offset the negative effect of raising awareness to the economic inequality attached to carbon taxation. Hence, we argue that informing (or reminding) respondents of the court ruling has a positive effect on their sentiment towards the carbon taxation policy:

Hypothesis 4: *Information about the court ruling should increase support for carbon taxation.*

3.3 Methods

3.3.1 Research design

We conducted a between-subjects survey experiment (2*4 randomization groups) in which our 6319 respondents are asked about their support for carbon taxation in Germany[14]. To test hypotheses 1-3, respondents were first randomized into one of four (equal and balanced) groups

[14] The research design obtained approval from the University of Konstanz Ethics Commission.

that feature a priming statement about: (1) generational inequality, (2) economic inequality, (3) both types of inequality (with the order of the two priming treatments being randomized) and lastly (4) a control group that does not receive any further information (see Appendix 2.A for more information on the survey experiment). The generational inequality statement gives respondents the information highlighting that the carbon taxation policy will mainly benefit younger future generations, whereas the economic inequality statement highlights the unequal economic impact of such a tax increase. To test hypothesis 4, half of the sample additionally received information about the German Federal Constitutional Court ruling. This treatment highlights the German Federal Constitutional Court's ruling in 2021, which ruled that the state is obligated to take more comprehensive climate protection measures. The random assignment of respondents to different experimental vignettes creates groups that are similar on average on (un)observed characteristics, allowing us to ascribe any difference in their policy support across groups to the differences in the vignettes. Power analyses based on pretests of our study design show that we can detect a change of half a point on our answer scale between framing groups with a power of 100% on the conventional statistical significance level of 5%[15].

Following the experiment, respondents were asked whether they supported the carbon taxation policy. Our outcome measure ranges from 1, no support, to 5, full support for carbon taxation. The survey includes standard socioeconomic items (age, gender, household income, household wealth, education, political preference, area of residence). A full overview over the variables used in the analysis can be found in Table 3.1 and further information on research design is available in appendices 2.A and 2.B. To test our theoretical predictions, we pool all randomization groups (N = 6319) and run ordinary least squares regression models, with robust standard errors, which we use to determine the differences between the groups. Regression tables are in the Appendix.

We recognize that the generational and economic inequality treatments do not necessarily convey the exact same information: The economic inequality treatment focuses solely on current costs whereas the generational treatment considers current costs in exchange for future benefits. While we know that individuals are likely more responsive to losses, i.e. costs, compared to benefits, and that therefore the generational treatment might be perceived to be less strongly worded, we deliberately chose the benefit formulation due to the following reason.

[15] See our pre-registration entry at the AEA RCT Registry: www.socialscienceregistry.org/trials/9745 (which also includes more information on the power analyses).

Table 3.1: Summary statistics

	Mean	SD	Min	Max	N
Priming Gen./Econ. inequalities	2.50	1.12	1	4	6319
Court treatment	0.50	0.50	0	1	6319
Policy acceptance	2.92	1.24	1	5	6137
Policy satisfaction	1.67	0.87	1	3	5711
Gender	1.51	0.50	1	2	6306
Age	48.53	17.06	18	89	6319
Education	2.05	0.83	1	3	6319
Migration background	0.09	0.29	0	1	6319
Left-Right (Categorical)	1.93	0.57	1	3	5719
Party preference w/ miss	4.17	2.30	1	7	6258
Trust (general)	3.81	2.58	0	10	6195
Political trust	3.95	2.18	0	10	6271
Household size	2.23	1.09	1	8	6319
Household income (Categorical)	5.38	2.73	1	10	5870
Former East/West Germany	0.15	0.36	0	1	6319

Note: Summary statistics for the variables used in the analysis. The control variables include gender, age, education background (low, middle and high education—not including tertiary education or higher), migration background (binary), Left-right category (categorical variable indicating whether the respondent self-identifies as left, centre or right), party preference (categorical variable indicating which party the respondent prefers, which includes the missing category), household size, household income (in income categories), East/West Germany (a binary variable indicating whether the respondent lives in former eastern Germany) and trust items. All trust items in the analysis are on scales, ranging from 0–10. We use items on 1) trust in the general population and 2) political trust as control variables throughout the analysis.

Highlighting only the costs could mislead respondents about potential future environmental costs, which are uncertain. Furthermore, we wanted to ensure that our approach was (a) consistent with the scientific consensus that there will be costs regardless, and (b) clear and understandable for a layperson. This approach, while potentially making the generational treatment seem less impactful, provides a more accurate description of reality. This, however, implies that the effect of the treatment is rather a lower bound of the generational effect. Moreover, since we are interested in the combined effect of our different treatments, formulating the generational treatment in terms of benefits has the advantage that we can assess whether it can compensate for the negative effect of people's loss aversion induced by the economic inequality prime.

The survey experiment also refrains from addressing compensation mechanisms, despite its relevance to the economic frame. Thereby the experiment to some extent fails to account for the realism of the actual cost that an increase in carbon taxation would incur to the individual.

This is because the compensation mechanisms in Germany are very unspecific (German Federal Government 2020), and at the time of designing the survey experiment (Spring 2022), there was no consensus among the political parties on how the CO2 compensation would work[16]. As of April 2024, there is still no clear consensus on the payout of the compensation.

3.3.2 Data

Our data is from the Inequality Barometer, a reoccurring survey by the Cluster of Excellence, 'The Politics of Inequality', representative of the adult German population in terms of age, gender, and education at the NUTS-2 level (Schönhage et al. 2024b). Respondents were recruited using a commercial online access panel (linked to Kantar) and surveyed via computer-assisted web interviewing (CAWI). The survey was piloted in October 2022 and fielded 14 November–2 December 2022[17]. We received 6319 complete responses (a response rate of 39.9% complete responses from the invited panel). To ensure representativeness across gender, age, and education, the dataset includes sampling weights to adjust for remaining imbalances resulting from quota sampling.

Table 3.1 provides the summary statistics and thus an overview of the main variables as well as the control variables used in the analysis[18].

3.4 Results

3.4.1 Economic inequality, generational inequality and the court ruling

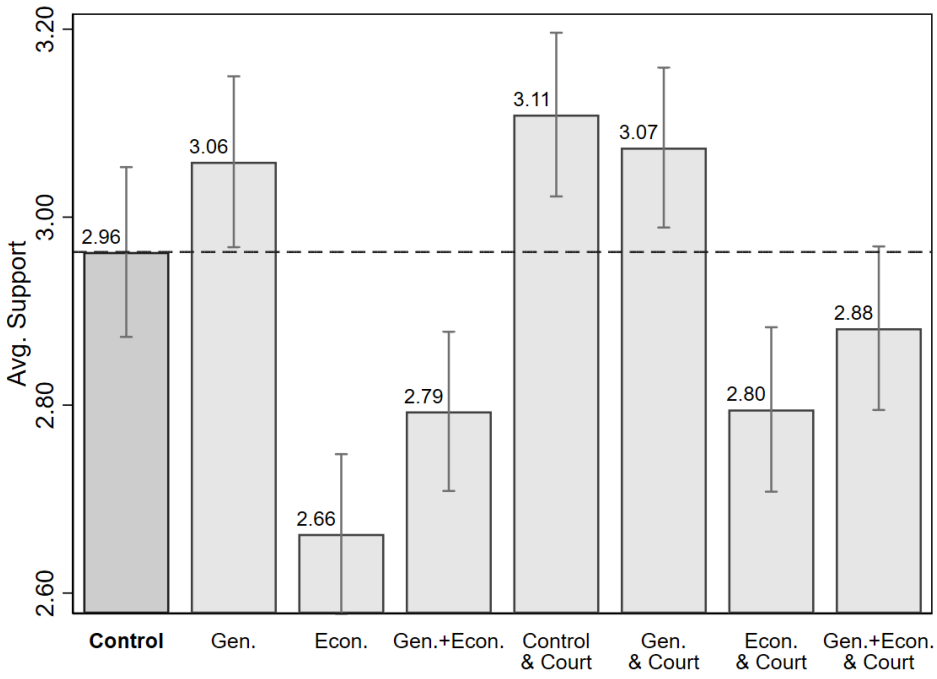
Figure 3.1 and Figure 3.2 provide an overview of the main results of our survey experiment. While Figure 3.1 shows the average policy support by treatment group, Figure 3.2 displays the

[16] The German government website promises that: '*There will not be an added burden on citizens in Germany as all the proceeds will be given back to them through funding measures and parallel relief measures. The Federal Government will use proceeds from CO2 pricing primarily to reduce the renewable energy levy and therefore electricity prices. In addition, there will be a rise in the tax-deductible commuting allowance, a mobility premium will be granted, and measures of the Climate Action Programme 2030 will be funded—to promote climate-friendly transport and energy-efficient buildings.*' German Federal Government 2020.

[17] Cognitive pretests were conducted in September 2022 before the survey launch. Cognitive pretest participants received an online survey, and while they responded, they were interviewed via video call. The interviews asked respondents to give spontaneous feedback and probed for their perceptions and comprehension of specific elements. 20 interviews were conducted, and the interviewees were diverse in age, gender, and educational background.

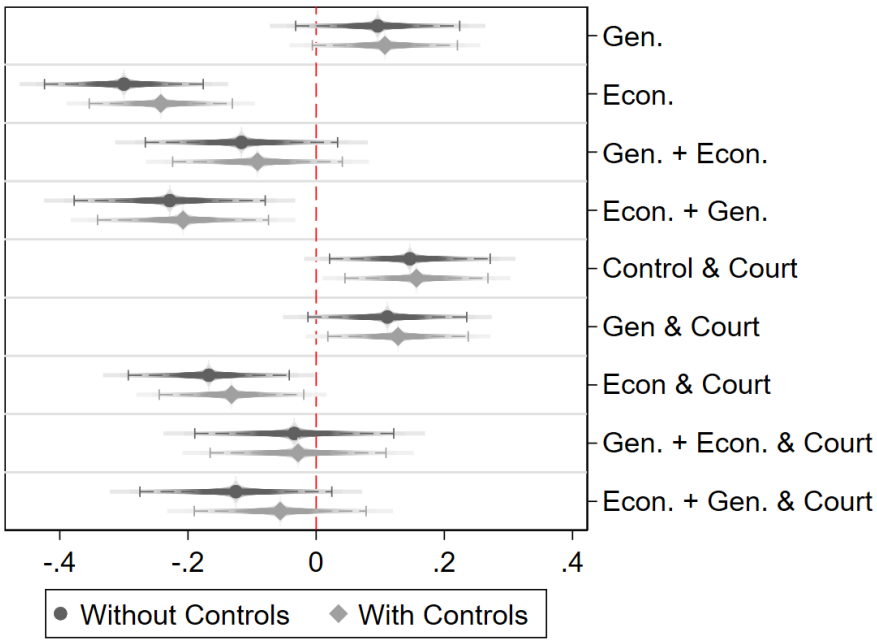
[18] Balance tests are provided in Appendix 2.C and indicate no significant differences in the treatment groups along any of the individual-level background characteristics available to us, highlighting the successful random allocation across our treatment groups. The dataset and the code for this study are available in the GESIS Dataverse repository (https://search.gesis.org), part of the Consortium of European Social Science Data Archives (CESSDA) https://datacatalogue.cessda.eu/. It can be found at: https://doi.org/10.7802/2756.

Figure 3.1: Subgroup acceptance of CO_2 pricing



Note: Mean of respondents' policy support (measured on a scale from 1 to 5) with 95% confidence intervals. See Appendix 2.D for regression estimates.

Figure 3.2: Priming effect



Note: Results from the regressions in Appendix 2.D, where the control group is used as the baseline category.

corresponding effect sizes. At first glance, all priming effects appear to align with our hypotheses, which we discuss in more detail below. Figure 3.2 additionally shows that the effects of our primes do not change when controlling for additional factors.

Specifically, the following aspects in Figure 3.1 are noteworthy. First, general support for carbon taxation in our sample is rather moderate, which aligns with previous findings on carbon taxation policy support in Germany (Umit and Schaffer 2020; Dechezleprêtre et al. 2022). The control group has a mean support level of 2.96, which is equivalent of being neither in favor nor against carbon taxation. A noteworthy finding, in our view, as carbon taxation is one of the cornerstones of the German government's climate policy and such tempered support levels imply that the general population seems to need further convincing with regard to the importance of this policy measure. Second, while respondents primed with the generational inequality ('Gen.') treatment are more supportive of the tax (in comparison to the control group) – as is in line with hypothesis 2 –, the difference just fails to reach the traditional levels of significance. As such, the data does not validate this hypothesis. In contrast, hypothesis 1 is supported by the data: respondents primed with the economic inequality treatment elicit the strongest effect, significantly reducing the support for carbon taxation. It even results in a significant negative effect when combined with the generational priming[19]. This is in line with hypothesis 3, and the theoretical and empirical literature: The acute and immediate economic concerns of citizens tend to trump their environmental concerns in general (Maestre-Andrés, Drews and van den Bergh 2019; Armingeon and Bürgisser 2021; Povitkina et al. 2021), but also their concerns for the (more distant) effect of climate change on future generations[20]. It is thus not surprising, that once respondents are primed with both the generational and economic inequality, the economic priming prevails in driving changes in support. This illustrates the gap in inequality concerns between the immediate and the future.

What is interesting to note here is that analyzing the policy support for the economic inequality treatment by respondents' household income produces no significant interaction effects (see Appendix 2.F). This indicates that the economic inequality treatment has a negative effect on all respondents, regardless of how low or high their income is. This suggests that respondents are rather sociotropically motivated in their responses (as opposed to egotropic) -

[19] Respondents receiving this treatment were further randomized into two separate groups with alternating orders, with the intention to eliminate any potential order effects of the treatments. The order effect fails to reach traditional levels of statistical significance, indicating that there are no order effects for the treatments. This is also confirmed by t-tests in Appendix 2.I.

[20] In further analyses, we controlled for whether our respondents currently have children in their household or not. Comparing these subgroups shows no clear differences between groups (see Appendix 2.M4).

meaning that the responses are largely driven by fairness concerns across the sample (Bergquist et al. 2022; Kallbekken 2023).

The second randomization tests hypothesis 4 – whether the court ruling might act as a cue able to mitigate the gap between the economic and generational inequality treatments. The four latter bars in Figure 3.1 show how this court ruling interacts with the prime treatments. Starting with the fifth bar ('Control + Court'), we observe that the court treatment, when respondents receive no other prime, significantly increases support for carbon taxation[21]. This is in line with our theoretical expectations: People are more likely to support the carbon taxation policy if they are made aware (or reminded) of the court ruling.

We observe that adding the court treatment partly compensates for the negative impact that the economic inequality priming has on the support for the carbon taxation policy[22]. The drastic decline in support for respondents who receive the economic inequality treatment ('Econ.') is slightly alleviated by the court treatment, and the predicted support increases by approximately 5 percentage points ('Econ. + Court'), thereby partially mitigating the impact of the economic inequality priming[23]. This finding indicates that such a court ruling overall has a positive impact on climate mitigation policy support, and may aid in garnering public support for such tax increases. In the following section, we shed more light on these findings.

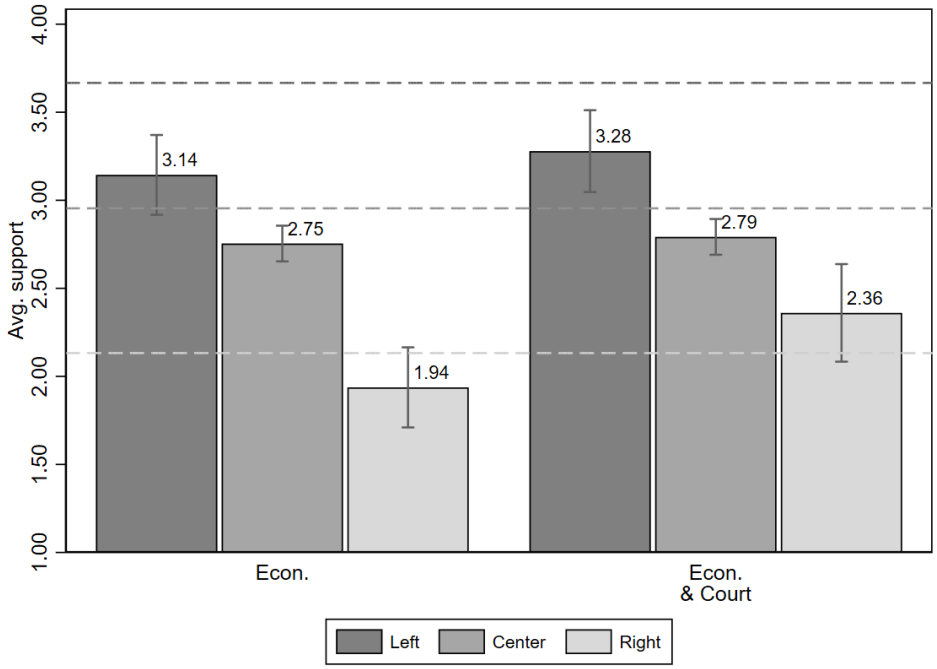
3.4.2 How does a judicial precedent bridge the gap?

In this section we examine the court effect more closely with a special focus on how it affects different subgroups (see Appendix 2.M for more results). In doing so, we are especially interested in analyzing the groups that are commonly identified as being less inclined to support climate change mitigation policies—like conservative, right-leaning citizens (Dechezleprêtre et al 2022). We do this by analyzing the effects by left, centre and right political ideology separately.

The results in Figure 3.3 and Figure 3.4 show that across all political alignments, respondents who receive the court information in addition to the economic prime tend to shift upwards in

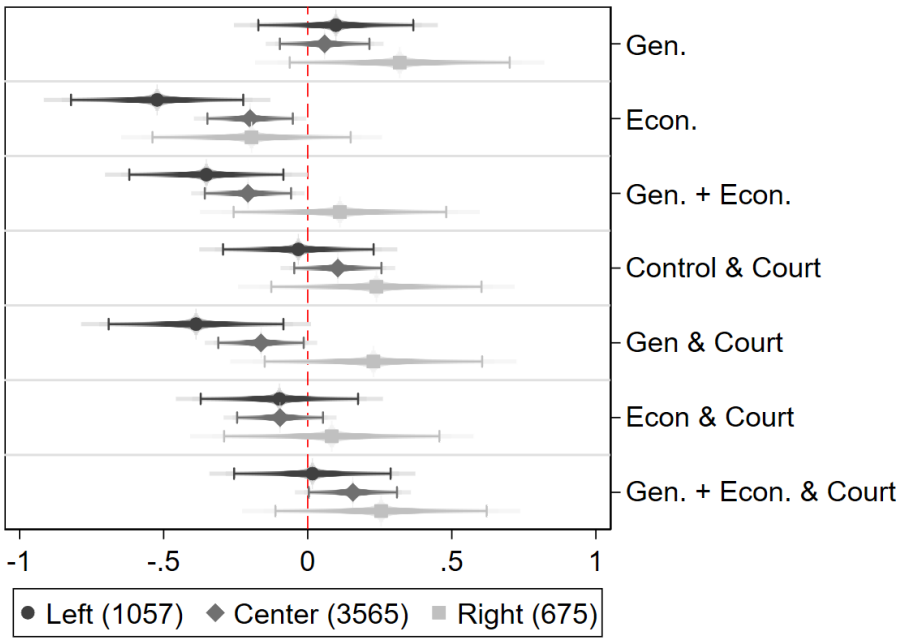
[21] We calculate that being informed about the court ruling increases strict support of the policy by approximately 7 percentage points. See column 1 in Appendix 2.D for the effect size estimate.
[22] Despite the direct effect the court treatment has on policy support, we do not observe general interaction effects between the generational and economic inequality primes and the court treatments when using interaction models. See Appendix 2.K.
[23] See column 1 ('Econ.'), in Appendix 2.D for the effect size estimate, where the 5 percentage points is based on subtracting the effect size of the 'Econ.' treatment by the effect size of the 'Econ. & Court' treatment.

Figure 3.3: Acceptance of CO_2 pricing by political alignment



Note: Mean of respondents' policy support (on a scale from 1 to 5) with 95% confidence intervals for our economic prime groups vs. the economic prime group that additionally receives the court information. The baseline support of the control group for the respective political alignments is shown as horizontal lines.

Figure 3.4: Priming effect by political alignment



Note: Prime effects for each political alignment group in comparison, control group is used as the baseline category. See Appendix 2.G for full results.

support (as seen by the right-wards shift Figure 3.4). This effect is especially pronounced among the right-leaning respondents, who are the only group for which their policy support shifts in a statistically significant way (as the difference between the two light-grey bars in Figure 3.3 is significant based on a t-test, see Appendix 2.J). This indicates that respondents who are politically conservative are the most responsive to the court treatment, and that alleviating the negative effect of the economic prime seems to work especially well for this group. This contrasts with previous findings that show that conservative voters (who are generally more opposed to carbon taxes) seldom change their views, even when provided with information about receiving compensation for these taxes (Mildenberger et al. 2022) – indicating that conservative voters need a specific type of information for their views to change. However, as most of our respondents identify themselves as being in the political center, the group of right-leaning participants is quite small. There may thus be potential under-reporting in subjective left-right positioning[24].

Furthermore, it is worth noting that the effect of the court treatment occurs regardless of whether respondents trust the judiciary institutions or other related governmental institutions. As can be seen in Table 3.2 below, the interaction effects between the various trust items in our survey and the court treatment are consistently not significant. This indicates that the court treatment has a positive effect on policy support regardless of people's trust, which is an interesting addition to existing research linking institutional and general trust to citizens' tax policy support. According to this literature, we would expect especially citizens with high institutional trust to be receptive to our court treatment, as individuals with higher levels of trust are generally more receptive to elite cues. We, however, find that trust does not enter into the equation when the signal comes from a type of court that stands at the top of the judicial system and above the political landscape. It rather seems like the judicial cue is acting like a general boost of citizens' trust in and therefore support for the carbon tax. In this context, it is interesting to note that the judicial trust in our sample is higher than in other trust items (i.e. politicians, parties, the federal government and the EU parliament—see Appendix 2.L for an overview of trust distributions). This could mean that the missing trust in politicians and parties is mitigated by the court's more trustworthy signal. A caveat to this finding is that we cannot carve out the exact mechanism at play. There may be a ceiling effect in our data: the observed

[24] This leads to rather large confidence intervals in Figure 3.4. As a robustness check we also assess party affiliation in Appendix 2.H. Supporters of parties typically considered right of centre (CDU/CSU, FDP and AfD) tend to have a much less negative effect in the 'Econ. & Court' treatment (and positive for FDP), as compared to left of centre parties.

Table 3.2: Interaction between Court treatment and trust in institutions

	1	**2**	**4**	**5**	**6**
Court	.167***	.134*	.131**	.172***	.093*
	(.060)	(.077)	(.059)	(.060)	(.056)
Bundestag	.125***				
	(.009)				
Court × Bundestag	**–.013**				
	(.011)				
Judiciary		.092***			
		(.008)			
Court × Judiciary		**–.003**			
		(.011)			
Parties			.116***		
			(.010)		
Court × Parties			**–.006**		
			(.012)		
EU Parliament				.124***	
				(.009)	
Court × EU Parliament				**–.014**	
				(.011)	
Trust (general)					.063***
					(.009)
Court × Trust (general)					**.002**
					(.012)
Constant	2.546***	2.673***	2.611***	2.507***	3.001***
	(.122)	(.129)	(.124)	(.125)	(.122)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	5566	5574	5566	5532	5562

*Note: The table displays the results of linear regressions. The outcome variable we use is policy acceptance, and asks whether the respondent support the carbon trading policy on a scale from 1 ('Do not agree at all') to 5 ('Fully agree'). Court is a dummy variable indicating whether the respondent received the court treatment. The variables Bundestag (the German Federal parliament), Judiciary, Politicians, (political) parties and EU Parliament are all trust questions. These are all phrased 'How much do you trust the following institutions?' on a scale from 0 ('Do not trust at all) to 10 (Trust completely). The 'Trust (general)' variable is measured on the same scale, and asks about the general trust in regards to other people.***, **and * indicate statistical significance at the 1%, 5% and 10% level, respectively.*

pattern might be driven by respondents with higher levels of judicial trust being less affected by the court treatment since their policy support is already high. Additionally, the court information might not be new to individuals, as it received extensive coverage in the media.

This treatment effect may thus be a lower bound since it just serves as a reminder for the respondents.

3.5 Discussion and conclusion

Our findings show that priming individuals with economic inequalities results in a much stronger reaction compared to priming individuals with generational inequalities. In particular, respondents who received information on economic inequalities show less favorable attitudes toward a carbon tax than any other group in our experiment. Since we find this effect for all economic groups, we consider it to be largely due to fairness concerns rather than individual egotropic (i.e. economic pocketbook) motivations. We interpret these findings to mean that while respondents care about the impact of climate change for future generations, they care even more about the unequal burden of certain policies to combat climate change, in our case a carbon tax, on the poor. In our view, this finding is important as it directly speaks to recent literature on how to compensate the losers of climate policies (Klenert et al. 2018; Beiser-McGrath and Bernauer 2019; Gaikwad, Genovese and Tingley 2022; Mildenberger et al. 2022; Schaffer 2024). The lack of a consistently significant effect of the generation treatment may be related to its framing: research finds that reframing carbon taxation policy does not tend to do much to change people's minds (Bernauer and McGrath 2016) – and this generational framing may just be one of those framings of carbon taxation that does not go far enough. In reality, we are constantly exposed to varying frames about the costs and benefits of the different types of climate policy measures. Individuals' prior attitudes, knowledge and interests on climate change policies are already influenced by information from media end their social environments. To some extent, this information abundance could weaken our treatment.

In contrast, making individuals aware of the German Federal Constitutional Court ruling results in more positive views on carbon taxation. The court ruling additionally partially mitigates the negative effect of the economic inequality treatment. A simple reframing in terms of an elite cue, therefore, does seem to work. Furthermore, we find that the court ruling is equally effective regardless of how much respondents trust judiciary institutions. Based on the populism literature we may well expect that respondents with lower trust in institutions (and higher suspicions of the 'corrupt elite out-group'), would react negatively to the court ruling, as it effectively acts as an elite cue (Mudde 2004). This, however, does not happen in our survey. We think it would be a promising avenue for future research to take a closer look at the effect of similar rulings in other countries. One could thereby account for pro- and anti-climate

outcomes, and investigate whether different courts or legislative systems yield distinct effects. Moreover, climate litigation can bring the issue into the political and public discourse (regardless of the outcome), which already has the potential to sway public opinion (O Neill and Alblas 2020). This is especially interesting as we are witnessing increasing judicial action on behalf of the climate all around the world (Peel and Osofsky 2018; Setzer and Vanhala 2019; Setzer and Higham 2022). Based on the literature dealing with legislative politics, one can argue that our findings are likely generalizable to most countries with constitutional courts that have high levels of public support and trust (Caldeira and Gibson 1995; Gibson, Caldeira and Baird 1998; Gibson and Nelson 2014). In contrast, it has been demonstrated that individuals can interpret judicial rulings through the lens of their partisan affiliations, which potentially constrains the applicability of our findings in highly polarized societies with overtly politicized courts (Clark and Kastellec 2015; Engst, Gschwend and Sternberg 2020; Rogowski and Stone 2021; Mazepus and Toshkov 2022).

We also find that the court ruling is especially effective with groups that are traditionally less supportive of carbon taxation policies—like conservative, right-leaning, older and less educated respondents. With regard to policy implications, this finding indicates that altering the legal reality could potentially increase support of carbon mitigation policies, particularly within demographic groups that typically require more persuasion. Thus, both policy makers and activists striving for more ambitious climate regulation might want to take this legal signaling effect into account. Moreover, it is noteworthy that the court case was fairly present in the German media, so the effect of making people aware of the ruling can be seen as a lower bound (as respondents are likely to already have been aware of it).

The effect of the court treatment is, however, also one aspect, which future research could investigate in further detail. One potential limitation of our study is that we cannot pinpoint the exact mechanism by which the court ruling increases support levels for carbon taxation. While we have shown that it is not necessarily via institutional trust, we still do not know whether the effect mainly runs via elite cuing or rather a general increase in public and political attention. Another limitation of our study and something that future research might want to test is whether generational inequality if presented in a (future) loss frame would result in a more pronounced increase in support levels for climate mitigation policy.

We interpret the overall findings as a cautionary reminder that implementing strong carbon taxation remains challenging, even in a climate where many young people go to the streets and protest against the generational inequalities and for more extensive climate policies. Rather it

seems highly important to take the economic inequalities that are typically attached to climate change policies seriously, to think about proper compensation mechanisms and to carefully consider the framing of climate policies. Additionally, it is important to consider alternative institutions that may aid in combating climate change – like harnessing the power of judicial action.

4 3rd Research Paper: Can't Buy Me Love: Rural Compensation Mechanisms Fail to Increase Carbon Tax Support

Theresa Wieland

Abstract

Carbon taxes are widely recognized as effective tools for reducing emissions, yet public opposition – often tied to perceptions of unfairness – remains high. A common concern is that rural populations are disproportionately burdened due to greater reliance on cars and limited public infrastructure. This study examines whether a compensation mechanism that explicitly addresses such disparities can improve support for carbon taxation. Austria offers a valuable case: it is the only country where rurality-based variation is a central and highly visible feature of the carbon tax rebate system. Using a preregistered survey experiment (N = 1,186) on a representative Austrian sample, I test the effect of different information framings. Results show that highlighting the rural differentiation in the rebate does not significantly increase overall support for the carbon tax. While the regional framing produces the strongest positive response among rural and right-leaning respondents, these effects remain modest. Across all groups, political attitudes exert a much stronger influence on tax support than any information treatment. These findings suggest that even targeted compensation mechanisms fail to meaningfully shift public opinion when citizens have already made up their minds.

4.1 Introduction

To mitigate climate change, emission reduction is a central objective of environmental policy. Among the various policy tools available, carbon taxation is frequently cited as one of the most cost-effective mechanisms for achieving emission reductions (OECD 2013). By assigning a monetary cost to carbon emissions, such taxes seek to internalize the environmental externalities of fossil fuel use, thereby discouraging high-emission behaviors and shifting consumption and investment toward greener alternatives. However, despite their economic efficiency, carbon taxes tend to be highly unpopular with the public (Carattini, Carvalho and Fankhauser 2018). As a result, understanding how to increase public support and reduce opposition has become a key challenge for implementing effective climate policy – especially given evidence that public opinion is related to policy outcomes. Early research shows that, in cross-national comparisons, higher public concern about climate change is associated with greater reductions in greenhouse gas emissions (Tjernström and Tietenberg 2008), and more recent works find that public opinion shifting towards more environmental and climate-friendly viewpoints positively affects the output of corresponding renewable energy policies in Europe (Anderson, Böhmelt and Ward 2017) and climate policies in OECD countries (Schaffer, Oehl and Bernauer 2022). In the U.S., states are more likely to adopt climate policies when public concern and attention are high (Bromley-Trujillo and Poe 2020).

While public support increases the likelihood of green policy implementation, public opposition is also common and has, in many cases, proven to be a decisive barrier to its adoption. Examples include the repeal of Australia's carbon pricing scheme, the rejection of carbon tax initiatives in the U.S. state of Washington, and the abolition of Canada's federal consumer carbon tax (Crowley 2017; Harrison 2012). Yet the most prominent case is the Yellow Vest protests in France in 2018, which were sparked by a planned increase in the national carbon tax. However, and importantly, many French protesters were not opposed to climate action itself, but rather to the perceived unfairness and implementation design of the tax reform (Douenne and Fabre 2020; Gagnebin, Graichen and Lenck 2019). This has been the case in many movements against climate policies (Ewald, Sterner and Sterner 2022) and aligns with research showing that most people around the world do believe in climate change and worry about its consequences (Poortinga et al. 2019). A recent wide-scale study across 125 countries even found that public support for climate action (measured as the willingness to contribute a small percentage of one's income) is internationally widespread, and most citizens believe that their governments should do more to fight global warming (Andre et al. 2024). Given this, understanding the barriers that prevent individuals from supporting specific climate

policies appears more important than attempting to shift underlying climate change attitudes, since these attitudes tend to be broadly pro-climate and not the main drivers of policy opposition.

One commonly proposed approach to reduce opposition to carbon taxation is to implement a rebate system concurrently with the tax itself. This mechanism lessens the financial burden and returns tax revenues directly to the public (see Section 4.2.3 for further discussion on mitigation mechanisms). Several countries have adopted compensation schemes to offset the costs of carbon taxation, including Canada's former "Canada Carbon Rebate" and Switzerland's redistribution through social security and health insurance. Austria recently joined these countries and implemented a carbon tax (called "carbon pricing"[25]) in October 2022, with a mitigation mechanism also including a rebate payment. However, the payout in Austria is varied specifically by rurality and public infrastructure, thereby shifting the focus toward urban-rural disparities.

Urban–rural disparities are frequently mentioned in public discourse as a reason for the unpopularity of carbon taxes. A common perception is that rural populations are disproportionately burdened by carbon pricing due to greater reliance on private vehicles, carbon-intensive heating systems, and limited access to public infrastructure. While the extent to which this holds true varies across contexts (Wang et al. 2016) and has been questioned in academic debates (Beck, Rivers and Yonezawa 2016), the sentiment that rural residents are being disproportionately hit by carbon taxation remains widespread in the population. Respective concerns have also been found in focus group and survey studies across multiple countries (Baranzini and Carattini 2017; Hope, Limberg and Steinebach 2025; Ewald, Sterner and Sterner 2022; Harwatt et al. 2011; Kallbekken and Aasen 2010; Povitkina et al. 2021).

In light of these prevalent concerns, it seems to be a promising avenue of research to explore whether explicitly addressing perceived rural disadvantages within the design of compensation mechanisms can help reduce opposition to carbon taxation. This study therefore examines the case of Austria, which is thus far the only country to have introduced a carbon tax alongside a rebate system that explicitly varies by rurality and the availability of public infrastructure from the outset.

[25] Technically, Austria's "carbon pricing" policy introduced in October 2022 is a national emissions trading scheme with a fixed price per tonne of CO_2 during its initial phase. While not formally a tax, it functions equivalently to one by setting a rising, predefined price trajectory (€30/tCO_2 in 2022, increasing to €55/tCO_2 by 2025), and is often referred to as such in public and political discourse. It applies to emissions not already covered under the EU Emissions Trading System (EU ETS), primarily from the transport and heating sectors. Accordingly, the terms *carbon pricing* and *carbon tax* are used interchangeably in this paper.

To examine the effect of the regional compensation mechanism on public support for carbon taxation, I fielded a preregistered information provision experiment (N = 1186) in March and April 2025 in Austria, using a sample representative of the adult population. The experiment featured multiple treatments, each making participants aware of different aspects of the Austrian rebate scheme. The findings indicate that while providing information about the regional differentiation does decrease perceptions of inequality, the framing alone does not significantly increase overall support for carbon taxation. Only when combined with information about the social redistribution aspect of the policy, a modest positive effect emerges. However, the regional framing does stand out when focusing on the most rural respondents, where it produces the strongest increase in support – though overall levels of support remain low. The same pattern is observed among right-leaning, conservative participants. Additional analyses show that political orientation has a much stronger effect on attitudes toward the carbon tax than informational treatments or rurality, highlighting the role of partisan polarization in climate policy debates.

4.2 Background

4.2.1 Why are carbon taxes unpopular?

There is broad consensus in the literature that carbon taxes are unpopular with the public, and multiple reasons have been identified to explain this opposition (Carattini, Carvalho and Fankhauser 2018). A primary reason is their direct impact on consumer prices: individuals tend to oppose measures that raise the cost of everyday goods and services, particularly energy and fuel. These so-called pocketbook concerns, centered on personal financial burdens, have been widely documented across various countries (Armingeon and Bürgisser 2021; Beiser-McGrath and Bernauer 2024; Brannlund and Persson 2012).

Beyond individual cost considerations, carbon taxes are also perceived as socially regressive. Because lower-income households typically spend a larger share of their income on energy and have lower price elasticity, they are disproportionately affected by carbon price increases in the absence of compensatory mechanisms (Flues and Thomas 2015; Gough 2013; Schulte and Heindl 2017). When not adequately addressed through such measures (see Section 4.2.2), these regressive effects lead to perceptions of unfairness and reduce public support (Drews and van den Bergh 2016). Thus, opposition is not solely rooted in self-interest but also broader normative concerns about equitable burden-sharing. In fact, concerns about the immediate

economic fairness of climate mitigation policies even seem to outweigh perceptions about their long-term benefits for future generations (Schönhage et al. 2024a).

Another prominent fairness concern relates to the perception that large-scale polluters, such as corporations, are insufficiently held accountable, while ordinary citizens have to shoulder the burden of climate policy (Povitkina et al. 2021). These institutional and accountability-based concerns add to perceptions of injustice surrounding carbon taxation. Overall, fairness considerations – encompassing both economic and procedural dimensions – play a central role in shaping public evaluations of climate policy (Bergquist 2025). Notably, two recent meta-analyses find that perceived fairness even exerts a stronger influence on support for climate policies than perceived effectiveness, for both climate mitigation and sustainable transport policies (Bergquist et al. 2022; Isaacson et al. 2024).

While economic fairness has been the focus of much of the existing literature, regional and place-based fairness concerns have gained increasing scholarly attention as important drivers of opposition to climate mitigation policies (Beiser-McGrath, Stutzmann and Zhang 2025; Gazmararian 2025; Im 2024; Stutzmann 2025). Moreover, studies consistently find regional fairness concerns being mentioned as important for climate tax support throughout multiple countries (Baranzini and Carattini 2017; Hope, Limberg and Steinebach 2025; Ewald, Sterner and Sterner 2022; Harwatt et al. 2011; Kallbekken and Aasen 2010; Povitkina et al. 2021).

Though these concerns can overlap with economic grievances, they often go beyond them. For example, Povitkina et al. (2021) distinguish between distributional fairness (concerning unequal outcomes) and procedural fairness (concerning perceived injustices in decision-making). While concerns about rural populations' greater reliance on private vehicles reflect a distributional logic, others are more procedural in nature. Hope, Limberg and Steinebach (2025) show that rural residents in the UK are more likely to feel systematically disadvantaged by government decisions and to view carbon taxes as part of a broader pattern of unequal treatment. The perception of being treated unfairly, therefore, seems to go deeper than the simple distributional impact of climate policies. Furthermore, there is evidence for this broader sense of injustice being intertwined with questions of identity and belonging. Studies suggest that climate policies are sometimes perceived as designed by and for urban elites, ignoring the everyday realities of rural populations (Harrison and Peet 2012; Tallent 2025). In this sense, regional discontent is not merely about who pays more, but about who is seen to matter in the political process. Understanding how policy design can respond to these spatially grounded grievances is thus a pressing challenge for climate policy research.

4.2.2 The role of compensation mechanisms

Since public discontent with climate policy can trigger political backlash (Colantone et al. 2024; Stutzmann 2025; Voeten 2025), policymakers are increasingly attentive to designing climate instruments in ways that enhance public approval. As discussed above, perceptions of fairness are central to public support for carbon taxes. A commonly proposed strategy to increase fairness – and therefore acceptability – is the concurrent implementation of carbon taxation and a compensation mechanism aimed at mitigating the financial burden for citizens (Jagers et al. 2021). Typically, this is done by redistributing part or all of the revenue generated by the carbon tax back to the population. Compensation can take various forms, including direct cash transfers (mostly through lump-sum payments), reductions in income or payroll taxes, or cuts to social insurance contributions. These formats differ not only in their economic implications but also in how visible and salient they are to the public (see Section 4.2.3).

There are several design options for such compensation schemes, both in the academic literature and in real-world policy (Klenert et al. 2018). One prominent proposal involves equal rebates to all residents. This approach tends to have a progressive net effect, as lower-income households typically emit less, pay less in carbon taxes, and thus receive a rebate that exceeds their additional costs. Moreover, research shows that citizens generally prefer progressive to regressive tax designs, therefore favoring schemes perceived as fairer in their distributional outcomes (Hedegaard and Kongshøj 2024).

Other studies find that targeted transfers to especially vulnerable groups, such as low-income or high-energy-cost households, may be slightly more popular in certain contexts (Carattini et al. 2017). Moreover, earmarking some revenues for green infrastructure can additionally boost public support of taxes (Bürgisser, Stadelmann-Steffen and Armingeon 2024; Maestre-Andrés et al. 2021), while using them for corporate tax cuts seems to be rather unpopular (Beiser-McGrath and Bernauer 2019).

Because this literature has already been extensively reviewed elsewhere (Carattini, Carvalho and Fankhauser 2018; Drews and van den Bergh 2016; Maestre-Andrés, Drews and van den Bergh 2019), this section provides only a brief overview. Overall, existing research consistently finds that compensation mechanisms enhance public support for carbon taxation. However, there is still no consensus on which design features are most effective, and public preferences appear to be highly context-dependent (see Mohammadzadeh Valencia et al. 2024 for a recent meta-analysis). Notably, a review of the existing literature suggests that no systematic research has yet addressed these questions in the Austrian context. However, recent studies in German-

speaking countries suggest that universal lump-sum payments are generally preferred over targeted transfers to households with low income or high energy costs (Woerner et al. 2024; Sommer, Mattauch and Pahle 2022).

Crucially, while this evidence suggests universal lump-sum payments are slightly preferred over targeted benefits for vulnerable groups, none of the studies explicitly identify rural populations as such a group. Given the growing focus on urban–rural disparities and rural grievances in the context of carbon tax backlash, it is particularly timely to examine how a compensation mechanism designed specifically with these spatial concerns in mind is perceived by the public. This paper responds to that gap by empirically investigating whether explicitly addressing rural–urban disparities within a carbon tax rebate system can improve public support.

4.2.3 The Austrian case

The carbon tax compensation mechanism of Austria stands out due to the high visibility of its rebate payments and the explicit focus on rurality and infrastructure in the design. The rebate is paid annually to individuals who have resided in Austria for at least six months, typically via direct bank transfer, with the amount determined by the rurality and infrastructure level at the registered primary residence. To ensure transparency, the government created a website explaining the classification system, allowing residents to check their category, and made maps showing the distribution of the four payout categories publicly available.

Austria's approach differs from other rebate systems in key ways. In Switzerland, rebates are largely invisible, as they are integrated into annual social security accounting. In Canada, while rebates were paid as direct transfers, they were issued per household rather than per person, and the rural supplement (10%, later 15% after protests) was modest and not prominently communicated as a central design feature. Canada's carbon pricing system was also implemented unevenly, with provinces like British Columbia already operating their own carbon tax before the federal policy was implemented, and only later adding a rural supplement in response to backlash (Beck, Rivers and Yonezawa 2016).

By contrast, Austria introduced its carbon tax uniformly nationwide in 2022 and, from the outset, linked it to a compensation mechanism explicitly designed to address urban–rural disparities. This spatial differentiation was a prominent element of the communication strategy and likely reflected a political compromise between the governing Green Party and the conservative ÖVP, which has a strong rural voter base. Austria can thus be considered a "most-

likely case" (Flyvbjerg, Denzin and Lincoln 2018; Levy 2008) for the success of targeted mitigation design in reducing rural opposition to carbon pricing, given the visibility and spatial specificity of its compensation mechanism[26]. If such a design fails to improve public perceptions of fairness in burden-sharing, the value of explicitly addressing urban-rural disparities may be limited in less tailored contexts.

To date, no empirical studies appear to have examined how the Austrian public perceives the national carbon tax and its associated rebate system. The most comparable literature comes from neighboring Switzerland: Mildenberger et al. (2022) conducted a survey experiment in which Swiss citizens were informed about the country's rebate system, shown an exemplary social insurance slip (where the rebate is recorded), and invited to retrieve their own social insurance slip. They find a statistically significant increase in carbon tax support among treated participants, although the effect remains quite small. Similarly, Fremstad et al. (2022) used a calculator embedded in a survey to estimate participants' expected tax costs and rebate payments. Their findings indicate that awareness of rebates increases support among lower-income households and right-leaning respondents. However, this effect disappears when respondents are additionally exposed to political messaging about the rebate.

These findings suggest that, in a context similar to Austria's, compensation mechanisms can increase public support for carbon taxation, particularly among skeptical subgroups. However, the success of such measures depends heavily on how clearly the policy and its associated benefits are communicated to the public. Maestre-Andrés, Drews and van den Bergh (2019), in their review of the literature, also identify that citizens' satisfaction with governmental information provision is an important determinant of carbon tax support. In Austria, the simultaneous implementation of the carbon tax and rebate, clear communication from the outset, the visibility of direct annual cash transfers, and the cross-ideological backing of the governing coalition created conditions that should be favorable for the Austrian rebate system to mitigate opposition to carbon taxation.

While the academic literature on Austria's carbon tax is still limited, some relevant studies exist. A survey experiment by Bolte et al. (2024) shows that attitudes toward carbon taxation

[26] Although the Austrian carbon tax and its regionally differentiated rebate were introduced as a joint policy package in 2021, the first rebate payment after the start of the carbon pricing in October 2022 was issued as a higher flat lump sum (500€) to all residents, regardless of rurality. This was a temporary adjustment made in response to the European energy crisis and broader inflation-related concerns. While the regional differentiation was part of the original policy design and clearly communicated from the beginning, this initial uniform pay-out may have limited the perceived salience of the spatial element in the first year. However, by the time of this study's survey fieldwork in April 2025, the regionally staggered version of the rebate had already been paid out for both 2023 and 2024.

differ by political orientation, with conservative respondents being significantly more opposed. However, the study focused solely on tax acceptability and did not provide information about the compensation mechanism, leaving open the question of how respondents would react to the integrated rebate system. In addition, Eisner, Kulmer and Kortschak (2021) analyze the distributional effects of various carbon pricing models in Austria and find that while carbon taxation alone risks regressive outcomes, a range of compensation mechanisms can effectively mitigate such effects. Notably, the authors identify a geography-based transfer system as the most equalizing design in their analysis, as it achieves the largest reduction in the Gini coefficient. This indicates that Austria's regional rebate scheme has the potential to address both rural grievances and economic inequality simultaneously.

Compared to other European countries, Austria ranks in the middle range on two major predictors of carbon tax support – political trust and climate change beliefs (Fairbrother, Johansson Sevä and Kulin 2019:7). Similarly, in cross-national comparisons of general carbon tax support prior to implementation with data from 2016, Austria also occupies a mid-range position (ibid.). The country thus does not represent an outlier in terms of either attitudes or institutional context, making it a relevant and informative case from which to draw broader conclusions about the design and reception of carbon pricing schemes.

4.3 This study

Given the extensive evidence in the literature that urban–rural grievances reduce public support for carbon taxation, this study investigates whether a compensation mechanism that explicitly targets rurality and infrastructure can mitigate such opposition. To examine this question, I focus on the case of Austria, which introduced a carbon tax along with a regionally differentiated rebate system in 2022. The empirical strategy consists of two components.

First, to assess the development of carbon tax support among different subgroups over time, I draw on panel data from the Austrian Corona Panel Project (Kittel et al. 2020), covering the years 2020, 2021, and 2023. This longitudinal perspective makes it possible to track changes in public opinion before and after the introduction of the carbon pricing scheme and its accompanying compensation mechanism (see Section 4.4).

Second, I conducted an original information provision experiment in April 2025. In this survey, respondents were randomly assigned to receive different framings related to the Austrian rebate system, after which they were asked about their attitudes toward carbon taxation and their perceptions of policy fairness (see Section 4.5). This design allows me to assess the

level of public awareness regarding the regional differentiation in the rebate system, and to test whether making this feature salient affects support for the carbon tax.

4.3.1 Hypotheses

In relation to the information provision experiment, I formulate the following hypotheses[27]:

Given the recurring finding across multiple countries that rural respondents are generally less supportive of carbon taxation than their urban counterparts, I expect a similar pattern in Austria. Although the regional compensation mechanism may help to alleviate urban–rural grievances, it cannot be assumed that the entire population is aware of its existence or design. Despite the comparatively high visibility of the Austrian mechanism (in part because the rebate is delivered through direct cash transfers), not all recipients will necessarily realize that the payout amount is differentiated by region. I therefore hypothesize:

H_1: Without treatment, the carbon pricing support of urban respondents will be higher than those of rural respondents.

Next, I assume that informing respondents about the regional compensation mechanism in Austria will increase support for carbon pricing across all subgroups. This expectation is based on prior findings showing that public evaluations of carbon taxes are not solely shaped by self-interest or direct financial impact. Rather, people care about whether the policy is perceived as fair for society as a whole. Because rural populations are often seen as more affected by carbon pricing due to their dependence on driving, I expect that addressing this perceived imbalance through compensation will improve fairness perceptions and strengthen public support. I therefore hypothesize that:

H_2: If respondents are informed about the regional compensation mechanism, their carbon pricing support will be higher compared to the control group of respondents who do not receive the information treatment.

Finally, although I expect that information about the compensation mechanism will increase support across the board, I anticipate that this effect will be particularly pronounced among rural respondents. This expectation is based on two considerations: first, rural residents receive the highest rebates and are thus the primary beneficiaries of the mechanism; second, support

[27] The experimental design and all hypotheses are preregistered at: https://osf.io/c8gze

levels in this group are generally lower, making ceiling effects less likely and leaving more room for upward movement. I therefore hypothesize:

H_3: This effect will be especially strong for rural respondents (compared to urban respondents).

4.4 Austrian carbon tax support over time

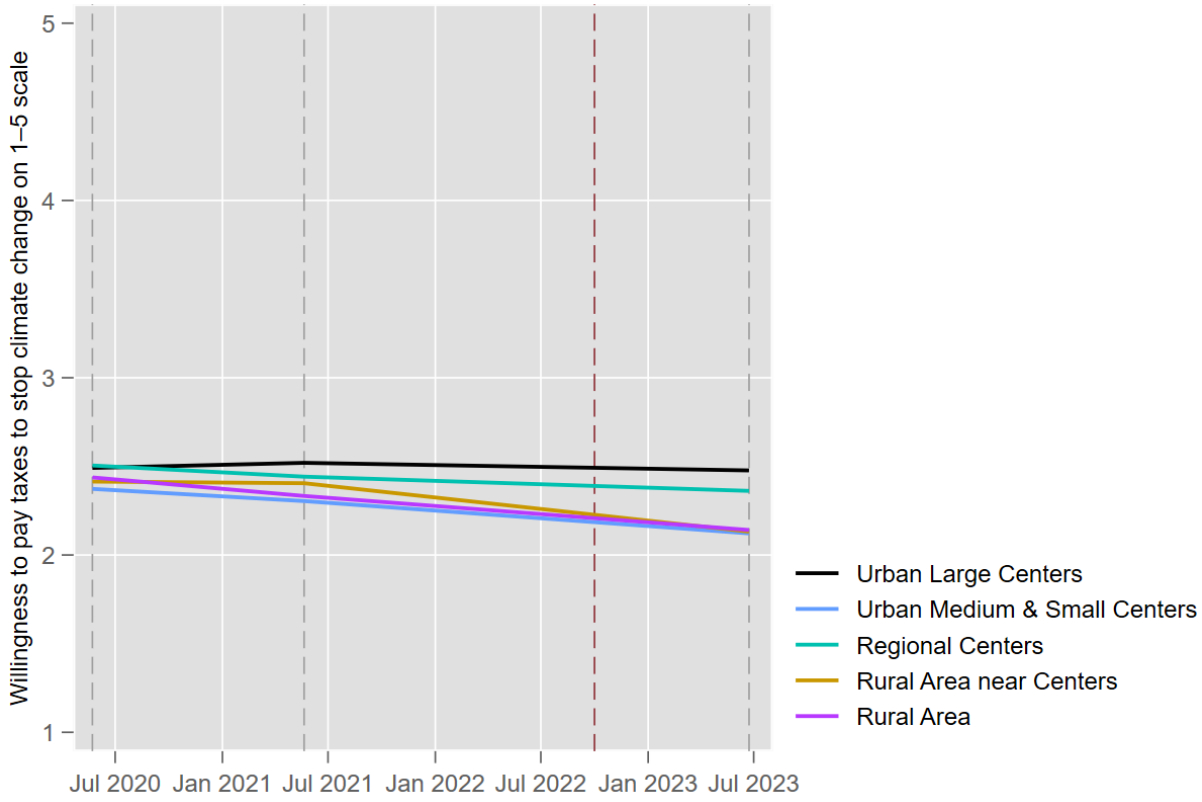
Before turning to the results of the survey experiment, this section presents descriptive data from the Austrian Corona Panel Project (ACPP) (Kittel et al. 2020). The ACPP is an ongoing panel study that began on 27 March 2020 in Austria. While initially designed to monitor public opinion during the COVID-19 crisis, later waves broadened the scope to include additional topics, including climate-related attitudes. Relevant for the present analysis is a survey item measuring whether respondents find it acceptable to pay higher taxes to combat climate change. This question was included in three survey waves: May 2020 (wave 9), May 2021 (wave 23), and June 2023 (wave 35). In addition, the survey also includes information on respondents' municipality size, enabling a disaggregation of attitudes by rurality.

The timing of the waves allows for a longitudinal view of evolving public opinion in relation to carbon taxation. The first wave (May 2020) predates the announcement of Austria's carbon pricing scheme (October 2021), the second (May 2021) follows the announcement but precedes implementation (October 2022), and the third (June 2023) takes place after the tax had been introduced and the first rebate payments issued. This sequencing provides a useful window into how public attitudes may have shifted before and after the policy rollout.

Figure 4.1 presents the development of public support for climate-related taxation in Austria from 2020 to 2023, disaggregated by municipality type[28] according to the official rurality classification of Statistics Austria. Respondents were asked to indicate their agreement with the statement, "It is acceptable for me to pay higher taxes to stop climate change", on a scale from 1 (not at all) to 5 (fully). The data reveal a general decline in willingness to pay climate-related taxes across most municipality types over the observed period. Moreover, support tends to be higher in more urban areas and decreases with increasing rurality. An exception to this trend

[28] For readers wondering how this relates to the rebate payments: While Figure 4.1 relies on official municipality classifications to capture rurality, additional analyses using the regional rebate categories – which determine rebate amounts based on location and infrastructure – yield highly similar trends. The correlation between municipality type and rebate category is r = 0.84. Willingness to pay higher taxes remains highest in the most urban areas and lowest in the most rural, and the introduction of the carbon pricing and compensation mechanism does not appear to have altered the downward trend or shifted the relative differences between groups (see Appendix 3.A)

Figure 4.1: Willingness to pay taxes over time by rurality



Note: Data from the Austrian Corona Panel Project.: Respondents' willingness to pay higher taxes to stop climate change on a scale from 1 to 5 over time. Mean values condensed by rurality categories from Statistics Austria. Grey vertical lines represent the timing of the survey waves, while the red line indicates the implementation date of Austria's carbon pricing scheme. N=1,437 (wave 23); 1,453 (wave 9); 1,482 (wave 35)

appears in medium-sized urban centers and small centers, where support is consistently lower than in other categories.

The implementation of carbon pricing in 2022, alongside the introduction of the regional compensation mechanism, does not appear to have reversed or halted this downward trend. While all respondents showed quite similar approval in the beginning, opinions diverge as time passed. However, the differences are comparably small – in absolute terms, average willingness to pay remains fluctuates only modestly between approximately 2.1 and 2.5 on the 5-point scale.

However, this descriptive evidence does not necessarily imply that the regional compensation mechanism had no effect. The analysis is based on aggregated trends, and it remains unclear whether respondents were aware of the regional differentiation in rebate payments or which specific category they belonged to. Additionally, the first rebate distributed in 2022 took the form of a uniform lump-sum payment for all residents, introduced in response to the energy crisis (see footnote 25). As a result, the visibility and salience of the regionally

staggered compensation mechanism may have been limited during this period. Furthermore, the survey item used in the panel is phrased broadly and does not ask about support for the Austrian carbon pricing scheme specifically, but rather measures general willingness to pay higher taxes to combat climate change. While this provides a rough indicator of public attitudes, it may not accurately reflect views on the implemented policy or its compensation design.

Finally, no more recent wave of the panel includes the same tax support item after the first differentiated payment was issued in Autumn 2023. Consequently, the panel data alone cannot fully assess the effect of the regional mechanism on public support. The following section, therefore, turns to the survey experiment, which allows for a more targeted examination of whether informing Austrians about the regional compensation mechanism increases support for the carbon pricing policy.

4.5 Survey Data and Methods

To better understand Austrians' perceptions of their national carbon pricing system and the accompanying regional compensation mechanism, I fielded an information provision survey experiment in April 2025. The survey was conducted online over 16 days, and respondents were recruited through a professional Austrian panel provider. A total of 1,210 individuals residing in Austria participated in the study. After excluding respondents with missing data or implausible responses, the final sample consists of 1,186 participants. An attention check was included in the questionnaire to ensure data quality by screening out inattentive respondents who did not correctly follow the instructions embedded in the item.

The sample is representative of the adult Austrian population in terms of gender, age (18 years and older), education, and municipality size. To account for the study's focus on urban–rural grievances, the smallest and most rural municipalities were slightly oversampled (by 4 percent). All participants provided informed consent prior to beginning the survey. Ethical approval was obtained from the Institutional Review Board (Ethics Committee) of the University of Konstanz. Sample size and power analyses were conducted in advance and documented in the preregistration of the study (see https://osf.io/c8gze). On average, respondents required approximately 11.5 minutes to complete the survey.

The survey began with a series of questions concerning respondents' socioeconomic characteristics, their perception of the rurality of their place of residence, and their political

Table 4.1: Focus of each framing group

Basic Info (Control)	Regional	Social	Regional + Social
CO_2 emissions contribution to Climate Change, Implementation of the carbon tax in AT	(Basic Info) + Regional differentiation	(Basic Info) + Benefit for low-income households	(Basic Info) + Regional differentiation + Benefit for low-income households

attitudes[29]. This was followed by the implementation of the information provision experiment. A between-subjects design was used, with respondents randomly assigned to one of four framing groups. Each group was presented with different information about the Austrian compensation mechanism (see Table 4.1 for an overview). The control group received only basic information stating that the Austrian government had introduced a carbon tax in 2022. In contrast, the regional framing group received additional information emphasizing that a compensation mechanism was implemented alongside the carbon tax, which provides a rebate to all residents of Austria, with the amount varying by the rurality and public infrastructure of their place of residence. The treatment text for this condition was adapted from official government communication materials, but was shortened and simplified for improved readability. The social framing group was not informed about the regional differentiation, but instead received information highlighting the redistributive character of the lump-sum payment, specifically that lower-income households tend to benefit more from the rebate than higher-income households. This enables a comparison of whether public opinion is more responsive to the general existence of a rebate or the specific targeting of rural regions. The final group, referred to as the regional + social framing group, received both sets of information[30], allowing evaluation of a potential additive effect.

To ensure that participants were sufficiently exposed to the information, respondents were required to remain on the treatment page for a minimum duration that varied based on the length of the treatment text and both treatments included a figure, illustrating the information further – a map of the distribution of the regional rebate in Austria for the regional treatment and a

[29] For descriptive statistics of respondent characteristics see Appendix 3.F.

[30] To control for potential order effects, the treatment group receiving both framings was split in half: one subgroup was shown the social framing first, the other the regional framing first. A t-test revealed no significant differences in policy support responses between the two subgroups; consequently, they are treated as a single group in the following analyses (see Appendix 3.B).

figure illustrating the impact of the rebate for different income groups for the social treatment (see Appendix 3.G for the information provision experiment and treatment wordings).

Following the experimental treatments, respondents answered a series of questions evaluating their perceptions of Austria's carbon pricing and compensation system. The primary outcome measure is support for the Austrian carbon tax, measured on a 5-point Likert scale ranging from 1 ("very much against") to 5 ("very much in favor").

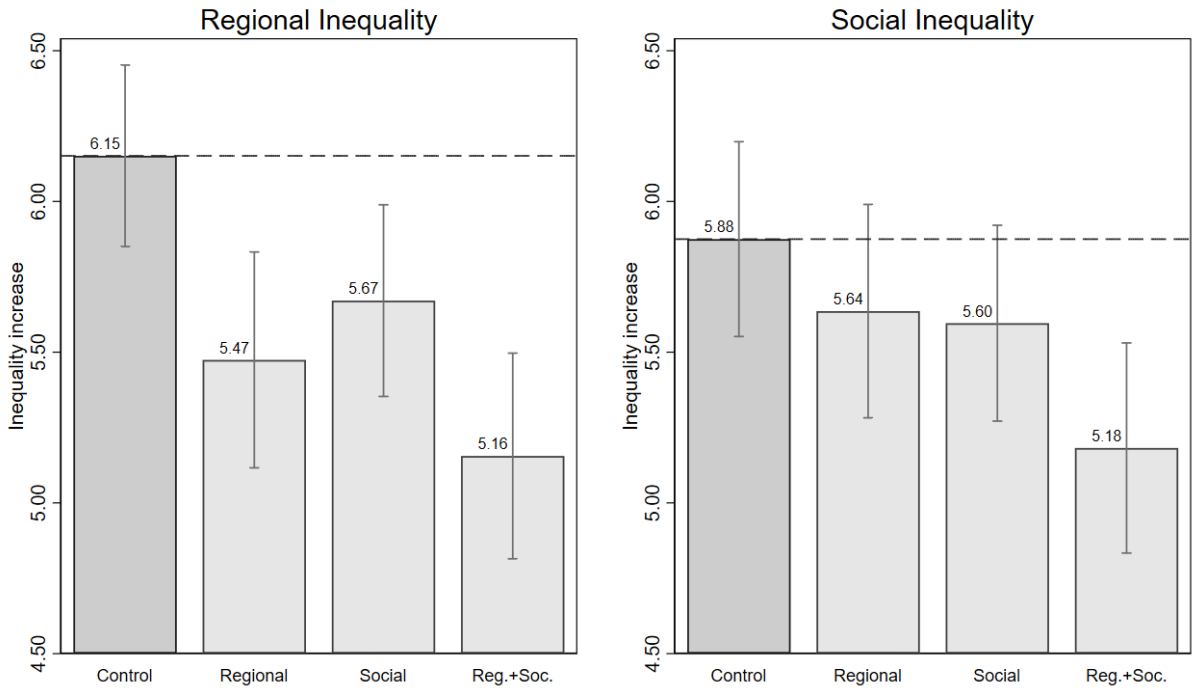
To test the hypotheses put forward in Section 4.3.1, I conduct one-sided independent t-tests to compare mean carbon tax support across experimental conditions and relevant subgroups. Additionally, binary logistic regression models are employed to estimate the effect of the treatments while controlling for key covariates such as socioeconomic status and political attitudes. For this purpose, support is coded as a binary variable, where responses of "in favor" and "very much in favor" are treated as indicating support. Details on robustness checks are reported in the Appendix 3 (see Appendix 3.C).

4.6 Results

This section presents the empirical findings from the information provision experiment conducted in Austria. The analyses proceed in two steps. Section 4.6.1 examines the average treatment effects of the regional compensation mechanism on support for the carbon tax, using both descriptive statistics and one-sided t-tests to test the hypotheses formulated in Section 4.3.1. Section 4.6.2 explores heterogeneity in treatment effects across political and sociodemographic subgroups, with particular attention to ideological divides. Results from logistic regression models using both the survey and ACPP data supplement the analysis by assessing the relative influence of prior political attitudes on respondents' support for the carbon tax.

Before analyzing treatment effects, a brief check on baseline awareness of the compensation mechanism was conducted. Following the treatment, respondents were asked whether they had already known about the regional compensation mechanism prior to the survey, had only learned about it through the information presented in the experiment, or remained unfamiliar with it. A large majority (95%) reported being aware of the rebate system beforehand, while 2% indicated they had learned of it through the survey, and 3% stated they were still unfamiliar with it. Respondents who claimed no knowledge of the rebate mechanism but had received one of the information treatments (regional, social, or both) were excluded from further analysis, as this indicated they had not properly engaged with the survey.

Figure 4.2: Perceived Inequality Increase over Treatment Groups



Note: Mean inequality perceptions across treatment groups by type of inequality. Respondents indicated their agreement to the increase in inequality from 0 (not at all) to 10 (absolutely).

However, awareness of the rebate's existence does not necessarily imply understanding of its content or implications. To assess whether respondents comprehended the information provided in the framing texts, a manipulation check was conducted using two follow-up items. Respondents were asked to indicate their agreement (on a scale from 0 = not at all to 10 = absolutely) with the following statements: "CO_2 pricing and the associated political measures in Austria are leading to greater social inequality in society" and "CO_2 pricing and the associated political measures in Austria are leading to greater regional inequality in society".

Figure 4.2 presents agreement levels with both statements by treatment group. Respondents exposed to the regional framing were less likely to perceive regional inequality compared to the control and social framing groups. The difference between control and regional framing group is statistically significant ($Pr(T > t) = 0.0021$, $\alpha = 0.05$). This indicates that respondents have read and understood the information in the framing texts. Moreover, it suggests that awareness of the regional differentiation mechanism reduces perceived urban–rural inequalities. While the social framing also slightly reduced regional inequality perceptions, it was not as effective as the regional framing.

Regarding social inequality, differences between the control and social framing groups were comparatively smaller than those observed for regional inequality. However, baseline

agreement with the statement on regional inequality was higher than for the statement on social inequality, which may help explain the stronger framing effect in the former case. Notably, respondents who received both the regional and social framing reported the lowest perceived levels of both regional and social inequality. This suggests that the two framings may reinforce each other when presented in combination.

Taken together, these findings provide support for the validity of the experimental manipulation: respondents engaged with the information treatments, and the treatments influenced perceptions in the intended direction.

4.6.1 The effect of the regional rebate system on public support for carbon taxes

To assess the effect of the regional compensation mechanism on public support for carbon taxation, this subsection first presents descriptive differences in tax support across treatment and control groups, followed by statistical tests of the hypotheses formulated in Section 4.3.1.

The main outcome variable was measured immediately after the experimental treatment and asked respondents: "What do you think of the CO_2 pricing measure in Austria? Are you more in favor or more against?" The response options ranged from 1 (very much against) to 5 (very much in favor). Figure 4.3 shows average carbon pricing support across the four treatment groups. On average, support is just below the scale midpoint of 3, indicating a neutral stance overall. Neither the regional nor the social framing produced a significant increase in support. In fact, average support in both groups is slightly lower than in the control group. Only the combined regional and social framing group shows a marginally higher average level of support than the control group, but the difference is very small. These findings suggest that, although the information treatments were able to reduce perceived inequality (as shown above), this shift in perception did not translate into higher support for carbon pricing. In other words, even if respondents acknowledge that inequalities are being addressed through the rebate system, this recognition does not necessarily affect their broader approval of the policy.

However, these are the results for the full sample. Given that the regional rebate system was designed primarily to address rural disadvantages, it is relevant to examine treatment effects within rural and urban subgroups. Figure 4.4 displays average support across treatment groups, disaggregated by municipality size, an objective measurement of rurality, and by respondents' subjective perception of how rural their place of residence is. For the objective measurement, support appears somewhat higher in larger municipalities, particularly those with more than

Figure 4.3: Mean Tax Support over Treatment Groups

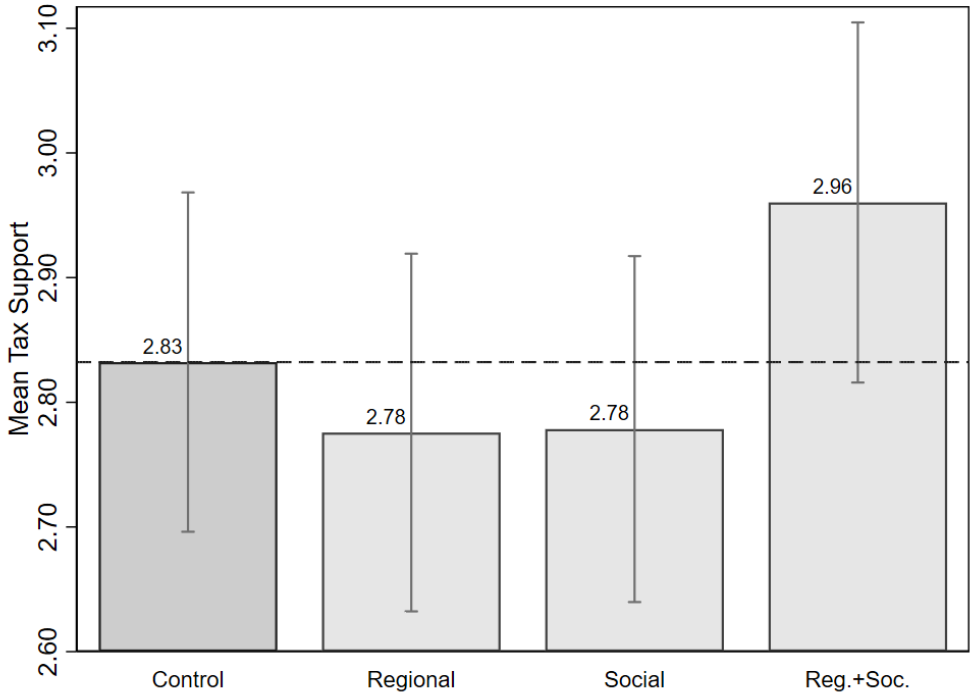
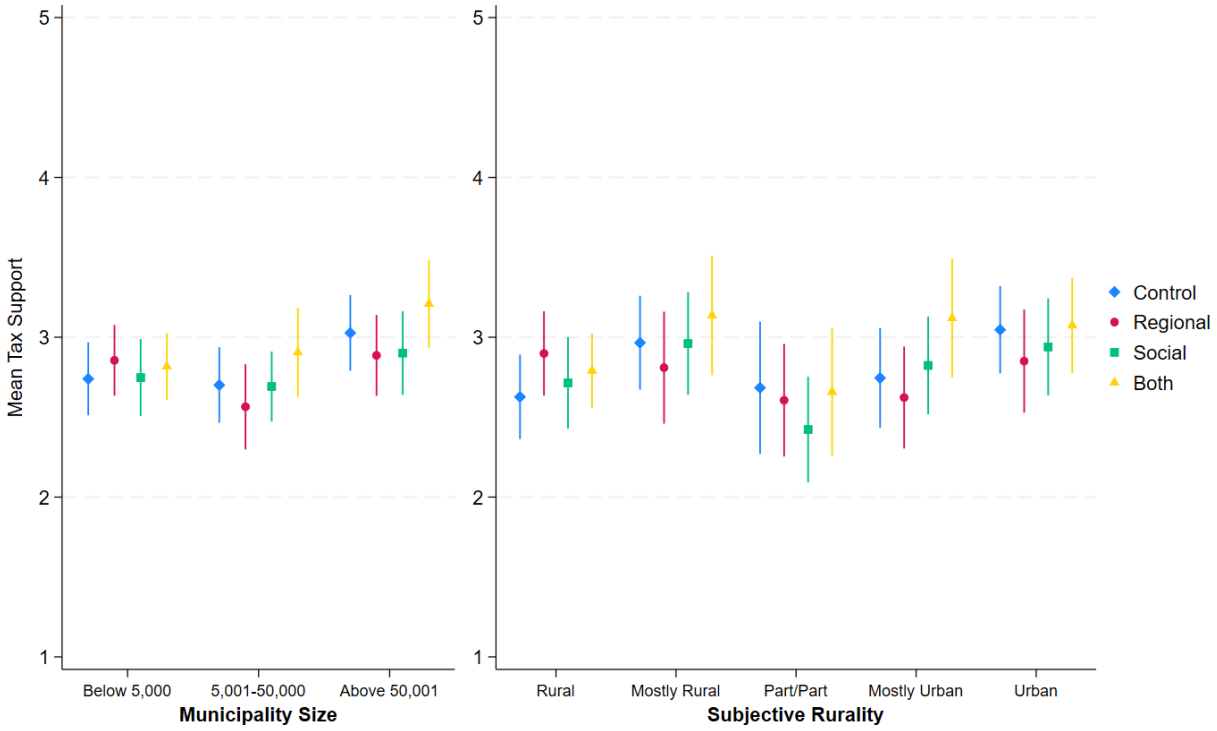


Figure 4.4: Mean Tax Support by Rurality



Note: Mean tax support across treatment groups by objective (= municipality size) and subjective rurality. For the subjective measurement respondents were asked, "Which of these terms best describes your place of residence?", with answers ranging from 1 (rural) to 5 (urban). The x-axis reflects the five response categories.

50,000 residents, while remaining relatively stable across smaller categories (below 50,000 residents). Notably, and in line with theoretical expectations, the regional framing shows the strongest positive effect in the most rural category. However, no comparable effect is observed among respondents from larger municipalities. For the subjective measurement, results follow a similar pattern, with the most urban subgroup showing the highest support in the control category. Notably, the effect of the regional framing appears even stronger for the most rural subgroup when using the subjective measure. However, as with the objective measurement, no comparable effects are observed among respondents in any of the less rural categories, and support levels among the mid-range subgroups vary considerably.

To formally test the hypotheses, a series of one-sided t-tests was conducted. H_1 posited that without treatment, urban respondents would show higher support for carbon pricing than rural respondents. To evaluate this, the analysis uses the objective measurement and compares the most rural respondents (municipalities under 5,000 inhabitants) to the most urban respondents (municipalities over 50,000 inhabitants) within the control group, which serves as the untreated baseline. The results reveal a statistically significant difference in means ($Pr(T < t) = 0.0447$, $\alpha = 0.05$), confirming H_1. However, the difference in average support is small (2.79 compared to 3.00).

The second hypothesis proposed that respondents who received the regional compensation framing would exhibit higher support for the carbon tax than those in the control group. A one-sided t-test comparing the full samples of the control and regional framing groups finds no statistically significant difference ($Pr(T < t) = 0.7130$, $\alpha = 0.05$). This result aligns with the descriptive findings in Figure 4.4, which showed no increase in support for the two larger municipality categories. As such, H_2 must be rejected.

Finally, H_3 suggested that the effect of the regional compensation framing would be especially strong among rural respondents. While Figure 4.4 indicates that the regional framing led to higher support in the smallest municipality category, it also shows that support declined in mid-sized and urban municipalities, counter to expectations of a general positive effect. Moreover, even within the most rural subgroup – where the framing appeared to have the intended effect – a t-test comparing the control and treatment groups does not yield a

statistically significant difference ($Pr(T < t) = 0.2371$, $\alpha = 0.05$). Therefore, H_3 also cannot be supported[31].

In summary, while H_1 regarding baseline rural–urban differences in support can be confirmed, H_2 and H_3 concerning the effect of the regional framing on carbon tax support must be rejected.

4.6.2 Subgroups and the role of ideology

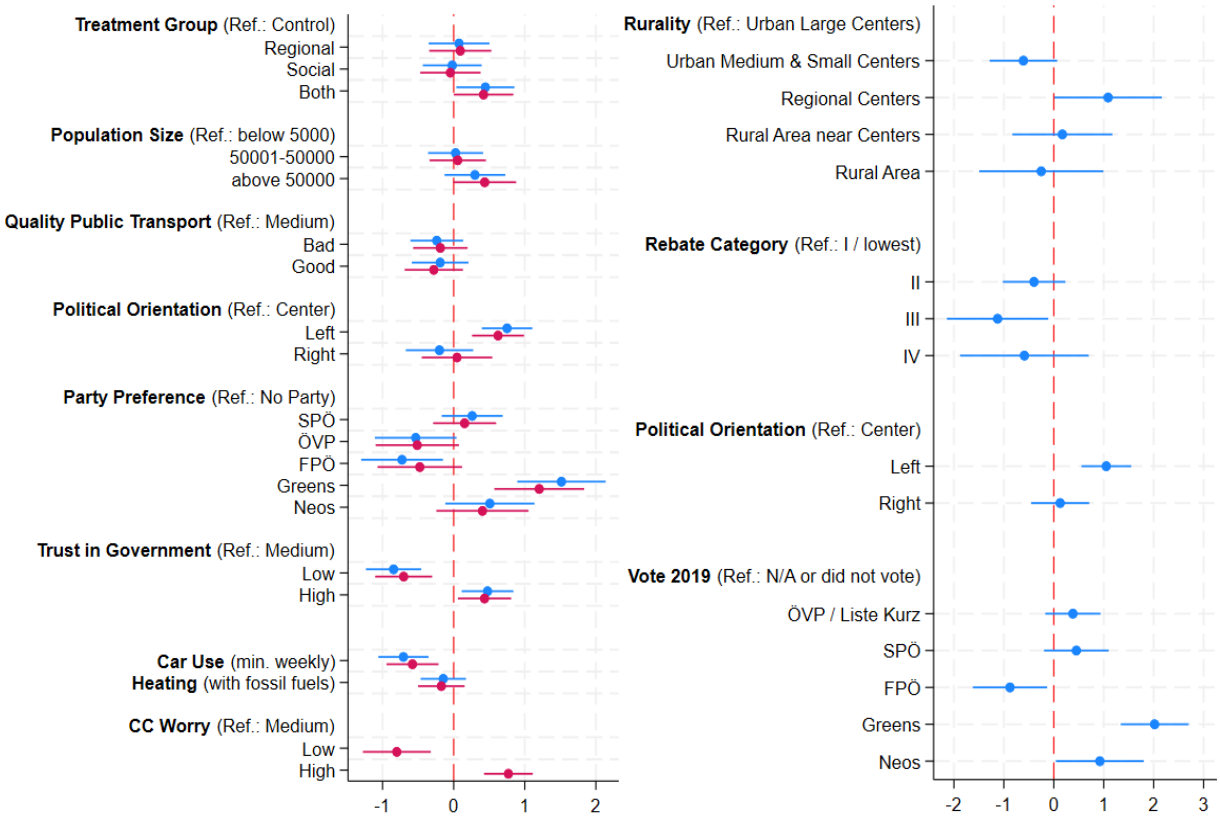
The previous analyses have shown that while respondents adjust their perceptions of inequality after receiving information treatments, this shift does not translate into increased support for carbon taxation. This section explores possible explanations for this disconnect by examining the influence of other variables on tax support. To this end, I estimate logistic regression models that include additional survey variables alongside treatment assignment and rurality, and complement these results with similar analyses of the ACPP to provide a broader empirical perspective.

Prior to the experimental treatment, the survey included a series of questions designed to capture key characteristics commonly associated with support for carbon taxation. These included sociodemographic variables such as gender, age, education, income, and parenthood. In addition, respondents were asked about the type of heating used in their household. These variables, along with car usage and local public transport quality, were included to provide an indication of respondents' potential vulnerability to carbon taxation[32]. To capture attitudinal

[31] When using the alternative rurality measure based on respondents' subjective assessment of their place of residence, the difference in tax support between the control group and the regional framing group among the most rural respondents becomes statistically significant at the 10% level ($Pr(T < t) = 0.0772$). However, since the regional framing appears to have a negative effect among respondents in more urban categories with this operationalisation, too, this still contradicts the assumption of a generally positive effect. Therefore, H_3 would not be confirmed under this alternative operationalization either.

[32] In line with research by Bechtel, Genovese and Scheve 2019, the survey included a measure to assess whether respondents might be concerned that carbon taxation could negatively affect their employment situation or the economic viability of their workplace. To assess this, all respondents who were currently employed, seeking employment, or on personal leave were asked to identify their sector of employment using the 21 categories of the International Standard Industrial Classification (ISIC). These responses were then matched with sectoral CO_2 emissions data for Austria from the OECD 2022, the most recent year available. This approach provides an indication of whether respondents are employed in carbon-intensive sectors that may be more affected by climate policy. However, a large number of respondents were unable to assign themselves to a sector, leading to approximately 42% of missing cases. As a result, the variable is not included in the main regression analyses but is reported in Appendix 3.C1. When included in the regression analysis, a binary indicator distinguishing between high- and low-emission employment sectors (based on the median) does not exhibit a statistically significant effect. Importantly, the direction and magnitude of the other predictors remain largely consistent with the main results presented in Figure 5. This also holds when the variable is restricted to only the top quartile of emission-intensive sectors.

Figure 4.5: Logistic Regression Results for Tax Support in Both Datasets



Note: Results from logistic regression models predicting support for carbon taxation. Left: data from the survey experiment. Right: Longitudinal data from the ACPP, RE model. Shown are point estimates with 95% confidence intervals. Control variables (not shown) include gender, age, education, parenthood, and indicators associated with economic strain. N = 1,159 (survey experiment), N = 2,986, n = 1,627 (ACPP). For full regression results, see Appendix 3.E1 and 3.E2.

and political predispositions, the survey also measured respondents' self-placement on the left-right ideological scale, party preference, trust in government, and level of concern about climate change.

Figure 4.5 presents results from the survey experiment (left panel) and the ACPP (right panel). In both datasets, carbon tax support is coded as a binary outcome (support vs. non-support or undecided)[33]. For the survey experiment, the first model (blue) excludes the variable measuring climate change worry, while the second model (red) includes it. This specification strategy allows for assessing how controlling for climate concern alters the effects of other predictors. Unfortunately, climate change worry could not be included in the ACPP

[33] Additional analyses treating the carbon tax support variable as a continuous scale from 1 to 5 and using linear regression yield similar results to those presented in Figure 4.5. These findings reinforce the importance of left-leaning political alignment, trust in government, car use, and climate change concern. Treatment and rurality effects remain statistically insignificant (see robustness tests, Appendix 3.C2).

model, as it is not measured consistently across waves and therefore could not be incorporated into the RE model.

The results for the survey experiment confirm that neither the regional nor the social framing individually has a statistically significant effect on support for carbon taxation. Only the combined regional and social framing yields a modest positive effect, and this effect is only significant in the model without climate worry. Furthermore, respondents' evaluation of public transport availability in their place of residence does not significantly influence tax support. However, frequent car users (defined as those using a private vehicle at least once a week) are significantly more likely to oppose the tax.

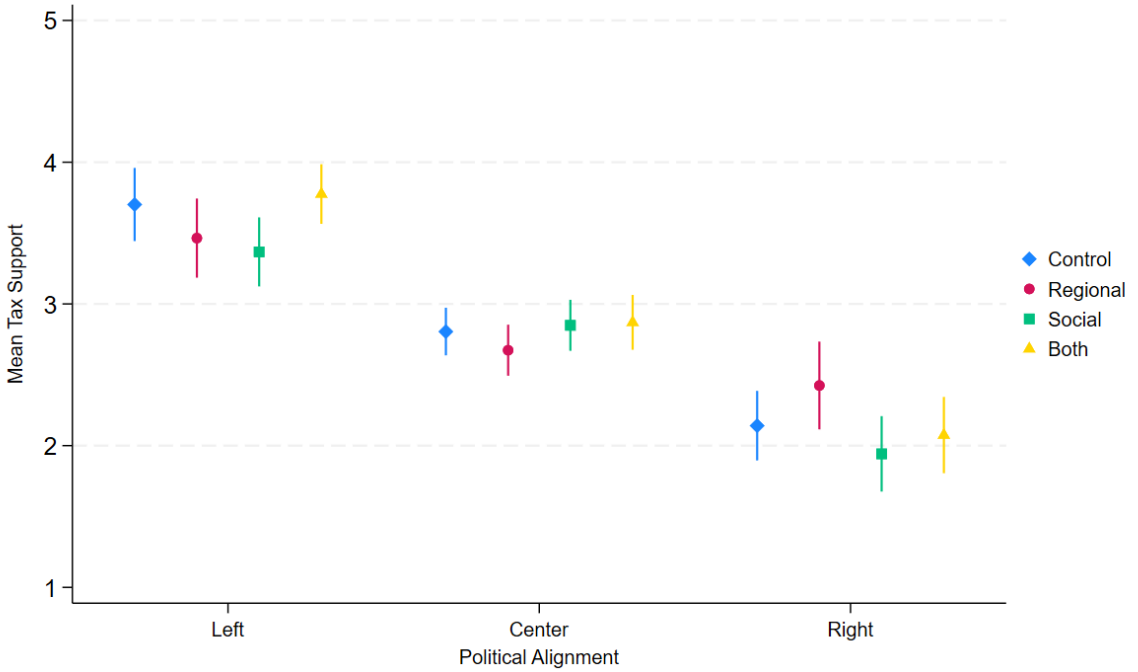
In terms of rurality, municipality size exerts only a marginal influence in the second model. While respondents living in the largest municipalities exhibit slightly higher support compared to those in the most rural areas, the difference is minimal. Thus, although rural–urban differences were significant in bivariate analyses (see Section 4.6.1), their explanatory power diminishes once additional covariates are included.

Instead, the most influential predictors are political and ideological variables. Respondents who identify as left-leaning, support the Austrian Green Party, or express high trust in government are significantly more supportive of carbon taxation. Right-leaning political orientation, in contrast, does not have a significant effect on its own, but low trust in government is a strong negative predictor of support. Moreover, preference for the right-wing populist FPÖ party is associated with greater opposition to carbon taxation, though this effect becomes non-significant when climate worry is included in the model. In addition to these attitudinal factors, frequent car use is associated with significantly lower support for the carbon tax, suggesting that perceived personal cost also plays a role.

The analyses using the ACPP data yield a very similar pattern of results. Matching respondents to the rurality classification of their place of residence and the amount of their rebate payment shows that neither has a meaningful association with the willingness to pay higher taxes to combat climate change. In contrast, political ideology and party preference remain strong predictors: left-leaning respondents and voters for the Austrian Green Party are significantly more willing to pay, whereas supporters of the right-wing FPÖ are significantly more opposed.

Overall, the analyses highlight that political attitudes – particularly ideology, party identification, and institutional trust – as well as perceived exposure to cost (at least in the

Figure 4.6: Mean Tax Support by Political Alignment



dimension of mobility), are more strongly associated with carbon tax support than either the informational treatments or rural–urban context.

Given the pronounced role of political orientation, I further examine treatment effects across ideological subgroups. Figure 4.6 illustrates mean tax support by treatment group for respondents identifying as left-, center-, or right-leaning. The data suggest that the regional framing has little impact on left- or center-aligned respondents, but leads to the most substantial increase in support among right-leaning individuals. This implies that addressing perceived regional inequalities in climate policy may resonate particularly with right-leaning Austrians[34]. However, it is worth noting that even with this increase, average tax support among right-leaning respondents remains lower than among those in the center or on the left.

These findings underscore that while targeted informational treatments may shift perceptions of inequality, they are not sufficient on their own to meaningfully change tax support. Instead, support for carbon pricing appears to be shaped primarily by deeper political orientations and pre-existing beliefs.

[34] While analytically compelling, disaggregating the treatment effect by both ideology *and* rurality is unfortunately not feasible given the limited number of respondents in this subgroup (a cross-tabulation of respondents' rurality and political alignment is provided in Appendix 3.D).

4.7 Discussion and conclusions

This study investigates whether a regionally differentiated rebate system can increase public support for carbon taxation in Austria. The findings show that informing respondents about the regional compensation mechanism significantly reduces perceived regional inequality – more so than the social framing reduces perceived social inequality. This suggests that regional fairness concerns may be more salient or more responsive to targeted messaging. However, this change in perception does not translate into a meaningful increase in carbon tax support. The regional framing appears to positively affect support only among the most rural subgroup and right-leaning respondents, but it fails to increase support among other parts of the population. These findings highlight the limits of regional rebates: while they may resonate with specific groups, they do not necessarily lead to broader gains in public approval. Interestingly, the combined framing – highlighting both the regional and social equity aspects – had the strongest effects on both inequality perceptions and tax support. This suggests that emphasizing multiple policy benefits may be more effective in improving public attitudes. Overall, and most importantly, the survey experiment results underscore that while perceptions of fairness can be shaped by information, enduring support for carbon pricing remains strongly influenced by deeper political attitudes and economic concerns. Analyses of the ACPP data reinforce this finding, showing that both political orientation and party preference are far stronger predictors of the willingness to pay higher taxes for climate mitigation than rurality or rebate amount.

There are some contextual limitations that should be considered when interpreting the findings of the survey experiment. During April 2025 fieldwork, Austria had just formed a new centrist coalition under significant fiscal pressure. Debates about a potential abolishment of the rebate had begun, but no formal decision was made until after the survey concluded, when the rebate was discontinued as part of broader austerity measures. Importantly, this decision reflected economic rather than climate policy considerations, as the carbon pricing scheme itself remained in place. This evolving political context may have weakened the credibility of the rebate, despite its intended role in addressing fairness concerns. Notably, however, respondents expressed greater support for the rebate itself than for the carbon pricing policy: when asked an identical support question specifically about the rebate, the average rating across all treatment groups was higher (3.34 on a 5-point-scale) than for the carbon pricing measure itself (2.84), suggesting that the rebate mechanism is not rejected in principle. These findings also suggest that the Austrian government may not have succeeded in clearly linking the rebate to the carbon pricing scheme in the public's perception. The subsequent decision to abolish the rebate while

retaining the carbon tax reinforces this disconnect and reflects how economic pressures increasingly override climate policy priorities in public discourse and policymaking.

Moreover, the fact that analyses of the ACPP data point in the same direction as the survey experiment strongly suggests that the limited effect of the information treatments is not merely due to temporary political or economic circumstances. Across both datasets, rurality and rebate amount have little explanatory power for carbon tax support, whereas political orientation and party preference emerge as consistently strong predictors. This indicates that public opinion on carbon pricing is shaped less by direct material benefit and more by deeper political alignments. Rather than relying solely on financial compensation to build support, policymakers may therefore need to explore strategies for reducing the partisan polarization of climate policy debates.

5 Conclusion

5.1 Key findings and contributions to the literature

This dissertation builds on findings in the existing literature that fairness perceptions, moral concerns, and social norms regarding "the right thing to do" can influence climate-related behavior. It identified a research gap in that, although climate change and inequality are closely intertwined, few studies examine whether and how individual perceptions of these inequalities affect climate-related behavior and policy support. The central gaps in the literature were summarized in the following questions: (1) *Do individuals perceive some dimensions of inequality in climate change as more important than others?* (2) *Do such perceptions influence behavior differently than policy support?* (3) *And do these effects vary across subgroups?* The three research papers address these questions as follows:

(1) The first paper finds that respondents perceive economic inequality as the most unfair, followed by generational and, lastly, global inequality. While overall agreement with the statement that disparities in responsibility and exposure between groups are unfair is high, this perception is most pronounced for low-income households and least for the Global South. Interestingly, the effects of these inequality dimensions on climate-related behavior run in the opposite direction: the global inequality prime leads to the highest reported willingness to adopt more climate-friendly behavior, whereas the economic inequality prime has the weakest effect. These effects, however, are small and often insignificant and should therefore be interpreted with caution.

The second paper likewise points to the strong salience of economic inequality. Informing respondents about the potentially disproportionate burdens of carbon taxes on low-income households produces a markedly stronger negative effect on policy support than information highlighting the necessity and benefits of such mitigation measures for future and younger generations. Although this negative effect can be partly mitigated by the positive signal of the Federal Constitutional Court ruling in favor of protecting future generations, support nonetheless remains below that of the control group. This finding suggests not only that economic inequality is the most salient dimension for respondents, but also that they are more concerned about new inequalities potentially arising from climate change mitigation measures than about existing inequalities being addressed.

Building on this, the third paper examines perceptions of different inequalities within the context of compensation mechanisms, contrasting economic and regional inequality. In the

Austrian case, concerns about rural populations being disproportionately affected by carbon taxes can be partly alleviated through a rural rebate, but this does not translate into greater overall support for the tax. Likewise, pointing out the rebate's positive effect for low-income households does not mitigate concerns about economic inequality or increase support. Only the combination of both information treatments produces a positive effect. This indicates that concerns about the creation of new inequalities through climate mitigation measures exert a substantial negative influence on policy support, and that effective compensation mechanisms must be accompanied by clear communication addressing multiple possible inequality dimensions simultaneously.

In sum, while the economic dimension appears somewhat more salient than the generational or regional dimensions, the more fundamental distinction lies between existing and potential new inequalities. Across the three studies, respondents proved more sensitive to the creation of new inequalities than to the reduction of existing ones, with economic inequality consistently emerging as the most important dimension – primarily in the sense of deterring support for action rather than motivating greater engagement. This pattern mirrors the findings of Makov, Newman and Zauberman (2020), who show that individuals are less likely to support decisions that increase environmental equality when these involve the allocation of environmental harms rather than benefits. It is also consistent with the well-established principle of loss aversion (Kahneman and Tversky 1979), which posits that individuals tend to perceive and weigh potential losses more heavily than equivalent gains. In this context, new inequalities highlighted in negative frames may be perceived as losses, thereby exerting a stronger influence on attitudes than the potential gains associated with reducing existing inequalities.

(2) This also complicates the answer to the question of whether inequalities influence behavior differently than policy support. Overall, the positive effects of existing inequalities on willingness to adopt climate-friendly behavior are small to negligible, whereas the negative effects of potential new inequalities on policy support are substantial and not easily offset by compensation mechanisms or judicial signals. However, it cannot be ruled out that this pattern reflects the stronger impact of highlighting new inequalities rather than an inherently weaker influence on behavior. In the second paper, for instance, the perceived threat of economic inequality exerted a larger effect on policy support than the reduction of existing generational inequality, which supports the interpretation that the observed difference is driven by the salience of new inequalities rather than by a fundamental behavior–policy support divide. Nonetheless, this pattern may make inequalities more relevant for policy support than for

behavior, as existing inequalities appear to exert limited influence, and the creation of new inequalities is more likely to occur through policy interventions than through individual actions.

(3) Regarding variation between subgroups, the central finding across the dissertation is the strong influence of prior political attitudes on policy support. In both the second and third research papers, political alignment emerges as the most consistent predictor of carbon tax support, with right-leaning and conservative respondents expressing markedly lower levels of support than left-leaning respondents. This pattern aligns closely with the literature (McCright, Dunlap and Marquart-Pyatt 2016; Berkebile-Weinberg et al. 2024; Dechezleprêtre et al. 2025). While certain frames – such as positive judicial signals or highlighting relief for rural populations – can increase support among more skeptical groups, these effects are not sufficient to close the gap with other respondents. Consistent with expectations, prior attitudes toward the issues, such as concern about climate change or pro-environmental orientations, are positively associated with both policy support and climate-friendly behavior. Being personally affected by policy measures tends to reduce support, as seen in the case of frequent car users in the third paper. This effect appears particularly relevant for policy support: in the first paper, no evidence of backlash was found among affected subgroups when confronted with primes corresponding to their situation (e.g., low-income households receiving the economic prime, or young respondents receiving the generational prime). Again, this difference may be explained by the broader distinction between perceptions of existing inequalities and perceptions of newly created ones.

In summary, the overarching research question – *How do different perceptions of inequality shape individual climate-friendly behavior and climate policy support?* – can be answered as follows: perceptions of inequality do play a role in how individuals evaluate climate action, but their influence appears stronger when related to concerns about new inequalities arising from climate policies and reducing support, rather than to concerns about existing inequalities that such policies might address. Furthermore, inequality itself does not seem to exert a uniform effect; rather, its impact depends on how it is perceived, and these perceptions are strongly shaped by pre-existing attitudes, ideological orientations, and political worldviews.

Beyond the overarching conclusions, each of the three research papers makes distinct contributions to the literature. The first paper advances research on climate-friendly behavior by differentiating the potential for behavioral adaptation across various lifestyle domains with high emission reduction potential – responding to recent calls for such targeted analyses (Wynes and Nicholas 2017). Methodologically, its use of a factorial survey experiment is likely to

produce estimates less affected by social desirability bias than the conventional survey question formats typically employed in this literature (Atzmüller and Steiner 2010; Auspurg et al. 2015). The second paper is the first to analyze the impact of climate litigation on public policy support – a timely contribution in light of the growing number of climate-related court cases (Setzer and Higham 2022). It also explicitly examines the trade-off between future inequalities and present ones, a critical yet rarely analyzed dilemma in climate change mitigation. The third paper provides the first empirical assessment of acknowledging regional disparities in carbon taxation, as well as the first analysis of a regionally staggered compensation mechanism. By contrasting this with the more conventional framing of reducing burdens for low-income households, it generates important insights for policymakers seeking to increase public acceptance of carbon taxes. Furthermore, the second and third papers shed light on potential avenues for increasing climate policy support among right-leaning citizens, while also underscoring the persistent and deepening political polarization surrounding climate politics. The findings indicate that existing approaches have so far not succeeded in bridging this divide.

5.2 Political and societal implications

The central finding of this dissertation is that public support for climate change mitigation can be significantly reduced by perceptions of inequality, yet not meaningfully increased. This has important implications for policymakers and other stakeholders seeking to promote climate-friendly behavior and strengthen support for climate policy. Structural transformations and new measures should therefore be communicated primarily in terms of their direct benefits, as framing them through the mitigation of existing inequalities appears to yield only limited positive effects. At the same time, public concerns about generating new inequalities must be avoided as much as possible. Ideally, such perceptions should not arise in the first place; if they do, compensation measures should be implemented and communicated in a direct, immediate, and comprehensible way, ideally addressing all subgroups that might perceive themselves as disproportionately burdened (e.g., low-income households *and* rural residents).

In a related vein, the substantial influence of prior political orientation – observed both in the literature and in the empirical findings of this dissertation – suggests that depoliticizing climate policies would be a promising strategy to increase support. Many proposed mitigation measures yield co-benefits beyond climate protection, such as economic redistribution or enhanced energy independence from foreign suppliers. The latter, in particular, often enjoys cross-partisan appeal. Emphasizing such broader benefits, rather than focusing primarily on the

politically charged aspects of climate change, could therefore be a valuable communication strategy, and doing so from the outset may be more effective than centering initial discussions on potential drawbacks and subsequent mitigation measures.

Finding ways to make mitigation policies less politically charged appears essential, as the findings from Paper 1 – as well as the broader state of global emissions – suggest that individuals are unlikely to substantially reduce their emissions in the absence of structural and political transformations. Paper 1 also provides evidence of important variation across behavioral domains: while reducing car use was rarely accepted, flying less received the highest willingness to change among respondents. This aligns with previous studies showing that willingness to adopt climate-friendly behavior varies by domain, with air travel often ranking highest among activities people are willing to reduce (Dechezleprêtre et al. 2025). This finding suggests that more targeted, domain-specific policies might achieve higher public support. By contrast, the policy support experiments in Papers 2 and 3 focus on carbon taxes, which research consistently identifies as one of the least popular climate mitigation instruments (Fairbrother 2022). Public support might therefore be greater for more tailored measures or alternative instruments.

Research also indicates that "pull" measures are generally preferred over "push" measures, with subsidies often enjoying higher public approval than, for instance, taxes or regulatory restrictions (Drews and van den Bergh 2016). Many citizens also tend to favor investments in new technologies that are perceived as potential long-term solutions to climate change. In this context, careful attention to avoiding the creation of new inequalities could further enhance support. Subsidies, while popular, can also disproportionately benefit certain groups. For example, subsidies for solar panels or electric vehicles may primarily advantage higher-income households. Ensuring that such measures are designed so that low-income households can also benefit could further amplify the already relatively high support for these types of policies.

Taken together, these findings suggest that public support for climate mitigation could be strengthened by combining domain-specific and politically less contentious measures with careful policy design that avoids creating new inequalities and ensures visible benefits for a broad range of social groups. At the same time, behavioral change should be actively facilitated, made easy, and incentivized so that adopting low-carbon practices becomes a realistic and attractive option for as many citizens as possible.

5.3 Limitations

In addition to the specific limitations outlined in each paper, there are several general constraints that apply to the dissertation as a whole. The first concerns the methodological reliance on survey settings. Although all three surveys were carefully implemented, included attention checks, and underwent data cleaning to remove speeders and implausible responses, they still do not capture actual behavior in the case of willingness-to-adapt measures. Likewise, in the policy support studies, it is impossible to fully ascertain how respondents interpret specific questions. However, the use of a factorial survey experiment rather than direct questioning was intended to reduce the gap between socially desirable responses and actual behavior to some extent, and the information treatments and policy perception questions were designed to be as clear as possible. Moreover, the survey results were broadly consistent with real-world patterns, and in the case of Paper 3, they aligned with findings from the Austrian Corona Panel Project, which supports the reliability of the results.

Another limitation inherent in survey research is the inability to control for all potentially relevant influences. In the first paper, for instance, self-efficacy emerges as a significant predictor of willingness to adopt more climate-friendly behavior. This finding is consistent with the literature, which emphasizes that individuals must believe that their own actions, or their country's policies, can meaningfully contribute to climate change mitigation. Surveys 2 and 3, however, do not explicitly account for this dimension of efficacy and responsibility, even though in the political context it is common for citizens to question the value of stringent national measures if other major emitters do not act. More broadly, surveys offer limited insight into why respondents oppose certain measures. This is a trade-off inherent in the chosen research design, which prioritizes the ability to examine how large, representative samples respond to inequalities in climate change over the ability to explore underlying motivations in depth.

A second limitation concerns the restricted country focus of the dissertation. Two studies are based on data from Germany and one on Austria, which may limit the generalizability of the findings to contexts with different political systems, histories of climate policy, or patterns of inequality. However, as discussed in Paper 3, Austria is not an outlier in the European context with respect to key predictors of carbon tax support, such as political trust and climate change beliefs, nor in terms of overall support for carbon taxation. The same applies to Germany (Fairbrother, Johansson Sevä and Kulin 2019:7). At least within Europe, both countries can therefore be considered relevant and informative cases from which to draw broader insights

regarding the design and public reception of carbon taxes in particular, and climate mitigation more generally.

A third methodological limitation is that all three studies rely on framing effects to some extent: Paper 1 primes respondents with different frames of inequality in climate change, Paper 2 presents frames highlighting distinct aspects of inequality related to carbon taxation, and Paper 3 applies similar framing to compensation mechanisms. Previous research has found that framing tends to have only limited effects on both climate-related behavioral intentions and policy support (Bernauer and McGrath 2016; Fesenfeld et al. 2021; Fesenfeld, Rudolph and Bernauer 2022). Notably, these studies primarily examine potential positive effects of framing. By contrast, this dissertation finds significant negative effects when respondents are exposed to frames highlighting the emergence of new inequalities. Therefore, it is also possible that the limited effects observed in earlier work may stem not from inherent limits of framing itself, but from the broader difficulty of motivating support for climate mitigation.

A related concern in information treatments, priming, or framing studies is the uncertainty about the duration of such effects. This limitation also applies to the present research. However, even if the effects are short-lived, they remain relevant for contexts such as public debates or political campaigns, where brief but intense exposure to specific narratives can influence public opinion and policy outcomes.

Lastly, it is important to consider the specific political and societal context during the fielding of the three surveys. Since the start of this dissertation project, multiple other crises have emerged, including the Russia–Ukraine war, renewed conflict in the Middle East, and rising inflation. Such developments may have significantly reduced public support for climate mitigation, as previous research has shown that "policy distraction" can be a substantial impediment when other highly salient events divert public attention (Genschel, Limberg and Seelkopf 2025). However, this does not diminish the significance of the findings presented here, as the influence of concurrent crises is itself a real-world condition. If these dynamics affected support in the surveys, they are equally likely to affect support in practice, underscoring the relevance of studying climate policy attitudes under such circumstances.

5.4 Avenues for further research

Building on the limitations discussed above, several promising directions for future research emerge from the findings of this dissertation.

A first avenue concerns the broadening of the empirical scope. Since the present studies draw on survey data from Germany and Austria, future work should test whether the observed patterns hold in a wider range of European and non-European contexts. Comparative research across countries with differing political systems, climate policy trajectories, and inequality structures would enable a more nuanced assessment of cross-country generalizability.

Second, there is considerable scope to deepen the understanding of *how* and *why* inequality perceptions influence climate-related behavior and policy support. An important step in this direction would be to disentangle perceptions of inequality from perceptions of fairness. Paper 1 explicitly asked respondents about fairness and found that those perceiving disparities as unfair were more willing to adopt climate-friendly behaviors. By contrast, Papers 2 and 3 did not measure fairness perceptions directly: In Paper 2, the influence of inequality-related information treatments is only observed indirectly via changes in carbon tax support and in Paper 3, perceptions of disproportionate burdens can be reduced through information on compensation mechanisms, yet without direct measurement of fairness evaluations. Future research could therefore examine when unequal outcomes are perceived as unfair and when they are accepted, and whether concerns about economic inequality sometimes serve as a socially acceptable proxy for self-interest, such as opposition to personal cost burdens.

Relatedly, it is important to better understand the mechanisms that mediate the influence of inequality perceptions on climate-related behavior and policy support. These may include moral concerns, perceived justice, threat perceptions, anticipated personal losses, or other psychological pathways, which may in turn interact with political orientation or other predispositions. Closely related is the need to further investigate the distinction between "existing" and "new" inequalities. The findings of this dissertation suggest that potential new inequalities exert a stronger influence on attitudes than existing ones, but the underlying psychological mechanisms remain unclear. Future studies could explicitly test whether this pattern reflects loss aversion or alternative mechanisms. A systematic comparison of positive and negative frames across different climate action domains would help assess whether this relationship is consistent in climate mitigation communication.

A third strand of future research should address additional predictors that may shape responses to inequality framing. Variables such as self-efficacy, perceived responsibility, and trust in international cooperation could be incorporated into study designs to better capture the individual-level factors that condition climate policy support. Moreover, richer methodological approaches – including open-ended survey responses, focus groups, and qualitative interviews

– could help uncover why individuals respond to particular frames in specific ways, as survey experiments primarily capture the direction and magnitude of effects without illuminating their underlying causes.

Fourth, future work should examine more systematically the role of concurrent crises. As the survey fieldwork for this dissertation coincided with major geopolitical and economic disruptions, such as the Russia–Ukraine war and high inflation, it remains an open question whether these contexts only divert attention from climate issues ("policy distraction") or whether they can also be leveraged to increase support. For example, energy supply shocks could enable reframing climate policies as co-beneficial measures that enhance energy security or economic resilience. Future studies could test under which framing conditions concurrent crises amplify rather than dampen public support for mitigation.

Finally, expanding the focus beyond carbon pricing would provide valuable insights into the public acceptability of different policy instruments. Since carbon taxes are among the least popular mitigation measures, it would be informative to investigate more domain-specific policies (e.g., in aviation, heating, or mobility) and to compare "push" instruments such as taxes with "pull" instruments such as subsidies. Research could also explore how the perceived fairness of these measures affects their support, and whether targeted interventions in domains with higher stated willingness to change – as observed in Paper 1 for air travel – could yield greater acceptance. Combining behavioral domain willingness with fairness-oriented framing might inform more effective and politically viable policy designs.

6 Declaration of Authorship

I hereby declare that I am the sole author of the **Introductory Chapter (Chapter 1)**, the **3rd Research Paper (Chapter 4)**, "*Can't Buy Me Love: Rural Compensation Mechanisms Fail to Increase Carbon Tax Support*", the **Conclusion (Chapter 5),** and the appendix of the 3rd Research Paper (Appendix 3). I developed and fielded the survey underlying the 3rd Research Paper, conducted the analyses, and wrote the manuscript. Chapter 2 and Appendix 1 are co-authored with Fabian Thiel, while Chapter 3 and Appendix 2 are co-authored with Nanna Lauritz Schönhage, Gabriele Spilker, and Luna Bellani. The following descriptions of the distribution of work are based on the official declarations of co-authorship for both research papers:

Chapter 2 (1st Research Paper), "*Increasing Individual-Level Climate Mitigation Action: The Role of Behavioral Dimensions and Inequality Perceptions*", was developed as follows: Fabian Thiel and I conceived the survey, collected the data, and analyzed the results. I wrote the initial manuscript and developed the theoretical framework as well as the research idea behind the paper. Fabian Thiel programmed the vignette module. We both discussed the results and jointly revised the final manuscript.

Chapter 3 (2nd Research Paper), "*Can the Court Bridge the Gap? Public Perception of Economic vs. Generational Inequalities in Climate Change Mitigation Policies*", was developed as follows: Nanna Lauritz Schönhage and I were the lead authors, developing the research ideas into a survey design. Schönhage obtained ethical approval for the research design and was mainly in charge of the survey. Together, we cooperated closely during the survey fielding, performed power analyses, conducted a literature review, wrote the first draft, and carried out primary analyses. Initial data analysis of the complete dataset was conducted jointly, as were the revisions, large parts of the final version of the text, and the manuscript's theoretical and conceptual development. Luna Bellani and Gabriele Spilker initiated the central idea of the article and provided feedback during the development of the survey design. Bellani aided in gaining ethical approval and the data analysis. Spilker contributed to the draft, wrote large parts of the final version, and contributed to the manuscript's theoretical and conceptual development.

7 Bibliography

Ajzen, Icek. 1991. "The theory of planned behavior." *Organizational Behavior and Human Decision Processes* 50(2):179–211.

Aklin, Michaël. 2016. "Re-exploring the Trade and Environment Nexus Through the Diffusion of Pollution." *Environmental and Resource Economics* 64(4):663–82.

Aklin, Michaël and Matto Mildenberger. 2020. "Prisoners of the Wrong Dilemma: Why Distributive Conflict, Not Collective Action, Characterizes the Politics of Climate Change." *Global Environmental Politics* 20(4):4–27.

Alesina, Alberto and Paola Giuliano. 2010. "Preferences for Redistribution." Pp. 93–131 in *Handbook of Social Economics*, v.1A, *Handbook of Social Economics*, edited by J. Benhabib, A. Bisin, and M. O. Jackson. Burlington: Elsevier Science.

Andersen, Henrik K. and Jochen Mayerl. 2022. "Is the Effect of Environmental Attitudes on Behavior Driven Solely by Unobserved Heterogeneity?" *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie* 74(3):381–408.

Anderson, Brilé, Tobias Böhmelt, and Hugh Ward. 2017. "Public opinion and environmental policy output: a cross-national analysis of energy policies in Europe." *Environmental Research Letters* 12(11):114011.

Andre, Peter, Teodora Boneva, Felix Chopra, and Armin Falk. 2024. "Globally representative evidence on the actual and perceived support for climate action." *Nature Climate Change* 14(3):253–59.

Armingeon, Klaus and Reto Bürgisser. 2021. "Trade-offs between redistribution and environmental protection: the role of information, ideology, and self-interest." *Journal of European Public Policy* 28(4):489–509.

Atzmüller, Christiane and Peter M. Steiner. 2010. "Experimental Vignette Studies in Survey Research." *Methodology* 6(3):128–38.

Auspurg, Katrin and Thomas Hinz. 2015. *Factorial survey experiments*. Vol. 175. Thousand Oaks, Calif.: Sage.

Auspurg, Katrin, Thomas Hinz, Stefan Liebig, and Carsten Sauer. 2015. "The Factorial Survey as a Method for Measuring Sensitive Issues." in *European Association of Methodology series, Improving survey methods. Lessons from recent research*, edited by U. Engel. New York: Routledge.

Auspurg, Katrin, Claudia Schmiedeberg, Christiane Bozoyan, Andreas Diekmann, Fabian Thiel, and Henning Best. 2023. "Umstieg auf öffentliche Verkehrsmittel und finanzielle Entlastung durch das 9-Euro-Ticket." *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie* 75(3):341–63.

Avtar, Ruchi, Kristian Blickle, Rajashri Chakrabarti, Janavi Janakiraman, and Maxim Pinkovskiy. 2023. "Understanding the Linkages between Climate Change and Inequality in the United States." *Economic Policy Review* 29(1):1–39.

Bailer, Stefanie and Florian Weiler. 2015. "A political economy of positions in climate change negotiations: Economic, structural, domestic, and strategic explanations." *The Review of International Organizations* 10(1):43–66.

Ballew, Matthew T., Anthony Leiserowitz, Connie Roser-Renouf, Seth A. Rosenthal, John E. Kotcher, Jennifer R. Marlon, Erik Lyon, Matthew H. Goldberg, and Edward W. Maibach. 2019. "Climate Change in the American Mind: Data, Tools, and Trends." *Environment: Science and Policy for Sustainable Development* 61(3):4–18.

Bamberg, Sebastian and Guido Möser. 2007. "Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour." *Journal of Environmental Psychology* 27(1):14–25.

Baranzini, Andrea and Stefano Carattini. 2017. "Effectiveness, earmarking and labeling: testing the acceptability of carbon taxes with survey data." *Environmental Economics and Policy Studies* 19(1):197–227.

Basseches, Joshua A., Rebecca Bromley-Trujillo, Maxwell T. Boykoff, Trevor Culhane, Galen Hall, Noel Healy, David J. Hess, David Hsu, Rachel M. Krause, Harland Prechel, J. T. Roberts, and Jennie C. Stephens. 2022. "Climate policy conflict in the U.S. states: a critical review and way forward." *Climatic Change* 170(3-4):32.

Bättig, Michèle B. and Thomas Bernauer. 2009. "National Institutions and Global Public Goods: Are Democracies More Cooperative in Climate Change Policy?" *International Organization* 63(2):281–308.

Bechtel, Michael M., Federica Genovese, and Kenneth F. Scheve. 2019. "Interests, Norms and Support for the Provision of Global Public Goods: The Case of Climate Co-operation." *British Journal of Political Science* 49(4):1333–55.

Beck, Marisa, Nicholas Rivers, and Hidemichi Yonezawa. 2016. "A rural myth? Sources and implications of the perceived unfairness of carbon taxes in rural communities." *Ecological Economics* 124:124–34.

Beiser-McGrath, Liam F. and Thomas Bernauer. 2019. "Could revenue recycling make effective carbon taxation politically feasible?" *Science advances* 5(9):eaax3323.

Beiser-McGrath, Liam F. and Thomas Bernauer. 2024. "How Do Pocketbook and Distributional Concerns Affect Citizens' Preferences for Carbon Taxation?" *The Journal of Politics* 86(2):551–64.

Beiser-McGrath, Liam F. and Marius R. Busemeyer. 2023. "Carbon inequality and support for carbon taxation." *European Journal of Political Research*.

Beiser-McGrath, Liam F. and Robert A. Huber. 2018. "Assessing the relative importance of psychological and demographic factors for predicting climate and environmental attitudes." *Climatic Change* 149(3-4):335–47.

Beiser-McGrath, Liam F., Sophia Stutzmann, and Muzhou Zhang. 2025. "Regional Inequality and Support for Place-Based Policies.".

Bellani, Luna, Nona Bledow, Marius R. Busemeyer, and Guido Schwerdt. 2021. *When everyone thinks they're middle-class : (Mis-) Perceptions of inequality and why they matter for social policy*.

Berenguer, Jaime. 2007. "The Effect of Empathy in Proenvironmental Attitudes and Behaviors." *Environment and Behavior* 39(2):269–83.

Bergquist, Magnus. 2025. "Limiting support for environmental policies: Unfairness is a more critical barrier than cost and ineffectiveness." *Ambio* 54(2):350–63.

Bergquist, Magnus, Andreas Nilsson, Niklas Harring, and Sverker C. Jagers. 2022. "Meta-analyses of fifteen determinants of public opinion about climate change taxes and laws." *Nature Climate Change* 12(3):235–40.

Bergquist, Magnus, Maximilian Thiel, Matthew H. Goldberg, and Sander van der Linden. 2023. "Field interventions for climate change mitigation behaviors: A second-order meta-analysis." *Proceedings of the National Academy of Sciences of the United States of America* 120(13):e2214851120.

Berkebile-Weinberg, Michael, Danielle Goldwert, Kimberly C. Doell, Jay J. van Bavel, and Madalina Vlasceanu. 2024. "The differential impact of climate interventions along the political divide in 60 countries." *Nature communications* 15(1):3885.

Bernard, René, Panagiota Tzamourani, and Michael Weber. 2022. "Climate Change and Individual Behavior." *SSRN Electronic Journal*.

Bernauer, Thomas. 2013. "Climate Change Politics." *Annual Review of Political Science* 16(1):421–48.

Bernauer, Thomas, Anna Kalbhenn, Vally Koubi, and Gabriele Spilker. 2010. "A Comparison of International and Domestic Sources of Global Governance Dynamics." *British Journal of Political Science* 40(3):509–38.

Bernauer, Thomas and Liam F. McGrath. 2016. "Simple reframing unlikely to boost public support for climate policy." *Nature Climate Change* 6(7):680–83.

Beuermann, Christiane and Tilman Santarius. 2006. "Ecological tax reform in Germany: handling two hot potatoes at the same time." *Energy Policy* 34(8):917–29.

Blocker, T. J. and Douglas L. Eckberg. 1997. "Gender and Environmentalism: Results from the 1993 General Social Survey." *Social Science Quarterly* 78(4):841–58.

Bolderdijk, J. W., L. Steg, E. S. Geller, P. K. Lehman, and T. Postmes. 2013. "Comparing the effectiveness of monetary versus moral motives in environmental campaigning." *Nature Climate Change* 3(4):413–16.

Bolte, Susanne, Johannes Klackl, Jochim Hansen, Eva Jonas, and Isabella Uhl-Hädicke. 2024. "The role of political orientation and value framing in carbon pricing acceptance: Evidence from a representative sample." *Journal of Environmental Psychology* 96:102330.

Boudon, Raymond. 1998. "Limitations of Rational Choice Theory." *American Journal of Sociology* 104(3):817–28.

Bouman, Thijs, Mark Verschoor, Casper J. Albers, Gisela Böhm, Stephen D. Fisher, Wouter Poortinga, Lorraine Whitmarsh, and Linda Steg. 2020. "When worry about climate change leads to climate action: How values, worry and personal responsibility relate to various climate actions." *Global Environmental Change* 62:102061.

Bradley, Graham L., Zakaria Babutsidze, Andreas Chai, and Joseph P. Reser. 2020. "The role of climate change risk perception, response efficacy, and psychological adaptation in pro-

environmental behavior: A two nation study." *Journal of Environmental Psychology* 68:101410.

Brannlund, Runar and Lars Persson. 2012. "To tax, or not to tax: preferences for climate policy attributes." *Climate Policy* 12(6):704–21.

Bromley-Trujillo, Rebecca and John Poe. 2020. "The importance of salience: public opinion and state policy action on climate change." *Journal of Public Policy* 40(2):280–304.

Bruderer Enzler, Heidi, Andreas Diekmann, and Ulf Liebe. 2019. "Do environmental concern and future orientation predict metered household electricity use?" *Journal of Environmental Psychology* 62:22–29.

Bruycker, Iskander de and Francesca Colli. 2023. "Affluence, congruence, and lobbying success in EU climate policy." *Journal of Public Policy* 43(3):512–32.

Büchs, Milena, AbuBakr S. Bahaj, Luke Blunden, Leonidas Bourikas, Jane Falkingham, Patrick James, Mamusu Kamanda, and Yue Wu. 2018. "Promoting low carbon behaviours through personalised information? Long-term evaluation of a carbon calculator interview." *Energy Policy* 120:284–93.

Bürgisser, Reto, Isabelle Stadelmann-Steffen, and Klaus Armingeon. 2024. "Can information, compensation and party cues increase mass support for green taxes?" *Journal of European Public Policy:*1–28.

Cacioppo, John T. and Gary G. Berntson. 1994. "Relationship between attitudes and evaluative space: A critical review, with emphasis on the separability of positive and negative substrates." *Psychological Bulletin* 115(3):401–23.

Caldeira, Gregory A. and James L. Gibson. 1995. "The Legitimacy of the Court of Justice in the European Union: Models of Institutional Support." *American Political Science Review* 89(2):356–76.

Carattini, Stefano, Andrea Baranzini, Philippe Thalmann, Frédéric Varone, and Frank Vöhringer. 2017. "Green Taxes in a Post-Paris World: Are Millions of Nays Inevitable?" *Environmental and Resource Economics* 68(1):97–128.

Carattini, Stefano, Maria Carvalho, and Sam Fankhauser. 2018. "Overcoming public resistance to carbon taxes." *Wiley interdisciplinary reviews. Climate change* 9(5):e531.

Clark, Tom S. and Jonathan P. Kastellec. 2015. "Source Cues and Public Support for the Supreme Court." *American Politics Research* 43(3):504–35.

Claydon, Jane. 2011. "A new direction for CSR: the shortcomings of previous CSR models and the rationale for a new model." *Social Responsibility Journal* 7(3):405–20.

Climate Watch. 2023. "Historical GHG Emissions." Retrieved September 7, 2023 (https://www.climatewatchdata.org/ghg-emissions).

Colantone, Italo, Livio Di Lonardo, Yotam Margalit, and Marco Percoco. 2024. "The Political Consequences of Green Policies: Evidence from Italy." *American Political Science Review* 118(1):108–26.

Cole, Jennifer C., Phillip J. Ehret, David K. Sherman, and Leaf van Boven. 2022. "Social norms explain prioritization of climate policy." *Climatic Change* 173(1-2):10.

Coleman, James S. 1990. *Foundations of Social Theory.* Cambridge, Mass: Belknap Press of Harvard University Press.

Collins, Christy M., Linda Steg, and Martine A. S. Koning. 2007. "Customers' values, beliefs on sustainable corporate performance, and buying behavior." *Psychology and Marketing* 24(6):555–77.

2020. *Confronting Carbon Inequality: Putting climate justice at the heart of the COVID-19 recovery*.

Congleton, Roger D. 1992. "Political Institutions and Pollution Control." *The Review of Economics and Statistics* 74(3):412.

Cook, John, Naomi Oreskes, Peter T. Doran, William R. L. Anderegg, Bart Verheggen, Ed W. Maibach, J. S. Carlton, Stephan Lewandowsky, Andrew G. Skuce, Sarah A. Green, Dana Nuccitelli, Peter Jacobs, Mark Richardson, Bärbel Winkler, Rob Painting, and Ken Rice. 2016. "Consensus on consensus. A synthesis of consensus estimates on human-caused global warming." *Environmental Research Letters* 11(4):48002.

Crowley, Kate. 2017. "Up and down with climate politics 2013–2016: the repeal of carbon pricing in Australia." *Wiley Interdisciplinary Reviews: Climate Change* 8(3).

Dechezleprêtre, Antoine, Adrien Fabre, Tobias Kruse, Bluebery Planterose, Ana Sanchez Chico, and Stefanie Stantcheva. 2022. "Fighting climate change: International attitudes toward climate policies. OECD Economics Department Working Papers." 1714.

Dechezleprêtre, Antoine, Adrien Fabre, Tobias Kruse, Bluebery Planterose, Ana Sanchez Chico, and Stefanie Stantcheva. 2025. "Fighting Climate Change: International Attitudes toward Climate Policies." *American Economic Review* 115(4):1258–300.

Diekmann, Andreas and Peter Preisendörfer. 2003. "Green and Greenback." *Rationality and Society* 15(4):441–72.

Dietz, Simon and Giles Atkinson. 2010. "The Equity-Efficiency Trade-off in Environmental Policy: Evidence from Stated Preferences." *Land Economics* 86(3):423–43.

Dietz, Thomas, Gerald T. Gardner, Jonathan Gilligan, Paul C. Stern, and Michael P. Vandenbergh. 2009. "Household actions can provide a behavioral wedge to rapidly reduce US carbon emissions." *Proceedings of the National Academy of Sciences of the United States of America* 106(44):18452–56.

Doherty, Kathryn L. and Thomas N. Webler. 2016. "Social norms and efficacy beliefs drive the Alarmed segment's public-sphere climate actions." *Nature Climate Change* 6(9):879–84.

Dolšak, Nives and Aseem Prakash. 2022. "Three Faces of Climate Justice." *Annual Review of Political Science* 25(1):283–301.

Doran, Rouven, Gisela Böhm, Hans-Rüdiger Pfister, Katharine Steentjes, and Nick Pidgeon. 2019. "Consequence evaluations and moral concerns about climate change: insights from nationally representative surveys across four European countries." *Journal of Risk Research* 22(5):610–26.

Douenne, Thomas and Adrien Fabre. 2020. "French attitudes on climate change, carbon taxation and other climate policies." *Ecological Economics* 169:106496.

Douenne, Thomas and Adrien Fabre. 2022. "Yellow Vests, Pessimistic Beliefs, and Carbon Tax Aversion." *American Economic Journal: Economic Policy* 14(1):81–110.

Doyle, Joshua and Alex Richardson. 2025. "The moderating role of post-materialism in the relationship between income and red meat consumption." *International Journal of Sociology* 55(4):303–21.

Drews, Stefan and Jeroen C. van den Bergh. 2016. "What explains public support for climate policies? A review of empirical and experimental studies." *Climate Policy* 16(7):855–76.

Eisner, Anna, Veronika Kulmer, and Dominik Kortschak. 2021. "Distributional effects of carbon pricing when considering household heterogeneity: An EASI application for Austria." *Energy Policy* 156:112478.

Elliott, Euel, Barry J. Seldon, and James L. Regens. 1997. "Political and Economic Determinants of Individuals» Support for Environmental Spending." *Journal of Environmental Management* 51(1):15–27.

Engst, Benjamin G., Thomas Gschwend, and Sebastian Sternberg. 2020. "Die Besetzung des Bundesverfassungsgerichts." *Politische Vierteljahresschrift* 61(1):39–60.

Ewald, Jens, Thomas Sterner, and Erik Sterner. 2022. "Understanding the resistance to carbon taxes: Drivers and barriers among the general public and fuel-tax protesters." *Resource and Energy Economics* 70:101331.

Fairbrother, Malcolm. 2022. "Public opinion about climate policies: A review and call for more studies of what people want." *PLOS Climate* 1(5):e0000030.

Fairbrother, Malcolm, Ingemar Johansson Sevä, and Joakim Kulin. 2019. "Political trust and the relationship between climate change beliefs and support for fossil fuel taxes: Evidence from a survey of 23 European countries." *Global Environmental Change* 59:102003.

Fesenfeld, Lukas, Lukas Rudolph, and Thomas Bernauer. 2022. "Policy framing, design and feedback can increase public support for costly food waste regulation." *Nature food* 3(3):227–35.

Fesenfeld, Lukas P., Yixian Sun, Michael Wicki, and Thomas Bernauer. 2021. "The role and limits of strategic framing for promoting sustainable consumption and policy." *Global Environmental Change* 68:102266.

Fielding, Kelly S., Matthew J. Hornsey, Ha A. Thai, and Li L. Toh. 2020. "Using ingroup messengers and ingroup values to promote climate change policy." *Climatic Change* 158(2):181–99.

Fisher, Liz. 2020. "Challenges for the EU Climate Change Regime." *German Law Journal* 21(1):5–9.

Fisher, Stephen D., John Kenny, Wouter Poortinga, Gisela Böhm, and Linda Steg. 2022. "The politicisation of climate change attitudes in Europe." *Electoral Studies* 79:102499.

Flues, Florens and Alastair Thomas. 2015. "The distributional effects of energy taxes." *OECD Taxation Working Papers* 23.

Flyvbjerg, Bent, Norman K. Denzin, and Yvonna S. Lincoln. 2018. *The SAGE handbook of qualitative research.* Los Angeles, London, New Delhi, Singapore, Washington DC, Melbourne: Sage.

Folke, Carl, Henrik Österblom, Jean-Baptiste Jouffray, Eric F. Lambin, W. N. Adger, Marten Scheffer, Beatrice I. Crona, Magnus Nyström, Simon A. Levin, Stephen R. Carpenter, John M. Anderies, Stuart Chapin, Anne-Sophie Crépin, Alice Dauriach, Victor Galaz, Line J.

Gordon, Nils Kautsky, Brian H. Walker, James R. Watson, James Wilen, and Aart de Zeeuw. 2019. "Transnational corporations and the challenge of biosphere stewardship." *Nature ecology & evolution* 3(10):1396–403.

Fouquet, Roger. 2014. "Long-Run Demand for Energy Services: Income and Price Elasticities over Two Hundred Years." *Review of Environmental Economics and Policy* 8(2):186–207.

Franzen, Axel and Reto Meyer. 2004. "Klimawandel des Umweltbewusstseins? / Climate Change in Environmental Attitudes?" *Zeitschrift für Soziologie* 33(2):119–37.

Franzen, Axel and Dominikus Vogl. 2013. "Two decades of measuring environmental attitudes. A comparative analysis of 33 countries." *Global Environmental Change* 23(5):1001–08.

Fremstad, Anders, Matto Mildenberger, Mark Paul, and Isabelle Stadelmann-Steffen. 2022. "The role of rebates in public support for carbon taxes." *Environmental Research Letters* 17(8):84040.

Gadenne, David, Bishnu Sharma, Don Kerr, and Tim Smith. 2011. "The influence of consumers' environmental beliefs and attitudes on energy saving behaviours." *Energy Policy* 39(12):7684–94.

Gagnebin, Murielle, Patrick Graichen, and Thorsten Lenck. 2019. *Die Gelbwesten-Proteste: Eine (Fehler-)Analyse der französischen CO2-Preispolitik*.

Gaikwad, Nikhar, Federica Genovese, and Dustin Tingley. 2022. "Creating Climate Coalitions: Mass Preferences for Compensating Vulnerability in the World's Two Largest Democracies." *American Political Science Review* 116(4):1165–83.

Gampfer, Robert. 2014. "Do individuals care about fairness in burden sharing for climate change mitigation? Evidence from a lab experiment." *Climatic Change* 124(1-2):65–77.

Gardiner, Stephen M. 2006. "A Perfect Moral Storm. Climate Change, Intergenerational Ethics and the Problem of Moral Corruption." *Environmental Values* 15(3):397–413.

Gazmararian, Alexander F. 2025. "Sources of Partisan Change: Evidence from the Shale Gas Shock in American Coal Country." *The Journal of Politics* 87(2):601–15.

Gelissen, John. 2007. "Explaining Popular Support for Environmental Protection." *Environment and Behavior* 39(3):392–415.

Genschel, Philipp, Julian Limberg, and Laura Seelkopf. 2025. "The climate crisis, policy distraction and support for fuel taxation." *European Journal of Political Research* 64(1):207–28.

German Federal Government 2020. "Climate action: effectively reducing Co2 emissions." Retrieved August 16, 2023 (https://www.bundesregierung.de/breg-en/issues/climate-action/effectively-reducing-co2-1795850).

Gibson, James L., Gregory A. Caldeira, and Vanessa A. Baird. 1998. "On the Legitimacy of National High Courts." *American Political Science Review* 92(2):343–58.

Gibson, James L. and Michael J. Nelson. 2014. "The Legitimacy of the US Supreme Court: Conventional Wisdoms and Recent Challenges Thereto." *Annual Review of Law and Social Science* 10(1):201–19.

Gifford, Robert and Reuven Sussman. 2012. "Environmental Attitudes." in *Oxford library of psychology, The Oxford handbook of environmental and conservation psychology,* edited by S. D. Clayton. New York, NY: Oxford Univ. Press.

Global Witness. 2022. *World's biggest fossil fuel firms projected to spend almost a trillion dollars on new oil and gas fields by 2030.* London.

Goldberg, Matthew H., Abel Gustafson, Matthew T. Ballew, Seth A. Rosenthal, and Anthony Leiserowitz. 2021. "Identifying the most important predictors of support for climate policy in the United States." *Behavioural Public Policy* 5(4):480–502.

Goldstein, Noah J., Robert B. Cialdini, and Vladas Griskevicius. 2008. "A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels." *Journal of Consumer Research* 35(3):472–82.

Gough, Ian. 2013. "Carbon Mitigation Policies, Distributional Dilemmas and Social Policies." *Journal of Social Policy* 42(2):191–213.

Grasso, Maria, and Marco Giugni, editors. 2022. *Youth and Politics in Times of Increasing Inequalities.* Cham: Springer International Publishing.

Gravert, Christina and Ganga Shreedhar. 2022. "Effective carbon taxes need green nudges." *Nature Climate Change* 12(12):1073–74.

Graves, Catherine and Katy Roelich. 2021. "Psychological Barriers to Pro-Environmental Behaviour Change: A Review of Meat Consumption Behaviours." *Sustainability* 13(21):11582.

Green, Donald and Ian Shapiro. 1994. *Pathologies of rational choice theory: A critique of applications in political science:* Yale University Press.

Green, Fergus and Noel Healy. 2022. "How inequality fuels climate change: The climate case for a Green New Deal." *One Earth* 5(6):635–49.

Greenwood, Philip. 2019. "Letter to the Editor on: “The Climate Mitigation Gap: Education and Government Recommendations Miss the Most Effective Individual Actions” by Wynes and Nicholas, 2017." *Annals of Geographical Studies* 2(1):29–31.

Gustafson, Abel, Seth A. Rosenthal, Matthew T. Ballew, Matthew H. Goldberg, Parrish Bergquist, John E. Kotcher, Edward W. Maibach, and Anthony Leiserowitz. 2019. "The development of partisan polarization over the Green New Deal." *Nature Climate Change* 9(12):940–44.

Hallegatte, Stephane and Julie Rozenberg. 2017. "Climate change through a poverty lens." *Nature Climate Change* 7(4):250–56.

Hammar, Henrik and Sverker C. Jagers. 2006. "Can trust in politicians explain individuals' support for climate policy? The case of CO 2 tax." *Climate Policy* 5(6):613–25.

Hanss, Daniel, Gisela Böhm, Rouven Doran, and Andreas Homburg. 2016. "Sustainable Consumption of Groceries: the Importance of Believing that One Can Contribute to Sustainable Development." *Sustainable Development* 24(6):357–70.

Harrington, Luke J., David J. Frame, Erich M. Fischer, Ed Hawkins, Manoj Joshi, and Chris D. Jones. 2016. "Poorest countries experience earlier anthropogenic emergence of daily temperature extremes." *Environmental Research Letters* 11(5):55007.

Harrison, Kathryn. 2012. "A Tale of Two Taxes: The Fate of Environmental Tax Reform in Canada." *Review of Policy Research* 29(3):383–407.

Harrison, Kathryn and Chelsea Peet. 2012. "Historical Legacies and Policy Reform: Diverse Regional Reactions to British Columbia’s Carbon Tax." 97-122 Pages / BC Studies: The British Columbian Quarterly, No 173: Spring 2012.

Harwatt, Helen, Miles Tight, Abigail L. Bristow, and Astrid Gühnemann. 2011. "Personal Carbon Trading and fuel price increases in the transport sector: an exploratory study of public response in the UK.".

Hedegaard, Troels F. and Kristian Kongshøj. 2024. "How redistribution can make carbon taxes more acceptable to the public." *The Social Science Journal:*1–14.

Hertwich, Edgar G. and Glen P. Peters. 2009. "Carbon footprint of nations: a global, trade-linked analysis." *Environmental science & technology* 43(16):6414–20.

Homburg, Andreas and Andreas Stolberg. 2006. "Explaining pro-environmental behavior with a cognitive theory of stress." *Journal of Environmental Psychology* 26(1):1–14.

Hope, David, Julian Limberg, and Yves Steinebach. 2025. "Unequal Treatment, Fairness Perceptions, and the Rural Backlash Against Carbon Taxation." *(forthcoming)*.

Hornsey, Matthew J., Emily A. Harris, Paul G. Bain, and Kelly S. Fielding. 2016. "Meta-analyses of the determinants and outcomes of belief in climate change." *Nature Climate Change* 6(6):622–26.

Hornsey, Matthew J. and Stephan Lewandowsky. 2022. "A toolkit for understanding and addressing climate scepticism." *Nature human behaviour* 6(11):1454–64.

Huang, Huiping. 2016. "Media use, environmental beliefs, self-efficacy, and pro-environmental behavior." *Journal of Business Research* 69(6):2206–12.

Huang, Yilin and Martijn Warnier. 2019. *Bridging the Attitude-Behaviour Gap in Household Energy Consumption:*1–5.

Huber, Robert A. 2020. "The role of populist attitudes in explaining climate change skepticism and support for environmental protection." *Environmental Politics* 29(6):959–82.

Hurlstone, Mark J., Annabel Price, Susie Wang, Zoe Leviston, and Iain Walker. 2020. "Activating the legacy motive mitigates intergenerational discounting in the climate game." *Global Environmental Change* 60:102008.

Hurst, Kristin and Marc J. Stern. 2020. "Messaging for environmental action: The role of moral framing and message source." *Journal of Environmental Psychology* 68:101394.

Im, Zhen J. 2024. "Paying the piper for the Green Transition? Perceptions of unfairness from regional employment declines in carbon-polluting industrial sectors." *Journal of European Public Policy* 31(6):1620–46.

Inglehart, Ronald. 1977. *The Silent Revolution: Changing Values and Political Styles Among Western Publics.* Princeton: Princeton University Press.

Innocenti, Matteo, Gabriele Santarelli, Gaia S. Lombardi, Lorenzo Ciabini, Doris Zjalic, Mattia Di Russo, and Chiara Cadeddu. 2023. "How Can Climate Change Anxiety Induce Both Pro-Environmental Behaviours and Eco-Paralysis? The Mediating Role of General Self-Efficacy." *International Journal of Environmental Research and Public Health* 20(4):3085.

International Air Transport Association. 2025. *Global Air Passenger Demand Reaches Record High in 2024.* Geneva.

Isaacson, Summer, Sverker C. Jagers, Marvin Helferich, and Magnus Bergquist. 2024. "The Role of Perceived Fairness in Public Opinion on Sustainable Transportation Policy: A Meta-Analytic Structural Equation Model." *The International Journal of Climate Change: Impacts and Responses* 17(1):1–24.

Ivanova, Diana, John Barrett, Dominik Wiedenhofer, Biljana Macura, Max Callaghan, and Felix Creutzig. 2020. "Quantifying the potential for climate change mitigation of consumption options." *Environmental Research Letters* 15(9):93001.

Jacobs, Kathleen, Lars Petersen, Jacob Hörisch, and Dirk Battenfeld. 2018. "Green thinking but thoughtless buying? An empirical extension of the value-attitude-behaviour hierarchy in sustainable clothing." *Journal of Cleaner Production* 203:1155–69.

Jagers, Sverker C., Erick Lachapelle, Johan Martinsson, and Simon Matti. 2021. "Bridging the ideological gap? How fairness perceptions mediate the effect of revenue recycling on public support for carbon taxes in the United States, Canada and Germany." *Review of Policy Research* 38(5):529–54.

Jakovcevic, Adriana and Linda Steg. 2013. "Sustainable transportation in Argentina. Values, beliefs, norms and car use reduction." *Transportation Research Part F: Traffic Psychology and Behaviour* 20:70–79.

Jenny, Mirjam A. and Cornelia Betsch. 2022. "Large-scale behavioural data are key to climate policy." *Nature human behaviour* 6(11):1444–47.

Jorgenson, Andrew K. and Brett Clark. 2011. "Societies consuming nature. A panel study of the ecological footprints of nations, 1960–2003." *Social science research* 40(1):226–44.

Kahneman, Daniel and Amos Tversky. 1979. "Prospect Theory: An Analysis of Decision under Risk." *Econometrica* 47(2):263.

Kahneman, Daniel and Amos Tversky. 2013. "Prospect Theory: An Analysis of Decision Under Risk." Pp. 99–127, in *Handbook of the Fundamentals of Financial Decision Making*.

Kallbekken, Steffen. 2023. "Research on public support for climate policy instruments must broaden its scope." *Nature Climate Change*.

Kallbekken, Steffen and Marianne Aasen. 2010. "The demand for earmarking: Results from a focus group study." *Ecological Economics* 69(11):2183–90.

Keuschnigg, Marc and Fabian Kratz. 2017. "Thou Shalt Recycle. How Social Norms of Environmental Protection Narrow the Scope of the Low-Cost Hypothesis." *Environment and Behavior* 50(10):1059–91.

Kittel, Bernhard, Sylvia Kritzinger, Hajo Boomgaarden, Barbara Prainsack, Jakob-Moritz Eberl, Fabian Kalleitner, Noëlle S. Lebernegg, Julia Partheymüller, Carolina Plescia, David W. Schiestl, and Lukas Schlogl. 2020. *Austrian Corona Panel Project (SUF edition):* AUSSDA.

Klar, Samara, Thomas Leeper, and Joshua Robison. 2020. "Studying Identities with Experiments: Weighing the Risk of Posttreatment Bias Against Priming Effects." *Journal of Experimental Political Science* 7(1):56–60.

Klenert, David, Linus Mattauch, Emmanuel Combet, Ottmar Edenhofer, Cameron Hepburn, Ryan Rafaty, and Nicholas Stern. 2018. "Making carbon pricing work for citizens." *Nature Climate Change* 8(8):669–77.

Knill, Christoph. 2003. *Europäische Umweltpolitik*. v.4. Wiesbaden: VS Verlag fur Sozialwissenschaften GmbH.

Knill, Christoph. 2013. *Europäische Umweltpolitik: Steuerungsprobleme und Regulierungsmuster im Mehrebenensystem*. Vol. 4. Opladen: Leske + Budrich.

Lacroix, Karine. 2018. "Comparing the relative mitigation potential of individual pro-environmental behaviors." *Journal of Cleaner Production* 195:1398–407.

Lee, Tien M., Ezra M. Markowitz, Peter D. Howe, Chia-Ying Ko, and Anthony A. Leiserowitz. 2015. "Predictors of public climate change awareness and risk perception around the world." *Nature Climate Change* 5(11):1014–20.

Lee, Yong-ki, Sally Kim, Min-seong Kim, and Jeang-gu Choi. 2014. "Antecedents and interrelationships of three types of pro-environmental behavior." *Journal of Business Research* 67(10):2097–105.

Levi, Sebastian. 2021. "Why hate carbon taxes? Machine learning evidence on the roles of personal responsibility, trust, revenue recycling, and other factors across 23 European countries." *Energy Research & Social Science* 73:101883.

Levy, Jack S. 2008. "Case Studies: Types, Designs, and Logics of Inference." *Conflict Management and Peace Science* 25(1):1–18.

Liebe, Ulf, Heidi Bruderer Enzler, Andreas Diekmann, and Peter Preisendörfer. 2024. "One Justice for All? Social Dilemmas, Environmental Risks and Different Notions of Distributive Justice. Environmental risks and different notions of distributive justice." *Games* 15(4):25.

Liebe, Ulf, Jennifer Gewinner, and Andreas Diekmann. 2021. "Large and persistent effects of green energy defaults in the household and business sectors." *Nature human behaviour*.

Lo, Alex Y. 2016. "National income and environmental concern: Observations from 35 countries." *Public understanding of science (Bristol, England)* 25(7):873–90.

Lockwood, Matthew. 2018. "Right-wing populism and the climate change agenda. Exploring the linkages." *Environmental Politics* 27(4):712–32.

Ma, Yoon J. and Hyun-Hwa Lee. 2012. "Understanding consumption behaviours for fair trade non-food products: focusing on self-transcendence and openness to change values." *International Journal of Consumer Studies* 36(6):622–34.

Maestre-Andrés, Sara, Stefan Drews, Ivan Savin, and Jeroen van den Bergh. 2021. "Carbon tax acceptability with information provision and mixed revenue uses." *Nature communications* 12(1):7017.

Maestre-Andrés, Sara, Stefan Drews, and Jeroen van den Bergh. 2019. "Perceived fairness and public acceptability of carbon pricing: a review of the literature." *Climate Policy* 19(9):1186–204.

Maki, Alexander, Amanda R. Carrico, Kaitlin T. Raimi, Heather B. Truelove, Brandon Araujo, and Kam L. Yeung. 2019. "Meta-analysis of pro-environmental behaviour spillover." *Nature Sustainability* 2(4):307–15.

Makov, Tamar, George E. Newman, and Gal Zauberman. 2020. "Inconsistent allocations of harms versus benefits may exacerbate environmental inequality." *Proceedings of the National Academy of Sciences of the United States of America* 117(16):8820–24.

Mayerl, Jochen and Henning Best. 2019. "Attitudes and behavioral intentions to protect the environment: How consistent is the structure of environmental concern in cross-national comparison?" *International Journal of Sociology* 49(1):27–52.

Mazepus, Honorata and Dimiter Toshkov. 2022. "Standing up for Democracy? Explaining Citizens' Support for Democratic Checks and Balances." *Comparative Political Studies* 55(8):1271–97.

McCright, Aaron M. and Riley E. Dunlap. 2011. "The Politicization of Climate Change and Polarization in the American Public's Views of Global Warming, 2001–2010." *The Sociological Quarterly* 52(2):155–94.

McCright, Aaron M., Riley E. Dunlap, and Sandra T. Marquart-Pyatt. 2016. "Political ideology and views about climate change in the European Union." *Environmental Politics* 25(2):338–58.

Menard, Jyler, Thomas M. Bury, Chris T. Bauch, and Madhur Anand. 2021. "When conflicts get heated, so does the planet: coupled social-climate dynamics under inequality." *Proceedings. Biological sciences* 288(1958):20211357.

Mildenberger, Matto, Erick Lachapelle, Kathryn Harrison, and Isabelle Stadelmann-Steffen. 2022. "Limited impacts of carbon tax rebate programmes on public support for carbon pricing." *Nature Climate Change* 12(2):141–47.

Mohammadzadeh Valencia, Farah, Cornelia Mohren, Anjali Ramakrishnan, Marlene Merchert, Jan C. Minx, and Jan C. Steckel. 2024. "Public support for carbon pricing policies and revenue recycling options: a systematic review and meta-analysis of the survey literature." *npj Climate Action* 3(1).

Moran, Daniel, Richard Wood, Edgar Hertwich, Kim Mattson, Joao F. D. Rodriguez, Karin Schanes, and John Barrett. 2018. "Quantifying the potential for consumer-oriented policy to reduce European and foreign carbon emissions." *Climate Policy* 20(sup1):S28-S38.

Mudde, Cas. 2004. "The Populist Zeitgeist." *Government and Opposition* 39(4):541–63.

Nielsen, Kristian S., Viktoria Cologna, Florian Lange, Cameron Brick, and Paul C. Stern. 2021. "The case for impact-focused environmental psychology." *Journal of Environmental Psychology* 74:101559.

Nyborg, Karine, John M. Anderies, Astrid Dannenberg, Therese Lindahl, Caroline Schill, Maja Schlüter, W. N. Adger, Kenneth J. Arrow, Scott Barrett, Stephen Carpenter, F. S. Chapin, Anne-Sophie Crépin, Gretchen Daily, Paul Ehrlich, Carl Folke, Wander Jager, Nils Kautsky, Simon A. Levin, Ole J. Madsen, Stephen Polasky, Marten Scheffer, Brian Walker, Elke U. Weber, James Wilen, Anastasios Xepapadeas, and Aart de Zeeuw. 2016. "Social norms as solutions." *Science (New York, N.Y.)* 354(6308):42–43.

O Neill, Sadhbh and Edwin Alblas. 2020. "Climate Litigation, Politics and Policy Change: Lessons from Urgenda and Climate Case Ireland." Pp. 57–72, in *Ireland and the Climate*

Crisis, edited by D. Robbins, D. Torney, and P. Brereton. Cham: Springer International Publishing.

OECD. 2013. *Effective Carbon Prices.* Paris: OECD Publishing.

OECD. 2022. "CO_2 emissions by sector – Austria [Data set]. OECD Data Explorer." Retrieved July 9, 2025

Ogunbode, Charles A. 2022. "Climate justice is social justice in the Global South." *Nature human behaviour* 6(11):1443.

Ogunbode, Charles A., Rouven Doran, Arin H. Ayanian, Joonha Park, Akira Utsugi, Karlijn L. van den Broek, Jihane Ghorayeb, Sibele D. Aquino, Samuel Lins, John J. B. R. Aruta, Marc E. S. Reyes, Andreas Zick, and Susan Clayton. 2024. "Climate justice beliefs related to climate action and policy support around the world." *Nature Climate Change* 14(11):1144–50.

Oswald, Yannick, Anne Owen, and Julia K. Steinberger. 2020. "Large inequality in international and intranational energy footprints between income groups and across consumption categories." *Nature Energy* 5(3):231–39.

Otto, Ilona M., Jonathan F. Donges, Roger Cremades, Avit Bhowmik, Richard J. Hewitt, Wolfgang Lucht, Johan Rockström, Franziska Allerberger, Mark McCaffrey, Sylvanus S. P. Doe, Alex Lenferna, Nerea Morán, Detlef P. van Vuuren, and Hans J. Schellnhuber. 2020. "Social tipping dynamics for stabilizing Earth's climate by 2050." *Proceedings of the National Academy of Sciences of the United States of America* 117(5):2354–65.

Parker, Larissa, Juliette Mestre, Sébastien Jodoin, and Margarentha Wewerinke-Singh. 2022. "When the kids put climate change on trial: youth-focused rights-based climate litigation around the world." *Journal of Human Rights and the Environment* 13(1).

Pearson, Adam R., Corinne G. Tsai, and Susan Clayton. 2021. "Ethics, morality, and the psychology of climate justice." *Current opinion in psychology* 42:36–42.

Peel, Jacqueline and Hari M. Osofsky. 2018. "A Rights Turn in Climate Change Litigation?" *Transnational Environmental Law* 7(1):37–67.

Pickering, Gary J., Kaylee Schoen, Marta Botta, and Xavier Fazio. 2020. "Exploration of youth knowledge and perceptions of individual-level climate mitigation action." *Environmental Research Letters* 15(10):104080.

Plehwe, Dieter. 2022. "Reluctant transformers or reconsidering opposition to climate change mitigation? German think tanks between environmentalism and neoliberalism." *Globalizations* 20(8):1277–95.

Poortinga, Wouter, Lorraine Whitmarsh, Linda Steg, Gisela Böhm, and Stephen Fisher. 2019. "Climate change perceptions and their individual-level determinants. A cross-European analysis." *Global Environmental Change* 55:25–35.

Povitkina, Marina. 2018. "The limits of democracy in tackling climate change." *Environmental Politics* 27(3):411–32.

Povitkina, Marina, Sverker Carlsson Jagers, Simon Matti, and Johan Martinsson. 2021. "Why are carbon taxes unfair? Disentangling public perceptions of fairness." *Global Environmental Change* 70:102356.

Preisendörfer, Peter and Andreas Diekmann. 2021. "Environmental behavior: measurement approaches and determining factors." Pp. 134–50, in *Research Handbook on Environmental Sociology,* edited by A. Franzen and S. Mader.

Quitzow, Leslie, Weert Canzler, Philipp Grundmann, Markus Leibenath, Timothy Moss, and Tilmann Rave. 2016. "The German Energiewende – What's happening? Introducing the special issue." *Utilities Policy* 41:163–71.

Rees, Jonas H. and Sebastian Bamberg. 2014. "Climate protection needs societal change: Determinants of intention to participate in collective climate action." *European Journal of Social Psychology* 44(5):466–73.

Rees, Jonas H., Sabine Klug, and Sebastian Bamberg. 2015. "Guilty conscience: motivating pro-environmental behavior by inducing negative moral emotions." *Climatic Change* 130(3):439–52.

Reese, Gerhard and Eva Junge. 2017. "Keep on Rockin' in a (Plastic-)Free World: Collective Efficacy and Pro-Environmental Intentions as a Function of Task Difficulty." *Sustainability* 9(2):200.

Ripple, William J., Christopher Wolf, Jillian W. Gregg, Johan Rockström, Michael E. Mann, Naomi Oreskes, Timothy M. Lenton, Stefan Rahmstorf, Thomas M. Newsome, Chi Xu, Jens-Christian Svenning, Cássio C. Pereira, Beverly E. Law, and Thomas W. Crowther. 2024. "The 2024 state of the climate report: Perilous times on planet Earth." *BioScience* 74(12):812–24.

Ripple, William J., Christopher Wolf, Thomas M. Newsome, Phoebe Barnard, and William R. Moomaw. 2020. "World Scientists' Warning of a Climate Emergency." *BioScience* 70(1):8–100.

Rockström, Johan, Owen Gaffney, Joeri Rogelj, Malte Meinshausen, Nebojsa Nakicenovic, and Hans J. Schellnhuber. 2017. "A roadmap for rapid decarbonization." *Science (New York, N.Y.)* 355(6331):1269–71.

Rogowski, Jon C. and Andrew R. Stone. 2021. "How Political Contestation Over Judicial Nominations Polarizes Americans' Attitudes Toward the Supreme Court." *British Journal of Political Science* 51(3):1251–69.

Rozin, Paul and Edward B. Royzman. 2001. "Negativity Bias, Negativity Dominance, and Contagion." *Personality and Social Psychology Review* 5(4):296–320.

Rüttenauer, Tobias. 2024. "More talk, no action? The link between exposure to extreme weather events, climate change belief and pro-environmental behaviour." *European Societies* 26(4):1046–70.

Schaffer, Lena M. 2024. "Who's afraid of more ambitious climate policy? How distributional implications shape policy support and compensatory preferences." *Environmental Politics* 33(4):567–90.

Schaffer, Lena M., Bianca Oehl, and Thomas Bernauer. 2022. "Are policymakers responsive to public demand in climate politics?" *Journal of Public Policy* 42(1):136–64.

Schlosberg, David and Lisette B. Collins. 2014. "From environmental to climate justice: climate change and the discourse of environmental justice." *Wiley Interdisciplinary Reviews: Climate Change* 5(3):359–74.

Schönhage, Nanna L., Theresa Wieland, Luna Bellani, and Gabriele Spilker. 2024a. "Can the court bridge the gap? Public perception of economic vs. generational inequalities in climate change mitigation policies." *Environmental Research Letters* 19(10):104047.

Schönhage, Nanna L., Theresa Wieland, Gabriele Spilker, and Luna Bellani. 2024b. *Replication material: can the court bridge the gap: Exzellenzcluster "The Politics of Inequality" datenfile version 1.0.0*.

Schuldt, Jonathon P. and Adam R. Pearson. 2023. "Public recognition of climate change inequities within the United States." *Climatic Change* 176(8).

Schulte, Isabella and Peter Heindl. 2017. "Price and income elasticities of residential energy demand in Germany." *Energy Policy* 102:512–28.

Schwartz, Shalom H. 1992. "Universals in the Content and Structure of Values. Theoretical Advances and Empirical Tests in 20 Countries." Pp. 1–65 in *Advances in Experimental Social Psychology, Advances in Experimental Social Psychology Volume 25,* edited by M. P. Zanna: Elsevier.

Setzer, Joana and Catherine Higham. 2022. *Global trends in climate change litigation : 2022 snapshot.* London, UK: Grantham Research Institute on Climate Change and the Environment and Centre for Climate Change Economics and Policy.

Setzer, Joana and Lisa C. Vanhala. 2019. "Climate change litigation: A review of research on courts and litigants in climate governance." *Wiley Interdisciplinary Reviews: Climate Change* 10(3).

Sheagley, Geoffrey and Scott Clifford. 2023 // 2025. "No Evidence that Measuring Moderators Alters Treatment Effects." *American Journal of Political Science* 69(1):49–63.

Shi, Jing, Vivianne H. M. Visschers, Michael Siegrist, and Joseph Arvai. 2016. "Knowledge as a driver of public perceptions about climate change reassessed." *Nature Climate Change* 6(8):759–62.

Silvi, Mariateresa and Emilio Padilla Rosa. 2023. "A tragedy of the horizons? An intertemporal perspective on public support for carbon taxes." *Energy Economics* 125:106815.

Simon, Herbert A. 1955. "A Behavioral Model of Rational Choice." *The Quarterly Journal of Economics* 69(1):99.

Skeirytė, Agnė, Ričardas Krikštolaitis, and Genovaitė Liobikienė. 2022. "The differences of climate change perception, responsibility and climate-friendly behavior among generations and the main determinants of youth's climate-friendly actions in the EU." *Journal of Environmental Management* 323:116277.

Smith, Tom W., Jibum Kim, and Jaesok Son. 2017. "Public Attitudes toward Climate Change and Other Environmental Issues across Countries." *International Journal of Sociology* 47(1):62–80.

Sommer, Stephan, Linus Mattauch, and Michael Pahle. 2022. "Supporting carbon taxes: The role of fairness." *Ecological Economics* 195:107359.

2025. *Special Eurobarometer 565 Report - Climate Change*.

Steg, Linda, Jan W. Bolderdijk, Kees Keizer, and Goda Perlaviciute. 2014. "An Integrated Framework for Encouraging Pro-environmental Behaviour. The role of values, situational factors and goals." *Journal of Environmental Psychology* 38:104–15.

Steg, Linda and Charles Vlek. 2009. "Encouraging pro-environmental behaviour. An integrative review and research agenda." *Journal of Environmental Psychology* 29(3):309–17.

Stern, Paul C., Thomas Dietz, Troy Abel, Gregory A. Guagnano, and Linda Kalof. 1999. "A Value-Belief-Norm Theory of Support for Social Movements: The Case of Environmentalism." *Human Ecology Reviwe* 6(2):81–97.

Stern, Paul C., Linda Kalof, Thomas Dietz, and Gregory A. Guagnano. 1995. "Values, Beliefs, and Proenvironmental Action. Attitude Formation Toward Emergent Attitude Objects1." *Journal of Applied Social Psychology* 25(18):1611–36.

Stevenson, Kathryn T., M. N. Peterson, Howard D. Bondell, Susan E. Moore, and Sarah J. Carrier. 2014. "Overcoming skepticism with education: interacting influences of worldview and climate change knowledge on perceived climate change risk among adolescents." *Climatic Change* 126(3-4):293–304.

Stoutenborough, James W., Donald P. Haider-Markel, and Mahalley D. Allen. 2006. "Reassessing the Impact of Supreme Court Decisions on Public Opinion: Gay Civil Rights Cases." *Political Research Quarterly* 59(3):419–33.

Streimikiene, Dalia. 2023. "Use of Nudges for Promotion of Sustainable Energy Consumption in Households." *Contemporary Economics* 17(1):1–9.

Stutzmann, Sophia. 2025. "Asymmetric backlash against structural economic change: The electoral consequences of the coal phase-out in Germany." *European Journal of Political Research*.

Sullivan, Rory and Andy Gouldson. 2020. "Climate Change and the Governance ofCorporations.".

Syropoulos, Stylianos, Hanne M. Watkins, Azim F. Shariff, Sara D. Hodges, and Ezra M. Markowitz. 2020. "The role of gratitude in motivating intergenerational environmental stewardship." *Journal of Environmental Psychology* 72:101517.

Taconet, Nicolas, Aurélie Méjean, and Céline Guivarch. 2020. "Influence of climate change impacts and mitigation costs on inequality between countries." *Climatic Change* 160(1):15–34.

Tallent, Theodore. 2025. "Understanding Rural Discontent with Climate Policies: Putting Place in Perspective.".

Tatham, Michaël and Yvette Peters. 2022. "Fueling opposition? Yellow vests, urban elites, and fuel taxation." *Journal of European Public Policy* 30(3):574–98.

Täuber, Susanne, Martijn van Zomeren, and Maja Kutlaca. 2015. "Should the moral core of climate issues be emphasized or downplayed in public discourse? Three ways to successfully manage the double-edged sword of moral communication." *Climatic Change* 130(3):453–64.

Thaler, Richard H. 1992. *The winner's curse: Paradoxes and anomalies of ecnomic life.* New York: Free Press.

Thaler, Richard H. and Cass Sunstein. 2008. *Nudge: Improving decisions about health, wealth, and happiness:* Yale University Press.

Thiel, Fabian. 2020. "Die Low-Cost-Hypothese. Ein empirischer Test am Beispiel der Befürwortung einer City-Maut." *Kölner Zeitschrift für Soziologie und Sozialpsychologie* 72(3):429–53.

Thompson, Jack. 2022. "Attitudes Towards LGBT Individuals After bostock v. Clayton County: Evidence From a Quasi Experiment." *Political Research Quarterly:* 106591292110680.

Tiezzi, Silvia and Erte Xiao. 2016. "Time delay, complexity and support for taxation." *Journal of Environmental Economics and Management* 77:117–41.

Tjernström, E. and T. Tietenberg. 2008. "Do differences in attitudes explain differences in national climate change policies?" *Ecological Economics* 65(2):315–24.

Tobler, Christina, Vivianne H. Visschers, and Michael Siegrist. 2012. "Addressing climate change: Determinants of consumers' willingness to act and to support policy measures." *Journal of Environmental Psychology* 32(3):197–207.

Torgler, Benno. 2003. "Tax Morale, Rule-Governed Behaviour and Trust." *Constitutional Political Economy* 14(2):119–40.

Tschötschel, Robin, Andreas Schuck, Alexandra Schwinges, and Anke Wonneberger. 2021. "Climate change policy support, intended behaviour change, and their drivers largely

unaffected by consensus messages in Germany." *Journal of Environmental Psychology* 76:101655.

Tschötschel, Robin, Andreas Schuck, and Anke Wonneberger. 2020. "Patterns of controversy and consensus in German, Canadian, and US online news on climate change." *Global Environmental Change* 60:101957.

Umit, Resul and Lena M. Schaffer. 2020. "Attitudes towards carbon taxes across Europe: The role of perceived uncertainty and self-interest." *Energy Policy* 140:111385.

United Nations Development Programme and University of Oxford. 2024. *Peoples' Climate Vote: Results*.

United Nations Environment Programme. 2023. "Emissions Gap Report 2023: Broken Record – Temperatures hit new highs, yet world fails to cut emissions (again).".

van de Ven, Dirk-Jan, Mikel González-Eguino, and Iñaki Arto. 2018. "The potential of behavioural change for climate change mitigation: a case study for the European Union." *Mitigation and Adaptation Strategies for Global Change* 23(6):853–86.

van Valkengoed, Anne M., Wokje Abrahamse, and Linda Steg. 2022. "To select effective interventions for pro-environmental behaviour change, we need to consider determinants of behaviour." *Nature human behaviour* 6(11):1482–92.

van Valkengoed, Anne M. and Linda Steg. 2019. "Meta-analyses of factors motivating climate change adaptation behaviour." *Nature Climate Change* 9(2):158–63.

van Valkengoed, Anne M., Linda Steg, and Goda Perlaviciute. 2023. "The psychological distance of climate change is overestimated." *One Earth* 6(4):362–91.

van Zomeren, Martijn, Russell Spears, and Colin W. Leach. 2010. "Experimental evidence for a dual pathway model analysis of coping with the climate crisis." *Journal of Environmental Psychology* 30(4):339–46.

Venhoeven, Leonie A., Jan W. Bolderdijk, and Linda Steg. 2020. "Why going green feels good." *Journal of Environmental Psychology* 71:101492.

Voeten, Erik. 2025. "The Energy Transition and Support for the Radical Right: Evidence from the Netherlands." *Comparative Political Studies* 58(2):394–428.

Walker, Gordon. 2012. *Environmental Justice:* Routledge.

Wang, Qian, Klaus Hubacek, Kuishuang Feng, Yi-Ming Wei, and Qiao-Mei Liang. 2016. "Distributional effects of carbon taxation." *Applied Energy* 184:1123–31.

Whitmarsh, Lorraine and Stuart Capstick. 2018. "Perceptions of climate change." Pp. 13–33, in *Psychology and climate change. Human perceptions, impacts, and responses*, edited by S. D. Clayton and C. M. Manning. London, United Kingdom, San Diego, United States, Cambridge, United States, Oxford, United Kingdom: Academic Press an imprint of Elsevier.

Whitmarsh, Lorraine and Adam Corner. 2017. "Tools for a new climate conversation: A mixed-methods study of language for public engagement across the political spectrum." *Global Environmental Change* 42:122–35.

Whitmarsh, Lorraine, Wouter Poortinga, and Stuart Capstick. 2021. "Behaviour change to address climate change." *Current opinion in psychology* 42:76–81.

Woerner, Andrej, Taisuke Imai, Davide D. Pace, and Klaus M. Schmidt. 2024. "How to increase public support for carbon pricing with revenue recycling." *Nature Sustainability* 7(12):1633–41.

Wonneberger, Anke. 2024. "Climate change litigation in the news: litigation as public campaigning tool to legitimize climate-related responsibilities and solutions." *Social Movement Studies* 23(1):94–112.

Wonneberger, Anke and Rens Vliegenthart. 2021. "Agenda-Setting Effects of Climate Change Litigation: Interrelations Across Issue Levels, Media, and Politics in the Case of Urgenda Against the Dutch Government." *Environmental Communication* 15(5):699–714.

Wynes, Seth and Kimberly A. Nicholas. 2017. "The climate mitigation gap: education and government recommendations miss the most effective individual actions." *Environmental Research Letters* 12(7):74024.

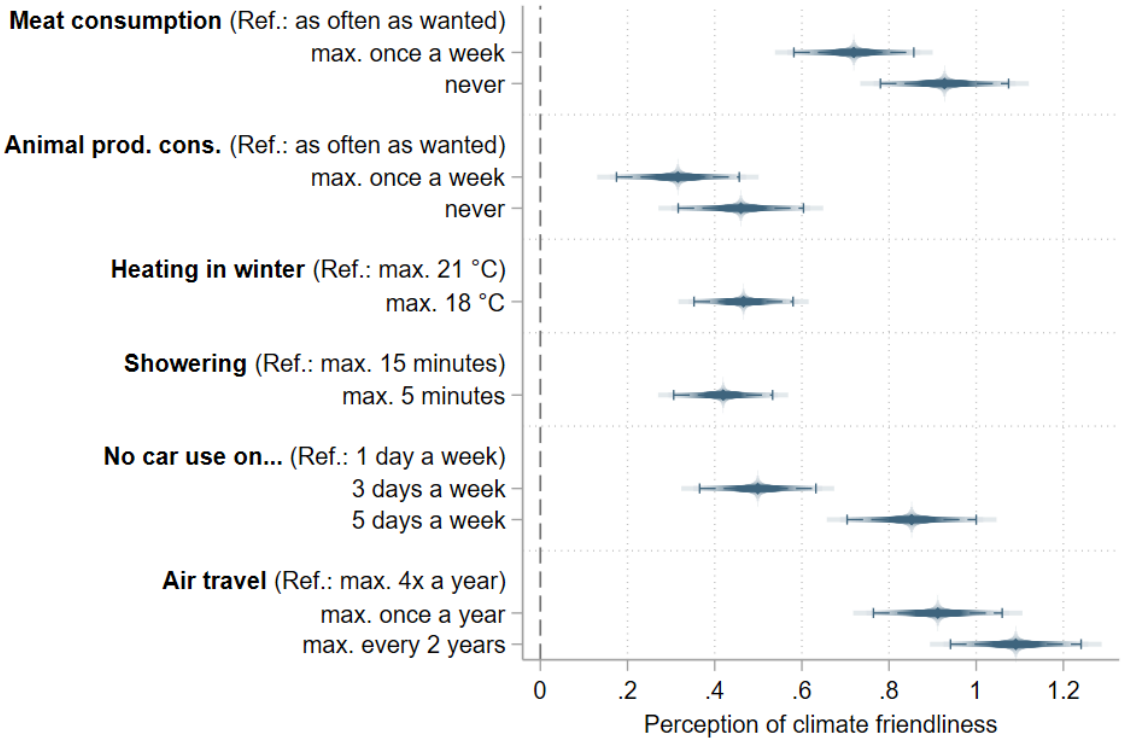
Wynes, Seth, Kimberly A. Nicholas, Jiaying Zhao, and Simon D. Donner. 2018. "Measuring what works: quantifying greenhouse gas emission reductions of behavioural interventions to reduce driving, meat consumption, and household energy use." *Environmental Research Letters* 13(11):113002.

Wyss, Annika M., Daria Knoch, and Sebastian Berger. 2022. "When and how pro-environmental attitudes turn into behavior: The role of costs, benefits, and self-control." *Journal of Environmental Psychology* 79:101748.

8 Appendix

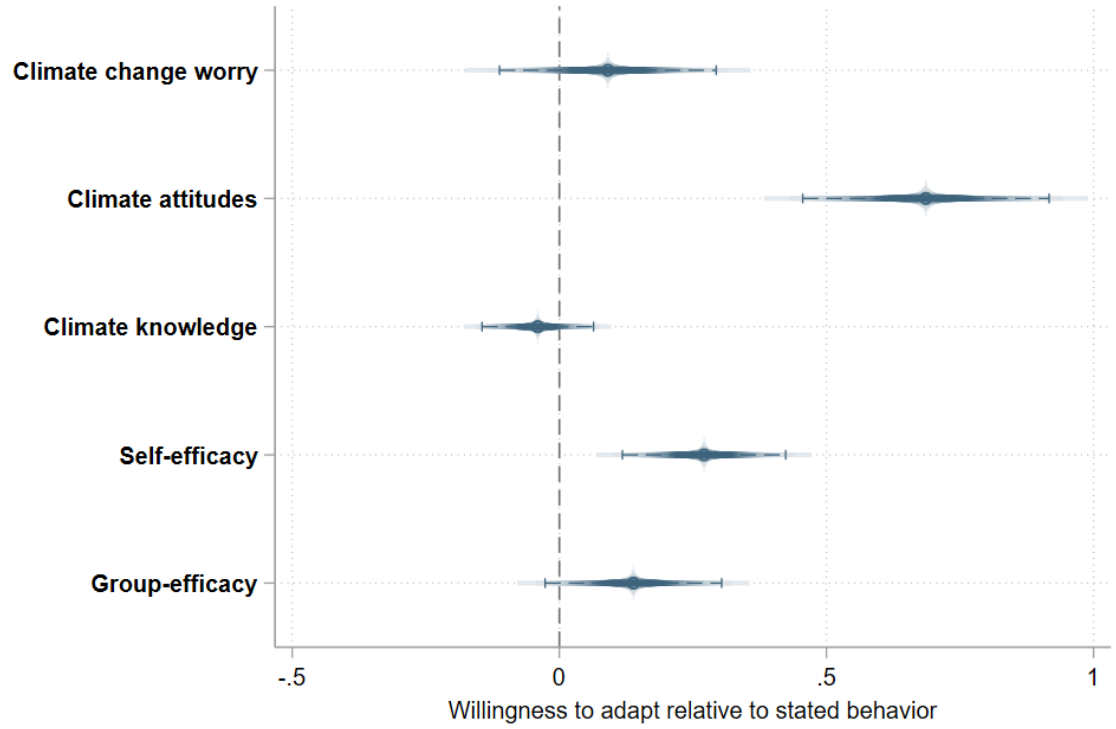
8.1 Appendix 1: 1st Research Paper: Increasing Individual-Level Climate Mitigation Action: The Role of Behavioral Dimensions and Inequality Perceptions

Appendix 1.A: Respondents' rating of climate friendliness



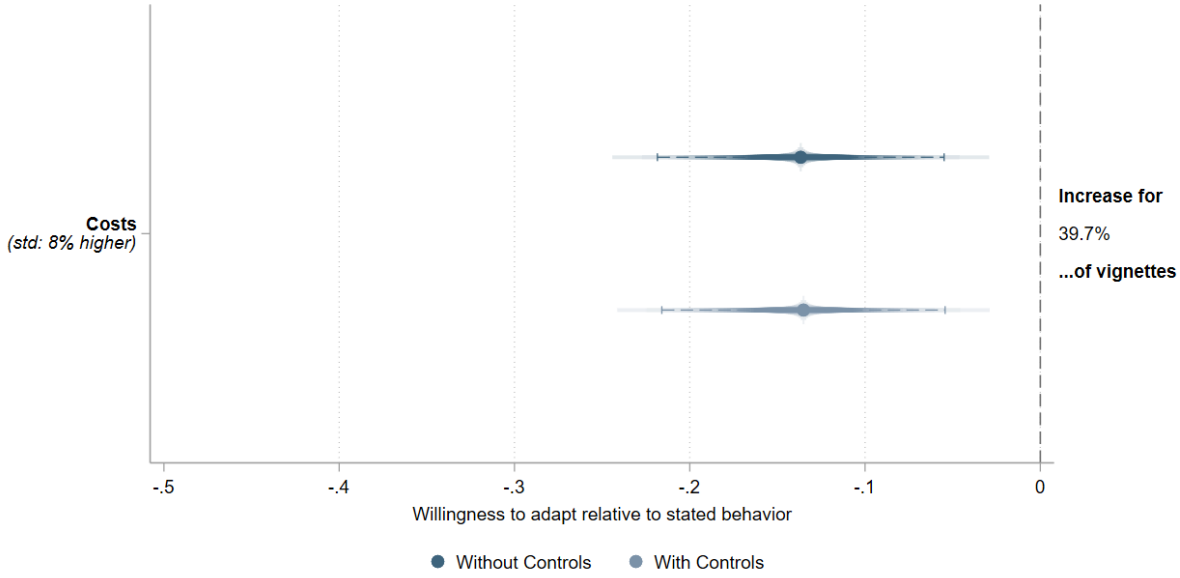
Note: Linear random intercept regression using cluster-robust standard errors. Depicted are point estimates of the perceived climate friendliness of our vignettes (rated on scales from -5 to 5) and smoothed confidence intervals (vertical bar signifies 95% level). Estimation results are based on 4297 vignette ratings from 1439 respondents. For the exact estimates, see also the regression tables in Appendix 1.D1.

Appendix 1.B1: Effect of control variables on the willingness to adapt behavior



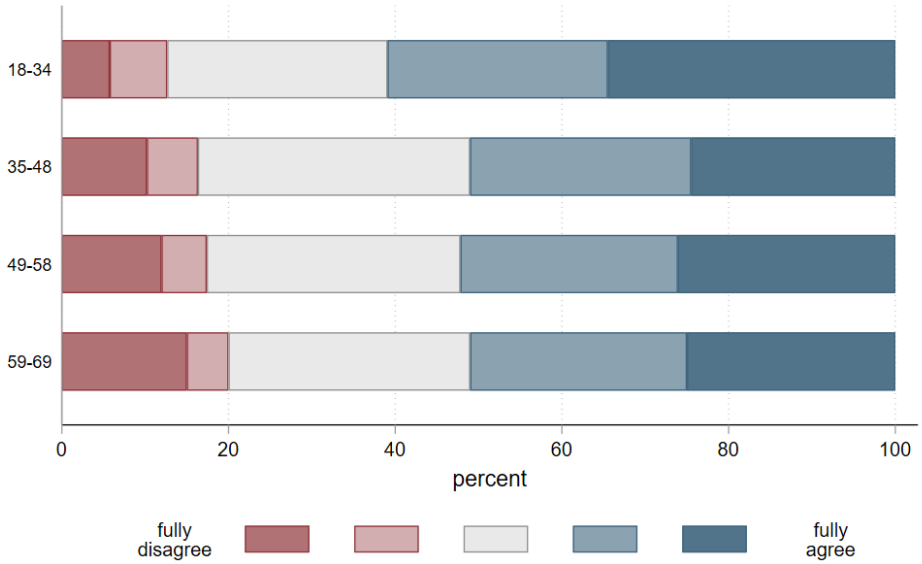
Note: Linear random intercept regression using cluster-robust standard errors. Depicted are point estimates of the effect of the most important controls used in figure 2 on respondents' willingness to adapt to the specific lifestyle described in the vignette (rated on scales from -5 to 5) (not pictured are: gender, age, education, income, climate change denial, and the costs described in the vignette) and smoothed confidence intervals (vertical bar signifies 95% level). Estimation results are based on 3952 vignette ratings from 1321 respondents. For the exact estimates, see also the regression tables in Appendix 1.D2.

Appendix 1.B2: Effect of costs on the willingness to adapt behavior



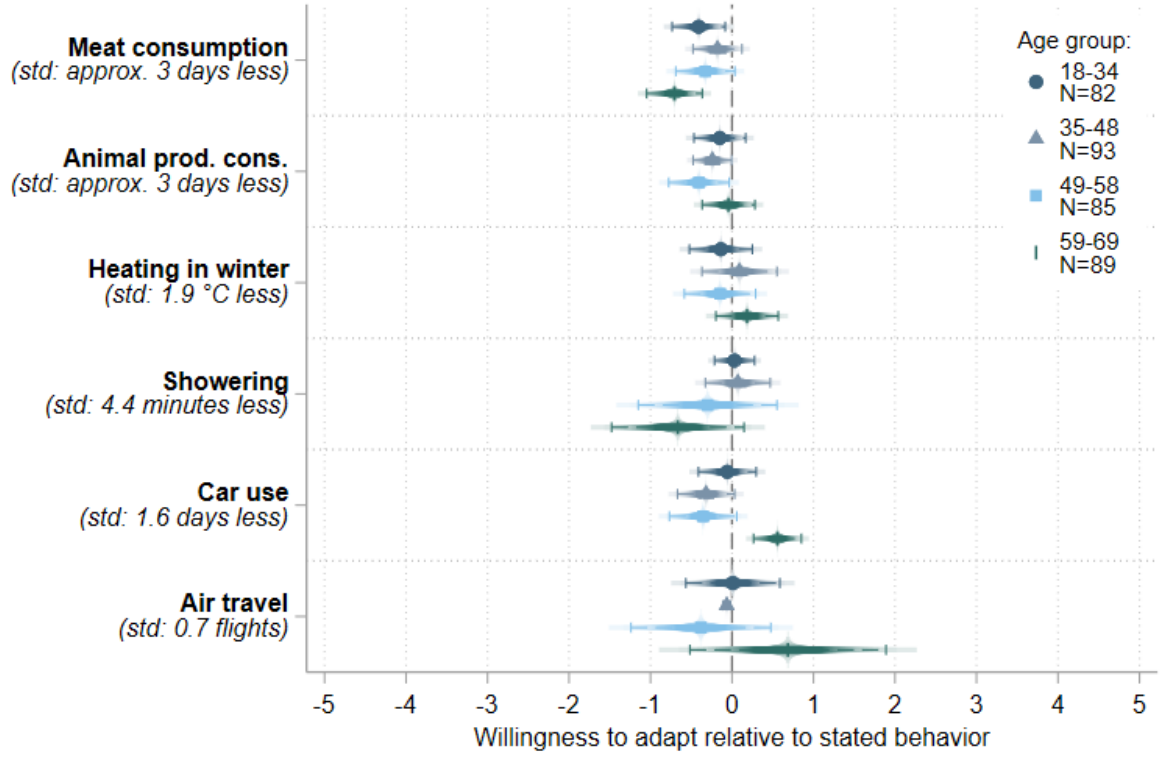
Note: Linear random intercept regression using cluster-robust standard errors. Depicted are point estimates of the effect of costs on respondents' willingness to adapt to the specific lifestyle described in the vignette (rated on scales from -5 to 5) and smoothed confidence intervals (vertical bar signifies 95% level). Effects of variables of our main interest are pictured in figure 2, most important controls in figure B1. Estimation results are based on 3952 vignette ratings from 1321 respondents. For the exact estimates, see also the regression tables in Appendix 1.D2.

Appendix 1.C1a: Agreement to generational inequality prime by age groups



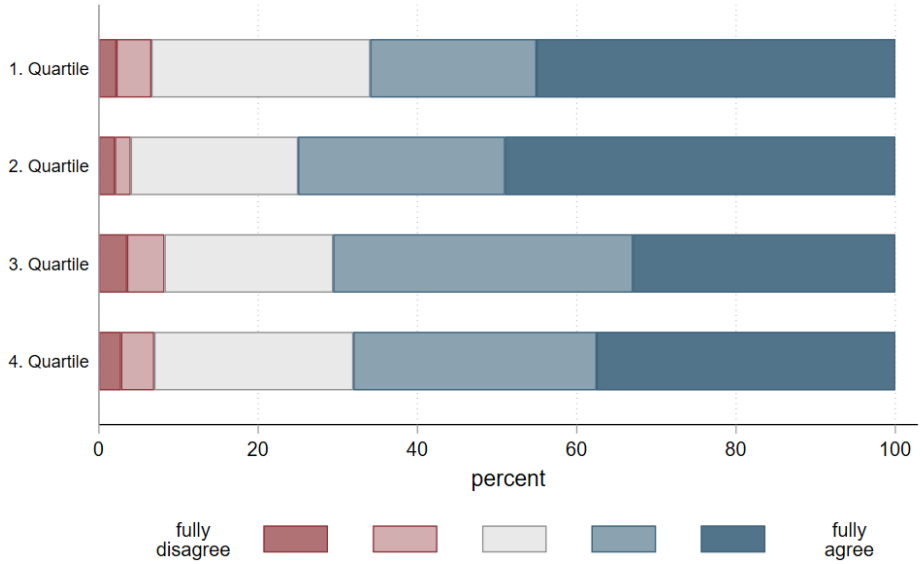
Note: Agreement measured on a 5-point scale; pictured by age groups in percent; N=349

Appendix 1.C1b: Subgroup analyses for generational framing and age groups



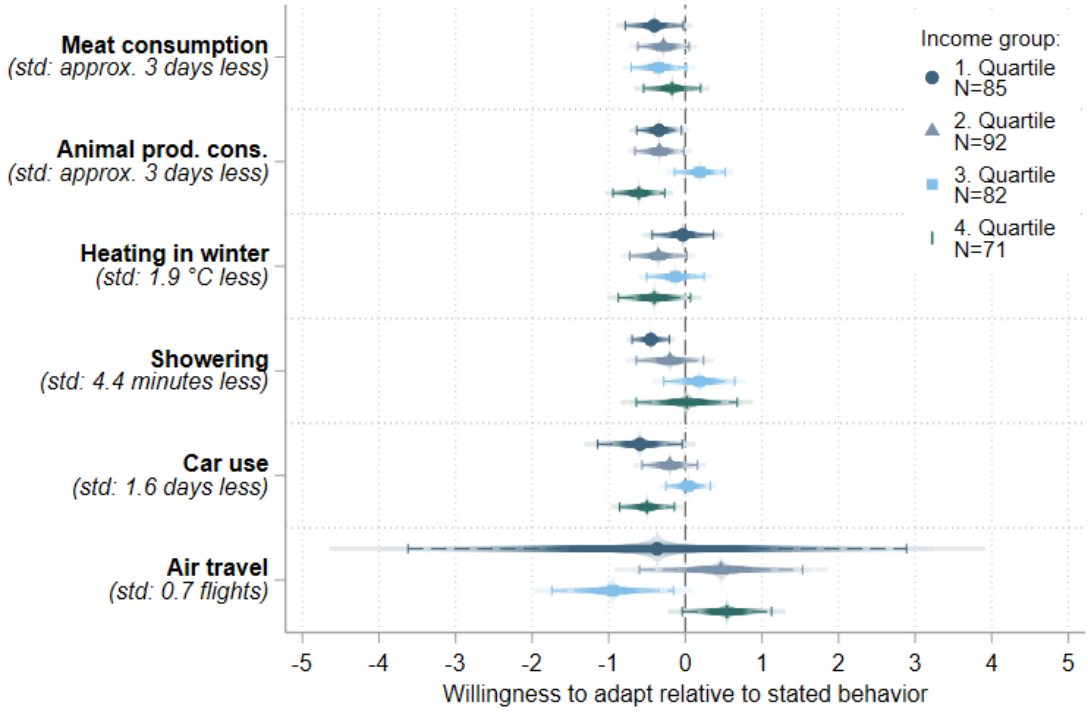
Note: Linear random intercept regression using cluster-robust standard errors. Depicted are point estimates of the effect of behavioral reductions on the willingness to adapt to the lifestyle described in the vignette (rated on scales from -5 to 5) (controlling for gender, age, education, income, climate change denial, climate change worry, climate attitudes, climate change knowledge, self-efficacy, group-efficacy, and the costs described in the vignette) and smoothed confidence intervals (vertical bar signifies 95% level) by age group. Estimation results are based on 1047 vignette ratings from 349 respondents. For the exact estimates, see also the regression tables in Appendix 1.D4.

Appendix 1.C2a: Agreement to economic inequality prime by income quartiles



Note: Agreement measured on a 5-point scale; pictured by income quartiles in percent; N=330

Appendix 1.C2b: Subgroup analyses for economic framing and income groups



Note: Linear random intercept regression using cluster-robust standard errors. Depicted are point estimates of the effect of behavioral reductions on the willingness to adapt to the lifestyle described in the vignette (rated on scales from -5 to 5) (controlling for gender, age, education, income, climate change denial, climate change worry, climate attitudes, climate change knowledge, self-efficacy, group-efficacy, and the costs described in the vignette) and smoothed confidence intervals (vertical bar signifies 95% level) by income group. Estimation results are based on 984 vignette ratings from 330 respondents. For the exact estimates, see also the regression tables in Appendix 1.D5.

Appendix 1.D1: Respondents‘ rating of climate friendliness in the basic factorial survey experiment (Linear random intercept regression using cluster-robust standard errors)

	Climate friendliness
Meat consumption (per week)	
once	0.719***
	(0.070)
never	0.927***
	(0.075)
Animal prod. cons. (per week)	
once	0.316***
	(0.072)
Never	0.460***
	(0.073)
Heating in winter	
max. 18°C	0.466***
	(0.058)
Daily Showering time	
max. 5 min.	0.419***
	(0.058)
No car use on...	
3 days a week	0.499***
	(0.068)
5 days a week	0.852***
	(0.076)
Air travel	
1x a year	0.912***
	(0.075)
every two years	1.091***
	(0.076)
Costs for diet, energy use, and mobility	
20% lower than average	0.067
	(0.091)
10% lower than average	0.018
	(0.091)
10% higher than average	-0.018
	(0.092)
20% higher than average	-0.165
	(0.093)
Intercept	-2.070***
	(0.125)
Var(_cons)	2.363
	(0.138)
Var(e)	2.659
	(0.103)
Number of vignettes	4297
Number of respondents	1439
ICC	0.471
AIC	18294.514
BIC	18402.731

*** p<.001, ** p<.01, * p<.05

Appendix 1.D2: Respondents' willingness to adapt behavior in different dimensions relative to their own behavior (Linear random intercept regression using cluster-robust standard errors) **– With and without controls**

	Without Controls	With Controls
Std: Meat consumption	-0.354***	-0.294***
	(0.047)	(0.046)
Std: Animal prod. cons.	-0.197***	-0.187***
	(0.042)	(0.042)
Std: Heating in winter	-0.176**	-0.131*
	(0.054)	(0.051)
Std: Showering	-0.179*	-0.184*
	(0.081)	(0.075)
Std: Car use	-0.290***	-0.212***
	(0.050)	(0.048)
Std: Air travel	-0.098**	-0.068*
	(0.030)	(0.027)
Std: Costs	-0.137**	-0.135**
	(0.042)	(0.041)
Climate change denial		
yes		-0.020
		(0.469)
Climate change worry		0.091
		(0.104)
Climate attitudes		0.686***
		(0.118)
Climate knowledge		-0.040
		(0.053)
Self-efficacy		0.271***
		(0.078)
Group-efficacy		0.139
		(0.084)
Var(_cons)	3.787	2.873
	(0.221)	(0.195)
Var(e)	5.173	5.165
	(0.203)	(0.202)
Number of vignettes	3952	3952
Number of respondents	1321	1321
ICC	0.423	0.357
AIC	19262.164	19046.446
BIC	19324.983	19197.213
Additional controls	no	yes

*** p<.001, ** p<.01, * p<.05

Additionally controlling for gender, age, education and net equivalent income in column 2.

Appendix 1.D3: Respondents' willingness to adapt behavior in different dimensions relative to their own behavior (Linear random intercept regression using cluster-robust standard errors) **– All vs. agreeing respondents by priming groups**

	All: Gen.	All: Global	All: Econ.	Control Group	Agree: Gen.	Agree: Global	Agree: Econ.
Std: Meat consumption	-0.375***	-0.171	-0.300**	-0.307***	-0.257*	-0.072	-0.298**
	(0.086)	(0.099)	(0.093)	(0.091)	(0.125)	(0.189)	(0.115)
Std: Animal prod. cons.	-0.204*	-0.099	-0.255**	-0.205*	-0.059	-0.087	-0.198*
	(0.082)	(0.085)	(0.083)	(0.086)	(0.104)	(0.148)	(0.100)
Std: Heating in winter	-0.019	-0.057	-0.216*	-0.194*	-0.023	-0.166	-0.270*
	(0.110)	(0.100)	(0.103)	(0.095)	(0.153)	(0.184)	(0.129)
Std: Showering	-0.040	-0.231	-0.234	-0.353*	0.039	0.018	0.055
	(0.119)	(0.129)	(0.123)	(0.145)	(0.116)	(0.176)	(0.151)
Std: Car use	-0.151	-0.202*	-0.294**	-0.188	-0.131	-0.132	-0.353**
	(0.094)	(0.088)	(0.103)	(0.096)	(0.162)	(0.144)	(0.129)
Std: Air travel	-0.074***	0.047	0.000	0.113	0.152	0.727**	-0.026
	(0.018)	(0.251)	(0.220)	(0.344)	(0.316)	(0.260)	(0.270)
Std: Costs	-0.122	-0.045	-0.285***	-0.065	-0.113	0.097	-0.334***
	(0.080)	(0.079)	(0.086)	(0.084)	(0.116)	(0.120)	(0.099)
CC denial yes	-0.767	0.440	-0.077	0.693	-0.954		0.349
	(0.692)	(0.803)	(1.227)	(0.839)	(0.767)		(1.822)
CC worry	0.161	-0.419*	0.220	0.282	0.139	-0.593	0.406
	(0.199)	(0.203)	(0.200)	(0.223)	(0.292)	(0.328)	(0.272)
Climate attitudes	0.867***	1.093***	0.532*	0.388	0.970*	1.093**	0.295
	(0.229)	(0.218)	(0.240)	(0.250)	(0.380)	(0.384)	(0.317)
Climate knowledge	-0.109	-0.059	-0.126	0.177	-0.069	0.171	-0.111
	(0.103)	(0.102)	(0.108)	(0.107)	(0.147)	(0.156)	(0.137)
Self-efficacy	0.112	0.358*	0.095	0.558***	0.188	0.121	0.195
	(0.130)	(0.149)	(0.147)	(0.167)	(0.185)	(0.232)	(0.177)
Group-efficacy	0.216	0.102	0.199	-0.050	0.115	-0.221	0.201
	(0.159)	(0.161)	(0.180)	(0.169)	(0.227)	(0.270)	(0.218)
Var(_cons)	2.494	2.448	2.974	2.676	2.869	2.188	3.148
	(0.374)	(0.347)	(0.388)	(0.400)	(0.552)	(0.525)	(0.474)
Var(e)	5.368	4.689	5.217	5.326	5.485	5.205	5.323
	(0.411)	(0.383)	(0.407)	(0.420)	(0.574)	(0.657)	(0.467)
# of vignettes	1045	930	984	993	572	363	684
# of respondents	349	310	330	332	191	121	230
ICC	0.317	0.343	0.363	0.334	0.343	0.296	0.372
AIC	5071.922	4416.433	4793.549	4829.406	2822.845	1771.660	3365.985
BIC	5185.813	4532.477	4910.948	4942.122	2922.875	1857.336	3474.656
Controls	yes	yes	yes	yes	yes	yes	yes

*** p<.001, ** p<.01, * p<.05

Controls: gender, age, education and net equivalent income.

Appendix 1.D4: Respondents' willingness to adapt behavior in different dimensions relative to their own behavior (Linear random intercept regression using cluster-robust standard errors) – **Subgroup analyses for generational framing and age groups**

	18-34	35-48	49-58	59-69
Std: Meat consumption	-0.409*	-0.178	-0.327	-0.706***
	(0.166)	(0.153)	(0.185)	(0.174)
Std: Animal prod. cons.	-0.150	-0.241*	-0.406*	-0.043
	(0.162)	(0.121)	(0.189)	(0.165)
Std: Heating in winter	-0.137	0.092	-0.148	0.185
	(0.197)	(0.235)	(0.223)	(0.195)
Std: Showering	0.031	0.071	-0.300	-0.665
	(0.125)	(0.203)	(0.434)	(0.415)
Std: Car use	-0.058	-0.319	-0.355	0.558***
	(0.181)	(0.179)	(0.211)	(0.149)
Std: Air travel	0.010	-0.065**	-0.382	0.686
	(0.294)	(0.024)	(0.438)	(0.614)
Std: Costs	-0.295*	0.035	-0.063	-0.230
	(0.148)	(0.162)	(0.180)	(0.145)
Climate change denial				
yes	1.225	-2.156		-0.751
	(1.179)	(1.169)		(1.575)
Climate change worry	0.662	-0.038	-0.025	0.042
	(0.479)	(0.428)	(0.306)	(0.373)
Climate attitudes	0.996	1.245**	0.796*	0.396
	(0.531)	(0.406)	(0.368)	(0.436)
Climate knowledge	-0.057	-0.478**	0.048	-0.378*
	(0.193)	(0.160)	(0.214)	(0.191)
Self-efficacy	-0.111	0.464*	-0.012	0.321
	(0.300)	(0.220)	(0.262)	(0.229)
Group-efficacy	0.046	0.237	0.472	-0.082
	(0.372)	(0.245)	(0.285)	(0.262)
Var(_cons)	1.905	1.862	1.325	1.479
	(0.668)	(0.665)	(0.758)	(0.703)
Var(e)	4.486	4.840	6.558	5.581
	(0.769)	(0.802)	(0.946)	(0.801)
# of vignettes	246	278	254	267
# of respondents	82	93	85	89
ICC	0.298	0.278	0.168	0.210
AIC	1178.713	1342.487	1280.655	1312.858
BIC	1255.830	1422.294	1354.939	1391.777
Controls	yes	yes	yes	yes

*** p<.001, ** p<.01, * p<.05

Controls: gender, age, education and net equivalent income.

Appendix 1.D5: Respondents' willingness to adapt behavior in different dimensions relative to their own behavior (Linear random intercept regression using cluster-robust standard errors) – **Subgroup analyses for generational framing and income groups**

	1. Quartile	2. Quartile	3. Quartile	4. Quartile
Std: Meat consumption	-0.406 *	-0.286	-0.347	-0.173
	(0.193)	(0.171)	(0.183)	(0.190)
Std: Animal prod. cons.	-0.343 *	-0.339 *	0.190	-0.607 ***
	(0.149)	(0.163)	(0.169)	(0.173)
Std: Heating in winter	-0.033	-0.354	-0.131	-0.404
	(0.204)	(0.190)	(0.191)	(0.240)
Std: Showering	-0.452 ***	-0.202	0.182	0.019
	(0.124)	(0.224)	(0.236)	(0.336)
Std: Car use	-0.593 *	-0.203	0.035	-0.501 **
	(0.282)	(0.185)	(0.147)	(0.182)
Std: Air travel	-0.367	0.466	-0.949 *	0.542
	(1.661)	(0.544)	(0.405)	(0.298)
Std: Costs	-0.252	-0.249	-0.419 **	-0.234
	(0.170)	(0.177)	(0.132)	(0.226)
Climate change denial				
yes	0.384	-1.561		0.083
	(1.501)	(1.079)		(1.214)
Climate change worry	-0.063	0.251	1.219 *	0.777 *
	(0.308)	(0.368)	(0.558)	(0.374)
Climate attitudes	0.556	0.635	-0.094	0.112
	(0.428)	(0.565)	(0.507)	(0.478)
Climate knowledge	-0.421	-0.160	-0.099	0.009
	(0.233)	(0.229)	(0.293)	(0.188)
Self-efficacy	0.429	0.335	-0.497	0.143
	(0.303)	(0.306)	(0.376)	(0.223)
Group-efficacy	-0.133	0.322	0.118	0.166
	(0.331)	(0.300)	(0.446)	(0.335)
Var(_cons)	2.861	2.596	2.857	1.067
	(0.738)	(0.752)	(0.832)	(0.542)
Var(e)	5.045	5.513	4.728	5.027
	(0.827)	(0.870)	(0.703)	(0.675)
# of vignettes	253	275	244	212
# of respondents	85	92	82	71
ICC	0.362	0.320	0.377	0.175
AIC	1253.451	1372.701	1195.826	1018.814
BIC	1327.652	1448.653	1265.769	1085.946
Controls	yes	yes	yes	yes

*** p<.001, ** p<.01, * p<.05

Controls: gender, age, education and net equivalent income.

Appendix 1.D6: Respondents' willingness to adapt behavior in different dimensions relative to their own behavior (Linear random intercept regression using cluster-robust standard errors) – **Alternative codings of agreement by priming groups**

	Agree (3-5): Gen.	Agree (3-5): Global	Agree (3-5): Econ.	Agree (5): Gen.	Agree (5): Global	Agree (5): Econ.
Std: Meat consumption	-0.364***	-0.185	-0.299**	-0.180	0.151	-0.309*
	(0.094)	(0.107)	(0.098)	(0.191)	(0.378)	(0.151)
Std: Animal prod. cons.	-0.181*	-0.067	-0.257**	-0.118	0.006	-0.246
	(0.087)	(0.095)	(0.085)	(0.163)	(0.217)	(0.131)
Std: Heating in winter	-0.074	-0.047	-0.236*	-0.031	0.020	-0.279
	(0.121)	(0.109)	(0.109)	(0.219)	(0.296)	(0.170)
Std: Showering	0.032	-0.204	-0.234	0.046	0.188	0.006
	(0.112)	(0.141)	(0.129)	(0.277)	(0.210)	(0.198)
Std: Car use	-0.121	-0.156	-0.319**	-0.235	-0.006	-0.305
	(0.108)	(0.095)	(0.107)	(0.289)	(0.281)	(0.183)
Std: Air travel	-0.058**	0.052	-0.007	0.448	0.353	0.592
	(0.021)	(0.272)	(0.241)	(0.372)	(0.676)	(0.508)
Std: Costs	-0.142	0.020	-0.258**	-0.178	-0.033	-0.399**
	(0.087)	(0.085)	(0.090)	(0.170)	(0.191)	(0.135)
CC denial yes	0.113	-0.306	-0.882			0.524
	(0.684)	(0.941)	(1.494)			(2.021)
CC worry	0.212	-0.462*	0.333	0.255	-0.592	0.296
	(0.223)	(0.217)	(0.218)	(0.438)	(0.426)	(0.371)
Climate attitudes	0.928***	0.981***	0.414	0.490	0.748	0.549
	(0.269)	(0.236)	(0.255)	(0.642)	(0.635)	(0.417)
Climate knowledge	-0.064	-0.030	-0.142	-0.042	0.408	-0.187
	(0.112)	(0.109)	(0.114)	(0.231)	(0.218)	(0.203)
Self-efficacy	0.056	0.403*	0.111	-0.117	0.479	0.003
	(0.140)	(0.166)	(0.152)	(0.283)	(0.355)	(0.237)
Group-efficacy	0.233	-0.035	0.183	0.425	-0.308	0.141
	(0.175)	(0.187)	(0.195)	(0.307)	(0.440)	(0.277)
Var(_cons)	2.445	2.474	2.962	3.488	1.454	3.624
	(0.424)	(0.387)	(0.408)	(0.875)	(0.798)	(0.679)
Var(e)	5.275	4.858	5.307	6.421	5.521	5.584
	(0.440)	(0.421)	(0.425)	(0.904)	(1.153)	(0.669)
# of vignettes	881	801	921	299	153	399
# of respondents	294	267	309	100	51	135
ICC	0.317	0.337	0.358	0.352	0.209	0.394
AIC	4267.275	3834.869	4501.403	1544.990	769.299	2010.963
BIC	4377.239	3947.330	4617.214	1626.399	835.968	2106.698
Controls	yes	yes	yes	yes	yes	yes

*** p<.001, ** p<.01, * p<.05

Controls: gender, age, education and net equivalent income.

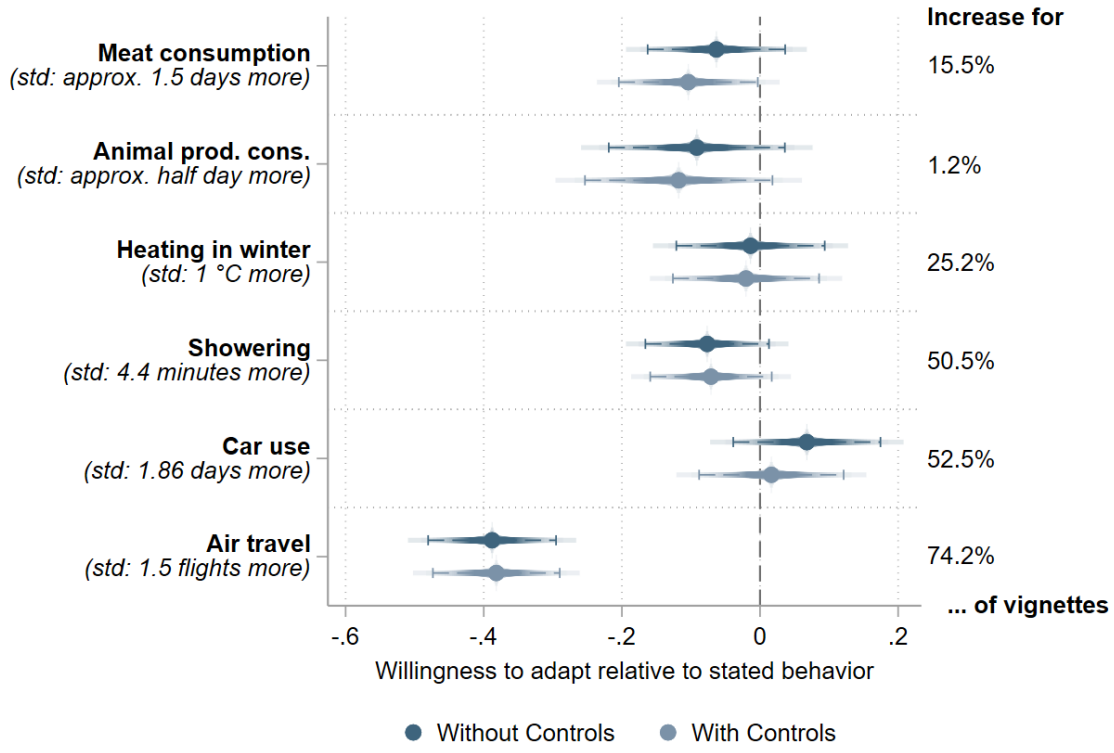
Appendix 1.D7: Respondents' willingness to adapt behavior in different dimensions relative to their own behavior (Linear random intercept regression using cluster-robust standard errors) – **With and without controls (robustness check: vignettes that would demand increases of specific behavior)**

	Without Controls	With Controls
Std: Meat consumption	-0.354***	-0.294***
	(0.047)	(0.046)
Std: Animal prod. cons.	-0.197***	-0.187***
	(0.042)	(0.042)
Std: Heating in winter	-0.176**	-0.131*
	(0.054)	(0.051)
Std: Showering	-0.179*	-0.184*
	(0.081)	(0.075)
Std: Car use	-0.290***	-0.212***
	(0.050)	(0.048)
Std: Air travel	-0.098**	-0.068*
	(0.030)	(0.027)
Std: Costs	-0.137**	-0.135**
	(0.042)	(0.041)
Climate change denial		
yes		-0.020
		(0.469)
Climate change worry		0.091
		(0.104)
Climate attitudes		0.686***
		(0.118)
Climate knowledge		-0.040
		(0.053)
Self-efficacy		0.271***
		(0.078)
Group-efficacy		0.139
		(0.084)
Var(_cons)	4.271	3.144
	(0.248)	(0.209)
Var(e)	5.072	5.054
	(0.194)	(0.192)
Number of vignettes	3952	3952
Number of respondents	1321	1321
ICC	0.423	0.357
AIC	19262.164	19046.446
BIC	19324.983	19197.213
Additional controls	no	yes

*** p<.001, ** p<.01, * p<.05

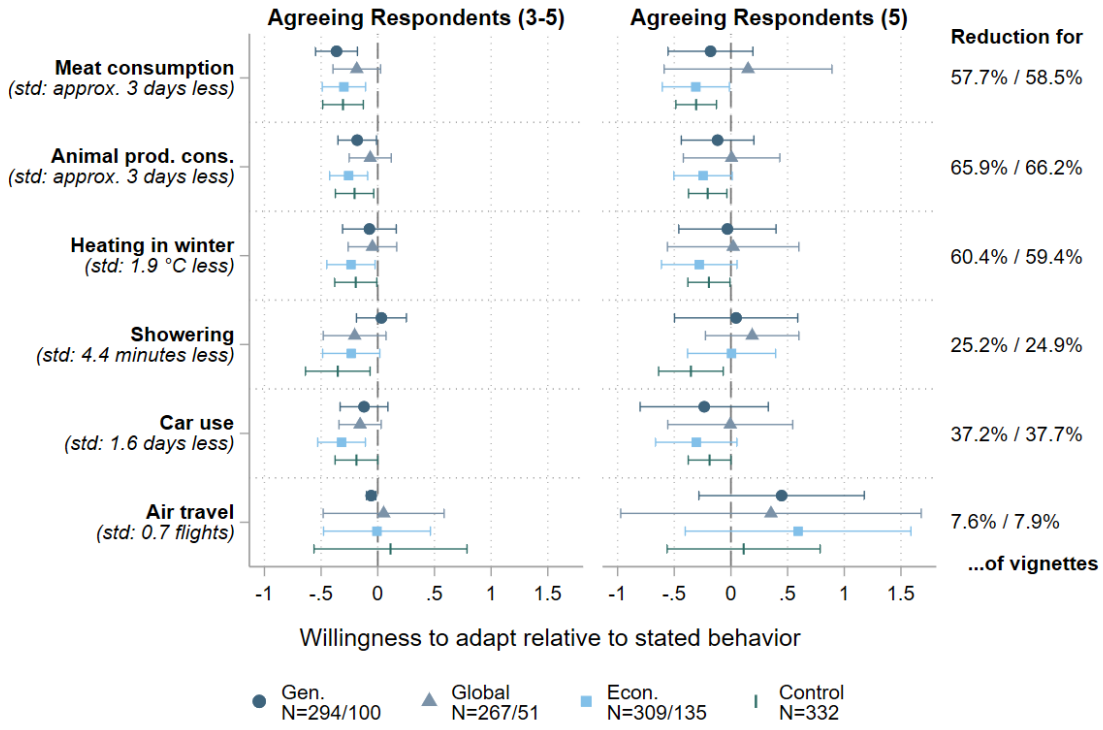
Additionally controlling for gender, age, education and net equivalent income in column 2.

Appendix 1.E1: Robustness check – effect of vignettes that signify increase of behavior



*Note: Linear random intercept regressions using cluster-robust standard errors. Depicted are point estimates of the effect of behavioral **increases** on the willingness to adapt to the lifestyle described in the vignette (rated on scales from -5 to 5) (controlling for gender, age, education, income, climate change denial, climate change worry, climate attitudes, climate change knowledge, self-efficacy, group-efficacy, and the costs described in the vignette) and smoothed confidence intervals (vertical bar signifies 95% level). Estimation results are based on 3952 vignette ratings from 1321 respondents. Percentages on the right indicate the amount of vignettes that would demand behavioral changes from the respondent. For the exact estimates, see also the regression tables in Appendix 1.D7.*

Appendix 1.E2: Robustness check – coding of agreeing respondents



Note: Linear random intercept regressions using cluster-robust standard errors. Depicted are point estimates of the effect of behavioral reductions on the willingness to adapt to the lifestyle described in the vignette (rated on scales from -5 to 5) (controlling for gender, age, education, income, climate change denial, climate change worry, climate attitudes, climate change knowledge, self-efficacy, group-efficacy, and the costs described in the vignette) and 95% confidence intervals for all agreeing respondents coded as 3-5, and only 5. Estimation results are based on 3952 vignette ratings from 1321 respondents overall (number of respondents agreeing to the priming statement for both codings is depicted in the legend). Percentages on the right indicate the amount of vignettes that would demand behavioral changes from the respondent (for both codings). For the exact estimates, see also the regression tables in Appendix 1.D6.

Appendix 1.F1: Example for vignette depiction – original (German)

Nehmen Sie an, eine fiktive Person verhält sich in verschiedenen Lebensbereichen beispielsweise folgendermaßen:

Ernährung	
Fleischkonsum	Max. einmal pro Woche
Konsum von Milchprodukten/Eiern	Mehrmals pro Woche
Wohnen	
Maximale Heiztemperatur im Winter	18 °C
Maximale Duschdauer pro Tag	5 Minuten
Mobilität	
Auto stehen lassen an …	1 Tag die Woche
Private Flugreisen (Hin- & Rückflug)	Maximal 1x pro Jahr
Kosten	
Regelmäßige Ausgaben in den oben genannten Bereichen	Sind ca. 10 % niedriger als die durchschnittlichen Kosten für Ernährung, Wohnen und Mobilität

Für wie klimafreundlich halten Sie den beschriebenen Lebensstil?

-5	-4	-3	-2	-1	0	1	2	3	4	5
Nicht genug					Angemessen					Zu weitreichend
○	○	○	○	○	○	○	○	○	○	○

… und inwieweit sind Sie persönlich bereit, sich auch so zu verhalten, wie es hier beschrieben ist?

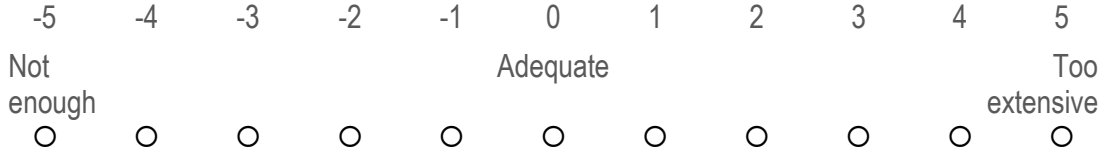
-5	-4	-3	-2	-1	0	1	2	3	4	5
Auf keinen Fall										Auf jeden Fall
○	○	○	○	○	○	○	○	○	○	○

Appendix 1.F2: Example for vignette depiction – English translation

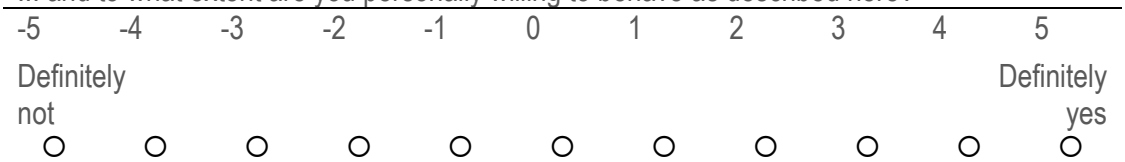
Suppose, for example, that a fictional person behaves as follows in various areas of life:

Diet	
Meat consumption	max. once a week
Dairy product / egg consumption	multiple times a week
Dwelling	
Heating in winter	18 °C
Showering (per day)	5 minutes
Mobility	
Don‘t use the car on…	1 day a week
(Non-business) flights	max. once a year
Costs	
Regular costs in these dimensions	are ~10% less than the average costs for diet, dwelling and mobility

How climate-friendly do you think the lifestyle described is?



... and to what extent are you personally willing to behave as described here?



Appendix 1.G1: Descriptive statistics of respondent characteristics

	Mean (SD) / N (%)	Min.	Max.	Median
Gender: male	0.5 (-)	0	1	0
Age	46.05 (14.13)	18	69	48
Education: Finished school without a diploma	6 (0.45%)	-	-	-
Certificate of secondary education	364 (27.55%)	-	-	-
General certificate of secondary education	447 (33.84%)	-	-	-
University entrance qualification	504 (38.15%)	-	-	-
Net equivalent income: 1. Quartile	330 (24.98%)	-	-	-
2. Quartile	325 (24.60%)	-	-	-
3. Quartile	330 (24.98%)	-	-	-
4. Quartile	336 (25.44%)	-	-	-
Climate change denial: yes	0.02 (-)	0	1	0
Climate change worry	3.51 (1.02)	1	5	4
Climate change attitudes index	3.71 (0.98)	1	5	3.80
Climate change knowledge	2.07 (1.22)	0	5	2
Self-efficacy	3.23 (0.95)	1	5	3
Group-efficacy	3.24 (0.86)	1	5	3

Note: N=1321 respondents; mean and standard deviation indicated for metric variables, N and percentage indicated for each category of categorial variables, mean indicated for dummy variables

Appendix 1.G2: Descriptive statistics of respondents' behavior

	Mean	Std..	Min.	Max.	Median
Meat consumption[1]	5.39	2.45	0	7	7
Other animal product cons. [1]	6.88	0.89	0	7	7
Heating temperature in winter (°C)	20.73	2.03	10	30	21
Daily showering time (min.)	7.84	4.90	1	60	5
Weekly car use[1]	3.43	2.48	0.5	7	2
Yearly (not work related) flights	0.61	1.63	0	50	0.5

Note: N=1321 respondents; Dimensions marked with [1] are calculated with the respondents' replies to similar questions to achieve comparability with our vignette dimensions. See next page for the original answer categories and the corresponding coding:

Respondents' diet	% of respondents	Coding: Consumption on days in a week	
		Meat	Other animal products
Omnivore	66.09	7	7
Flexitarian	21.88	3.5	7
Pescatarian	5.90	0	7
Vegetarian	4.47	0	7
Vegan	1.67	0	0

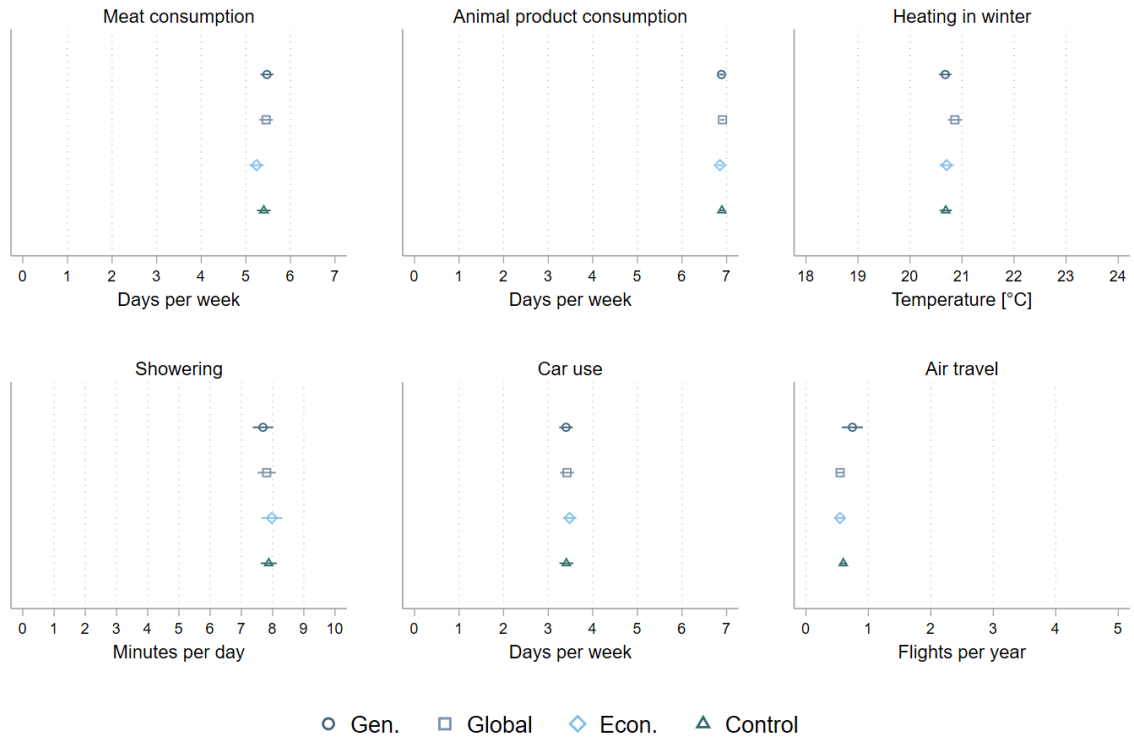
Respondents' car use	% of respondents	Coding: Weekly car use
(Almost) every day	22.33	7
Around 4-6 days	22.63	5
Around 1-3 days	30.28	2
Less than once	24.75	0.5

Appendix 1.H1: Survey Experiment Design

Our factorial survey experiment was designed to keep the social desirability in our respondents' answers as low as possible. Therefore, we purposely did not ask them about their behavior before showing the primes and the lifestyle vignettes. We assume that respondents have their behavior in mind when they evaluate whether they would adopt the behavior described in the vignette but wanted them to make the comparison implicitly. To have them explicitly state their behavior before would have led to a more obvious comparison and a higher danger of social desirability in answers. However, we acknowledge that there might be concern about our respondents adapting the report of their behavior after being primed. To avoid this, we allowed for the maximum of time between exposing our respondents to the prime and factorial survey part of the questionnaire and the report of their own behavior by letting them answer the other parts of the questionnaire which are unrelated to our research in-between. The exact number of unrelated questions between the vignettes and behavioral reporting varied depending on respondents' filtering throughout the survey, but there were always at least 10 pages between these sections. Moreover, we made sure to formulate our questions about the current habits of respondents as different as possible from how the behavior was presented in the vignette (see App. I).

As an additional robustness check, we compared the reported behavior of respondents across our priming groups. If the reported behavior changed after exposure to the prime, there should be a difference in the climate-friendliness of the reported behavior between the primed groups and the control group. Appendix 1.H2 (see below) shows that the mean self-reported behavior between priming groups does not differ substantially. This is supported by an additional ANOVA combined with Tukey's HSD test, which show that differences between groups are significant at the $p<.05$ level only for the dimension of flights and only when comparing the generational with the global priming group. This difference is likely due to chance fluctuations, and both groups do not significantly differ from the control group. These results indicate that our inequality primes did not significantly affect respondents' self-reported behavior at the end of the survey.

Appendix 1.H2: Self-reported behavior between priming groups



Note: Mean self-reported behavior comparison between priming groups for all behavioral dimensions. For additional ANOVA and Tukey's HSD test see next page.

Appendix 1.H2 continued:

ANOVA results

		Partial SS	df	MS	F	Prob>F
Diet	Model	4.984	3	1.661	1.99	0.114
	Priming Group	4.984	3	1.661	1.99	0.114
	Residual	3597.056	4301	0.836		
	Total	3602.040	4304	0.837		
		Partial SS	df	MS	F	Prob>F
Heating	Model	27.668	3	9.223	2.19	0.087
	Priming Group	27.668	3	9.223	2.19	0.087
	Residual	18023.406	4277	4.214		
	Total	18051.074	4280	4.218		
		Partial SS	df	MS	F	Prob>F
Showering	Model	114.000	3	38.000	1.32	0.265
	Priming Group	114.000	3	38.000	1.32	0.265
	Residual	121786.780	4238	28.737		
	Total	121900.780	4241	28.743		
		Partial SS	df	MS	F	Prob>F
Flights	Model	30.470	3	10.157	4.04	0.007
	Priming Group	30.470	3	10.157	4.04	0.007
	Residual	10824.412	4301	2.517		
	Total	10854.881	4304	2.522		
		Partial SS	df	MS	F	Prob>F
Car use	Model	1.038	3	0.346	0.29	0.833
	Priming Group	1.038	3	0.346	0.29	0.833
	Residual	5112.917	4277	1.195		
	Total	5113.955	4280	1.195		

Note: ANOVA for mean self-reported behavior comparison between priming groups. Please note that the differences between groups are significant at the $p<.05$ level only for the dimension of flights. However, Tukey's HSD test (see below) indicates that this result is not driven by comparisons with the control group.

Appendix 1.H2 continued:

Tukeys's HSD results

	Priming Group	Contrast	SE	t	P>|t|
Diet	2 vs 1	0.026	0.039	0.66	0.913
	3 vs 1	0.091	0.039	2.35	0.088
	4 vs 1	0.052	0.039	1.33	0.546
	3 vs 2	0.065	0.040	1.64	0.358
	4 vs 2	0.026	0.040	0.64	0.918
	4 vs 3	-0.040	0.039	-1.00	0.748
	Priming Group	Contrast	SE	t	P>|t|
Heating	2 vs 1	0.223	0.089	2.50	0.059
	3 vs 1	0.064	0.088	0.74	0.883
	4 vs 1	0.083	0.088	0.95	0.777
	3 vs 2	-0.158	0.090	-1.76	0.295
	4 vs 2	-0.139	0.090	-1.55	0.410
	4 vs 3	0.019	0.089	0.21	0.997
	Priming Group	Contrast	SE	t	P>|t|
Showering	2 vs 1	0.454	0.233	1.95	0.207
	3 vs 1	0.296	0.230	1.29	0.572
	4 vs 1	0.227	0.231	0.99	0.757
	3 vs 2	-0.158	0.235	-0.67	0.908
	4 vs 2	-0.226	0.236	-0.96	0.773
	4 vs 3	-0.068	0.233	-0.29	0.991
	Priming Group	Contrast	SE	t	P>|t|
Flights	2 vs 1	-0.222	0.068	-3.25	0.006
	3 vs 1	-0.179	0.067	-2.65	0.041
	4 vs 1	-0.143	0.068	-2.11	0.151
	3 vs 2	0.044	0.069	0.63	0.922
	4 vs 2	0.080	0.069	1.15	0.660
	4 vs 3	0.036	0.068	0.52	0.953
	Priming Group	Contrast	SE	t	P>|t|
Car Use	2 vs 1	-0.036	0.047	-0.77	0.869
	3 vs 1	-0.028	0.047	-0.60	0.932
	4 vs 1	-0.003	0.047	-0.07	1.000
	3 vs 2	0.008	0.048	0.17	0.998
	4 vs 2	0.033	0.048	0.69	0.900
	4 vs 3	0.025	0.047	0.53	0.953

Note: Tukey's HSD for mean self-reported behavior comparison between priming groups (1=Generational, 2=Global, 3=Economic, 4=Control). Please note that differences between groups are significant at the p<.05 level only for the dimension of flights when comparing the generational with the global priming group.

Appendix 1.I: Survey Questions

Please note: The survey questions used for our analysis are part of a broader research project with a more extensive questionnaire. Here, we included all parts of the questionnaire used for our specific research design. Places in the questionnaire where questions were omitted are marked with [...].

[…]

In order to control the quotas of the survey, we first ask you for a few details about yourself.

Gender	
You are …	
0	Female
1	Male
3	Diverse (excluded due to low respondent numbers)

Age
How old are you?
<Value>

Education	
What is your highest school certificate?	
1	Never been to school
2	Finished school without a diploma
3	Certificate of secondary education (“Volks- oder Hauptschule bzw. Mittelschule”)
4	General certificate of secondary education (“Mittlere Reife/ Realschulabschluss”)
5	University entrance qualification (“(Fach-) Hochschulreife”)

[…]

In addition to general environmental protection, one topic that is currently the subject of much public debate is climate change. This involves the fact that the earth is becoming increasingly warmer due to excessive emissions of greenhouse gases.

[…]

Climate change denial	
Do you think climate change is caused by natural processes, by human action, or by both?	
1	Only through natural processes
2	Above all through natural processes
3	In roughly equal parts by natural processes and human action
4	Above all through human action
5	Only through human action
6	I don't think climate change is happening → climate change denial dummy

Climate change concern	
How worried are you about climate change?	
1	Not worried at all
2	Not very worried
3	Somewhat worried
4	Very worried
5	Extremely worried

Climate attitudes Index	
To what extent do you agree with these statements?	
It makes me sad when I see other people wasting energy without thinking. (excluded in index due to factor analysis results)	
1	Strongly disagree
2	Disagree
3	Partly
4	Agree
5	Fully agree
When I hear news about the negative consequences of climate change, it worries me very much.	
1	Strongly disagree
2	Disagree
3	Partly
4	Agree
5	Fully agree
Climate change will cause us major problems in the future.	
1	Strongly disagree
2	Disagree
3	Partly
4	Agree
5	Fully agree
In my opinion, the negative consequences of climate change are often exaggerated in public. (reversed)	
1	Strongly disagree
2	Disagree
3	Partly
4	Agree
5	Fully agree
Climate protection should be discussed more in politics.	
1	Strongly disagree
2	Disagree
3	Partly
4	Agree
5	Fully agree
We should do more to stop climate change.	
1	Strongly disagree
2	Disagree
3	Partly
4	Agree

5	Fully agree

Now we ask you some questions about environmental protection and climate change. Here we are particularly interested in people's everyday knowledge. It is therefore quite normal if you do not know the right answer to some questions.

Climate Knowledge Quiz	
Are the following statements true or false?	
The cause of the greenhouse effect is a hole in the Earth's atmosphere.	
1	True
2	False
3	I don’t know
Every time we burn oil, coal or gas, we contribute to the greenhouse effect.	
1	True
2	False
3	I don’t know
Nitrous oxide (N2O) is a greenhouse gas.	
1	True
2	False
3	I don’t know
In the same amount, carbon dioxide (CO2) is more harmful to the climate than methane (CH4).	
1	True
2	False
3	I don’t know
Greenhouse gases partially hold back the Earth's thermal radiation.	
1	True
2	False
3	I don’t know

Climate Change Inequality Priming Questions	
To what extent do you agree with the following statement?	
<Split: Generational> It is unfair that future generations will be more affected by the consequences of climate change, although older generations are mainly responsible for CO2 emissions to date.	
1	I fully disagree
2	..
3	..
4	..
5	I fully agree
<Split: Global> It is unfair that countries in the Global South are more affected by the consequences of climate change, although the countries in the Global North are mainly responsible for CO2 emissions to date.	
1	I fully disagree
2	..
3	..
4	..
5	I fully agree
<Split: Economic> It is unfair that poorer households are more affected by the consequences of climate change, although richer households are mainly responsible for private CO2 emissions to date.	
1	I fully disagree
2	..
3	..
4	..
5	I fully agree

[Introductory text vignettes]

There is currently a lot of public discussion about climate-friendly lifestyles. The aim is to produce fewer climate-damaging greenhouse gases through certain behaviors.

Below you can see the description of some lifestyles. Please assess them and indicate to what extent you would personally be willing to behave accordingly. It is in the nature of things that some of the lifestyles described produce more and others less greenhouse gases than your already practiced behavior.

Please note that there are no "right" or "wrong" answers. We are only interested in your personal opinion on the proposed lifestyles.

[3 vignettes one after the other, each with two response scales]

For example, suppose a fictitious person behaves in different areas of life as follows:

How climate-friendly do you think the lifestyle described is?	
-5	Not enough
-4	..
-3	..
-2	..
-1	..
0	Appropriate
1	..
2	..
3	..
4	..
5	Too far-reaching

Dependent Variable	
… and to what extent are you personally willing to behave as described here?	
-5	Absolutely not
-4	..
-3	..
-2	..
-1	..
0	..
1	..
2	..
3	..
4	..
5	Absolutely

[…]

Self-efficacy items	
To what extent do you agree with these statements?	
As an individual, I can protect the climate by adapting my behavior.	
1	Strongly disagree
2	Disagree
3	Partly
4	Agree
5	Fully agree
If I, as an individual, adapt my behavior, it won't have a major impact on climate change. (reversed)	
1	Strongly disagree
2	Disagree
3	Partly
4	Agree
5	Fully agree

Group-efficacy items	
To what extent do you agree with these statements?	
Climate change can be stopped by the joint efforts of humanity.	
1	Strongly disagree
2	Disagree
3	Partly
4	Agree
5	Fully agree
Humanity will not be able to prevent the negative consequences of climate change. (reversed)	
1	Strongly disagree
2	Disagree
3	Partly
4	Agree
5	Fully agree

[…]

[Climate relevant behavior of respondents]

How many times a week do you use the car?	
(driving yourself or as a passenger)	
1	(Usually) every day
2	Around 4 to 6 times
3	Around 1 to 3 times
4	Less often than once a week

[…]

Which of the following diets applies to you?	
I eat…	
1	plant and animal products as well as meat
2	flexitarian (plant and animal products and only rarely meat)
3	pescatarian (vegetable and animal products such as milk/cheese/eggs/honey and fish)
4	vegetarian (vegetable and animal products such as milk/cheese/eggs/honey)
5	vegan (purely plant-based)

[…]

How often do you fly privately? [excluding flights for respondents' job]	
(Please indicate the total number of flights here, i.e. return flights individually.)	
1	Approx. <value> times a year
2	Less often than once a year
3	Never

How warm is the room in your home where you spend most of your time heated in winter?
If you don't know exactly, please estimate.
Approx. <value> °C

How long do you shower on average per day?
Approx. <value> minutes

[…]

[Questions used to calculate the net equivalent income]

How many people, including yourself, live in your household?
<Value> Total person(s)
Among them is/are <value> child(ren) under 15 years of age
<Value> Total Adults

Do you live in a shared apartment ("WG")?	
0	No
1	Yes

If you take all your incomes together, what is the monthly household income of all household members today?
Please indicate the monthly net amount, i.e. after deduction of taxes and social security contributions. Please include regular payments such as pensions, housing benefit, child benefit, BAföG, maintenance payments, etc.! *If you do not know exactly or are self-employed: Please estimate the monthly amount. If you live alone or in a shared flat, please enter your own monthly net income.*
< Value> Euro

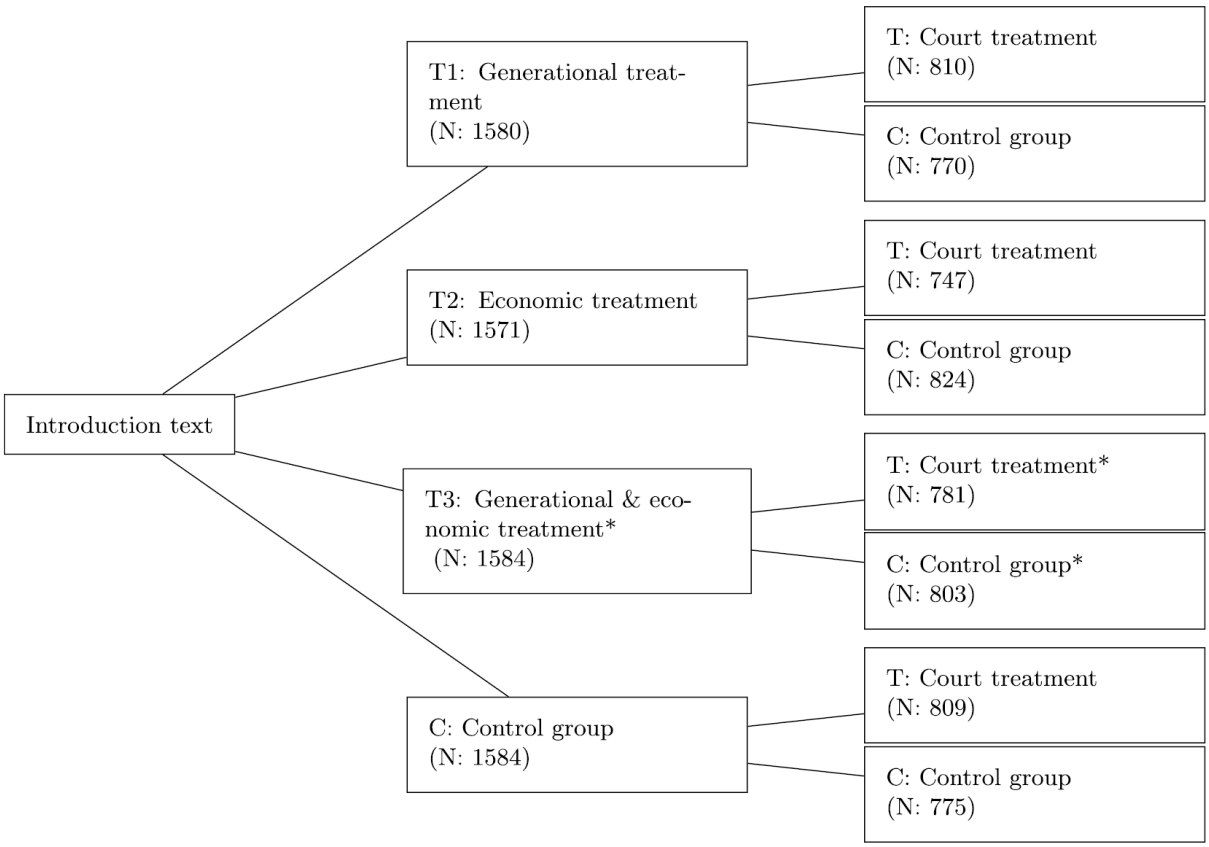
[If the respondent has not given an answer to the open question about monthly household income]

We understand that information about your income is sensitive. We assure that all data is anonymous and will not be shared. Since income is an important factor for us, we ask you to inform us of your income class as an alternative.	
This is about the monthly net amount, i.e. after deduction of taxes and social security contributions. Please include regular payments such as pensions, housing benefit, child benefit, BAföG, maintenance payments, etc.!.	
1	Below 200 Euro
2	200 – 299 Euro
3	300 – 399 Euro
4	400 – 499 Euro
5	500 – 624 Euro
6	625 – 749 Euro
7	750 – 874 Euro
8	875 – 999 Euro
9	1000 – 1124 Euro
10	1125 – 1249 Euro
11	1250 – 1374 Euro
12	1375 – 1499 Euro
13	1500 – 1749 Euro
14	1750 – 1999 Euro
15	2000 – 2249 Euro
16	2250 – 2499 Euro
17	2500 – 2749 Euro
18	2750 – 2999 Euro
19	3000 – 3999 Euro
20	4000 – 4999 Euro
21	5000 – 7499 Euro
22	7500 Euro and more

8.2 Appendix 2: 2nd Research Paper: Can the Court Bridge the Gap? Public Perception of Economic vs. Generational Inequalities in Climate Change Mitigation Policies

Appendix 2.A: The survey design in detail

We implemented a 2∗4 between-subject experiment research design (see figure below). Each group of respondents was shown a vignette consisting of three main parts: the first part of the vignette presented the respondent with a graphical representation of the rise in the Earth's temperature, and is accompanied by a small explanation ('*The following graph shows how the average temperature on Earth has changed over the last century*')[35] After the image, the respondent is given the following factual text: '*In order to reduce CO2 emissions and thus combat climate change, the German federal government has decided to set a price per ton of CO2. This CO2 price will be gradually increased. This means that climate-damaging products will become more expensive*.'.



Note: ***Survey Research Design****. The stars (∗) indicate that this treatment group has a second randomization to eliminate order effects.The respondent is thus randomized into two sub-groups, where the first group receives the generational prime before the economic prime and the second group receives the economic prime before the generational prime. N indicates the amount of respondents that were randomized into each treatment group. Of these sub-categories we have 420 respondents who receive the Generational & economic treatment + control. We have 377 respondents who receive the Generational & econonomic treatment + court. For Economic & generational treatment + control we have 383 respondents, and we have 404 respondents who receive the Economic & generational treatment + court.*

[35] The aim of the graph is to bring the severity of climate change to the respondent's mind, without introducing too much bias in explaining climate change. Explaining the topic of climate change may bias the respondent's impression in a generational-inequality-related direction if we include text explaining climate change and its related consequences.

The second part of the vignette introduced the first experimental variation—the inequality treatment, which randomly assigned respondents into one of the following four groups: (1) a generational inequality treatment group that highlighted how the carbon taxation policy would benefit future generations ('*The additional costs incurred now will primarily benefit younger and future generations'*); (2) an economic inequality treatment group, highlighting the likely increase in income inequality following such carbon taxation policies ('*People with low incomes have to spend a larger share of their income on CO2-taxed goods and are thus burdened more than those with high incomes*'); (3) an economic and generational inequality treatment group that com- bines the two primes from the first two dimensions. This group is further randomized so that half of the group receives the economic inequality prime, and then the generational inequality prime, and the second group receives the same information in the reversed order[36]. The aim of this combined group is to combat the problem of our rather incomparable treatment groups (generational and economic inequality). Lastly, dimension (4) is a control group that receives no further priming information.

The third part of the vignette introduced the second experimental variation (the court treatment) in two dimensions. Respondents were either assigned to a treatment where we highlighted the court's ruling or to a control group with no further information (with equal probability): '*Germany's highest court, the Federal Constitutional Court, also ruled in 2021 that the state is obliged to take more comprehensive climate protection measures.*

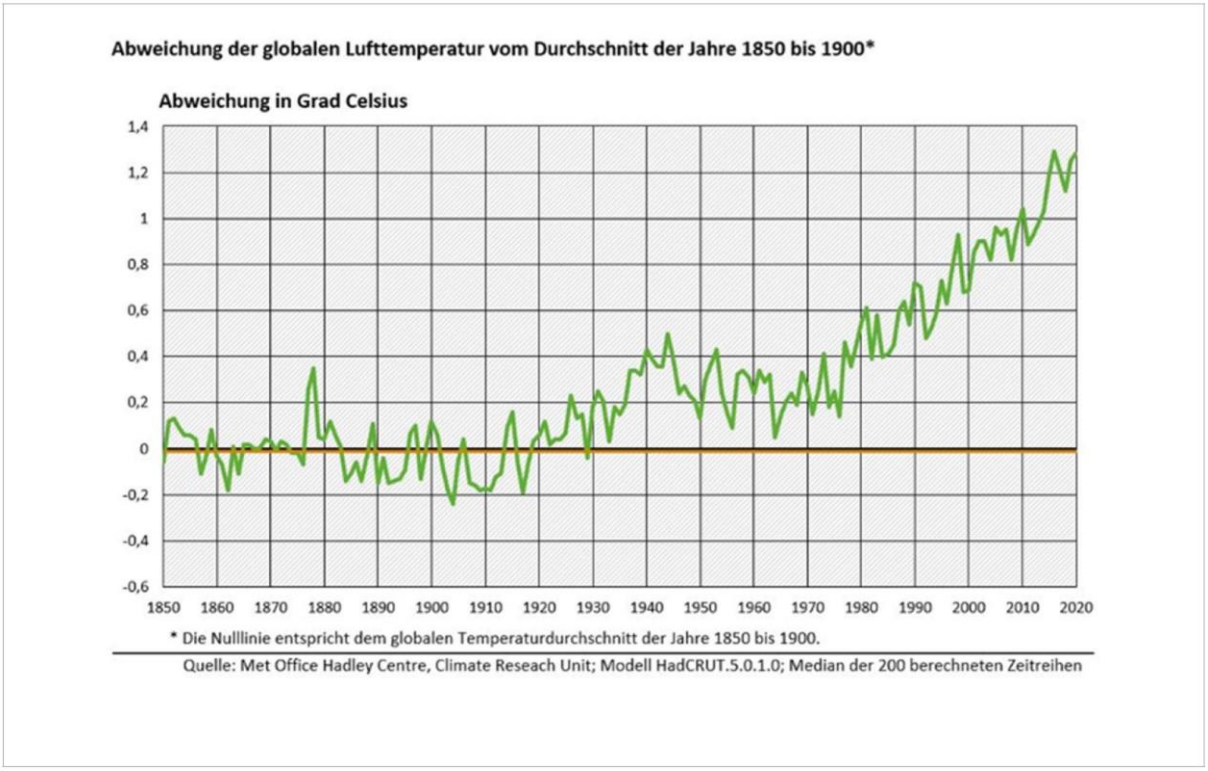
After the survey experiment, respondents are first asked: '*Do you support such a carbon taxation policy?*'. This is on a Likert-scale from 1 ('Do not agree at all') to 5 ('Fully agree'). In order to check whether respondents' disagreement with the policy might be due to it not aiding enough in climate change mitigation, we additionally ask respondents: '*Do you think the suggested CO2 taxation is'*: with the answer options '*Too high'*, '*Exactly right*', '*Too low'*, and lastly '*Don't know*'.[37]

[36] Treatment 3a: (Generation and economic treatment) '*The additional costs incurred now will primarily benefit younger and future generations. However, people with low incomes have to spend a larger share of their income on CO2 -priced goods and are thus burdened more than those with high incomes.*' Treatment 3b: (Economic and generation treatment) '*People with low incomes have to spend a larger share of their income on CO2 -priced goods and are thus burdened more than those with high incomes. However, the additional costs now incurred will mainly benefit younger and future generations.*'.

[37] Please see the Appendix 2.B for all versions of survey text in the original German version.

Appendix 2.B: Survey design (German version)

Folgende Grafik zeigt, wie sich die durchschnittliche Temperatur auf der Erde im letzten Jahrhundert verändert hat.



[New survey page]

Um CO_2-Emissionen zu senken und damit den Klimawandel zu bekämpfen, hat die deutsche Bundesregierung entschieden einen Preis pro Tonne CO_2 festzulegen. Dieser CO_2 Preis wird nach und nach erhöht. Das bedeutet, dass klimaschädliche Produkte teurer werden.

[Priming treatment = Generation, Court treatment = Control]

> Die jetzt anfallenden zusätzlichen Kosten kommen dabei vor allem den jüngeren und zukünftigen Generationen zugute.

[Priming treatment = Economic, Court treatment = Control]

> Dabei müssen Personen mit geringem Einkommen einen größeren Anteil ihres Einkommens für CO2 bepreiste Güter aufwenden und werden dadurch stärker belastet als Gutverdienende.

[Priming treatment = Generation and Economic, Court treatment = Control]

> Die jetzt anfallenden zusätzlichen Kosten kommen dabei vor allem den jüngeren und zukünftigen Generationen zugute. Allerdings müssen Personen mit geringem Einkommen einen größeren Anteil ihres Einkommens für CO_2 bepreiste Güter aufwenden und werden dadurch stärker belastet als Gutverdienende.

[Priming treatment = Economic and Generation, Court treatment = Control]

Dabei müssen Personen mit geringem Einkommen einen größeren Anteil ihres Einkommens für CO_2 bepreiste Güter aufwenden und werden dadurch stärker belastet als Gutverdienende. Allerdings kommen die jetzt anfallenden zusätzlichen Kosten dabei vor allem den jüngeren und zukünftigen Generationen zugute.

[Priming treatment = Control, Court treatment = Control]

[Empty]

[Priming treatment = Control, Court treatment = Treated]

Das höchste deutsche Gericht, das Bundesverfassungsgericht, hat 2021 zudem entschieden, dass der Staat zu umfassenden Klimaschutzmaßnahmen verpflichtet ist.

[Priming treatment = Generation, Court treatment = Treated]

Die jetzt anfallenden zusätzlichen Kosten kommen dabei vor allem den jüngeren und zukünftigen Generationen zugute.

Das höchste deutsche Gericht, das Bundesverfassungsgericht, hat 2021 zudem entschieden, dass der Staat zu umfassenden Klimaschutzmaßnahmen verpflichtet ist.

[Priming treatment = Economic, Court treatment = Treated]

Dabei müssen Personen mit geringem Einkommen einen größeren Anteil ihres Einkommens für CO_2 bepreiste Güter aufwenden und werden dadurch stärker belastet als Gutverdienende.

Das höchste deutsche Gericht, das Bundesverfassungsgericht, hat 2021 zudem entschieden, dass der Staat zu umfassenden Klimaschutzmaßnahmen verpflichtet ist.

[Priming treatment = Generation and Economic, Court treatment = Treated]

Die jetzt anfallenden zusätzlichen Kosten kommen dabei vor allem den jüngeren und zukünftigen Generationen zugute. Allerdings müssen Personen mit geringem Einkommen einen größeren Anteil ihres Einkommens für CO_2 bepreiste Güter aufwenden und werden dadurch stärker belastet als Gutverdienende.

Das höchste deutsche Gericht, das Bundesverfassungsgericht, hat 2021 zudem entschieden, dass der Staat zu umfassenden Klimaschutzmaßnahmen verpflichtet ist.

[Priming treatment = Economic and Generation, Court treatment = Treated]

> Dabei müssen Personen mit geringem Einkommen einen größeren Anteil ihres Einkommens für CO_2 bepreiste Güter aufwenden und werden dadurch stärker belastet als Gutverdienende. Allerdings kommen die jetzt anfallenden zusätzlichen Kosten dabei vor allem den jüngeren und zukünftigen Generationen zugute.
>
> Das höchste deutsche Gericht, das Bundesverfassungsgericht, hat 2021 zudem entschieden, dass der Staat zu umfassenden Klimaschutzmaßnahmen verpflichtet ist.

Appendix 2.C: Balance checks for priming treatments

Balance check for the court treatment.

	p-value
Gender	.7131
Age	.7657
Education	.911
Migration background	.5085
Left-Right	.4851
Partisanship	.1087
Trust(general)	.5022
Political trust	.6334
Household size	.8019
Income(categorical)	.4943
Wealth estimate	.8157
East Germany	.8576
Bundesland	.9068
Children	.6057

Note: The table displays the p-values of Kruskal–Wallis equality-of-populations rank tests, which compare the distribution of individual background characteristics across respondent samples in the experimental question treatment.

Balance checks for the economic and generational treatment.

	p-value
Gender	.9359
Age	.9047
Education	.8892
Migration background	.793
Left-Right	.6927
Partisanship	.1172
Trust(general)	.6658
Political trust	.6096
Household size	.8255
Income(categorical)	.9877
Wealth estimate	.4922
East Germany	.474
Bundesland	.7927
Children	.8866

Note: The table displays the p-values of Kruskal–Wallis equality-of-populations rank tests, which compare the distribution of individual background characteristics across respondent samples in the experimental question treatment.

Appendix 2.D: Effect of priming treatment on policy support

Linear regression tables for the effect of the priming on policy support.

	1	2	3	4
Gen.	.043	.063**	.096	.110*
	(.032)	(.028)	(.071)	(.060)
Econ.	–.147***	–.106***	–.295***	–.261***
	(.031)	(.028)	(.068)	(.058)
Gen. + Econ.	–.074*	–.056	–.143*	–.110
	(.038)	(.034)	(.082)	(.069)
Econ. + Gen.	–.119***	–.095***	–.218	–.224
	(.040)	(.035)	(.082)	(.071)
Control & Court	.071**	.070**	.132*	.139**
	(.031)	(.028)	(.070)	(.059)
Gen. & Court	.061*	.073***	.121*	.136**
	(.032)	(.028)	(.068)	(.057)
Econ. & Court	–.096***	–.052*	–.157**	–.138**
	(.032)	(.030)	(.069)	(.059)
Gen. + Econ. & Court	–.026	–.016	–.020	–.030
	(.040)	(.035)	(.085)	(.072)
Econ. + Gen. & Court	–.082**	–.042	–.127	–.052
	(.040)	(.035)	(.082)	(.070)
Woman		–.008		–.027
		(.015)		(.030)
Age		–.000		–.001
		(.000)		(.001)
Medium education		.019		.049
		(.020)		(.039)
Higher education		.108***		.236***
		(.021)		(.042)
Migration background		–.016		–.077
		(.029)		(.054)
CDU/CSU		–.081***		–.168***
		(.028)		(.050)
Grüne		.205***		.570***
		(.024)		(.051)
FDP		–.036		–.122*
		(.038)		(.073)
AfD		–.191***		–.517***
		(.032)		(.067)
Die Linke		–.035		–.015
		(.040)		(.078)
Other/missing		–.089***		–.157***
		(.028)		(.048)
Center		–.110***		–.276***
		(.020)		(.041)
Right		–.196***		–.56***
		(.028)		(.063)
Trust (general)		.011***		.026***
		(.003)		(.007)
Political trust		.056***		.141***
		(.004)		(.009)
Household size		–.004		.001
		(.007)		(.015)
Former East/West Germany		–.047**		–.127***
		(.020)		(.042)
Von 1.000 bis unter 1.450 Euro netto		–.034		–.053
		(.036)		(.073)

(Continued.)

(Continued.)

	1	2	3	4
Von 1.450 bis unter 1.800 Euro netto		–.078**		–.131**
		(.037)		(.074)
Von 1.800 bis unter 2.200 Euro netto		–.034		–.069
		(.035)		(.070)
Von 2.200 bis unter 2.600 Euro netto		–.029		–.048
		(.035)		(.070)
Von 2.600 bis unter 3.000 Euro netto		–.028		–.111
		(.040)		(.084)
Von 3.000 bis unter 3.650 Euro netto		–.087***		–.165**
		(.034)		(.070)
Von 3.650 bis unter 4.500 Euro netto		–.039		–.097
		(.037)		(.076)
Von 4.500 bis unter 5.700 Euro netto		–.029		–.066
		(.036)		(.075)
5.700 Euro oder mehr		–.062		–.136
		(.039)		(.086)
Constant	.515***	.390***	2.998***	2.692***
	(.022)	(.054)	(.050)	(.112)
Control mean	.527	.527	2.998	2.998
Observations	3931	3417	5296	5296

*Note: The table displays the results of the estimated linear regression model informing Figure 3.2, thereby including the distinction between the order effect for the mixed generation and economic prime groups. For the outcome variable in models 1 and 2 we use a dummy version of the policy acceptance variable that is equal to 1 if the respondent chooses option 4 ('Agree') or 5 ('Fully agree'), and 0 otherwise (excluding the middle category as missing). Models 3 and 4 use the full range of the policy acceptance variable (on a scale from 1 'Do not agree at all' to 5 'Fully agree'). Model 3 corresponds to the data used to create Figure 3.2, and models 1 and 2 are included to aid in the interpretation of effect sizes. See Section 3.3.2 for the control variables used. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.*

Appendix 2.E: Interaction effects of information treatments

Linear regression tables for the interaction effects of the information treatments

	1	2	3	4
Econ.	–.292***	–.269***	–.281***	–.242***
	(.047)	(.041)	(.067)	(.057)
Gen.	.033	.039	.099	.108*
	(.048)	(.040)	(.069)	(.058)
Econ. × Gen.	.065	.056	.013	–.012
	(.066)	(.057)	(.094)	(.080)
Court treatment			.143**	.157***
			(.068)	(.057)
Econ. × court treatment			–.014	–.047
			(.094)	(.081)
Gen. × court treatment			–.128	–.136*
			(.095)	(.080)
Econ. × Gen. × court treatment			.095	.130
			(.132)	(.114)
Gender		–.027		–.026
		(.029)		(.029)
Age		–.001		–.001
		(.001)		(.001)
Education		.126***		.127***
		(.021)		(.020)

(Continued.)

(Continued.)

	1	2	3	4
Migration background		–.067		–.070
		(.054)		(.054)
CDU/CSU		–.178***		–.181***
		(.049)		(.049)
Grüne		.579***		.575***
		(.050)		(.050)
FDP		–.115		–.119*
		(.072)		(.072)
AfD		–.534***		–.539***
		(.066)		(.066)
Die Linke		–.011		–.019
		(.077)		(.077)
Other/missing		–.145***		–.148***
		(.047)		(.047)
Center		–.266***		–.266***
		(.040)		(.040)
Right		–.534***		–.534***
		(.062)		(.062)
Trust (general)		.028***		.027***
		(.007)		(.007)
Political trust		.141***		.141***
		(.008)		(.008)
Household size		–.000		–.000
		(.015)		(.015)
Former East/West Germany		–.152***		–.152***
		(.040)		(.040)
From 1.000 to 1.450 Euro		–.064		–.063
		(.073)		(.073)
From 1.450 to 1.800 Euro		–.139*		–.143*
		(.074)		(.074)
From 1.800 to 2.200 Euro		–.080		–.080
		(.070)		(.070)
From 2.200 to 2.600 Euro		–.056		–.060
		(.070)		(.070)
From 2.600 to 3.000 Euro		–.123		–.124
		(.084)		(.084)
From 3.000 to 3.650 Euro		–.174**		–.176**
		(.069)		(.069)
From 3.650 to 4.500 Euro		–.108		–.110
		(.075)		(.075)
From 4.500 to 5.700 Euro		–.074		–.077
		(.074)		(.074)
5.700 Euro or more		–.141*		–.143*
		(.085)		(.086)
Missing		–.142		–.149*
		(.086)		(.087)
Constant	3.061***	2.625***	2.988***	2.548***
	(.034)	(.122)	(.049)	(.124)
Control mean	2.963	2.988	2.963	2.988
Observations	5560	5560	5560	5560

*Note: The table displays the results of linear regressions. The outcome variable we use is policy acceptance, and asks whether the respondent support the carbon trading policy on a scale from 1 ('Do not agree at all') to 5 ('Fully agree'). ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.*

Appendix 2.F: Interaction between Econ. treatment and HH income

Linear regression tables for the interaction effect between economic treatment and HH income.

	1	2
Econ.	–.246*	–.278**
	(.142)	(.117)
Under 1.000 Euro	–.157	.116
	(.138)	(.122)
From 1.000 to 1.450 Euro	–.274**	.068
	(.128)	(.111)
From 1.450 to 1.800 Euro	–.250*	–.009
	(.133)	(.113)
From 1.800 to 2.200 Euro	–.183	.050
	(.127)	(.107)
From 2.200 to 2.600 Euro	–.101	.078
	(.125)	(.104)
From 2.600 to 3.000 Euro	–.075	.011
	(.146)	(.122)
From 3.000 to 3.650 Euro	–.136	–.049
	(.124)	(.102)
From 3.650 to 4.500 Euro	–.055	.037
	(.133)	(.109)
From 4.500 to 5.700 Euro	.019	.077
	(.129)	(.106)
Missing	–.288**	–.082
	(.146)	(.122)
Econ. × Under 1.000 Euro	–.027	.054
	(.188)	(.163)
Econ. × From 1.000 to 1.450 Euro	.119	.029
	(.175)	(.149)
Econ. × From 1.450 to 1.800 Euro	–.041	.036
	(.178)	(.150)
Econ. × From 1.800 to 2.200 Euro	–.015	.040
	(.170)	(.143)
Econ. × From 2.200 to 2.600 Euro	.001	.028
	(.170)	(.142)
Econ. × From 2.600 to 3.000 Euro	–.065	.032
	(.204)	(.169)
Econ. × From 3.000 to 3.650 Euro	–.092	.049
	(.167)	(.139)
Econ. × From 3.650 to 4.500 Euro	–.036	.010
	(.181)	(.150)
Econ. × From 4.500 to 5.700 Euro	–.034	–.004
	(.176)	(.146)
Econ. × Missing	.090	.200
	(.208)	(.173)
Constant	3.213***	2.647***
	(.106)	(.138)
Controls	No	Yes
Control mean	2.963	2.963
Observations	5560	5560

*Note: The table displays the results of linear regressions, where the economic prime group is interacted with net household income. The outcome variable we use is policy acceptance, and asks whether the respondent support the carbon trading policy on a scale from 1 ('Do not agree at all') to 5 ('Fully agree'). 'Econ.' is a dummy variable indicating whether the respondent received the economic prime treatment. The household income variable ranges from households earning below 1000 Euro net per month, to households earning above 5.700 Euro. This latter category (highest earners) is set as the baseline (comparison group). ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.*

Appendix 2.G: Priming effects by political ideology

Linear regression tables for the priming effect by political ideology

	Left	Left	Centre	Centre	Right	Right
Gen.	.078	.108	.060	.064	.344*	.299*
	(.139)	(.118)	(.080)	(.071)	(.197)	(.170)
Econ.	–.532***	–.483***	–.209***	–.197***	–.165	–.090
	(.154)	(.141)	(.076)	(.068)	(.177)	(.165)
Gen. & Econ.	–.351**	–.328***	–.202***	–.157**	.116	.232
	(.138)	(.120)	(.077)	(.068)	(.189)	(.160)
Gen. & Court	–.040	.002	.108	.139**	.274	.258
	(.135)	(.113)	(.077)	(.069)	(.187)	(.171)
Econ. & Court	–.384**	–.314**	–.154**	–.160**	.248	.271
	(.155)	(.130)	(.076)	(.069)	(.193)	(.182)
Gen., Econ. & Court	–.095	–.062	–.102	–.087	.103	.211
	(.141)	(.122)	(.076)	(.068)	(.192)	(.173)
Control & Court	.011	.073	.156**	.147**	.275	.321*
	(.141)	(.119)	(.078)	(.070)	(.188)	(.177)
Constant	3.672***	3.084***	2.956***	2.279***	2.112***	2.792***
	(.102)	(.231)	(.055)	(.132)	(.134)	(.344)
Controls	No	Yes	No	Yes	No	Yes
Control mean	3.672	3.672	2.955	2.955	2.112	2.112
Observations	1097	1097	3758	3758	705	705

*Note: The table displays the results of linear regression models informing figure 3.4. The outcome variable we use is policy acceptance, and asks whether the respondent support the carbon trading policy on a scale from 1 ('Do not agree at all') to 5 ('Fully agree'). Columns 1–2 reduce the sample to the respondents who place themselves on the left (1–4 on an 11-point left-right scale). Columns 3–4 reduce the sample to respondents who place themselves in the centre (5–7 on the 11-point left-right scale). Columns 5–6 reduce the sample to respondents who place themselves on the right (8–11 on the 11-point left-right scale). Columns 1, 3 and 5 produce the results of the baseline regression, whereas results in columns 2, 4 and 6 include control variables. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.*

Appendix 2.H: Priming effects by party affiliation

Linear regression tables for the priming effect by party affiliation

	SPD	CDU/CSU	Grüne	FDP	AfD	Linke	Other
Gen.	.223*	.109	.050	.506**	.128	–.196	.006
	(.131)	(.131)	(.121)	(.251)	(.204)	(.281)	(.116)
Econ.	–.352***	–.179	–.531***	.545**	–.113	–.246	–.319***
	(.134)	(.134)	(.142)	(.230)	(.194)	(.326)	(.106)
Gen. & Econ.	–.229*	–.037	–.329**	.212	–.025	–.337	–.175
	(.133)	(.132)	(.131)	(.227)	(.185)	(.295)	(.109)
Gen. & Court	.053	.224*	.075	.699***	.173	–.050	.015
	(.124)	(.130)	(.124)	(.231)	(.201)	(.267)	(.110)
Econ. & Court	–.099	–.050	–.483***	.393*	–.036	–.574*	–.094
	(.135)	(.143)	(.135)	(.230)	(.196)	(.292)	(.108)
Gen., Econ. & Court	–.222	–.147	–.082	.652***	–.028	–.369	.025
	(.137)	(.125)	(.130)	(.244)	(.186)	(.273)	(.116)
Control & Court	.103	.240*	–.042	.484**	.022	.182	.202*
	(.146)	(.131)	(.125)	(.236)	(.196)	(.264)	(.110)
Constant	2.672***	2.183***	3.427***	2.180***	2.183***	3.327***	2.602***
	(.253)	(.274)	(.259)	(.532)	(.388)	(.392)	(.198)
Control mean	3.193	2.785	4.089	2.560	2.049	3.259	2.754
Observations	880	1099	835	369	619	296	1462

*Note: The table displays the results of linear regressions of the baseline model with controls, by party affiliation. The outcome variable we use is policy acceptance, and asks whether the respondent support the carbon trading policy on a scale from 1 ('Do not agree at all') to 5 ('Fully agree'). The columns limit respondents who identify with the SPD (Social Democratic Party), CDU/CSU (Christian Democratic Union), Grüne (Alliance 90/The Greens) FDP (Free Democratic Party) AfD (Alternative for Germany) Linke (The Left) and others (missing or other party affiliations), respectively. ***, ** and * indicate statistical significance at the 1%, 5% and 10% level, respectively.*

Appendix 2.I: T-test results of order effects

	Gen. + Econ.	Econ. + Gen.	*t*	*p*
Mean of policy acceptance	2.885	2.787	1.583	.114
Confidence interval	(2.798–2.972)	(2.703–2.872)		
Observations	1532			
Degrees of freedom	1530			

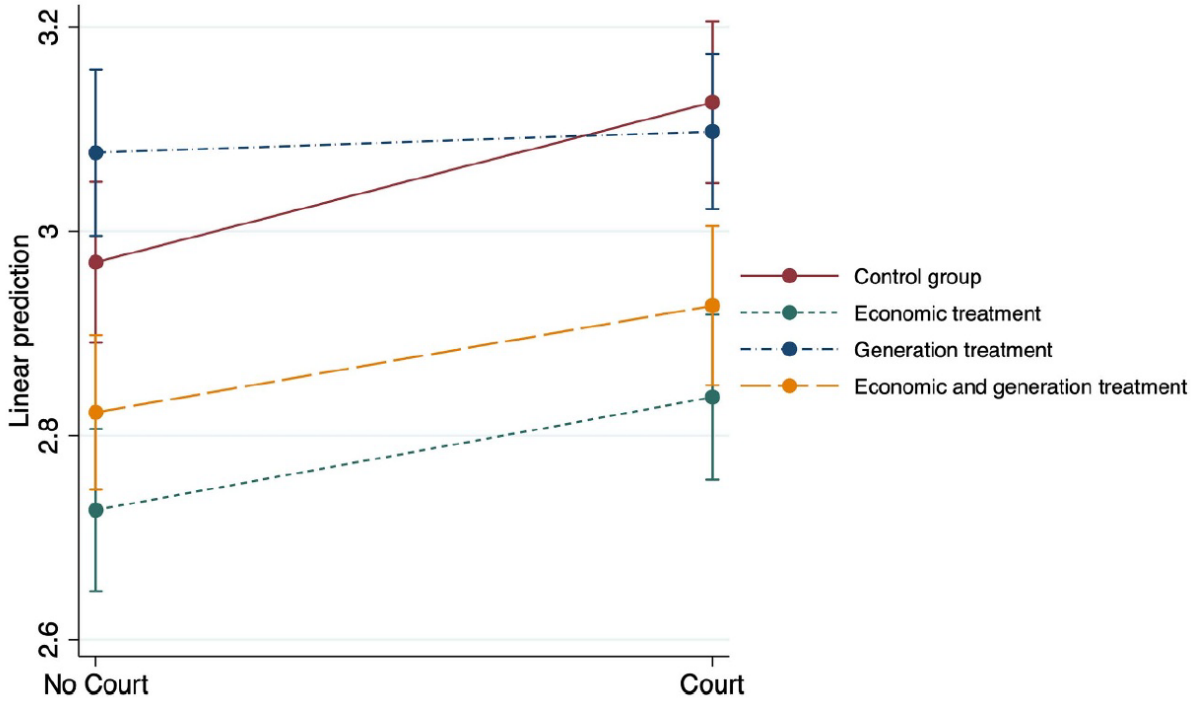
Note: The table displays the (two-sided) t-test results (with a 95% confidence level) of the difference between respondents who received a generation prime first, and then an economic prime, and vise versa.

Appendix 2.J: T-test results for court treatment by political ideology

	Econ.	Econ. + Court	*t*	*p*
Mean of policy acceptance	1.938	2.360	2.364	.0192
Confidence interval	(1.710–2.165)	(2.084–2.637)		
Observations	182			
Degrees of freedom	180			

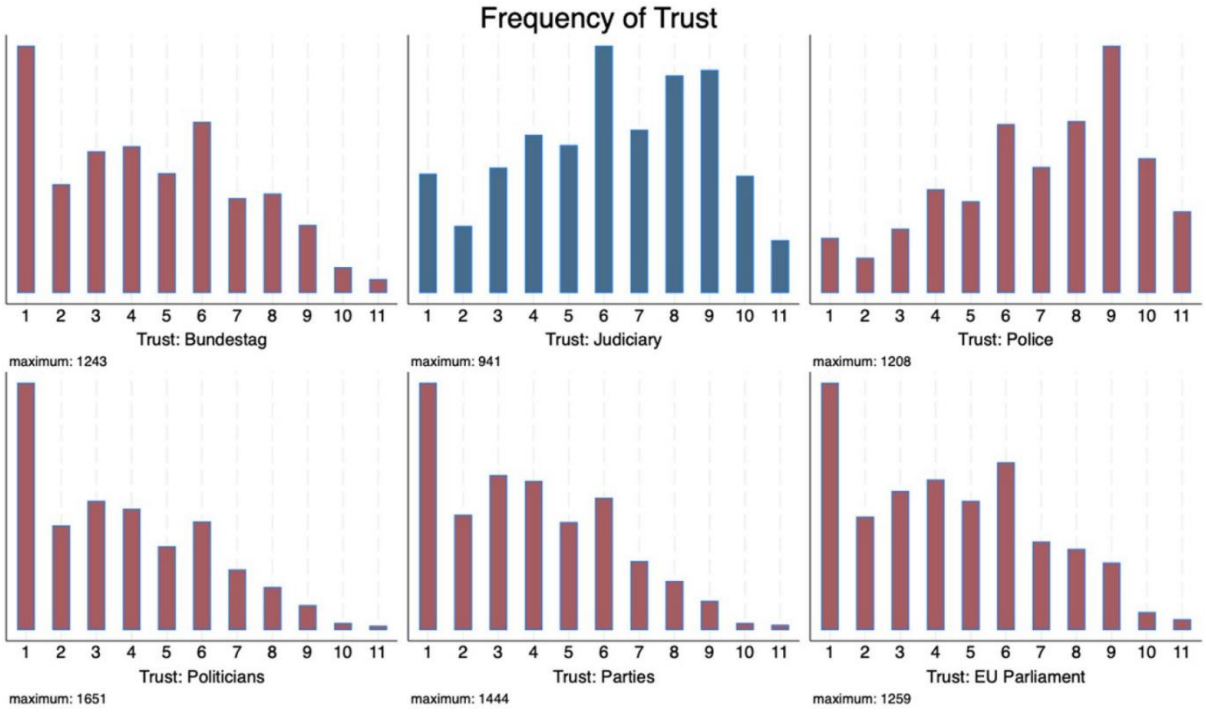
Note: The table displays the (two-sided) t-test results (with a 95 % confidence level) of the difference between respondents with a political ideology on the right of the spectrum who received the economic inequality treatment with and without the court treatment.

Appendix 2.K: Marginal effect plot of triple interaction in Appendix 2.E



Note: ***Predictive Margins of Economic Treatment with 95% Cis****. This figure is based on binary variables, and as such, the (dotted) lines are left to visualize the difference between respondents that receive the court treatment, versus the control.*

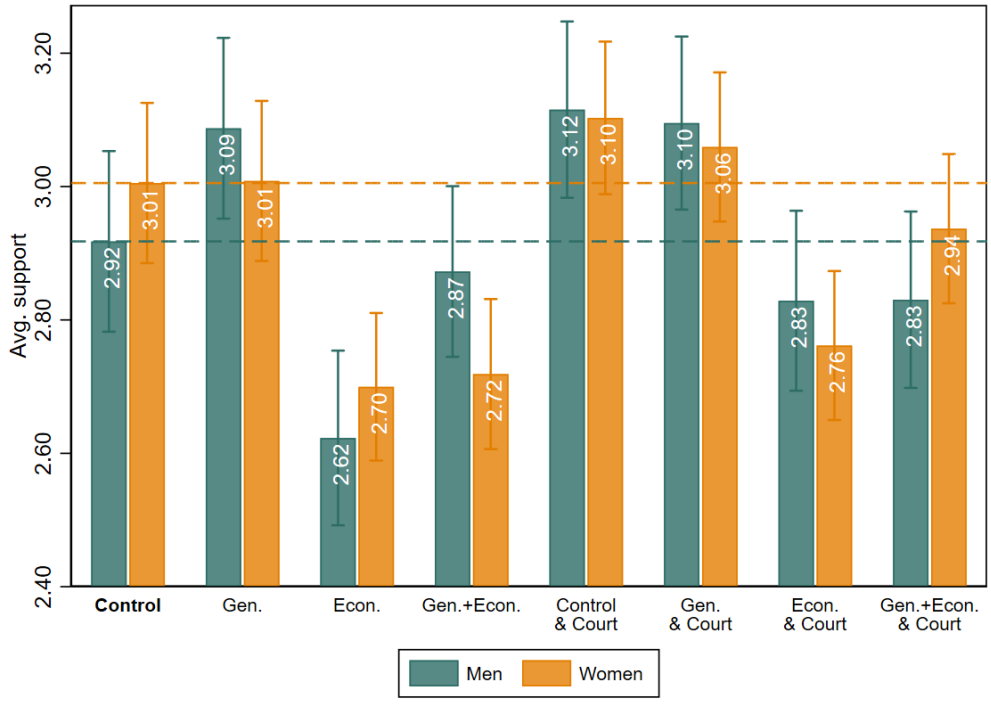
Appendix 2.L: Distribution of trust items



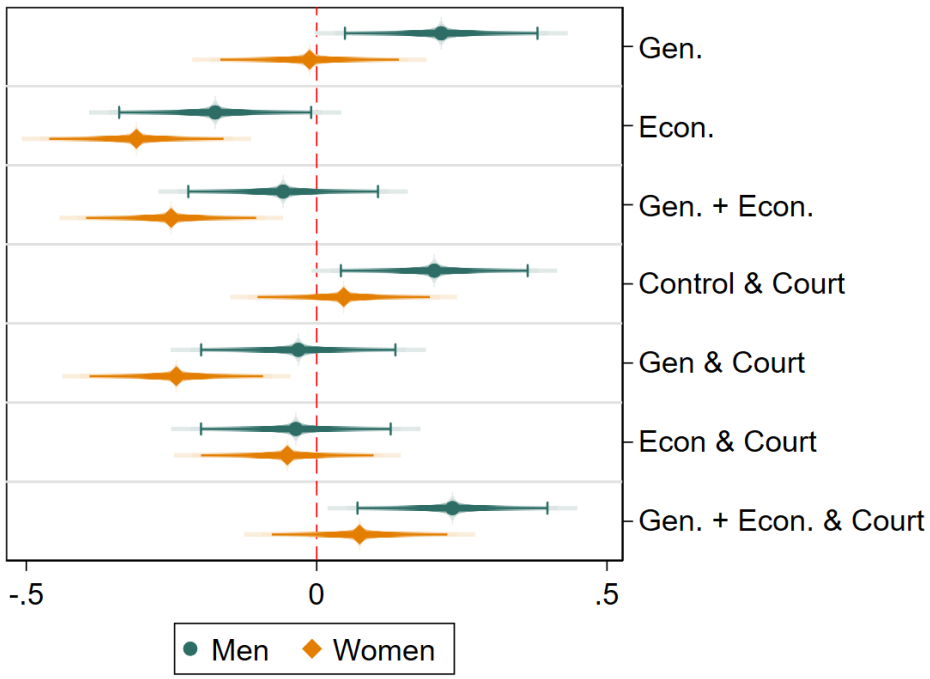
Note: ***Frequency of trust by different trust items****. The figure shows the distribution of responses to the trust items in the survey, respectively trust in the German Federal government (Bundestag), the judiciary, police, politicians, political parties and the EU parliament.*

APPENDIX 2.M: ADDITIONAL HETEROGENEITY CHECKS

Appendix 2.M1: Gender

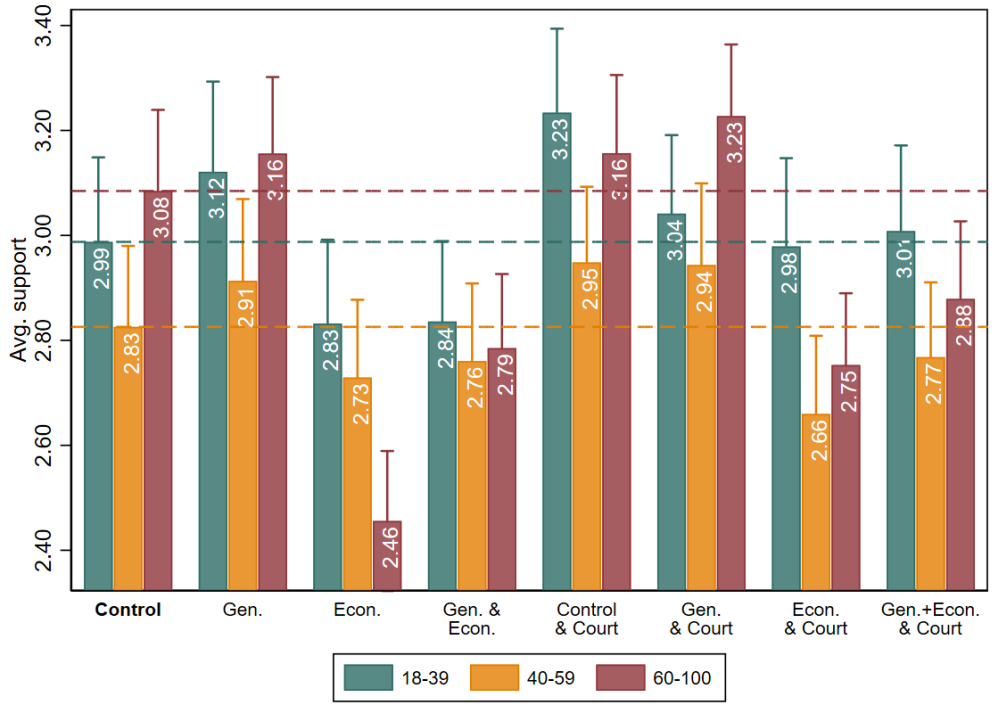


Note: ***Avg. Acceptance of CO_2 Pricing****. The figure shows the mean of respondents' policy support (on a scale from 1 to 5) with a 95 % confidence interval for men and women*

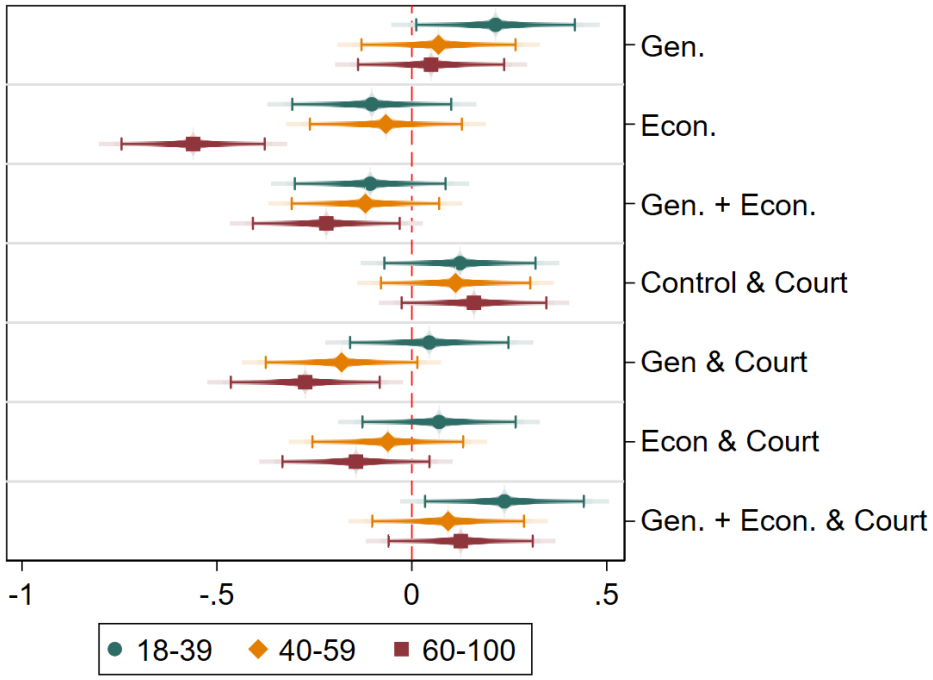


Note: ***Priming Effect with Controls****. The figure plots the priming effects we get from running a linear regression on our policy support variable for each gender separately. We are controlling for all other independent variables and use the control group as the baseline category.*

Appendix 2.M2: Age

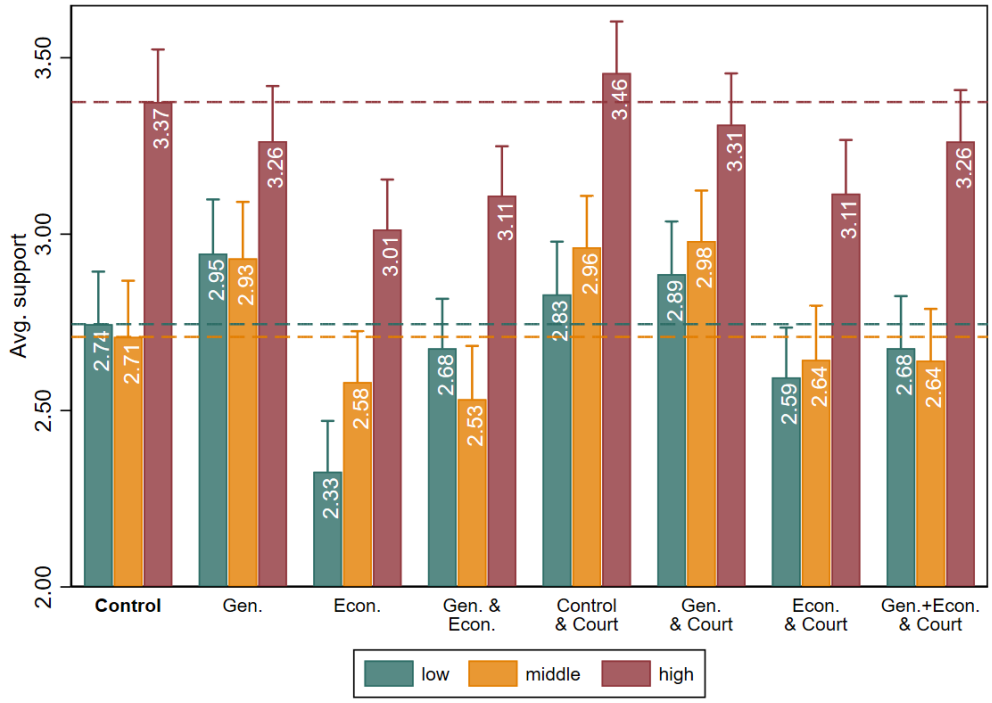


Note: ***Avg. Acceptance of CO_2 Pricing****. The figure shows the mean of respondents' policy support (on a scale from 1 to 5) with a 95 % confidence interval for the three age groups.*

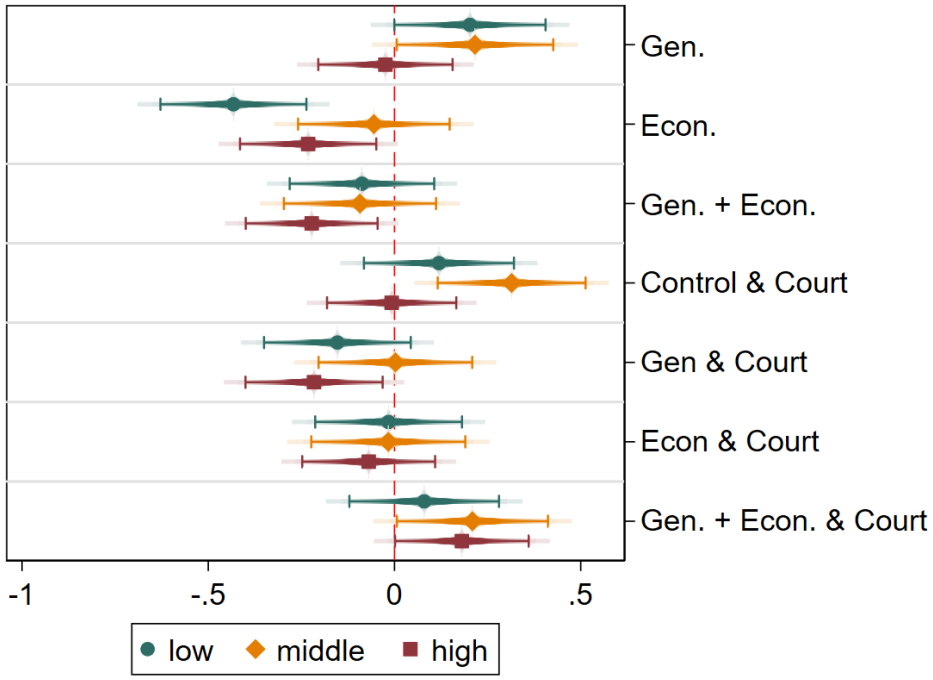


Note: ***Priming Effect with Controls****. The figure plots the priming effects we get from running a linear regression on our policy support variable by age group. We are controlling for all other independent variables and use the control group as the baseline category.*

Appendix 2.M3: Education

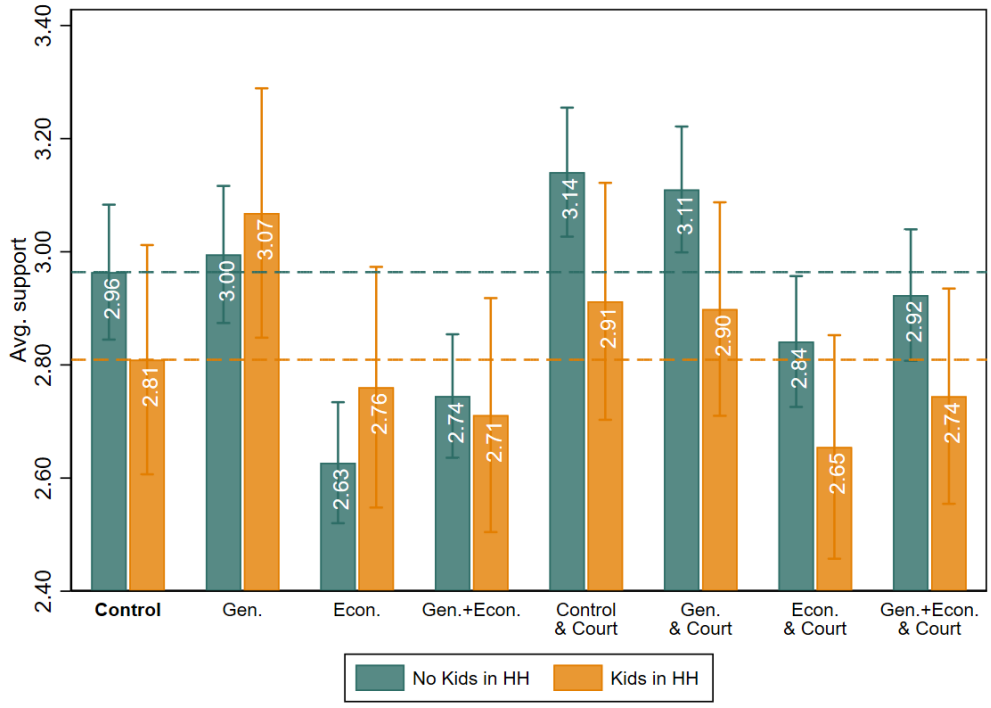


Note: ***Avg. Acceptance of CO_2 Pricing****. The figure shows the mean of respondents' policy support (on a scale from 1 to 5) with a 95 % confidence interval for different levels of education.*

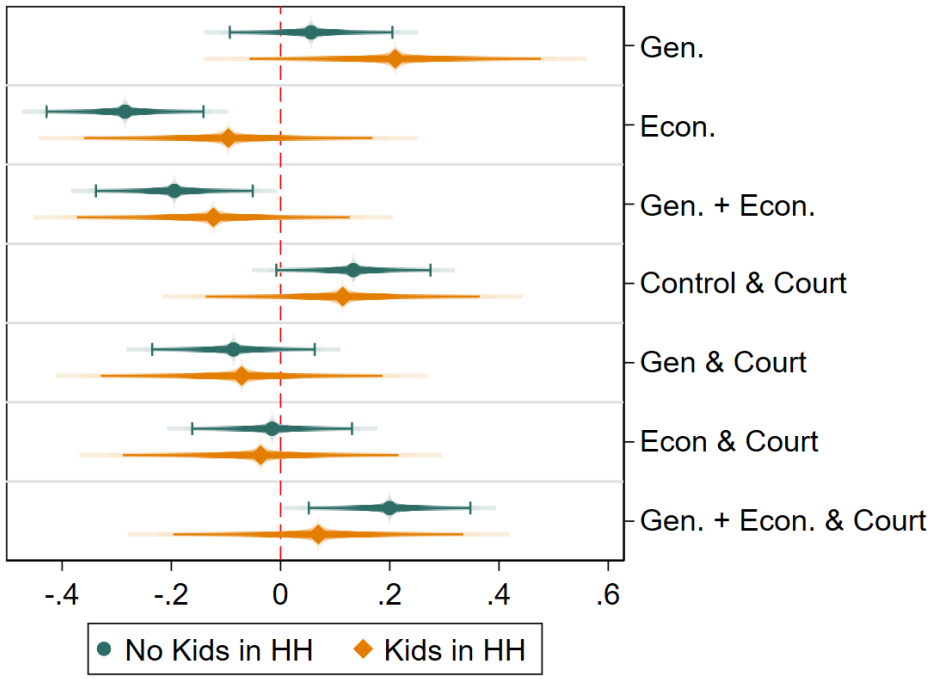


Note: ***Priming Effect with Controls****. The figure plots the priming effects we get from running a linear regression on our policy support variable by educational categories. We are controlling for all other independent variables and use the control group as the baseline category.*

Appendix 2.M4: Children in Household



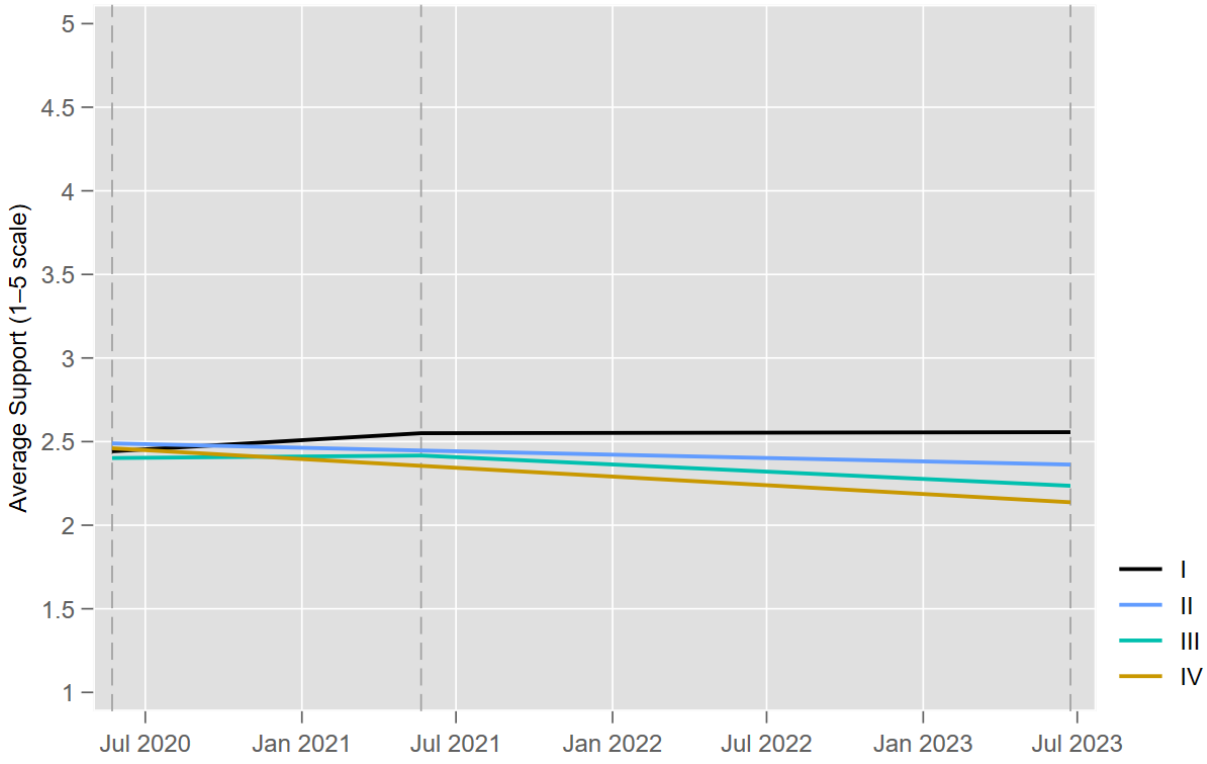
Note: ***Avg. Acceptance of CO_2 Pricing****. The figure shows the mean of respondents' policy support (on a scale from 1 to 5) with a 95 % confidence interval, comparing respondents with kids in their households (N = 3644) vs. those without (N = 1211).*



Note: ***Priming Effect with Controls****. The figure plots the priming effects we get from running a linear regression on our policy support variable for respondents with and without children in their household. We are controlling for all other independent variables and use the control group as the baseline category. Unfortunately, we do not have any information on whether our respondents are parents in general, but only on whether children live in their household. We are therefore careful with interpreting these results.*

8.3 Appendix 3: 3rd Research Paper: Can't Buy Me Love: Rural Compensation Mechanisms Fail to Increase Carbon Tax Support

Appendix 3.A: Willingness to pay higher taxes to stop climate change: regional rebate categories



Note: Data from the Austrian Corona Panel Project.: Respondents' willigness to pay higher taxes to stop climate change on a scale from 1 to 5 over time. Mean values condensed by Klimabonus (the regional rebate) categories. Higher categories indicate both higher rurality and a larger rebate amount. Grey vertical lines represent the timing of the survey waves, while the red line indicates the implementation date of Austria's carbon pricing scheme. N=1,437 (wave 23); 1,453 (wave 9); 1,482 (wave 35)

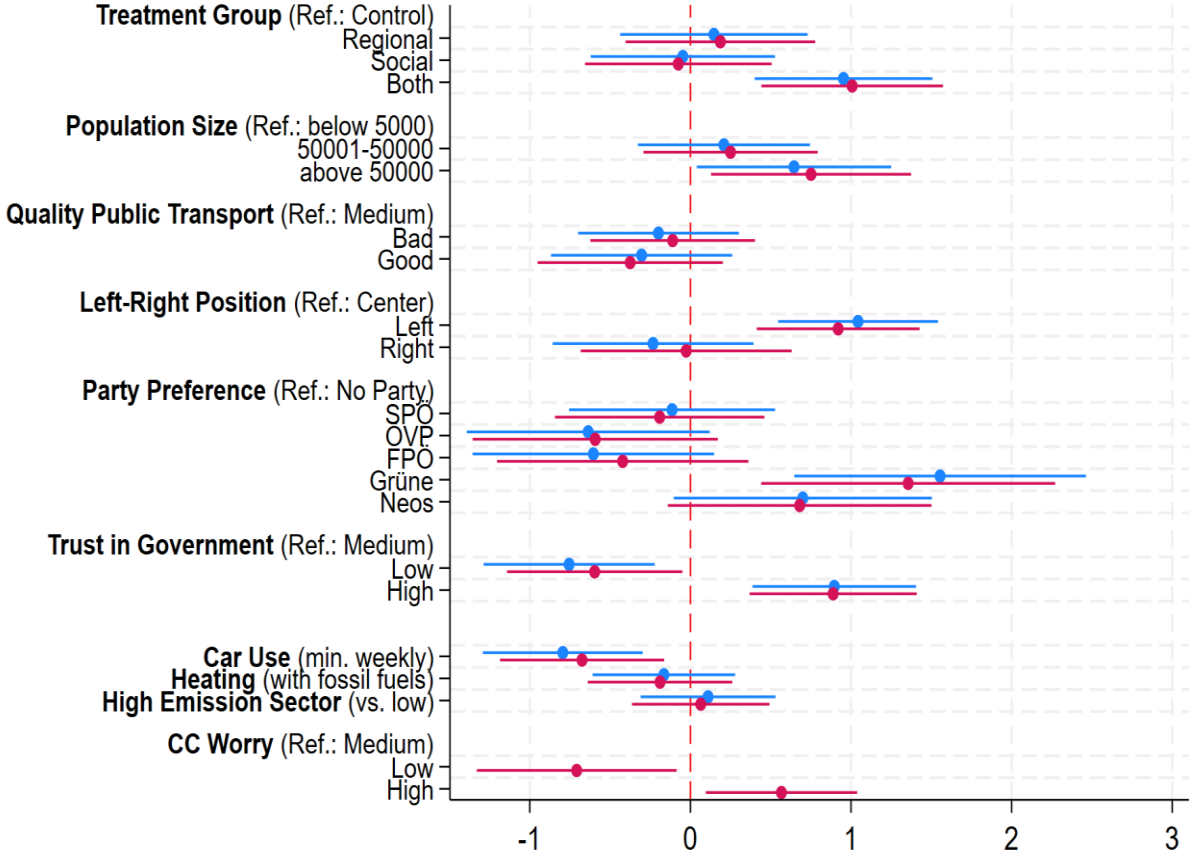
Appendix 3.B: T-test results for order effects in combined treatment

Group	*N*	*Mean*	*Std. dev.*	*CI*
Social + Regional	585	2.83	1.24	(2.73 – 2.93)
Regional + Social	600	2.85	1.23	(2.75 – 2.95)
Combined	1185	2.84	1.23	(2.77 – 2.91)
diff		-0.02		(-0.16 – 0.12)
diff = mean(SocRe) - mean(RegSoc)				t = -0.2460
H0: diff = 0				Degrees of freedom = 1183
Ha: diff !=0				
Pr(|T| > |t|) = 0.8057				

Note: The table displays (two-sided) t-test results (with a 95% confidence level) of the difference in policy support between respondents in the combined treatment group who received the social rebate information first vs. those who received the regional rebate information first.

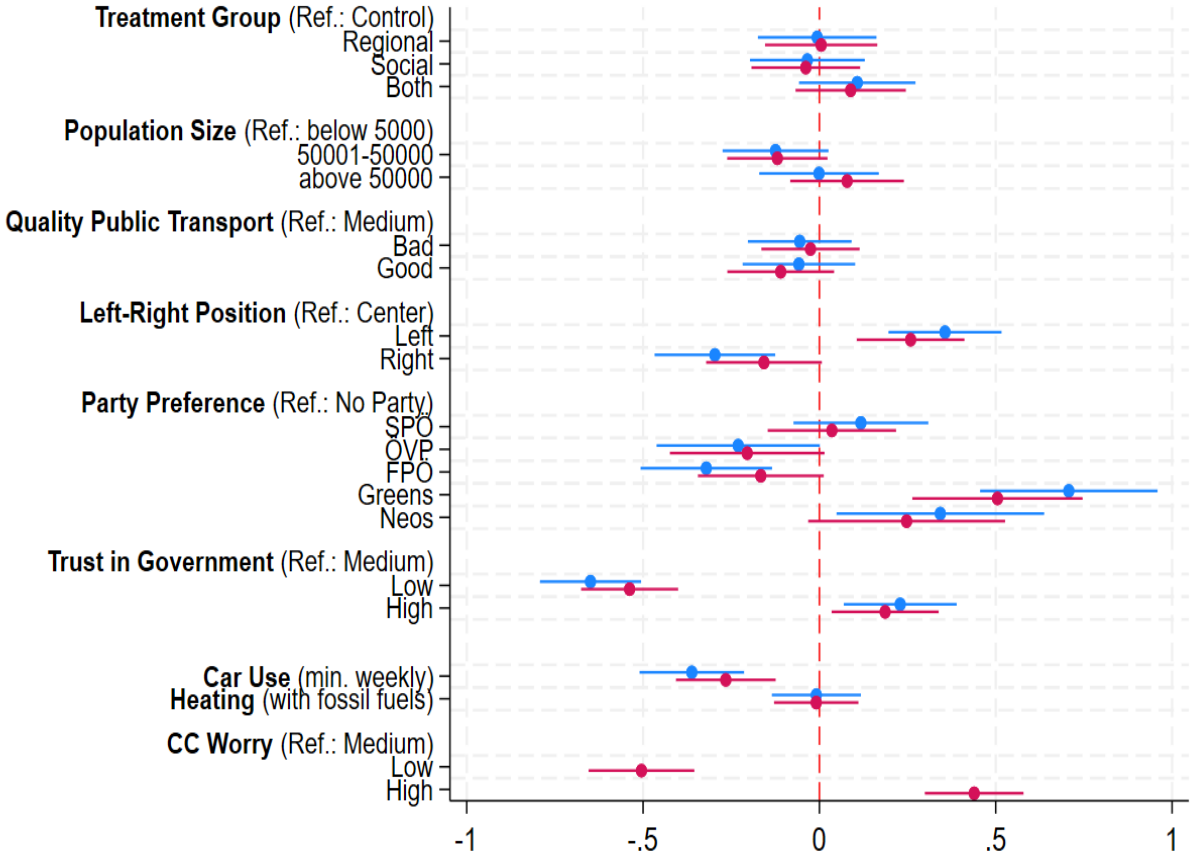
APPENDIX 3.C: ROBUSTNESS CHECKS

Appendix 3.C1: Tax Vulnerability: High Emission Sector Occupation included



Note: Results from logistic regression models predicting support for the Austrian carbon tax, with and without including climate change worry. Shown are point estimates with 95% confidence intervals. Control variables (not shown) include gender, age, education, income, economic strain, and parenthood. This model includes whether respondents are currently employed or looking for work in a high emission sector. N = 677. For full regression results, see Appendix 3.E3.

Appendix 3.C2: Linear Regression Results



Note: Results from linear regression models predicting support for the Austrian carbon tax, with and without including climate change worry. Shown are point estimates with 95% confidence intervals. Control variables (not shown) include gender, age, education, income, economic strain, and parenthood. N = 1,159. For full regression results, see Appendix 3.E4..

Appendix 3.D: Political Alignment by Rurality

	Political Orientation			
Population	Left	Center	Right	Total
Below 5,000	90	220	101	411
	21.90	*53.53*	*24.57*	*100.00%*
5,001 – 50,000	85	206	84	375
	22.67	*54.93*	*22.40*	*100.00%*
Above 50,001	116	189	95	400
	29.00	*47.25*	*23.75*	*100.00%*
Total	291	615	280	1,186
	24.54	*51.85*	*23.61*	*100.00%*

Note: Percentages are shown in italics beneath the corresponding absolute respondent counts.

APPENDIX 3.E: REGRESSION MODELS

Appendix 3.E1: Logistic Regression: Respondents' Carbon Tax Support (Survey Experiment)

	Without CC Worry	With CC Worry
Treatment Group *(Ref.: Control)*		
Regional	0.076	0.093
	(0.218)	(0.223)
Social	-0.020	-0.046
	(0.211)	(0.217)
Both	0.446*	0.420*
	(0.208)	(0.214)
Population Size *(Ref.: below 5,000)*		
5,001 – 50,000	0.027	0.057
	(0.198)	(0.202)
above 50,001	0.300	0.437
	(0.218)	(0.226)
Quality Public Transport *(Ref.: Medium)*		
Bad	-0.238	-0.187
	(0.189)	(0.195)
Good	-0.190	-0.279
	(0.204)	(0.209)
Political Orientation *(Ref.: Center)*		
Left	0.751***	0.624***
	(0.181)	(0.187)
Right	-0.199	0.047
	(0.242)	(0.253)
Party Affiliation *(Ref.: None)*		
SPÖ	0.260	0.154
	(0.219)	(0.226)
ÖVP	-0.533	-0.512
	(0.293)	(0.299)
FPÖ	-0.726*	-0.476
	(0.293)	(0.303)
Greens	1.516***	1.204***
	(0.317)	(0.322)
Neos	0.510	0.405
	(0.320)	(0.331)
Trust in Government *(Ref.: Medium)*		
Low	-0.845***	-0.703***
	(0.198)	(0.204)
High	0.477*	0.434*
	(0.186)	(0.191)
Car Use *(min. weekly)*	-0.706***	-0.579**
	(0.180)	(0.186)
Heating *(with fossil fuels)*	-0.146	-0.173
	(0.163)	(0.167)
Climate Change Worry *(Ref.: Medium)*		
Low		-0.799**
		(0.244)
High		0.770***
		(0.175)
Intercept	0.059	-0.223
	(0.476)	(0.495)
Number of observations	1159	1159

*** p<.001, ** p<.01, * p<.05
Additionally controlling for gender, age, education, income, economic strain and parenthood

Appendix 3.E2: Logistic Regression: Respondents' Carbon Tax Support (ACPP Data)

	Without CC Worry
Male	0.252
	(0.201)
Age in Decades	-0.125 *
	(0.063)
Education *(Ref.: Low)*	
Middle	-0.661
	(0.358)
High	0.330
	(0.354)
Parenthood	0.107
	(0.199)
Owns Home	0.437 *
	(0.216)
Rural-Urban Typology *(Ref.: Control)*	
Urban Medium Centers	-0.609
	(0.345)
Regional Centers, Central	1.088 *
	(0.549)
Rural Area near Centers, Central	0.171
	(0.511)
Rural Area, Central	-0.251
	(0.635)
Rebate Category *(Ref.: I / lowest)*	
II	-0.396
	(0.320)
III	-1.126 *
	(0.519)
IV	-0.589
	(0.657)
Political Orientation *(Ref.: Center)*	
Left	1.051 ***
	(0.254)
Right	0.128
	(0.296)
Vote National Election 2019	
ÖVP/ Liste Kurz	0.383
	(0.283)
SPÖ	0.452
	(0.330)
FPÖ	-0.877 *
	(0.380)
Greens	2.019 ***
	(0.347)
Neos	0.923 *
	(0.449)
Intercept	-2.251 ***
	(0.529)
Number of groups	1,627
Number of observations	2,986

*** p<.001, ** p<.01, * p<.05

Appendix 3.E3: Logistic Regression: Respondents' Carbon Tax Support with Sector Emissions (Survey Experiment)

	Without CC Worry	With CC Worry
Treatment Group *(Ref.: Control)*		
Regional	0.147	0.187
	(0.298)	(0.301)
Social	-0.047	-0.075
	(0.293)	(0.296)
Both	0.953***	1.007***
	(0.282)	(0.289)
Population Size *(Ref.: below 5,000)*		
5,001 – 50,000	0.209	0.250
	(0.273)	(0.277)
above 50,001	0.645*	0.751*
	(0.309)	(0.318)
Quality Public Transport *(Ref.: Medium)*		
Bad	-0.199	-0.110
	(0.255)	(0.262)
Good	-0.304	-0.375
	(0.288)	(0.294)
Political Orientation *(Ref.: Center)*		
Left	1.044***	0.920***
	(0.254)	(0.259)
Right	-0.233	-0.026
	(0.319)	(0.335)
Party Affiliation *(Ref.: None)*		
SPÖ	-0.114	-0.191
	(0.327)	(0.333)
ÖVP	-0.636	-0.593
	(0.386)	(0.389)
FPÖ	-0.604	-0.421
	(0.384)	(0.399)
Greens	1.555***	1.356**
	(0.463)	(0.467)
Neos	0.700	0.680
	(0.410)	(0.419)
Trust in Government *(Ref.: Medium)*		
Low	-0.755**	-0.596*
	(0.272)	(0.279)
High	0.896***	0.889***
	(0.260)	(0.265)
Car Use *(min. weekly)*	-0.795**	-0.675**
	(0.254)	(0.261)
Heating *(with fossil fuels)*	-0.165	-0.189
	(0.226)	(0.230)
High Emission Sector *(vs. low)*	0.110	0.064
	(0.214)	(0.218)
Climate Change Worry *(Ref.: Medium)*		
Low		-0.708*
		(0.317)
High		0.567*
		(0.241)
Intercept	-0.511	-0.715
	(0.678)	(0.699)
Number of observations	677	677

*** p<.001, ** p<.01, * p<.05

Additionally controlling for gender, age, education, income, economic strain and parenthood

Appendix 3.E4: Linear Regression: Respondents' Carbon Tax Support (Survey Experiment)

	Without CC Worry	With CC Worry
Treatment Group *(Ref.: Control)*		
Regional	-0.006	0.005
	(0.086)	(0.081)
Social	-0.034	-0.039
	(0.083)	(0.079)
Both	0.107	0.089
	(0.084)	(0.080)
Population Size *(Ref.: below 5,000)*		
5,001 – 50,000	-0.124	-0.119
	(0.077)	(0.072)
above 50,001	-0.001	0.078
	(0.086)	(0.082)
Quality Public Transport *(Ref.: Medium)*		
Bad	-0.056	-0.025
	(0.075)	(0.071)
Good	-0.058	-0.110
	(0.081)	(0.077)
Political Orientation *(Ref.: Center)*		
Left	0.356***	0.259***
	(0.082)	(0.078)
Right	-0.296***	-0.157
	(0.087)	(0.084)
Party Affiliation *(Ref.: None)*		
SPÖ	0.118	0.035
	(0.097)	(0.093)
ÖVP	-0.230	-0.205
	(0.118)	(0.112)
FPÖ	-0.321***	-0.166
	(0.095)	(0.091)
Greens	0.707***	0.505***
	(0.128)	(0.123)
Neos	0.343*	0.247
	(0.150)	(0.142)
Trust in Government *(Ref.: Medium)*		
Low	-0.649***	-0.538***
	(0.073)	(0.070)
High	0.229**	0.186*
	(0.082)	(0.077)
Car Use *(min. weekly)*	-0.362***	-0.265***
	(0.076)	(0.072)
Heating *(with fossil fuels)*	-0.009	-0.009
	(0.064)	(0.061)
Climate Change Worry *(Ref.: Medium)*		
Low		-0.505***
		(0.076)
High		0.439***
		(0.071)
Intercept	3.598***	3.421***
	(0.192)	(0.184)
R^2	0.34	0.41
Number of observations	1159	1159

*** p<.001, ** p<.01, * p<.05

Additionally controlling for gender, age, education, income, economic strain and parenthood

Appendix 3.F: Descriptive statistics of respondent characteristics

	Mean (SD) / N (%)	Min.	Max.	Median
Gender: male	0.48 (-)	0	1	0
Age	45.30 (15.33)	18	75	45
Education: Elementary school or lower	4 (0.35%)	-	-	-
Compulsory school	72 (6.21%)	-	-	-
Certificate of secondary education II	100 (8.63%)	-	-	-
Vocational training / school	464 (40.03%)	-	-	-
End of tertiary school or higher *(=with Matura)*	519 (44.78%)			
Household Income: 1. Quartile	496 (42.80%)	-	-	-
2. Quartile	179 (15.44%)	-	-	-
3. Quartile	252 (21.74%)	-	-	-
4. Quartile	232 (20.02%)	-	-	-
Economic Strain: Low	173 (14.93%)	-	-	-
Mostly Low	619 (53.41%)	-	-	-
Mostly High	482 (24.50%)	-	-	-
High	83 (7.16%)	-	-	-
Parenthood: yes	0.58 (-)	0	1	1
Car Use (min. weekly)	0.73 (-)	0	1	1
Heating (with fossil fuels)	0.32 (-)	0	1	0
Occupation in High Emission Sector	0.49 (-)	0	1	0
Climate change worry: Low	342 (29.51%)	-	-	-
Medium	375 (32.36%)	-	-	-
High	442 (38.14%)	-	-	-
Left-Right Position: Left	289 (24.94%)	-	-	-
Center	597 (51.51%)	-	-	-
Right	273 (23.55%)	-	-	-
Trust in Government: Low	396 (34.17%)	-	-	-
Medium	492 (42.45%)	-	-	-
High	271 (23.38%)	-	-	-
Party Preference: No Party	514 (44.35%)	-	-	-
SPÖ	166 (14.32%)	-	-	-
ÖVP	101 (8.71%)	-	-	-
FPÖ	241 (20.79%)	-	-	-
Greens	84 (7.25%)	-	-	-
Neos	53 (4-57%)	-	-	-
…				

	Mean (SD) / N (%)	Min.	Max.	Median
Treatment Group: Control	299 (25.80%)	-	-	-
Regional	266 (22.95%)	-	-	-
Social	301 (25.97%)	-	-	-
Both	293 (25.28%)	-	-	-
Population Size: Below 5,000	403 (34.77%)	-	-	-
5,001 – 50,000	363 (31.32%)	-	-	-
Above 50,000	400 (33.73%)	-	-	-
Subjective Rurality: Rural	284 (24.50%)	-	-	-
Mostly Rural	199 (17.17%)	-	-	-
Part/part	154 (13.29%)	-	-	-
Mostly Urban	239 (20.62%)	-	-	-
Urban	283 (24.42%)	-	-	-
Quality of Public Transport: Bad	415 (35.81%)	-	-	-
Medium	430 (37.10%)	-	-	-
Good	314 (27.09%)	-	-	-
Carbon pricing support	2.84 (1.23)	1	5	3
Regional rebate support	3.34 (1.25)	1	5	3

Note: Sample size reduced to the N=1159 respondents included in regression analyses; mean and standard deviation indicated for metric variables, N and percentage indicated for each category of categorial variables, mean indicated for dummy variables

Appendix 3.G: Information Provision Experiment

[all:]

[Pre-Treatment Warning:]

Important Information for the next page

You are about to see a brief explanation of political measures.

Please take a moment to read the text carefully - it is important for the next questions.

The page will remain displayed for a short time. After the time has elapsed, you can continue as usual or stay on the page for longer.

[randomized: one control, one treatment group „regional repayment“, one treatment group „social repayment“, one treatment group „social + regional repayment“

-> probability for each: 1 in 4]

[Control:]

CO_2 emissions from the combustion of fossil fuels such as coal, oil, gas, petrol and diesel are considered to be the main drivers of climate change. To counteract this, the Austrian government introduced a CO_2 pricing in October 2022. This means that those who consume more will pay more. This reform was accompanied by other measures.

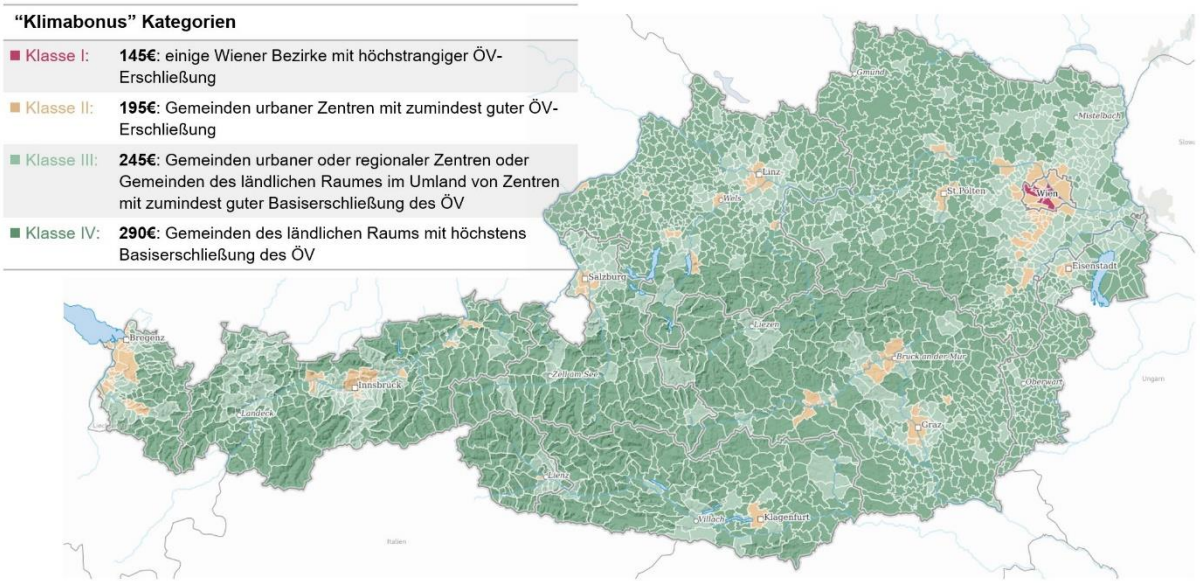
[Treatment group (regional repayment):]

CO_2 emissions from the combustion of fossil fuels such as coal, oil, gas, petrol and diesel are considered to be the main drivers of climate change. To counteract this, the Austrian government introduced a CO_2 pricing in October 2022. This means that those who consume more will pay more. This reform was accompanied by other measures.

One of these measures is the **regional climate bonus - an annual repayment of the CO_2 price revenue to everyone in Austria**. It is intended to reward climate-friendly behavior: Those who cause less CO_2 keep more of the bonus. The repayment also offsets the higher price burden. This is particularly important support for low-income households.

The climate bonus is also staggered regionally. **People in areas with poor public transport connections and infrastructure receive a higher compensation.** The division into four categories was determined by Statistics Austria. People with reduced mobility always receive the highest supplement, while children receive half of the climate bonus.

Below you will find a map of Austria with the classification of the four categories and the climate bonus payments for 2024.



Verteilung des regionalen Ausgleichsmechanismus in Österreich
Quelle: Statistik Austria, Datenstand: 01.04.2023

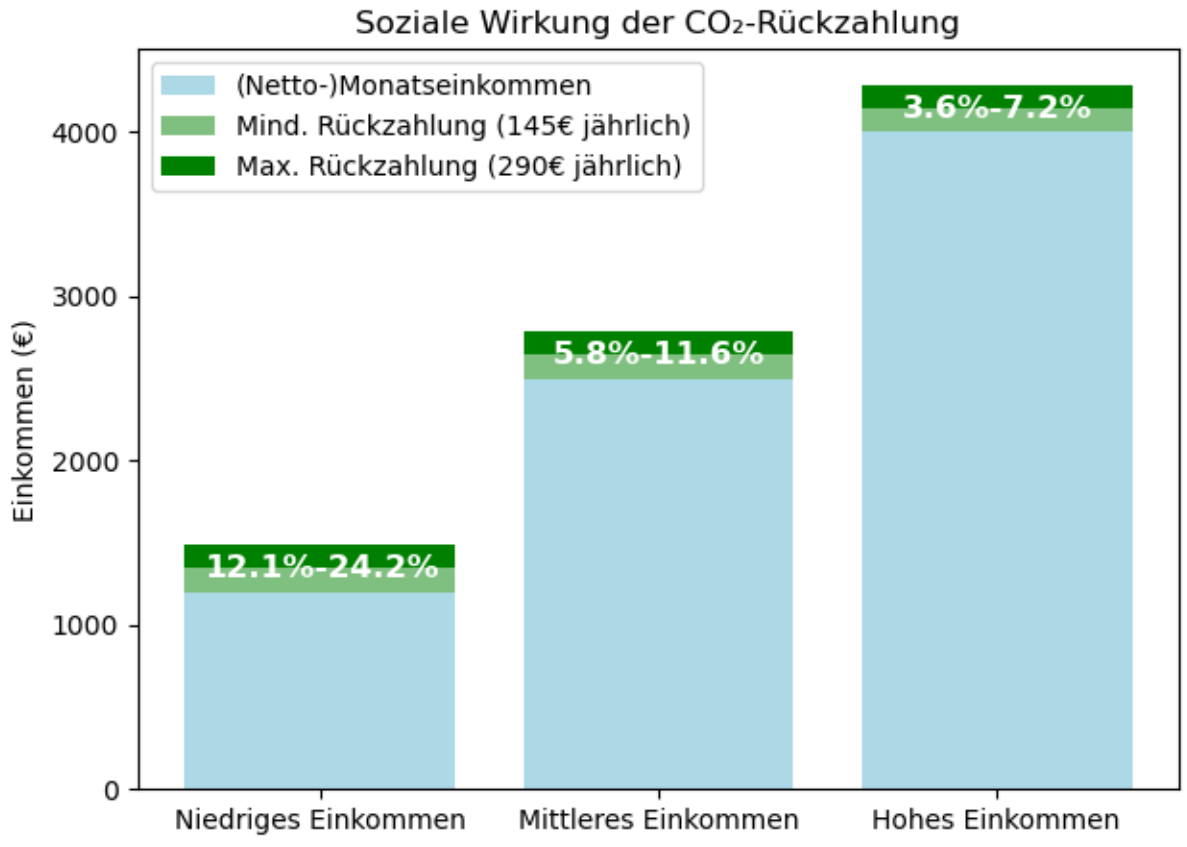
[Treatment group (social repayment):]

CO_2 emissions from the combustion of fossil fuels such as coal, oil, gas, petrol and diesel are considered to be the main drivers of climate change. To counteract this, the Austrian government introduced a CO_2 pricing in October 2022. This means that those who consume more will pay more. This reform was accompanied by other measures.

One of these measures is the regional **climate bonus - an annual repayment of the CO_2 price revenue to everyone in Austria.** It is intended to reward climate-friendly behavior: Those who cause less CO_2 keep more of the bonus. The repayment also offsets the higher price burden. This is particularly important support for regional households.

The climate bonus also has a socially equalizing effect, as everyone receives the same amount. **For people on low incomes, however, this proportion of their budget is higher, so that they benefit more in proportion and the measure strengthens social justice.** Children receive half of the climate bonus.

In 2024, the annual climate bonus payment amounted to at least €145 and up to €290. Below is a chart showing how high these repayments are in relation to average monthly income, for example.



[Treatment group (social + regional repayment):]

[This treatment group receives both the social and the regional repayment treatments in a randomized order. For the treatment that comes second, the first two paragraphs are deleted to not repeat them.]