Unequal representation

The case of climate policy and youth

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ABSTRACT

A growing body of research finds that representation is real, but likely unequal. Policy is shown to disproportionately follow the preferences of some societal groups, most notably the rich, in advanced democracies. This thesis advances a little explored phenomenon in this line of research. I argue that it is important to analyze representation in climate policy and that age, which is often neglected as a parameter in its own right, may be an important cleavage within this field of policy. Climate reports highlight that there is more action to be done to mitigate climate change, and that policy is not implemented at sufficient pace. The last years have shown large-scale protests and actions where youth are actively engaged in climate change mitigation, demanding more governmental action. Literature shows mixed findings regarding preferences for climate policy across age groups, and it will therefore be interesting to see whether climate policy follows preferences preferring less climate policy or status quo, and whether these are the indeed the preferences of the older age groups.

To test whether unequal representation is a feature of climate policy, I collect survey data on spending preferences and match them to corresponding climate policy in advanced democracies over the last three decades, to see whether policy (equally) represents preferences by age groups. This is done by creating a tailored dataset with aggregated preferences at country-level and analyzing the effect of preferences on different policies utilizing a quantitative approach. Second, I will test whether unequal representation in climate policy is mitigated by descriptive representation of youth in parliaments. The results suggest that climate policy partly follows average preference, whereas the results are mixed for unequal representation. For some issues, the policy reflected preferences of the younger age group, and for others it reflected the preferences of the older age group. Surprisingly, the preferences of the old were on average more “climate friendly” than those of youth for a minority of the issues considered. A stronger presence of younger parliamentarians showed the expected relationship, where a preference for increased output is associated with more output. Thus, based on the analyses, the thesis cannot conclude that there is unequal representation of age groups. Future research should aim to analyze more data and provide a fuller account of representation in climate policy.

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1. INTRODUCTION

"We have to look at how political representation works in existing conditions, and whether arrangements that might seem to embody general principles of fairness none the less favour particular groups" (Phillips 1995, 38).

1.1 Public preference and unequal representation

Representative democracy is the only political system which acquires its legitimacy from the idea of political equality. For government to be responsive to the preferences of its citizens, considered as political equals, their preferences ought to be weighted equally in the process of governing. Empirically, such an ideal of equal influence may appear unachievable, however, it is rather understood as a desirable standard against which one can measure what actually exists (Dahl 2006, 6, 8; Dahl 1971, 2). The central relationship between public preferences and policy within the literature on representative democracy is frequently analyzed and several studies find that governments in advanced democracies generally are responsive to the preferences of citizens (Soroka and Wlezien 2010; Rohrschneider and Thomassen 2020).

However, even if policy is responsive to the preferences of the people in general terms, democracies have a problem if systematic inequalities exist in the representation of the views of different social groups (Reher 2018, 613). Many studies have demonstrated that unequal representation is in fact the reality, where the preferences of the rich (Gilens 2012; Bartels 2008; Erikson 2015; Peters and Ensink 2015; Schakel, Burgoon and Hakhverdian 2020), the elite (Carnes 2012), and males (Ferland 2020; Mansbridge 1999; Wangnerud 2009; Uribinati and Warren 2008) are better represented in political outcomes and representative bodies. Looking at this evidence of the existence of political inequality[1], this thesis will contribute to the literature by looking at something that seems relatively unexplored compared to the existing literature in this field. Namely, whether there is a lack of representation of youth's preferences in climate policy.

Considering that climate change will affect people's lives dramatically in the future, in particularly the young, and considering that many young advocate the active countering of climate change, it is a puzzle that governments have not made more dramatic changes to their environmental policies (Talbot 2016, 220). It suggests that, perhaps, older generations are over-represented by emphasizing economic growth over countering climate change. We do not know

[1] Political inequality can refer to a variety of issues, but in this thesis, it refers to unequal representation. The terms are used interchangeably.

whether there is inequality here, and as much of the abovementioned scholars argue - we need to understand unequal representation better. When examining whether people feel equally represented, the most dramatic difference in reports belonged to the age-dimension, where youth did not feel heard or that their preferences are reflected in policy (Holmberg 2020, 424-428). In this thesis, I will investigate whether a representation gap indeed exists on the basis of age. The main research question for this thesis will be the following:

To what extent does climate policy in advanced democracies respond equally to the preferences of people from different age groups?

The nature of my research question suggests that two additional questions can also be considered. First, the relationship between climate policy and average preferences will be examined, with the aim of answering the first sub-question: *1) Is climate policy overall representative of the average preferences of citizens?* Second, I am interested in understanding whether likely variation in political inequality may be due to descriptive representation, i.e., the more or less equal representation of various societal groups in parliament, providing one major explanation for the potential existence of political inequality within the area of climate change. The second sub-question to be answered is therefore*: 2) Does the share of young people in parliament affect age-based inequality in representation?*

1.2 Background and justification for the research question

The quality of political representation is, at least in large part, indicated by the extent to which the decisions of elected representatives are broadly reflective of the represented. Scholars who set out to assess this have frequently chosen to explore how citizens' views enter the policy-making process and how well citizens' preferences are mirrored by political decisions. In the assessment of (unequal) representation, policy outputs are central (Soroka and Wlezien 2010, 10, 12-13). As climate has become an important and current topic, and much of the literature have focused on economic or welfare policies, it is important and relevant to expand the knowledge on how different socioeconomic characteristics relates to representation in this regard, beyond the income- and gender-dimension. What is the role of age in climate policy?

The politization of climate has been fueled by the increasing number of events to advocate global action against climate change, such as the People's Climate March in 2014 and other corresponding events in over 162 countries (Talbot 2016, 220). In the first large-scale polling of public opinion regarding climate change, covering over half of the world's population, two thirds of the respondents reported that climate change is a global emergency and showed wide-

ranging support for key climate policies across different action areas. This shows a general trend of public concern for the issue of climate change worldwide, where young people are more likely to believe climate change is a global emergency than older age groups (Flynn et al. 2021). While media presents preferences in this regard as generationally dividing, older people also express concern for climate change, as demonstrated by the abovementioned polling. Nevertheless, while older age groups may express general concern, this does not automatically imply that they prioritize climate or demand specific policies and subsequent government responses (Talbot 2016, 220, 224).

According to some research, this is due to differences in motivation to maintain existing social orders and growing conservatism as people age. Older age groups may believe they stand to lose more as a result of specific policy changes required to address climate change, and that change at the expense of, say, economic wealth and growth will be unjustified. As a result, scholars have argued that older people are generally too set in their ways to be responsible for social or political change, and that most long-term change occurs through generational replacement (Sloam 2013, 837; Poortinga et al. 2019, 26). Existing literature on the relationship between age, generations, and such preferences provides inconsistent results. Therefore, it is unclear whether there are potential differences between generations in terms of climate preferences (Lorenzini, Monsch, and Rosset 2021, 1, 4).

As part of my data analysis and exploration, I will first consider whether policy appears to follow average preferences. Here, I expect that the data will reveal that policy to a large extent follow public opinion. When examining unequal representation, it is central to look at the potential differences regarding climate change preferences. Here, I expect that the numbers will show generally high levels of support for climate related policies among the age groups, as theory suggests all generations have moved in a parallel, upward trend over the last twenty years. However, younger generations are expected to show higher levels of support for climate policy and the largest share of support, as they will experience the consequences of political action to a larger extent (Lorenzini, Monsch, and Rosset 2021, 1). I anticipate that climate policy will reflect older age groups to a greater extent, but that increased descriptive representation will mediate this relationship.

In several ways, the current thesis adds to the existing literature on inequality and representation, as well as the issue of climate change. First, by explicitly focusing on age, the research will supplement the literature on climate preferences by investigating whether they differ across age groups for different policies. Second, by examining whether these preferences

are mirrored by climate policies, the research will look at an understudied characteristic in the opinion-policy literature, namely age, as opposed to the more prevalent focus on the income- and gender-dimensions for such research inquiries. With a few exceptions, age is mostly used as a statistical control in this literature, and when age groups are studied, the analysis has not, at least not to my knowledge, used a cross-national perspective (see Kissau, Lutz, and Rosset 2012). Furthermore, to the best of my knowledge, no study has explicitly focused on representation in climate policy. Studies examining a variety of policy areas, including climate policy, often focus on preferences in comparison to subsequent spending (Donnelly and Lefkofridi 2014). By incorporating additional policies within climate, I will broaden my understanding of representation in climate policy. Finally, a data analysis on descriptive representation will add to our understanding of the impact of descriptive representation on unequal representation and policy. Altogether, the thesis seeks to respond to the call for greater knowledge and understanding of the types of inequality that exist, where they exist, and under what conditions they exist (Peters 2018, 353).

1.3 Central findings

The results suggest that climate policy partly follows average preference, whereas the results are mixed for unequal representation. For some issues, the policy reflected preferences of the younger age group, and for others it reflected the preferences of the older age group. Surprisingly, the preferences of the old were on average more "climate friendly" than those of youth for a minority of the issues considered. The hypothesis that a stronger presence of younger parliamentarians increase the representation of youth's preference is supported. Thus, based on the analyses, the thesis cannot conclude that there is unequal representation of age groups.

1.4 Structure

Chapter 2 will give a broad overview of the literature on unequal representation. First, I briefly introduce the concept of political inequality and how it is linked to representation. Subsequently, I review existing literature by presenting theory on democratic representation and how scholars have examined congruence and responsiveness empirically. Then, I elaborate on the research of unequal representation before I place my own research within the tradition. The main point of this chapter is that few studies look beyond the rich-poor and gender cleavages in relation to social policy or spending in a comparative perspective, while this thesis aims to go beyond this debate by looking at age and climate policy.

In chapter 3, I introduce the theoretical framework for unequal representation. I start by narrowing down the concept of political inequality so that it is more directly applicable to my research question, before presenting the climate issue. Then, I outline arguments for why unequal representation can be related to age groups in the climate issue and focus in more detail on one of its main explanations, descriptive representation. After conceptualizing descriptive representation, I argue how it should affect representation of youth's preferences. Throughout the chapter, I discuss the expectations of the direction of climate policy, how age groups might feel differently about climate policy, and explanations for why there may be more or less degree of unequal representation. This leads me to four hypotheses which states that: *(1) climate policy is representative of the general public opinion, (2) preferences on climate policy diverge between younger and older age groups, (3) climate policy tends to follow the preferences of the older age group,* and *(4) stronger presence of younger parliamentarians strengthens representation of the preferences of the younger compared to the older, alleviating differential responsiveness*.

Chapter 4 introduces the dataset I have constructed for the purpose of conducting the analyses. First, I describe the required data and explain the need of the distinctive elements, before presenting criteria and sources of the chosen data. Furthermore, I explain the approach of measurement and coding, before elaborating on the method chosen to analyze the research question. Lastly, there will be a discussion of the choices in research design and what inferences the analysis may make about unequal representation, before presenting some descriptive statistics.

Chapter 5 is devoted to presenting the results of this study. First, I consider the relationship between average preferences and climate policy. Overall, there seems to be support for the first hypothesis, but the findings are not robust. In the next step of comparing preferences, it turns out that they are not highly divergent between young and old, with some variations by policy issues. The following analyses of unequal representation of the age groups, demonstrate that policies show mixed tendencies regarding whose preference it follows. Lastly, I look at descriptive representation to see whether it impacts representation in one of the issues. The analysis indicates the expected direction of this effect.

Lastly, in chapter 6, I discuss the findings and conclude, before suggesting avenues for future research on the topic.

2. LITERATURE REVIEW

The purpose of this chapter is to provide a broad overview (but by no means an exhaustive review) of the literature on unequal representation. First, I introduce the concept of political inequality and how it relates to representation. Then, I review existing literature by presenting theory on democratic representation and how scholars have investigated representation empirically. Then, I elaborate on the research of unequal representation, before situating my own thesis within the tradition.

2.1 Political inequality

Although the extensive literature on democracy emphasizes political equality as a cornerstone of democracy, scholars have made several attempts to discuss theoretically whether and how this democratic standard is feasible and, to a lesser extent, conceptualizing and testing the relationship empirically (Peters 2018, 342). More philosophical research, as previously stated, has argued that perfect political equality is merely the ideal, and that some inequality is unavoidable (Dahl 2006). As a result, a common compromise is that some inequality is acceptable as long as it is not structural, i.e., that some people consistently get what they want while others do not. The acceptable limits of political inequality are debatable, however (Verba 2006, 501; Urbinati and Warren 2008, 389; Dubrow 2014, 15, 16).

Joshua Dubrow, one of the scholars concerned with conceptualizing political inequality, provides a broadly applicable conceptual framework for this complex concept. This framework is based on the findings of the 2004 APSA[2] Task Force on Inequality, as well as his review of 124 articles from 1991 to 2012 that deal explicitly with defining and understanding political inequality. The concept can be reduced to two interconnected dimensions in which one can have political inequality, which is applicable to a variety of contexts and decision-making levels. These are inequality in *voice* and inequality in *response*. The former refers to opportunities and input into political decisions, while the latter refers to policies and other outcomes of the political process. These dimensions are equally important, although the former has received more attention (Dubrow 2014, 9, 12, 14, 17). Based on Dubrow's conceptual framework, the thesis will investigate unequal representation by examining whether one side, voice[3], translates equally into response (policy). To describe how this thesis will add to the

[2] American Political Science Association
[3] In this thesis, voice will refer to citizens' preferences.

existing literature, a broad overview of the realm of representation research with previous approaches and findings will be presented next.

2.2 Democratic representation

David Plotke argues that representation is crucial in constituting democratic practices, and not an unfortunate compromise between an ideal of direct democracy and messy modern realities (1997, 19). Consistently, representation is thought to entail someone who has been given a right to act (authorization) and someone subject to election (held to account). The problem with these views, as argued by Hanna Pitkin, is that the meaning lies outside the activity of representing itself. She suggests that one should focus on the substantive content of the activity, namely whether the actions of the representatives are in the interests of the people being represented, in a responsive manner (1967, 39, 59, 209). This suggests that when considering representation, congruence between what the citizens want and policy, as well as responsiveness to changes in preferences in policy are important.

Pitkin proposes three intertwined but distinct definitions of democratic, political representation. The subsequent section will present the two most relevant definitions briefly, starting with representation as "standing for" something or someone. *Descriptive representation* is the making present of something absent by resemblance or reflection, often seen in relation to the composition of any representative institutions to the represented on relevant political characteristics, opinions, or experiences. Adherents argue that in order to provide congruent and responsive representation, representative institutions should reflect the diversity of those represented, and that some characteristic is required to achieve that goal (Phillips 1995). This can be race (Mansbridge 1999), having a working-class background (Carnes 2012), belonging to a certain education category (Hakhverdian 2015), or gender (Bratton and Ray 2002).

This type of representation emphasizes the importance of resemblance and pleasing the constituents, but it is sometimes argued that it is insufficient in and of itself because it does not guarantee a translation from a characteristic into acting for the represented. This is the concern of the second definition, *substantive representation* (Phillips 1995, 3; Pitkin 1967, 102, 110-111). It implies acting as if one would be held accountable for the actions. The essential part is that the represented is present in the *action* rather than in the *characteristics* of the actor. The representative must act in such a way that there is no conflict and must not be found persistently at odds with the wishes of the represented without a good reason. Substantive representation concerns responsive government in the interest of the represented (Pitkin 1967, 119, 122, 126,

144, 166, 209), which several scholars argue is a direct consequence of descriptive representation (see argumentation by Mansbridge 1999).

2.3 Empirical research on representation

Democratic theory, central to scholars for hundreds of years, is based on the idea that democratic institutions give citizens considerable power over their governance. A key principle (and expectation) of democratic government is that policy will be a function of opinion. The relationship between public preferences and policy has been the central concern of the literature on representative democracy since Rousseau's *The Social Contract* from 1762 (Burstein 1998, 27). Much of the opinion-policy literature evaluate the state of representation by analyzing empirically whether the representative body or its actions reflect the views of the citizens (Phillips 1995, 27; Wlezien and Soroka 2009, 2; Soroka and Wlezien 2010, 4). The following section will present two different approaches of such analyses, based on the conceptualization outlined by Peters (2018, 343).

2.3.1 Congruence

A substantial part of the opinion-policy literature examines congruence, as representatives' opinions and actions should, to some extent, reflect the wishes, needs, or interests of the represented (Pitkin 1967; Arnesen and Peters 2017, 873). Congruence is the degree of alignment between citizens' preferences and representatives' preferences/placement ideologically or for a specific issue (*preference congruence*), or policy output (*policy congruence*) (Peters 2018, 343). Congruence connotates agreement and is the major promise of democracy. As citizens delegate their power to rule to their representatives, congruence between the two implies 'empowerment' of the citizenry (Lefkofridi 2020, 357). The level of congruence is used to judge the quality of representation, given its importance to any democratic system (Soroka and Wlezien 2010, 10; Donnelly and Lefkofridi 2014, 5; Achen 1978). Even if "responsive" representation (e.g., that policy follows the preferred direction) is the reality, it may still fail in reflecting public preferences if the "level of policy" is incongruent (Bartels 2015, 17).

Preference congruence studies look at the statistical overlap between citizens' preferences and their representatives' ideological positions, policy positions, or issue priorities. The literature on preference congruence is frequently focused on ideological congruence, in which the distance between parties' or political elites' ideological placement on the left-right dimension is linked to citizens' self-placements on the left-right dimensions. Many of these types of studies support the existence of a match between preferences of citizens and positions in parliaments

(Peters 2018, 344). Although preference congruence-analyses have contributed to the understanding of representation, a common critique is that they do not address the system-level policy representation as preferences are structured along multiple dimension (Lefkofridi 2020, 361). The work is premised on the notion that e.g., representatives' attitudes will serve as a proxy to their behavior (Soroka and Wlezien 2010, 11, 12), in addition to the usually implicit assumption that representatives are equally responsive to the views of all their constituents (Bartels 2008, 254).

Policy congruence studies look at the statistical overlap between citizens' preferences and policy output. One of the most prevalent approaches to study the opinion-policy link in the United States, started out by comparing individuals' preferences by constituency to roll-call voting behavior of US Congressmembers in areas such as foreign policy, social welfare, and civil rights, in order to determine how prevailing attitudes within a constituency guided representatives' behavior. The research showed uneven representation across issues (Miller and Stokes 1963). This further sparked further research into aggregate constituency opinion, including demographics in constituency, representatives' own demographic traits, and party affiliations in relation to their voting behavior. Although the research remained primarily focused on the United States, the emphasis shifted from individual preferences to aggregated public preferences and system-level policy outcomes. This shift allowed for a greater focus on the outcome itself, as well as the extent to which this is in accordance to aggregated public preferences (Wlezien and Soroka 2009, 1-3). In this context, representation started to be studied as a systemic property found in the overall operation of the entire representative policy-making system, and evidence suggests that there are mixed findings in policy congruence (Soroka and Wlezien 2010, 11; Peters 2018, 344).

2.3.2 Responsiveness

Responsiveness, which is whether *changes in preferences* lead to *changes in policy* or *change in preferences of the representatives* (either increasing or decreasing the level of congruence) (Lax and Phillips 2012, 148; Peters 2018; Andeweg and Thomassen 2005, 511). Democratic responsiveness will be understood as a positive association between the level of public support for a policy and the likelihood of that policy being adopted, which is a key aim for democracies and a source of legitimacy (Arnesen and Peters 2017, 873; Gilens 2012, 70). This approach, in contrast to congruence, is argued to have a more causal nature given its time dimension, focusing on response as a change in representatives' preferences or policy (Wlezien and Soroka 2009, 3).

Research on preference responsiveness, whether changes in citizens' preferences is followed by changes in representatives' preferences on an issue or ideological position, often utilizes time-series data. By identifying survey-questions asking about policy change scholars examine the proportion of respondents or the median voter favoring change and whether representatives or parties have changed their positions in response (Ferland 2020, 179). Sometimes research focuses on a specific policy domain or different time periods. The majority of research has concentrated on single countries, most notably the United States (Brooks and Manza 2006, 475), with a more recent emphasis on European countries (Donnelly and Lefkofridi 2014; Peters and Ensink 2015).

Studies of policy responsiveness also identifies preferences for policy change to explore whether the proportion of respondents favoring that change is associated with the existence of proximate changes in policy. The output has often been government spending in or across issues (see Schakel, Burgoon, and Hakhverdian 2020). These analyses can establish the coincidence of a public preference for change and actual policy change, but it is challenging to demonstrate a clear causal connection between public opinion and policy change. The relationship is also probabilistic, which means that its magnitude varies between countries, over time, and across policies (Brooks and Manza 2006, 475). Whereas congruence only provides a static picture of representation, responsiveness can examine the dynamic of representation. If preferences for change precede policy change, it may imply that preferences lead policy. However, studies applying extended time-series of both opinion and policy show that this also happens the other way around, with citizens adjusting their preferences after policy changes occur. This is the logic behind the thermostatic model of public opinion and policy (Soroka and Wlezien 2010, 13, 22-23; Page and Shapiro 1983; Wlezien and Soroka 2009, 5).

Political influence is notoriously difficult to measure as it is an interaction process that is more inferred from conditions, actions and outcomes than directly observed (Dubrow 2014, 20). A common problem of inference arise because it is difficult to know exactly how preference measures, especially if they are diffuse, ought to translate into policy (Lax and Phillips 2012, 148). The correlation between e.g., public opinion and elite opinion, may reflect conscious efforts by elites, interest groups, or policy makers to shape public opinion in support of their views (Bartels 2008, 281). Congruence- or responsiveness studies examining a single issue is critiqued when using average position of a representative, a party, or the government. When considering multiple dimensions, such an approach becomes more meaningful. Looking at single issues ignores the complexities of the overall case, and the fact that citizens assign

varying degrees of importance to various issues. According to Brooks and Manza, rather than seeking to tailor (all) specific policy domains in perfect accordance with mass preferences, it is in the aggregate shape of policy output that officials respond most consistently to public opinion (2007, 132). Empirical studies demonstrate that there is great variation between policy domains, so in order to analyze overall responsiveness, the inclusion of as many policy domains as possible is more favorable (Brooks and Manza 2006, 479; Wlezien and Soroka 2009, 4; Bartels 2015). Another point, emphasized by Gilens, is that serious inquiries must also consider policy that did not happen to see the big picture. Influence can also be the ability to prevent policy from being realized (2012, 50).

Another bias to such studies may result from the certain salience of policy-issues included in surveys. As representatives may have a bigger incentive to follow public opinion on issues they assign importance, the estimated responsiveness can be biased upward (Wlezien and Soroka 2009, 4). Aggregate preference also leave open the question of whether to use a median, mean, or something else. Despite many potential weaknesses, Achen argues that an analysis with good statistical properties is possible if analyzed based on theory and employing a measure based on democratic theory, so that it can be defended both statistically and substantively (for proposals see Achen 1978).

Overall, many studies of congruence or responsiveness are positive to the working of democracy. The general findings are that public policies reflect, albeit imperfectly and in a probabilistic fashion, the preferences of citizens (Peters 2018, 344; Burstein 1998; Brooks and Manza 2007, 5; Brooks and Manza 2006, 475). Scholars have recently begun to investigate not only whether there is congruence and responsiveness, but also whether there is inequality in such representation. Democratic theory has moved in the direction of conceiving democracy as any set of arrangement where all affected by collective decisions should be able to influence the outcome and evaluate representation as a mechanism to achieve the equal representation of interests and views within the collective body (Peters 2018, 343; Urbinati and Warren 2008, 395). This norm is what separates democracy from any particular kind of institution or decision-making mechanism, and it is therefore important to assess whether this norm is fulfilled (Achen 1978, 478, 479; Urbinati and Warren 2008, 393, 395). The remainder of the review will focus on research concerning political inequality.

2.4 Unequal representation

As mentioned, several authors have identified *equal* representation of the preferences of all citizens to be central to the operation of national legislatures. That is to say that the normative

democratic ideal requires the absence of any systematic bias in the representation of citizens (Dahl 1971). Increasingly, research on representation has started to account for heterogeneity in public opinion and unequal representation of various groups within the public (Donnelly and Lefkofridi 2014, 3, 5; Ura and Ellis 2008, 792). Research on unequal representation has primarily focused on the United States, where they have found structural inequality in representation when considering economic inequality, skewed in favor of wealthier citizens. These findings may not come as a surprise, given that many argue that the United States has a system that generates and sustains significant economic inequality, which translates into political inequality (Lax and Phillips 2012; Schakel, Burgoon, and Hakhverdian 2020, 132; Gilens 2012, 13, 48). Perhaps political inequality is a peculiar feature of the United States, as other countries have a lesser degree of inequality, more policies aimed to address rising economic inequality, and more inclusive institutions?

Studies examining cases outside the United States suggest that this is not the case (Bartels 2015, 28-29; Peters and Ensink 2015; Donnelly and Lefkofridi 2014), indicating that there is more to unequal representation than only institutional and systematic features. Some even go to the extent of arguing that all modern democracies exhibit unequal representation as representative government is inevitably aristocratic, at best constituted and contained by democratic elections (Urbinati and Warren 2008, 393-394). In any case, the question at hand is whether representation is *systematically unequal* to some groups. Theory emphasize the intertwined, complex processes for why unequal representation exists and there are too many to adequately summarize all. This section will present some of the main explanations, which groups are underrepresented, and in what way.

2.4.1 What explains unequal representation?

Many empirical studies of the voice-dimension of political inequality are, according to Dubrow, about the inequality of opportunity to participate and its causes (2014, 21). Literature suggests three broad explanations for why there is unequal representation. These are: (1) systematic differences across groups in characteristics relevant for political representation and participation, (2) money as a resource of influence, and (3) descriptive representation (Rosset, Giger, and Bernauer 2013, 820).

In 2004, APSA concluded that little is known about inequality's effect on democracy and expressed concern about the effect of economic inequality on disparities in political voice. Since then, much research have investigated this dimension and found various ways economic inequality translates into unequal representation, not only within the United States (Bartels

2008, 2). Studies have shown that (especially) economic, social, or other forms of inequality can have a connection to the political participation and representation of individuals or groups. Participation is important, as representatives seek reelection and are likely to care about voter preferences and keeping in synch with the mean preference. If certain groups do not vote or express their demands, policy outcomes may be suboptimal and biased (Phillips 1995, 32; Pitkin 1967, 83; Donnelly and Lefkofridi 2014, 7-8). Several studies find that the differences in participation between richer and poorer groups are not so large that it alone explains unequal representation and suggest that disproportional influence may be contributed to wealthier citizens' contribution of money and energy into lobbying and political campaigns (Bartels 2008, 252-253, 279-280).

Another, intertwined strand of research focus on the extent to which some groups occupy strategic, privileged, and scarce political positions (Dubrow 2014, 21). Such studies on descriptive representation measure the extent to which the parliament resembles specific demographics (e.g., ethnicity or race) and life experiences (e.g., having a working-class background or being female) of the citizenry (Mansbridge 1999; Phillips 1995; Carnes 2012; Bartels 2015, 17; Urbinati and Warren 2008, 394). For example, political elites have a socioeconomic status that resembles more closely those at the higher end of the income distribution, which can result in their preferences being generally more distant from those of people with low income (Bartels 2008, 253).

Descriptive representation is relevant, as one way in which representation happens is when public selects like-minded politicians to deliver what it wants in policy (Wlezien and Soroka 2009, 7). Often such research does not explicitly account for whether descriptive representatives are actually concerned with substantive representation and research cannot directly capture differences in preferences and the correspondence to policy (Dubrow 2014, 21; Ferland 2020, 180). Adherents to descriptive representation argue that the opposite of representation is exclusion, and that one sees unequal representation because the representation of interests, policy positions, and preferences by agents within political institutions does not recognize the necessity of represented presence of the diversities within society, embodied within representatives who bring distinctive perspectives into political institutions. In other words, heterogeneity in the electorate not reflected in parliament need not be an issue in itself for democratic representation, but some argue that descriptive representation improve substantial representation and that demands for political inclusion require actual inclusion of members of such groups (Phillips 1995, 6; Ferland 2020, 180; Urbinati and Warren 2008, 394).

Other, more institutional explanations for why there may be unequal representation are the fact that governments are not able to represent equally. Representation generally is becoming increasingly problematic. Several issues today are collective and not contained by any single polity, and the growing complexity of issues strains the powers of representative agents and their capacity to act on the interests of the interested. No matter how universal the inclusion of individuals, the representation of nongeographical constituencies are represented only accidentally, insofar as they intersect with the circumstances of location. Some concrete institutional features are also demonstrated to affect representation by empowering electoral participation differently (Urbinati and Warren 2008, 390, 396-399; Wlezien and Soroka 2009, 8). Proportional representation, as opposed to majoritarianism, is thought of as securing representation in proportion to numbers and better representing subsets of the population that are demographically different (Soroka and Wlezien 2010, 8). However, proportional representation is not equal to political equality, as outcomes can also be counter majoritarian. Even where there are safeguards for minorities, mechanisms of democracy never guarantee the quality of the outcomes. The under-representation of certain categories of people is in one sense just an empirical fact. There will inevitably be winners and losers (Phillips 1995, 20, 30, 47; Verba 2006, 520, 521).

2.4.2 Who are unequally represented?

Studies of response by decision-makers form is another inquiry taken up by much empirical political inequality research. Most studies examine the equality of outcome and seek to understand which groups benefit most from the political system. Of special prominence is work on income differences, which has partly dominated research on inequality (Wlezien 2020, 500; Dubrow 2014, 21, 22; Reher 2018, 613-614). When examining the United States, several scholars have found that affluent people almost have an exclusive influence over actual outcomes, while the preferences of people in the bottom third of the income distribution have no apparent impact on the behavior of their elected officials (Bartels 2008, 285; Gilens 2012; Ura and Ellis 2008; Erikson 2015; Gilens and Page 2014; Jacobs and Soss 2010). These findings have also been proven to exist in Europe, but this has not been examined to an equal extent (Schakel, Burgoon, and Hakhverdian 2020; Peters and Ensink 2015; Donnelly and Lefkofridi 2014). Besides income groups, the other salient sources of differences in society where there is found unequal representation are race, ethnicity, and gender (Wlezien 2020, 501; Peters 2018).

Studies of descriptive representation have found that most representative bodies are disproportionally by populated wealthy, somewhat older, white, male representatives, with

mixed results regarding the impact on substantive representation (Peters 2018, 350; Kissau, Lutz, and Rosset 2012). Many studies have concluded that descriptive representation can crucially support the principles of democracy and produce better decisions that are more inclusive and legitimized to a wider set of popular voices (Arnesen and Peters 2017, 869; Bratton and Ray 2002; Mansbridge 1999). Studies such as Carnes' (2012) find that representatives' background (seen as their personal preferences, information, and personal experience of having a working background) is a significant source of bias in their legislative behavior. The presence of elected women in parties is found to decrease the gender gap in party congruence and responsiveness and descriptive representation of women in legislatures increases responsiveness to women's policy concerns, albeit to a lesser degree than anticipated in theory (Ferland 2020, 174; Wangnerud 2009, 64).

2.4.3 In which policy domains have scholars found unequal representation?

The research on representation suggests that representation may be unevenly distributed across policy domains and countries on the basis on the type or salience of the issue. Here, salience refers to the importance of issues to citizens, which has been found to influence representation. The "magnitude-of-the-problem"-conclusions can depend a lot on what type of group, and issue, is compared exactly when it comes to the size of the group (Peters 2018, 344, 345, 349; Wlezien 2020, 499). In salient issues the public is likely to care and have a meaningful opinion, while politicians are likely to pay attention to public preference, which is in their self-interest electorally (Wlezien and Soroka 2009, 9). Much research is inspired by the salience of social welfare programs, examining the relationship between citizens' preferences and governments' social policies and spending across domains (Bartels 2015; Peters and Ensink 2015).

2.5 Concluding Paragraph

Overall, studies have found that representation is real, but likely unequal. Looking at this evidence of the existence of political inequality, one key issue of contemporary times – (mitigating) climate change – remains relatively unexplored when it comes to political representation. In my thesis, I want to add to existing literature on (unequal) representation by looking at the climate issue and whether representation is equal across age groups. As climate and age constitute an important and current topic, and much of the literature have focused on economic- and welfare policies, it would be interesting to expand the knowledge on how a relatively underexplored socioeconomic characteristic relates to representation with regards to the issue of climate change. While income, as well as gender, may be a relevant here, it may be age that is crucial. Older generations have built current economies and have little future to lose

compared to younger generations, which are less invested in current economic structures but heavily so in their (longer) future (Sloam 2013, 837; Poortinga et al. 2019, 26). Such a divide in preferences may, however, not be helped by the generally under-representation of the young in national parliaments, possibly also resulting in the under-representation of the preferences of the young (Kissau, Lutz, and Rosset 2012, 63-64).

To address this gap in the literature, I construct an original dataset where survey data on climate preferences are merged with corresponding country-level policy data for advanced democracies, covering various issues within climate. This allows me to examine whether the policies reflect average preferences and which age groups' preferences are best represented by governments. Furthermore, this broad comparative approach implies variation in composition of government, which makes it possible to examine the effect of descriptive representation of youth. Before I can do this, I first develop a theoretical framework and set up testable hypotheses, which is the purpose of the following chapter.

3. THEORY

The review of research on (unequal) representation demonstrated that there are multiple ways and choices for analysis, and that an overarching assessment of the quality of representation constitutes a huge task. Before laying out in further detail how this thesis will assess unequal representation, this chapter will present the theoretical framework for the thesis' research question. The purpose is to validate theoretically whether preferences by age-groups can be expected to be unequally represented in climate policy. The expectations that flow from this theory will be formulated as clear, empirically testable hypotheses throughout this section. First, the central concept of this thesis is conceptualized more explicitly. Second, the chain of representation will be described, followed by an explanation of how this thesis will examine unequal representation. Third, the climate issue is described, along with literature on public opinion and preferences within this issue based on age. The following section presents explanations for why one can expect unequal representation of youth, with an emphasis on the descriptive representation.

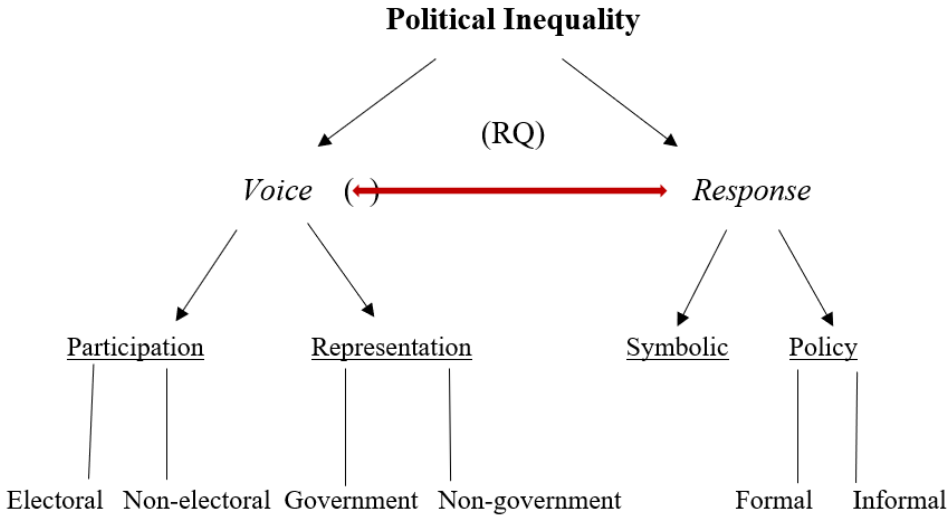
3.1 The conceptual framework of political inequality

The previously mentioned conceptual model of political inequality (see figure 3.1) demonstrates various types of political inequality and how they interact, applicable to diverse contexts across levels of decision-making. In its sum, political inequality is a form of power inequality whose domain is all things related to political processes. The two interlinked dimensions in which one can find political inequality is *voice* and *response*. Voice refers to how constituencies express their preferences to decision-makers, either directly or through representatives. The subdimensions of participation show that it can be electoral (through voting or standing for office) or non-electoral, such as attending demonstration, contacting public officials, joining a political organization, etc. The other subdimension, representation, involve someone, e.g., parliamentarians (government) or NGOs (non-governmental representation) interpreting the political voice and transmitting their interpretation to the decision-making body. Response refers to how decision-makers act and react (*congruence* and *responsiveness*) to their constituencies and is expressed via policy and symbols. Policy can be legislation, judicial precedent, or executive directives with the force of codified law. Symbolism is a response without firm guidelines for future decisions, often publicly expressed (e.g., speeches on the parliamentary floor or commemorative events) (Dubrow 2014, 18-20).

As mentioned earlier, many scholars question whether the ideal of political equality is realistic, as some inequality will be a constant feature of democracy. While equal treatment of voice may

be unattainable, equal consideration is worth striving for. Equal capacity to express- and equal expression of political voice are necessary first steps for political equality, but equal reception and consideration is the ultimate purpose (Verba 2006, 517, 532). Scholars stress the importance of examining influence (voice) over government decisions (response) is structural (Verba 2006, 501; Urbinati and Warren 2008, 389; Dubrow 2014, 14-16; Ura and Ellis 2008). The conceptualization, illustrated in figure 3.1, will here serve as the framework for analyzing political inequality. By examining policy preferences as a source of government activity within various cross-national and historical contexts, the thesis will assess whether voice (citizens' preferences) translates equally into response (climate policy). I will further discuss below the different dimensions and outline below on which dimensions I will focus. I will not test the whole conceptual framework, as such a task is too demanding.

Figure 3.1 The conceptual framework of political inequality



Note: The illustration is based on Dubrow (2014, 18).

3.2 From preferences to policy

One of the most important questions about politics is whether the 'chain of representation' (or in Powell's work 'The Chain of Responsiveness') functions as intended in liberal democracies. Ultimately, popular control is intrinsic to any notion of democracy, where people take some part in determining political decisions (Powell 2004, 91-92; Phillips 1995, 28). Democratic theory has provided a complex and increasingly sophisticated set of arguments regarding how and why preferences can be expected to translate into policy. The chain of representation, visualized in figure 3.2, connects the public's preferences to policies via competing parties that

vie for governing offices on the basis of the main political cleavages of each society. The opposition and governing parties channel alternative policy visions into national institutions. The outcome of party competition shapes policy in light of preferences of citizens, and citizens adjust their attitudes in light of the policy outcomes and the way actors behave. This complex relationship contains multiple assumptions, such as the preference-formation of citizens in the first stage, the choice set offered by political parties at the second stage, the way institutions and parties collaborate in forming governments and deciding policies in the remaining stages, and how citizens respond to them.

Figure 3.2 The chain of representation

1		2		3		4		5
Citizens' Preferences	⇨	Political Parties	⇨	Parliaments	⇨	Governments	⇨	Policies

Source: Rohrschneider and Thomassen 2020, 2.

There are good reasons to ask and test whether the chain meets the challenges of these assumptions, although one must recognize the complexity of representation and of paths through which preferences shape policy (Schakel et al. 2020, 157; Mair 2009, 3). Forces reducing representation of the public are politicians and parties trying to enact policies based on personal preferences and ideology, rather than public opinion. Interest organizations may pursue their own interest by providing politicians with resources crucial to victory or misleading them about public opinion. Legislative committees may distribute favors to special interests and the government may ignore public opinion because it pays no attention to most issues. In addition, the chain of representation requires that citizens be well informed and form their own independent judgement. Due to the rise of commercial social media and the proliferation of media sources citizens' level of information may be reduced (Rohrschneider and Thomassen 2020, 7-8).

In their recently published handbook on political representation in liberal democracies, where several prominent contributors assess multiple stages of representation, the authors nevertheless conclude that, in an overarching perspective, the chain works surprisingly well (Rohrschneider and Thomassen 2020, 2). Holmberg's study of 144,000 citizens in 46 established democracies reports that a majority of citizens across different social and political groups feel they are well

'policy represented', which is an important, subjective indicator of political equality[4] (2020, 425, 427). In order to better capture whether there is political inequality and avoid biased results by including democracies with little democratic experience, the scope of the thesis will concern advanced democracies, as they tend to have a higher probability of quality and experience in representation where policy is formed and implemented based on citizens wishes. If this process induces such policies consistently, it is called "democratic responsiveness". This is only one way to assess the quality of democracies, but it is critical (Powell 2004, 91).

Before hypothesizing unequal representation, I also expect representation to any large part of the public. Democratic states should strive to be in sync with their citizens and act according to stated preferences. Where majority will be truly sovereign, one can expect both strong responsiveness and high level of congruence. Following the literature, one would expect representation on climate change policy. The issue is not expected to diverge from the general pattern as the salience of the climate issue conditions the strength of the chain of representation for this issue. One can reasonable expect there to be responsiveness due to prominence, likelihood of widespread information and conveyed preferences, to which politicians are held accountable (Lax and Phillips 2012, 148, 153). This way, the thesis contributes to literature on representation, not just the more recent part on unequal representation, by examining the first hypothesis:

H1: Climate policy is representative of the general public opinion.

3.3 Unequal representation

As previously stated, the thesis will understand political inequality as *unequal representation* of citizens preferences based on the conceptual model. This perspective follows Dworkin's dependent interpretation of democracy where citizens' preferences should be treated with equal consideration in policies. To assess influence (power), the thesis will focus on whether preferences translate into policy (Phillips 1995, 30, 37, 38). The link between representation and equality implies that the representative body should somehow reflect citizen's views, without the expectation of each citizen's wish being granted each time, nor that representation is structurally unequal (Pitkin 1967; Peters and Ensink 2015, 577). No political system that allows for gross, sustained, and systematic differences between what the public wants and what policies the government delivers can be considered liberal and democratic (Rasmussen, Reher,

[4] Although a majority feel they are politically represented, there might still be inequality present. I will come back to the minorities that did not feel well represented politically in this study, later in this chapter.

and Toshkov 2018, 412). As evidenced by the review of literature, research on unequal representation has investigated how citizens' preferences enter the policy-making process and whether they are mirrored by representative bodies and political decisions. The findings revealed unequal representation, most notably when looking at gender, race, and wealth/income (Peters 2018, 341).

Following this literature, the thesis will try to account for which preferences at an aggregated group level tend to be mirrored in policy. Aggregated preference are more consistent, stable, and predictable than individual preferences and to some degree cancel out "noise" (Gilens 2012, 13, 18). The thesis will look at both responsiveness and congruence to assess whether citizens' preferences are deliberately incorporated into the policies that govern them, without violating the principle of political equality (Peters and Ensink 2015, 578). The choice of looking at policy representation is that outcome-measures are potentially the best for assessing whether policy outputs reflect an equal weighting of preferences irrespective of who expended them, whereas representatives' preferences not necessarily tell anything about actual policy (Dahl 2006, 78; Ware 1981, 395; Phillips 1995, 36-38).

The research question concerns whether there is unequal representation in climate policy with regard to people from different age groups. This is a correlational research question, insofar as the effort is to demonstrate a multidimensional associational pattern without causal assumptions. This is not to say that the association is not the result of some underlying causal factor(s) (such as older age groups' preferences), but the focus is not on claiming *how* or *why*, but *whether* there is a correlation (between opinion(s) and policy), which is interesting and important in and of itself (Gerring 2012, 153). As previously explained, the analytic goal of this thesis is to examine an "atypical" feature of this phenomenon, to contribute to a better understanding of the larger picture of unequal representation. Existing research on unequal representation has scarcely investigated the climate issue and age is neglected as an independent parameter of unequal representation in a comparative perspective (Peters and Ensink 2015, 578; Peters 2018, 347; Sundström and Stockemer 2020, 6; Kissau, Lutz, and Rosset 2012, 63-64).

Following the literature on aggregative theories of democracy, the preferences of citizens are taken as given (while recognizing they are shaped by the political process), and the focus is whether those preferences are incorporated equally into political decisions (Gilens 2012, 14). Although the rest of the chapter will present the theoretical causal mechanisms for unequal representation, the thesis' empirics will not make unjustified claims regarding *how* voice causes policy (or vice versa), as the research design employed in this thesis makes it impossible to

gauge whether policy is a result of citizens' preference (Bartels 2008, 281). The hypotheses presented subsequently will, even if supported by findings, merely capture empirical regularities or patterns (correlations), but may reflect conscious efforts by those who prefer the status quo to shape policy in their views.

The second sub-question the thesis will examine is whether the share of young people in parliament affects unequal representation. This question implies causality, as it explicitly indicates that a factor (the share of young parliamentarian) may generate variation in outcome (climate policy) (Gerring 2012, 107). In relation to the conceptual model, it concerns the subdimension of voice, representation through government, affecting the subdimension of response, formal policy. In the case of great variation in responsiveness, it will be interesting to see whether descriptive representation seems to have an effect on this relationship (Phillips 1995, 4).

Assessing unequal representation is not an unproblematic undertaking. The key problem is the impossibility to directly observe and measure influence and define "what and how much of it" is needed for equal representation. "*There is no metric such as money, no statistic such as the Gini index, and no body of data comparing countries*" (Verba and Orren 1985, 15). Inequality must be understood as the distance between two groups. By example, income inequality is often measured by the extent of the distance between those with a lot of income and those with less. In contrast, political inequality is the extent of the distance between those with a lot of potential influence and those with less, which can only be inferred from its outcome. Empirically, there probably is no instance of perfect equality/inequality, as these are the extremes of the scale, but a (varying) extent of inequality. Therefore, it begs the question; how much inequality is problematic? In a cross-national perspective, this is further complicated by needing a measure that is functionally equivalent across national contexts in order to produce ordinal measures based on judgements about "more", "less", or "about the same" (Dahl 2006, 78; Celis and Erzeel 2020, 194; Bartels 2015, 17).

3.4 The climate issue

Despite the fact that the body of research on public opinion and policy making is growing, the scope of research on public attitudes toward specific policies is currently quite narrow in, for example, the field of climate change (Kyselá 2018, 2), particularly in terms of differences in preferences by age and unequal representation (Lorenzini, Monsch, and Rosset 2021, 2; Ergas and York 2012, 965). There is insight to gain from looking at representation in more narrowly defined issues and climate-policy is interesting as it is a very publicly visible and controversial

issue, which is untypical in literature about unequal representation (Erikson 2015, 27; Reher 2018, 616).

Mitigation of the effects of climate change is as relevant as ever and poses a unique challenge to the world, as well as individual countries. This is a difficult issue as climate change's cause(s) and projected effect(s) are spatially and temporally disconnected from one another, where future discounting reduces the perceived urgency in daily life and the issue easily gets superseded by other present problems. Also, all countries are not equally at risk, the least affected tending to be industrialized countries, which ironically may be those more capable of dealing with these challenges (Talbot 2016, 209, 210). As the thesis is interested in policy representation in advanced democracies, the theory will focus on these countries. As advanced democracies are not the most vulnerable, why expect that they would prioritize climate mitigation policy?

As mentioned in the literature review, salient issues are more likely to produce representation, due to its prominence in public discourse and citizens being more likely to hold strong opinions, express them, and hold representatives accountable (Lax and Phillips 2012, 153). Climate is becoming increasingly salient, as evidenced by countries' participation in international agreements such as the Paris Agreement of 2016. Also, the adjustment of the UN's human development index [HDI] to include countries' planetary pressure (PHDI) resulted in more than fifty countries falling out of the high human development group due to their reliance on fossil fuels and material footprint (Conceição 2020, 235, 236, 239). This dependency and continued subsidies to such industry also demonstrate the reluctance to quit it. The latest Human Development Report (2020) urges the world leaders to radically reduce the immense pressure exerted on the environment and the natural world, in order of not stalling humanity's progress. According to the report, gross imbalances of power within and between countries stand in the way of transformation, but public action can address these inequalities by demanding e.g., increasingly progressive taxation and preventive investment (Conceição 2020). There is a need to increase present knowledge about representation of citizens' preferences in climate policy, as policies and spending ultimately rely on public support (Kulin and Sevä 2019, 110).

3.4.1 Public opinion and the climate issue

In a variety of ways, public opinion influences climate mitigation performance. To increase the likelihood of policy compliance while also providing an incentive for politicians to be re-elected for meeting the public's preferences, policies must be supported by the public and businesses. Climate policy change falls within the realm of policies with plausible public support, as

demonstrated by actions such as the People's Climate March and corresponding events around the world, which demonstrate a general trend of environmentalism and public concern (Gilens 2012, 85; Talbot 2016, 220, 220-221; Echavarren 2017, 145-148; Poortinga et al. 2019, 25). The results of the Peoples' Climate Vote, the first large-scale poll of public opinion on climate change, were published in January 2021. The survey, which included fifty countries covering more than half of the world's population, revealed that two-thirds (64 percent) of respondents believe climate change is a global emergency, despite the ongoing COVID-19 pandemic. There were also broad support for key climate policies across various action areas (Flynn et al. 2021). People can be reasonably assumed to have information and reasoned preferences based on the evident trend of wide-ranging support and engagement, though the link to representation may be biased as prominent issues tend to have more responsiveness (Gilens 2012, 85; Kyselá 2018, 13).

An assessment of unequal representation requires an understanding of whether different age groups, in fact, send substantively different policy signals, and whether representatives pay disproportionate attention to the preferences of certain types of citizens when making policy (Ura and Ellis 2008, 785). In 2019, youth took to the street to express their fears and ambitions in relation to climate change, alongside many adult and senior citizens. While media present the issue of climate as being generationally dividing, we know little about potential differences between age groups (Lorenzini, Monsch, and Rosset 2021, 1). Youth are shown to hold views that differ significantly from those of older individuals in some policy areas affecting young citizens differently. Youth also tend to have more multicultural and egalitarian beliefs, shown in both mature and newly established democracies (Sundström and Stockemer 2020, 2). The rest of this section will lay out theory on climate-preferences by age and the reasons one can expect unequal representation in this policy.

3.4.2 Age and climate-preferences

Literature on climate change perceptions show a consistent pattern across demographic groups, where men, older age groups, and those with little formal education tend to be more sceptic about the nature and reality of climate change, less worried about the impacts of climate change, and generally more accepting of environmental risks (Poortinga et al. 2019, 25). People with stronger beliefs in climate change tend to be younger, more educated, and have higher income. Also, they are more likely to be non-white and female (Hornsey, Harris, Bain, and Fielding 2016, 622). Age (in groups or as generational effect) forms part of the traditional sociodemographic variables used as controls in analyses of climate change perceptions, together

with gender and level of education (Echavarren 2017, 150; Lorenzini, Monsch, and Rosset 2021, 4).

Age effects in climate change perceptions have been found consistently across a large number of countries and is often negatively related to environmental concern and pro-environmental attitudes. It is not clear whether these effects are universal or vary across countries, as reported variation may be attributed to methodological or contextual differences between the different studies (Poortinga et al. 2019, 26). In addition, observed differences between age groups can be actually due to differences in the level of education or income, and not age itself (Kissau, Lutz, and Rosset 2012, 67).

The beforementioned *People's Climate Vote* includes over half a million people under the age of 18, a key constituency on climate change that is typically unable to vote yet in regular elections, nor easily included in large surveys. The results show that young people are more likely to believe climate change is a global emergency than other age groups, but a substantial majority of older people still agreed with them. Nearly 70 percent of respondents under-18 years said that climate change is a global emergency, compared to 65 percent of those aged 18-35, 66 percent aged 36-59, and 58 percent of those aged over 60. This illustrates how widely adopted this view is becoming (Flynn et al. 2021, 9). All in all, existing research does not show compelling evidence for the existence of systematic age or generational gaps in environmental concerns and policy preferences in Western democracies. All generations have moved in parallel over the last twenty years following a generally upward trend illustrating that the political context affect all generations. However, the share of individuals who favor the environment over the economy is greater among younger generations and the climate strike generation stands out with the largest share of pro-environmental attitudes (Lorenzini, Monsch, and Rosset 2021, 1, 4). What does the literature say explains the (potential) differences in preferences between age groups?

At the individual level, theory says climate change attitudes and preferences are shaped by socio-political variables, notably values, worldviews, and political orientation, alongside demographic variables (Poortinga et al. 2019, 25). Age effects, just as gender effects, have been explained by differences in motivation to maintain prevailing social structures. Political and social interests mainly depend on citizens' assessments of how (economic) problems and reforms will affect them personally. This political economy approach to age views it as 'marker' indicating where an individual is located within the economic life-cycle phase (in education, labor market participant, retired) and this influences policy preferences for different issues

(Kissau, Lutz, and Rosset 2012, 67). Such value orientations, priorities, and policy views may change over the life course, which may have implications for how one feels about climate change. There is evidence that people become more (politically) conservative as they age, and political values are among the strongest socio-political determinants of climate change perceptions (Poortinga et al. 2019, 26).

The motivation to maintain status quo may reflect societal inequalities, as well as differences in the subjective experience of vulnerability in relation to these risks. Younger citizens tend to be more oriented toward change and reform while older citizens are more inclined to support stability in political leadership and government policies. As older age groups are more integrated into existing social orders, their preferences and regulations may reflect the status quo bias, which is difficult to change or undo, especially because those who prefer change are not always taken seriously (Kissau, Lutz, and Rosset 2012, 68). Older citizens may view the changes required to address climate change as too costly, particularly in areas they perceive as very important and stand to lose more. An example is the cost of economic wealth and growth, for which the consequences will be felt in a shorter perspective than (mitigation of) climate change. On the whole, older people are argued to be too set in their ways to be responsible for social or political change, so most long-term change comes about by way of generational replacement (Sloam 2013, 837; Poortinga et al. 2019, 26).

Younger citizens, in contrast, grew up in another context and are perhaps more likely to see the world as being destroyed. This may be explained by the degradation hypotheses, where a reaction to severe environmental problems is shown to explain individual concern (Echavarren 2017, 145). They are already more vulnerable to climate change and the political decisions mostly affect their future. Youth today have experienced a labor market with austerity budgets and increasing unemployment, the global financial crisis, the refugee crisis, and an ever-worsening climate crisis. (Sloam 2013, 837; Talbot 2016, 224). Therefore, the biggest clash for this specific issue may be the preferences between ages, and the responsibility they feel toward the planet.

In terms of generations, being considered “youth” in the 1980s-90s versus today need not be the same. Young people’s lives have changed dramatically in recent decades, where certain traditional markers of the transition to adulthood have lost importance (e.g., marriage, leaving home and entering work force early). Therefore, youth today may also be characterized by more heterogeneity and changing values. The political activities of today’s youth are much less defined by old industrial cleavages, and increasingly by personally meaningful causes guided

by lifestyles and social networks, such as local volunteerism, consumer activism, support for issues and causes, and participation in transnational protest activities (Sloam 2013, 838-841).

As literature us somewhat inconclusive regarding what to expect regarding preferences by age, a key assumption for this thesis will be that there is some variation according to age. In this study I do not aim to disentangle whether or not policy preferences are a result of one's position within the life cycle (individual maturation) or due to societal circumstances that influenced one's cohort. Rather, I want to focus on the policy preferences and representational inequality across different aspects of climate policy between different age groups at different times in advanced democracies. Therefore, the second hypothesis (and a prerequisite to observe unequal representation) is:

H2: Preferences on climate policy diverge between younger and older age groups.

3.5 Why expect unequal representation of youth

In the earlier mentioned study by Holmberg, a minority of citizens reported feeling unequally democratically represented. These reports revealed the most dramatic skew within the socio-demographic characteristic of *age*, even after controlling for multilevel and multivariate tests. Older people (60+) clearly have a higher perception of being represented than young people (30 or less), which suggests that youth as a group is an anomaly in his study, not feeling their preferences being heard nor reflected in policy (2020, 424-428). In contrast to other politically marginalized groups that seldom change for an individual (gender, ethnic minority), being young is a temporary state of life and aging is inevitable. From a group perspective, the presence of youth in legislatures is crucial and the legislative dominance of older people cannot be justified in terms of their "natural superiority of talent" as there are many competent, young candidates qualified to serve in office (Sundström and Stockemer 2020, 2; Phillips 1995).

Assuming representation is real and that preferences vary according to age, to whose preference does climate policy respond more strongly? Youth are shown to be actively engaged in climate actions and protests, clearly expressing concern about the future impact of this issue on people's lives and demanding governmental action to mitigate climate change. Given the growing importance of this issue, it is puzzling that governments have not made more dramatic changes in climate policy (Talbot 2016, 220). It suggests that by emphasizing economic growth over climate change mitigation, older generations may be over-represented. People may express the same position but prioritize the issue differently, with youth placing greater weight on the issue,

which may explain why youth in advanced democracies feel the least represented. The third hypothesis to be tested is:

H3: The climate policy (outputs) tends towards the preferences of the older age group.

A growing number of studies show that climate beliefs and preferences are far from always translated into corresponding behaviors and policies, with considerable cross-national differences in this regard (Kulin and Sevä 2019, 112). This section will consider the key mechanisms by which youth may be underrepresented. According to the literature, inequality on the input side (voice) translates into policy, where the voice of one group of people systematically weighs more than all other voices, resulting in more inequality (Verba 2006, 518). Other scholars have highlighted that reasons for unequal representation of youth should be sought in the way structures and institutions operate (Marien, Hooghe, and Quintelier 2010, 205). Following the conceptual model there are two major explanations of inequality in general terms – participation and representation, which are the subdimensions of voice. I outline both here, but the thesis will focus on the latter.

3.5.1 Participation

The first subdimension is participation. According to the chain of representation, citizens need to somehow communicate their preferences sufficiently at stage one or else the lack of participation can result in a lack of representation. One frequent explanation for why there may be unequal representation of different groups is that unequal participation spells unequal influence (Dalton 2017, 5,6; Bartels 2008, 286; Peters 2018, 351; Marien, Hooghe, and Quintelier 2010, 204). Social inequalities shape vulnerability to climate change, so different individuals in the same region can be differently at risk (Talbot 2016, 212). Those vulnerable to climate change are often marginalized and less likely to have the resources and opportunity to participate equally in the political debate (this can both mean countries harder hit by climate change mitigation and younger generations which will experience the costs of climate change) (Ergas and York 2012, 965, 968).

Younger citizens may have less wealth for disposable income, making them less likely to donate to campaigns, politicians, or parties. Research has emphasized the direct link of a person's level of education, which is linked to their economic situation, as a profound driver of belief in the climate emergency and climate action in all types of countries (Flynn et al. 2021, 9). In addition, enlightened understanding is difficult to achieve and control of the agenda gets violated as political issues are worth consideration in democracies is the result of agenda-setting battles as

different members of society have different resources and opportunities to participate (Bakaki and Bernauer 2017, 1).

The idea is that through participating citizens, politicians will sense and be responsive to the movement in public opinion, often called dynamic representation or a thermostatic opinion change (Verba 2006, 518; Burstein 1998, 28-30; Soroka and Wlezien 2010; 2012; Erikson 2015). Representatives are more inclined to consider the effective electorate's preferences as they perceive turnout as a cue for the degree of public scrutiny and likelihood for re-election (Manin 1997, 237; Blais, Dassonneville, and Kostelka 2020, 404-406).

Therefore, voting participation is often used as a standard to assess democratic performance, where low turnout is considered problematic as it is assumed to entail higher variation in turnout among groups (Peters and Ensink 2015). The systematically supported socio-demographic groups more prone to abstain from participating through voting in empirical literature- and therefore possibly disadvantaged in terms of descriptive representation and policy- are the young, the less educated, and the poor. Youth abstention has been regarded as a life-cycle effect, meaning they are more prone to voting as the person ages, or as a generational difference in turnout, where the young are disengaged in politics. Seniors above the age of 60 years are in contrast politically active, attending polls, and better informed about political issues (Dalton 2017, 84, 85, 87; Kissau, Lutz, and Rosset 2012, 63, 64).

When examining the link between electoral participation and representation, scholars have mostly focused on education and income, although age is one of the strongest predictors of turnout. Age should also be considered given the demographic trend of increasing senior citizens, due to higher life-expectancy. A possible consequence of the increasing share of politically active senior citizens going to the polls is increased influence and better representation than the young especially, whose demographic weight is declining. If young people vote less and are smaller in number, politicians might place less emphasis on their group interest- which may cause more disillusionment with electoral politics and government (Sloam 2013, 843; Kissau, Lutz, and Rosset 2012, 70). Although systematic socio-demographic bias in turnout is proven empirically in developed democracies, findings show mixed results regarding inequality in representation (Blais, Dassonneville, and Kostelka 2020, 396-400).

Arguments weakening the role of turnout in affecting representation is that differential turnout rates are not detrimental unless the preferences of those abstaining differ from those participating. Also, the complexities of party politics and voting in multidimensional issue

spaces may frequently make responsiveness impossible, which points to a serious challenge of representation (Urbinati and Warren 2008, 390; Blais, Dassonneville, and Kostelka 2020, 403; Burstein 1998, 30; Rohrschneider and Thomassen 2020, 7-8). It is perhaps logical that older people are overrepresented, as they represent the status quo (Sloam 2013, 837). If the preferences expressed through voting is considered the final word on governments action, one may be condemning large sections of the community to persistently unjust conditions (Phillips 1995, 44). Voter turnout also assumes that all people vote, when in reality, the advantaged tend to vote more than the disadvantaged. Effective representation requires continuous responsiveness and accountability to the people, not just before an election. In addition, voting is not the only way of communicating preferences.

There is a growing understanding of the role and importance of new, untraditional ways of participating as means to compensate for the deficits of representative democracy and counterbalancing traditional sources of inequality among citizens. Political activity need not be electoral for citizens to express preferences and induce representatives to be responsive. The problem is if all forms of communication is characterized by abstention from the same group, which may result in unequal representation (Fisher 2012, 122). Empirical research shows that the various groups of citizens using new and traditional modes of participation overlap substantially, but that social inequalities are much greater in non-electoral forms of engagement. Women and youth frequently participate and are increasingly engaged in specific issues through the new information and communication technologies, facilitating protest, public action, and social movement (Peters 2016, 164; Rohrschneider and Thomassen 2020, 12).

Fisher finds in his review of studies examining youth participation, that affluence plays a role in each mode of participation, as young people from a family with higher socioeconomic status are shown to generally be more engaged in politics and associated activities (2012, 122). This is supported by other scholars examining youth participation, suggesting that the effect of education can also be due to income differences (Erikson 2015; Marien, Hooghe, and Quintelier 2010, 205; Sloam 2013, 838). Sloam finds that the social inequalities of various ways of participation are (with the major exception of voting) much less profound for young Europeans. The mechanism may be that young people have little engagement with the people who make the decisions. Whilst age and socio-economic factors are very important in determining political participation, there is a clear correlation between national traditions of civic and political engagement and youth participation (2013, 836, 852-853). This suggests youth generally are not politically apathetic and that reasons for unequal representation should be sought in the way

these structures and institutions operate (Fisher 2012, 125-126; Marien, Hooghe, and Quintelier 2010, 205). The following paragraphs will present the conceptual model's other subdimension of voice, non-governmental and governmental representation. The latter touches directly upon the second sub-question of this thesis and will therefore receive more attention.

3.5.2 Representation

Representation involves someone interpreting the political voice and transmitting their interpretation to the decision-making body. This can be e.g., parliamentarians (government) or NGOs (non-governmental representation). Interest groups' and social movement organizations' key role is providing politicians with information on public demand, but the preferences of younger citizens are often less organized and less represented by interest groups, which might result in legislation being in favor of older citizens (Bakaki and Bernauer 2017, 1). Some voices may also be louder than others (such as e.g., interest groups and climate change deniers), and those vulnerable to climate change are often marginalized and less likely to have the resources and opportunity to express themselves equally in the political debate (this can both mean countries harder hit by climate change mitigation and younger generations which will experience the costs of climate change) (Ergas and York 2012, 965-968). These are relevant notions for unequal representation, but the focus of this thesis is on formal representation.

A frequent explanation for unequal representation of different groups is poor inclusion in representative bodies, as representative democracy has distanced itself from physical presence as the measure of political equality (Phillips 1995, 34). It is argued that major groups of citizens should be included in representative bodies based on principles of equality, fairness, information, and participation. "… the 'government must know what is happening in that collective body (information) and then involve that collective, or its representatives, in its policies…" (Kissau, Lutz, and Rosset 2012, 64). Literature demonstrate that representatives resembling represented in characteristics or experiences are better suited to understand their needs and act in their interest, which has led to a call for more descriptive elements in the selection of members of parliament to make them more representative. Homogeneity in parliament is criticized for damaging equal citizenship and having a narrowing effect on policies adopted (Rohrschneider and Thomassen 2020, 11-12; Phillips 2020, 176; Kissau, Lutz, and Rosset 2012, 65).

There will always be (statistical) mismatches between the represented and their representatives, but not all matter. Two criteria offered to identify which mismatches matter is contemporary inequality as compared to other social groups and a history of discrimination and oppression

(Phillips 2020, 183). This can explain why most descriptive studies are concerned with salient political cleavages such as gender, class, or ethnicity, while youth's presence in legislatures comprise the group that has received the least scholarly attention. Although the absence of youth in legislatures can be a feature of democratic deficit with detrimental consequences, age in empirical research often constitutes part of the control variables despite being a significant predictor of participation, without specification of why there should be an age effect (Celis and Erzeel 2020, 192-194).

Literature on descriptive representation points to a multitude of factors influencing the numerical presence in politics, amongst others macro-level socio-economic and cultural factors, the openness of political institutions, the impact of social movements, the influence of gatekeepers such as political parties, voters, and media. Also, three formal institutions affecting the relative legislative presence of youth are lower candidate-age requirements, proportional representation electoral systems, and age quotas. From this, we can expect different levels of youth-inclusion into politics across different political systems (Celis and Erzeel 2020, 196; Sundström and Stockemer 2020, 2). Part of the problem too is young candidates' lack of success in elections, not the shortage of candidates. The cynical game of political elites nominating young, aspiring politicians as token candidates on noneligible list positions or for districts they cannot win, may fuel a cycle of youth not feeling represented and becoming increasingly apathetic- and parties catering less and less to younger generations in terms of policies and political influence (Sundström and Stockemer 2020, 1-2; Kissau, Lutz, and Rosset 2012, 63-64; Fisher 2012, 121).

3.6 Youth descriptive representation

The thesis is interested in assessing whether an increase in numbers of youth in legislatures is paralleled by a more equal representation of youth preferences in the climate issue, as the socio-demographic resemblance theoretically remains a condition for the ability and intention of giving information about the group perspective (Celis and Erzeel 2020, 205). Literature on gender equality suggests the descriptive representation of women cause gender equality in outcomes and feeling represented. The presence of a critical mass of women has also been shown to affect different climate policy specifically (Ergas and York 2012, 965, 968). Accordingly, the established underrepresentation of youth in parliament is interpreted as a sign of age inequality in policy. Improved descriptive representation does not automatically translate into equal representation in policy, but inclusion of those with certain life experiences and social perspectives in parliament increases the likelihood of their concerns/perspectives being

articulated in the representative process, which is the defining feature and function of descriptive representation (Celis and Erzeel 2020, 199-203; Pitkin 1967, 85; Kissau, Lutz, and Rosset 2012, 66; Mansbridge 1999, 629).

To be clear, there are mixed results about the effect of descriptive representation, but overall, it is regarded as one of the conditions for equality in representation, but not the sole (or sometimes even sufficient) factor. It is difficult to assess whether parliamentarians behavior can be contributed to their age or other influential institutional or party-political factors, but literature emphasizes that there is an interconnected nature of forms of representation, and that descriptive representation either way contributes to increased youth engagement generally (Celis and Erzeel 2020, 199-203). It is worth mentioning that an increased number not necessarily reveal anything about the distribution of power or the intersectional complexity that may complicate it further, which is why concluding political equality based on descriptive representation may be inaccurate.

Establishing an empirical under-representation of certain groups does not in itself add up to a normative case for their equal or proportionate presence, but it is unlikely that the full range of preferences has been adequately represented when those charged with the job of representation are e.g., all white, all male, or all middle-class. In representation research a number of societal groups have been shown to be politically underrepresented; the less well off, the less educated, ethnic minorities, women, and the young (Kissau, Lutz, and Rosset 2012, 63). How can a country live up to its democratic ideals if it marginalizes a group of the population to such a degree? These findings elucidate the potential vicious cycle of youths' political apathy. Young adults are still rather an anomaly in parliaments and may become even more indifferent to the representative system if the policy and the representatives seem alienated to them (Sundström and Stockemer 2020, 1, 6).

Examining the age-composition in parliaments of different countries allows for making a first assessment of the level of inequality in politics (Celis and Erzeel 2020, 194). Research on age and representation has identified middle-aged citizens, followed by seniors, to be best represented by political elites, while youth (below 30-35 years old) are underrepresented, confirmed by case studies of industrialized countries, and reports on global samples. Countries with a younger population display a stronger discrepancy in youth representation, demonstrating the need for more research on youth underrepresentation (Sundström and Stockemer 2020, 1-2, 6; Kissau, Lutz and Rosset 2012, 64). Although young people make up

the majority of the world's population, data show that fewer than 2.6 per cent of all MPs are under the age of 30 (Inter-Parliamentary Union 2021, 7).

Studies on descriptive (under)representation of other groups have argued that increased representation has consequences for the policies implemented, also regarding climate (Peters 2018, 347; Phillips 1995; Mansbridge 1999; Reher 2018, 614). A lack of descriptive representation of youth is generally seen as a democratic deficit and sign of political inequality, and more specifically, it is recognized as a problem in debates about the weak political response from lawmakers to hinder global warming. Yet, comparative research seldom focuses on the relative absence of youth in parliaments (Sundström and Stockemer 2020, 1). Thus, the final hypothesis is:

> *H4: Stronger presence of younger parliamentarians strengthens representation of the preferences of the younger compared to preferences of the older, alleviating unequal representation.*

3.7 Alternative challenges to the chain

Talbot argues that it is paradoxical that the countries' (varying) performances in climate mitigation do not match the levels of public concern and support, which may be because general concern often does not turn into specific political demands and subsequent responses. Assessing the connection between voice and response is complicated, since policies derive from many forces, not just citizen input (2016, 216, 220; Verba 2006, 532). Private ownership of productive resources generally limits the range of outcomes enabled from the democratic process. Governments, regardless of who is in power, who elected them and with what intentions, are constrained in any capitalist economy by the fact that crucial economic decisions, those affecting employment and investment, are a private prerogative (Przeworski 2016, 5). Performance on mitigating climate change cannot be seen in isolation from economic development, as it directly affects the cost and difficulty of decreasing the emission levels. Economic pressure can sometimes create incentives to save energy or to use more efficient technologies, which in turn leads to a decrease in emissions. Also, the level of economic development affect the standard of living which has been demonstrated to have an effect on the social values in a society (Talbot 2016, 213, 215).

As climate considerations often clash with economic ones, climate is an uneasy topic for politicians who, due to their (possible) short term in office, may care more about re-election than long-term policies. Also, countries will have different cost-benefit analyses and

accordingly different priorities and policy preferences regarding climate change mitigation (Talbot 2016, 218). Therefore, representatives' preferences may also overlap with those preferring status quo. A counterargument is that representatives may strategically endorse younger citizens' preferences, knowing that they will be voters for many elections to come (Kissau, Lutz, and Rosset 2012, 76).

Institutional explanations believes that states' capacities to tackle the climate problem depend on their political structure and institutions. An example is the number of veto points in a political system, which empirically is unable to explain changes in performance over time (Talbot 2016, 219, 222; see also Rohrschneider and Thomassen 2020, Gilens 2012, and Verba 2006 for a discussion on electoral systems). One might anticipate that the effects of both officials' strategic activities and organized interest groups able to block and enhance policy are larger with respect to specific policy domains. This can mute or even displace the effects of mass preferences. This is an argument for expecting policy responsiveness to be stronger with respect to aggregate government output than to domain specific policies. This is because, by hypothesis, politicians will tend to have greater information and incentive to respond to mass opinion through the overall amount or direction of welfare policy while retaining autonomy at the level of concrete policies (Brooks and Manza 2007, 132; Lax and Phillips 2012, 154, 155; Peters 2016, 177-179; Talbot 2016, 223).

Climate is a collective action problem that requires global action, in addition to local and national efforts. This can be an authority challenge to governments, as diffused authority may loosen the national grip to such transnational issues. Also, an increasing number of independent agencies and the private sector have significant influence on policies, in addition to non-majoritarian institutions with delegated authority in this issue (Peters 2016, 167, 172, 174; Talbot 2016, 213, 223; Rohrschneider and Thomassen 2020, 10-11). Within this, also lies the fact that an increasingly globalized and interdependent world of unpredictable shocks makes it harder for both citizens and representatives to play their roles. Uncontrollable shocks from international interdependence can exacerbate the tension between mandate and accountability (Powell 2020, 392). Weightier external constraints and legacies and a harder to read public opinion make government answer to more than only public opinion (Mair 2009, 3).

When issues are moved toward the international arena, such as the climate issue, legal procedures can undermine democratically made decisions, and people may have fewer and different ways of accessing these issues. Often, international instances are not directly accountable to citizens, even though they make decisions for them. People might still be able

to access the issues through their elected national governments, but influence is relatively limited (Peters 2016, 175, 177-179). In addition to governments complex and time-consuming nature, this leaves little room for partisan mobilization, making much of their action depoliticized and difficult to justify. This trend suggests a growing separation between the world of public opinion and the world of problem-solving (Mair 2009, 16-17).

4. RESEARCH DESIGN

The previous chapter produced four hypotheses that will be tested in the analyses. In summary, the hypotheses are that climate policy will respond to average public preference (H1); that policy preferences will vary by age (H2); that the response in policy tends toward the preferences of older age groups (H3); and finally, that stronger descriptive representation of youth alleviates unequal representation (H4). In any assessment of inequality, especially across countries and time, data availability, comparability, and quality are serious issues. When looking at political or representational inequality, scholars find little consensus about appropriate measurement strategies (Ahlquist 2017, 411, 412). This chapter will elaborate on the approach chosen to analyze unequal representation. First, it will present a description of the data and why the specific elements are essential to the analyses. Then, the choices of preferences and outputs will be discussed before presenting the resulting case-selection subject to examination. Then, the approach and operationalization will be presented, followed by the method. Finally, an assessment of the inference about unequal representation is discussed, together with pros and cons of the chosen research design, before presenting some descriptive statistics of the dataset.

4.1 Data description

This thesis aims to make an inquiry about democratic practice, focusing on human action and social institutions. The interest in unequal representation of youth in climate policy requires a complex dataset with several elements. To address unequal representation, information about the preferences of younger and older citizens is needed, in part allowing us to see whether preferences on climate issues between the young and old are different. I am thus dependent on survey data of national samples reporting individuals' age and preferences within climate-issues. To create age groups and aggregated preferences the sample will be split in equally sized groups for each preference question. This is important to avoid biased results caused by unequal group size. To analyze whether their preferences are reflected in policy I also need data on corresponding policies. By looking at 'who gets what they want' with data covering a larger timespan the focus follows the age groups[5] (Kissau, Lutz, and Rosset 2012, 76; Dalton 2017, 96). Also, by including several preference-questions with different focus and degree of specificity the likelihood of capturing a more valid and nuanced picture of unequal responsiveness within climate policy increases. The focus is on connecting preferences for

[5] With a larger timespan, several generations of «youth» are included, whereas a cross-sectional data would capture more of a 'generational' effect.

climate policy to the 'amount' of policy that is provided, both across countries and time. This variation of observations is crucial for testing the last hypothesis concerning the descriptive representation of youth in parliaments.

4.1.1 Individual-level preference-data

Considering the need for data on mass policy preferences from a suitably large number of respondents across countries and time, several large, comparative datasets were considered. The data were collected from four different survey organizations; the European Social Survey [ESS], the International Social Survey Programme [ISSP], the World Values Survey [WVS], and finally, the European Values Survey [EVS]. The resulting data covers samples from multiple countries at several time points between 1985 to 2016. The thesis is limited to this time interval based on issues of data availability. Public concern for climate has increasingly grown since reports and evidence on the state of the planet started getting published regularly (roughly from the early 1970s and onwards). By attending several climate conferences from the 1990s, many national governments now agree (at least principally) on the necessity of increasing global efforts to protecting environment and reducing pollution (Franzen and Meyer 2010, 219).

Government policies and spending is demonstrated to ultimately rely on public support (Kulin and Sevä 2019, 110). A set of suitable preferences must be chosen so that this can be tested. The set of policies included by survey organizations is heavily criticized for overrepresenting the most salient issues which political elites also tend to consider as important, producing an upwardly biased estimate of the preference/policy link's strength (Gilens 2012, 54-55). Climate is highly salient today, but this was not so much the case in the 1980s and 1990s. Considering this and the fact that several climate change related issues simply seem too small, technical, or unimportant, and therefore are excluded in surveys, a potential challenge is that the thesis may suffer from this bias. I have tried to overcome this flaw by including various questions on climate policy preferences, with different implications for action and in different areas.

Due to the lower (public) salience of climate policy before the midst of the 1990s, there is a shortage of statistics on both climate preferences and national climate policy. Other studies using some of the same individual data from the 1990s and 2000s find that general salience is similarly independent of round and model analyzed (Franzen and Meyer 2010, 227). Hopefully then, by collecting the data starting around the early 1990s the climate issue has reached "sufficient" saliency for respondents to be reasonably expected to hold an opinion on the matter. The resulting data covers almost thirty years, giving an opportunity for observing parts of climate policy and preferences in a time of increasing salience (Pierson 2004, 79). In order to

account for whether the salience of the issue differ between age groups, the indicator used by Gilens (the share of respondents answering "don't know") will be presented and discussed in relation to the result in the subsequent chapters.

As stated, different questions regarding more general (government) action and highly specific policy statements were desirable, as they evoke different sets of considerations. As such, individuals with weakly held preferences in one question, e.g., government spending, may have stronger held preferences in whether nuclear sources should be used to generate electricity. By including several questions in the dataset, one is closer to capturing the true underlying average preference of age groups. Identical questions over time were included, as (group)preferences can change over time. As reports in climate action consistently conclude that the action taken until now is not enough, these questions can be considered as enduring issues. Even if the preferences are fixed, the representation may vary (Gilens 2012, 57-59).

To be included, the preference-questions had to meet certain criteria: First, it needed to make possible expression of opposition or favoring. As one can see from table 4.1, each survey question asks the respondents whether they support or oppose various statements about governmental responsibility, such as "governments should spend much more/less money on the environment". Second, the scope of the question had to be within the competence of the government and be general enough to allow for matching the preference to some form of policy output (to see which direction the policy took in form of spending, laws, or trends in the society) at the national level (Reher 2018, 621). Surveys asking about very country-specific programs or policies is not beneficial for this thesis' comparative focus. Therefore, identically formulated, more general climate-questions within large, international surveys allow for the easiest comparison with the same national-level outputs and may provide a sufficiently large number of respondents from as many developed democracies as possible, so that one may generalize from the cases to the population, in this case being developed democracies.

The resulting individual-level data consists of 11 survey questions asked of national samples. As the focus is on policy representation, the preferences had to be connected to corresponding policy outputs in order to observe the effect of average- and age groups' preferences. Some questions ask about preference for change (understood relatively to the countries' level at the time of the survey), while others ask about level preference. The policy outputs should reflect these formulations, by reporting the value for relative change or level of the output. By including both types of question formulations, the analyses are able to assess the two aspects of policy representation (as discussed in previous chapters) - congruence and responsiveness,

albeit to a limited degree. A full-fledged assessment of policy representation requires amongst others a consideration of policies that plausibly could, but did not, get adopted or even considered (Gilens 2012, 51). The resulting questions cover different aspects of climate policy: government spending, pollution, strictness of law and sources for electricity. In table 4.1 the overview of the preferences (the main predictor variables) and the corresponding policy-outputs (the response variables) are presented.

Table 4.1. The main predictor and response variables

The predictors: Preferences regarding …	**The response: Policy outputs measuring …**
1. Government spending on environment (change in level) [ISSP]	(Change in) Spending on environmental protection [OECD]
2. Government should reduce environmental pollution (change in level) [WVS/EVS]	(Change in) Greenhouse gas emissions [OECD]
3. (Level of) Strictness of laws on businesses' responsibility toward the environment [ISSP]	(Level of) Environmental Policy Stringency Index [OECD]
4. (Level of) Strictness of laws on individuals' responsibility toward the environment [ISSP]	(Level of) Environmental Policy Stringency Index [OECD]
5-11. (Level of) Electricity in country generated by coal, natural gas, hydroelectric power, nuclear power, solar power, wind power, and biomass energy [ESS]	(Level of) Electricity production in country from coal, natural gas sources, hydroelectric sources, nuclear sources, solar power, wind power, and biomass energy [IEA]

The original variables and question-wordings with the data source can be found in Appendix A. For clarity, the last row is comprised for space, as it in the dataset is seven independent (variations) of a question.

4.1.2 Country-level policy output-data

As evident from table 4.1 nine questions ask about the level-preference for a policy and two ask about the relative change-preference for a policy. Once appropriate questions were included, the search for corresponding outputs began. There are many possibilities when deciding what policy outputs to look at. A question asking whether or not the respondent favored a reduction in government spending on climate can be matched with a spending-output with a fair degree of certainty, as opposed to many specific programs implemented to help climate mitigation. However, even coding this outcome as consistent or inconsistent with the preference addressed by the survey question can be complicated (Gilens 2012, 57-59). Based on the formulation of the preference survey question the search was based on three options. It could be (1) government spending, (2) policy or law, or (3) observable, societal trends.

The temporal order of processes is a crucial determinant of outcomes. Therefore, the outputs needed to occur after the expressed preferences, so one can look at how preferences affected policy (and not the other way around, which is also a possibility). Looking at the relationship for the same year would likely generate different outcomes (e.g., a possible endogeneity) and could damage the validity of the results (Pierson 2004, 11, 16). The outputs to the relative-change variables, spending and pollution, were coded to capture a two-year change relative to the year the question was asked in the survey. As such a change may vary considerably by the national policy-making processes and may take longer time to achieve, and the fact that some received the questions late in the calendar-year and in the middle of the election-cycle, an additional four-year change is considered as a robustness check to provide additional information about the more long-term change (see Bartels 2015, 18; Pierson 2004, 12). The rest of the policy and observable trend outputs concerning level-preferences were collected for two years after the survey question was posed, as this is a common lag for such outputs. Also, by considering a shorter time period following the survey, it is less likely that the preferences have changed (Gilens 2012, 60).

To find fully comparable data on output to the preferences, the outputs were collected from the international organizations the Organization for Economic Cooperation and Development [OECD] and the International Energy Agency [IEA]. These sources' careful use of consistent definitions and measures has made them some of the primary sources of government data within welfare state research and global energy data. By providing data on a large sample of countries over time they should ensure quality by using internationally accepted standards for collection. The data were downloaded in the most comparable format, using relative measures such as government spending by percentage of GDP or greenhouse gas [GHG]-emissions[6] in 'tonnes per capita', instead of absolute numbers, as the country-sample varies greatly in size, demographically and economically (Gilens 2012, 63).

4.1.3 Control variables

In addition to the main response and predictor variables presented, some additional variables are included to avoid omitted variable bias. The response variables of interest in this thesis vary greatly among the country-year observations and there are other factors, besides preferences of citizens, that may affect the output. This will be accounted for by including some factors that

[6] The greenhouse gases in question are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3).

have been demonstrated to account for the variation of policy responses. Although there are several possibilities, just a few controls are included as the aim is not to explain (change in) levels of policy as such, but rather to find whether there is a relation between what people want and what they get regardless of other explanations. It is nonetheless important to account for some minimal variation due to country and time differences (Peters and Ensink 2015, 585).

4.1.3.1 Economic controls

Economic development and performance of mitigating climate change are linked in various ways, as environmental standards increase when per capita income increases. The affluence hypothesis emphasizes that in wealthier countries, citizens hold more pro-environmental attitudes, and the country has less pressing economic problems. Thus, they can devote more resources to protecting the environment. If a country is located in early stages of economic growth the public may prefer to prioritize economic issues to fuel the economy, rather than to preserve environmental quality. The postmaterialist thesis support the pattern where rich countries are more environmentally concerned but emphasizes postmaterialist values as the mediating factor (Echavarren 2017, 146).

The change in spending on environmental protection (issue 1) is relative to the countries' GDP, where a change in level may be a result of actual change in spending or fluctuation according to change in GDP. If the spending level (as percentage of GDP) remains the same in the context of a growth in GDP, it actually implies a decrease in the share of the budget spent on environment. Therefore, for the spending-analyses, GDP growth (annual percentage) provided by the World Bank[7], is included for the same year as the spending-change as a control variable (Peters and Ensink 2015, 586). Regarding the level of pollution (issue 2, from table 4.1), change may be attributed to economic factors, rather than political effort. An example is the reductions among previously socialist countries, which is considered a consequence of their economic development, and therefore may be "accidental" (Talbot 2016, 215-219). Therefore, GDP and GDP per capita, also provided by the World bank[8], will both be tested as controls for the same year of the output for policy stringency and electricity (issues 3-11), as they are expected to immediately affect the response variables. They are measured as the level of current US dollars for policy stringency and electricity and change in GDP per capita in the pollution models. Given their large values due to their different measurement-scale compared to the rest of the

[7] https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG
[8] https://data.worldbank.org/indicator/NY.GDP.PCAP.CD

variables used in the analyses of the former issues, these variables are logged in order to avoid skewness (Imai 2017, 91).

4.1.3.2 Other controls

The unemployment rate is also a frequent control in literature on spending representation, as higher levels of unemployment is expected to affect the prioritization of the budget by providing social security to unemployed citizens (Bartels 2015; Brooks and Manza 2006). The harmonized change in unemployment rate (as the percentage of total labor force) for the year of the output, provided by the OECD[9], is therefore included as a control in the spending-models. Manufacturing (as percentage of GDP), defined as the output produced by industries concerned with physical or chemical transformation of materials into new products[10], will be included to control for the change in pollution and the level of various electricity sources, as some countries are more predisposed to and reliant on such industry and would experience a higher cost of changing to a more sustainable economy (Talbot 2016, 216). Finally, countries who are more exposed and affected by climate change can be expected to have better climate policies as they would have the most to benefit from mitigation. To have the possibility to control for a multidimensional predisposition to negative impact of climate change, a vulnerability-index[11] measuring a country's exposure, sensitivity, and ability to adapt to the negative impact of climate change is included for the pollution-, spending-, and policy stringency-issues[12] (Echavarren 2017, 146, 147; Talbot 2016, 215-218).

4.2 Creating the country-level dataset

Some modifications to the original data were necessary to better capture the relationship of interest. At the individual level, observations with "not available" and "don't know" in the preference-variables were removed for the analysis, as the thesis is interested in the aggregates of stated opinions. At the country-level, cases without a corresponding policy-output available were also deleted as an essential part of the analyses is the link between preferences and policy. This resulted in the exclusion of the entire samples from ISSP Role of Government I and II (1985, 1990), as data on governments' spending on environment were not collected for the nearest following years. Finally, in order to assume public preferences matter for policy, the cases of interest are restricted to advanced democracies. 'Advanced democracies' is here used

[9] https://data.oecd.org/unemp/harmonised-unemployment-rate-hur.htm
[10] https://data.worldbank.org/indicator/NV.IND.MANF.ZS
[11] https://gain.nd.edu/assets/254377/nd_gain_technical_document_2015.pdf
[12] https://gain.nd.edu/our-work/country-index/

to refer to democracies with a higher degree of institutional learning, as they tend to have a higher probability of quality and experience in representation (Holmberg 2020, 425, 427).

The sample of country-years was too large and complex to decide on a set of criteria to be met in order to be considered 'advanced' and looking into each country-year for fine-grained coding. In order to determine which country-years to be considered, the Liberal democracy index from Varieties of Democracy [V-Dem] was chosen. V-Dem is an approach for conceptualizing and measuring democracy based on expert evaluations, which research has concluded surpasses other similar indexes (Boese 2019, 119). It provides a score for the extent the ideal of liberal democracy is achieved in a country, ranging from 0 (low) to 1 (high)[13]. Following Lürhmann, Tannenberg, and Lindberg (2018), the cut-off point was set at 0.8, excluding all country-years with a lower score at the year of the survey, to ensure that no country included are undeservedly classified as a liberal democracy. The threshold is arbitrary, but the authors argue that setting it high ensures that the criterion adheres to the fairly strict demands expressed in the literature in the liberal tradition (2018, 65).

The resulting hierarchical country-level dataset contains measures of outputs and country-specific levels of aggregate policy preferences across the population and age groups for the available country-years of advanced democracies. In addition, the specific controls, V-Dem, score, and Europe-dummy were included (with non-European countries as the reference group). The data-selection includes most of the established democracies in the English-speaking world and Western Europe, in addition to some democracies in other continents[14]. The total of 200 country-year-items and are listed in Appendix B). It is aggregate rather than individual opinion that lies at the heart of questions concerning (unequal) policy representation and this country-level design is essential for conceptualizing aggregate opinion as an input into national policymaking (Page and Shapiro 1983; Schakel 2020, 132). The constructed dataset aims to enable a systematic portrait of representation in developed democracies across countries and time.

4.3 Approach and Operationalization

4.3.1 Coding sociodemographic variables relatively

The sociodemographic variables are used as controls when predicting preferences by age. These alternative set of preferences will be applied to the analysis as a robustness-test to the crude

[13] For more information, see Coppedge et al. (2018, 38-39).
[14] The latter category include Chile (2000, 2006) and Japan (2000).

preferences. Since the questions were asked by different organizations at different times, the demographic categories are frequently inconsistent. In particular income and education are variables coded with originally different numbers of categories and break points by the various surveys. In order to create consistent and comparable measures of sociodemographic variables across the different surveys and years in the sample, the sociodemographic background-variables are coded relatively. The idea is to use the relative number of people within a category to assign a score using the midpoint of the percentage of the group. For each country within a survey, respondents in each income category were assigned an income score equal to the percentile midpoint for their income group based on the income distribution from their survey. The identical rescoring-procedure is performed on all sociodemographic control variables for all countries in all survey-rounds (income, education level, gender). By converting e.g., education categories to percentiles for each survey, this approach allows for easy comparisons across survey questions with different raw categories and varying demographic compositions of country populations (Gilens 2012, 61).

4.3.2 Creating age groups and aggregate preferences

As the thesis is interested in unequal representation, a way of examining it is applying a model comparing young and old, how they match to preferences, and how they again match to policy. Assessing the representative failure hypothesis requires an understanding of whether citizens in different age groups, in fact, send substantively different policy signals, and whether representatives pay disproportionate attention to the preferences of certain types of citizens when making policy (Ura and Ellis 2008, 785). The country-specific age distributions will be presented at the end of this chapter with other descriptive statistics. Two of the preference questions were originally coded as a dummy while the rest used a variant of the 5-point and 4-point disagree-agree Likert scale (original coding available in appendix A). For the analysis, all the preferences received values ranging from 0 to 1. Scales that initially ran the other way, were turned for more intuitive interpretations of the data so that in most cases, a higher score (closer to 1) indicates agreement to a more climate-friendly preference. See table 4.2 for the recoded values and their description. The preferences from ESS are coded identically, as some energy sources are more ambiguous to characterize as climate friendly.

Concepts like “old” and “young” do not have a clear cutoff point in absolute numbers as they are relative to each demographic context. First, the age-variable were divided into quintiles (and alternatively quartiles) to ensure equally sized age groups, meaning the 20 percent youngest

and the 20 percent oldest of each country-year in each survey[15]. Then, the predicted preference for each country's age group in each policy-question were constructed, based on a linear, fitted model using appropriate design weights[16], where each country country-year has a different intercept and slope. By predicting 'crude' as well as preferences controlled by education, income, and gender, new variables with each quintiles' (and alternatively quartiles') aggregate preference were created. This tailored data allows for assessing the extent to which preferences vary across age groups and to model governmental representation of public opinion across the various groups.

4.3.3 The operationalization of the outputs

Table 4.2 below provides information about the response variables I used to match the preference indicators. The objective of this matching was to find an indicator that best matches the opinion question while also providing adequate coverage. The response variables are mostly continuous, except the two issues on policy stringency (issues 3 & 4) where the output is coded as an index. The European Policy Stringency Index [EPSI] is an annually collected country-specific and internationally comparable measure of the stringency of national environmental policy. Stringency is by OECD defined as the degree to which environmental policies put an explicit or implicit price on polluting or environmentally harmful behavior. The index ranges from 0 (not stringent) to 6 (highest degree of stringency) and is based on 14 environmental policy instruments, primarily related to climate and air pollution (Botta and Kozluk 2014).

The rest of the outputs are continuous implying a natural zero and equal distance between the steps of the scale. The spending output refers to total expenditure on environmental protection as percentage of GDP. The emission data on greenhouse gases were chosen as it refers to the sum of seven gases that have direct effects on climate change (including CO2, which is a very common variable to use for such purposes). This data refers to gross direct emissions from human activities, measured in tonnes per capita. The final outputs regarding electricity-production measured in GWh were calculated to reflect each country-year's relevant energy-source's percentage of the total electricity production. Solar power refers to Solar PV and Solar thermal added.

[15] In the ISSP's module «Role of Government» 2016, the age-variable of Denmark is country-specific and cannot be harmonized for the purpose set out in this paper of creating age-groups relative to country-samples' composition (GESIS 2018, XIV).
[16] The policy-stringency issues are originally dichotomous. Thus, logistic regression was applied for prediction.

Table 4.2. The operationalization of the response and predictor variables

Data source	**Preferences**	**Recoded values (0-1)**	**Data source**	**Type of output**	**Measurement**
ISSP Role of Government I, II, III, IV, V	1. (change in) government spending on environment	0 (spend much less) 0,25 (spend less) 0,50 (spend the same) 0,75 (spend more) 1 (spend much more)	OECD Environment Database	Output 1: spending	2/4-year-change in total general government expenditure as % of GDP* (continuous)
WVS Wave 2, 4, 5 EVS Wave 2, 3	2. Government should reduce environmental pollution (change in level)	0 (strongly disagree) 0.33 (disagree) 0.66 (agree) 1 (strongly agree)	OECD Environment Statistics	Output 3: observable trend	2/4-year-change in GHG emissions, tonnes/capita (continuous)
ISSP Environment I, II, III	3. Strictness of laws on businesses responsibility toward the environment	0 (businesses decide) 1 (government decide)	OECD Environment Database	Output 2: law	European Policy Stringency Index (0-6)
ISSP Environment I, II, III	4. Strictness of laws on individuals responsibility toward the environment	0 (people decide) 1 (government decide)	OECD Environment Database	Output 2: law	European Policy Stringency Index (0-6)
ESS Round 8	5-11. The amount of electricity in country generated by [source]	0 (none at all) 0.25 (small amount) 0.50 (medium amount) 0.75 (large amount) 1 (a very large amount)	IEA Data and statistics	Output 3: observable trend	Electricity production in [country] from [source], % of total electricity production, GWh (continuous)

*For space limitation, the electricity sources in the last row were left out. They are coal, natural gas, hydroelectric power, nuclear power, solar power, wind power, and biomass energy. * The country-years from 2016 have an alternative measure of 3-year change due to data availability.*

4.4 Descriptive representation

Recalling the fourth hypothesis, the analyses will also include a hypothesized conditional variable: the effect of youths' descriptive representation. The descriptive dimension of representation is visible, quantifiable, and comparable. Thus, it is easier to measure than other forms of representation but unsuited to assess political inequality alone (Celis and Erzeel 2020, 193-194). Descriptive representation will be defined as the percentage of youth in parliament in relation to the size of youth in country, as this gives more information than solely the quantity in parliament. The operationalization follows Sundström and Stockemer's approach – *The Youth Representation Index* [YRI] – by constructing a measure for those between 18 and 30 and an alternative for those between 18 and 40 years old. These thresholds are common in descriptive representation and studies have demonstrated people up to 35 years old generally being underrepresented in legislatures, especially for countries with a younger population (see Sundström and Stockemer 2020, 1-3).

The data were collected in several steps. First, to access the proportion of parliamentarians below 30 (and 40) years, data were collected from the Inter-parliamentary Union [IPU]. The available data covered 13 of the countries in the dataset, mostly for the year 2016 and one country for 2010. Next, population data were used to calculate the share of eligible young voters in the population for the same years[17]. The two versions of the YRI were then constructed by dividing the share of youth in parliament by the share of youth within the eligible voting-age population and then multiplying by 100 (Sundström and Stockemer 2020, 3).

Table 4.3 lists the results. To illustrate, in the case of Belgium the cohort of ages 18 to 30 constituted 2 percent of its' legislature and around 20 percent of the population, giving the YRI a measure of almost 10 (meaning that young adults' representation in parliament is 10 percent relative to their proportion in the population). For the alternative cohort from 18 to 40, the quantity in parliament and population is considerably larger, with increased (proportional) representation, as indicated by the higher YRI-score. This general pattern of underrepresentation (especially for the "below 30 group") is repeated for all observations. New Zealand scored the lowest YRI30-score, whereas the Nordic countries scored highest. For the YRI40, Ireland has the poorest representation, while Finland, as the only observation, has a perfect relative representation of this age group in proportion to its size. This data covers a total of 66 country-year-issues within the issue of electricity.

[17]United Nations Population Division https://population.un.org/wpp/Download/Standard/Interpolated

Table 4.3. The Youth Representation Index

Country-year	% of parliamentarians below (years)		% of population below (years)		YRI30	YRI40
	30	40	30	40		
Belgium 2016	2	28.67	20.03	36.45	9.99	78.66
Finland 2016	10	36	19.86	35.68	50.35	100.90
Germany 2016	2.54	17.59	17.59	17.91	14.18	53.86
Ireland 2016	1.99	15.89	20.48	42.13	9.72	37.72
Netherlands 2016	2.67	26.67	20.23	35.11	13.20	75.97
Norway 2016	10.06	27.22	22.30	39.16	45.11	69.50
Portugal 2016	5.22	25.22	16.70	33.36	31.26	75.61
Slovenia 2016	5.56	25.56	17.47	35.45	31.83	72.11
Sweden 2016	12.32	34.1	21.69	37.22	56.80	91.61
Switzerland 2016	2	19	19.82	36.74	10.10	51.72

Sources: IPU's Parline database on national parliaments (https://data.ipu.org) and UN, Population Division 2019 (https://population.un.org/wpp/Download/Standard/Interpolated/)

4.5 Method

With this study, I seek to investigate government representation in terms of citizen preferences, as well as whether age groups are unequally represented. Furthermore, I will investigate this relationship, including the impact of descriptive representation. In this section, I describe the approach for analyzing the dataset in order to test the hypotheses presented in the previous chapter. As previously stated, the purpose of this research is to see if there is a link between what people want and what they get in advanced democracies over the last few decades. As the response variables are continuous and nested within countries and time, a quantitative approach based on ordinary least squares will serve this purpose because it is an inference-based approach that allows one to assess the effect of preferences on policy while controlling for other potential causes. By holding the effect of the other variables constant, this technique incorporates several explanatory variables and allows estimation of the isolated effect of each explanatory variable in addition to their relative strength.

The response variables are continuous, measuring climate policy level/change in country *i* at some time *t*. Because of the various categories in the preference- and policy-variables, each policy issue will be examined separately (with the exception of the ESS-questions, as they are variations of the same question). The sample has an unbalanced number of time-observations

per country, with some countries having only one observation. This makes cross-sectional time-series analyses unsuitable for the data. Ordinary least squares [OLS] regression models are useful for comparison across units at different points in time and include country-level controls to observe whether preferences affect policy, after controlling for different contextual explanations that is theorized to affect policy output (Imai 2017, 139).

I am also partly interested in explaining some of the variation, by assessing the effects of the different controls. This is part of the reason why the alternative approach of fixed effects by country is not ideal. Also, is inefficient for data with few time-points, increasing the chances of both a type I and type II error (Peters and Ensink 2015, 598). I will thus account for some of the substantially interesting country variation by including these country-level controls. In order to assess the net effect of the predictors on the response variables, fixed effects by relevant year-dummies will be tested to eliminate over-time variation and potential confounders in the data structure. The use of a quantitative technique has the advantage of allowing statistical control and generalization independent of time and space. The statistical significance of the findings may be difficult to detect due to the small number of country years (ranging between 13 and 33 observations) (Midtbø 2016, 94). Awareness of this will mark the interpretation of the results of the analysis in the next chapter.

As a preliminary analysis to assess the first hypothesis, the policy outputs will be regressed on the public opinion considered as an undifferentiated whole by using average preference, to see if policy appear to follow majority preference. Then, to emphasize the consideration of citizens as political equals, an analysis of the preference of age groups (hypothesis 2) and corresponding policy (hypothesis 3) will follow. A problematic feature facing analyses comparing the effect of different groups' preferences is to disentangle the effects of the group preferences, as they will be highly correlated (Bartels 2015, 4). A test of correlation between preferences of age groups across the issues shows that the correlation between the youngest and oldest group ranged from 0.69 to 0.95. The correlation between the young and the middle age groups were stronger than between the young and the old age groups in all instances. These values are positive and strong, and all display statistical significance. The results were similar for both groups of quintiles and quartiles, as well as with crude and controlled preferences.

A common solution to this problem is to only include observations where there is a certain level of preference divergence between the groups (Gilens 2012) or to calculate the preference of the old subtracted to the preference of the young and use this as the independent variable. I will use the latter approach. As citizens' socio-demographic characteristics (e.g., income, education, and

gender) can have an effect on their preferences, the results of the same models with controlled preferences adjusted for these background-variables and quartiles instead of quintiles will also be reported in the chapter (Kissau, Lutz, and Rosset 2012, 71).

When assessing the electricity issue, I will apply mixed models with random intercepts and slopes as they enable an assessment of the relationship between preference and response when controlling for the variation between the different electricity items and to assess the variations between the items (Finch, Bolin, and Kelley 2014, 29-32). In addition, to test the last hypothesis and assess whether the effect of opinion on policy is conditioned by descriptive representation it is expedient to include an interaction in such a model. This is a product of two predictions, in this case, both on the country level (Finch, Bolin and Kelley 2019, 48). The interaction is restricted to be tested for those 66 out of the in total 200 country-year-issues where data on the relative percentage of youth in parliaments is available. I expect that a higher level of descriptive representation of youth strengthens the representation of the preferences of the younger, alleviating differential responsiveness. Thus, the effect of average/young minus old's preferences (X) on climate policy (Y) is expected to be at least partly conditional on the presence of youth in parliament (Z).

4.6 Assumptions in OLS-models

For each estimation of a regression model, a large set of assumptions about the unseen population model is made implicitly. In order to draw credible conclusions, OLS is the 'Best Linear Unbiased Estimator' (BLUE) if certain assumptions are met (Kellstedt and Whitten 2018, 207, 208). In addition, there are also some assumptions that must be met mixed models. The assumptions presented below, are tested for all models[18], and forms the basis of the specific choice for the models[19]. For example, some models are not able to explain all cases equally well (outliers), where some of these observations have too much influence over the results of the analyses (too high leverage). Such cases are removed or included as a dummy in the analyses (which is specified when the results are presented). Although such adjustments only aim to correct the models methodologically, they should allow the estimator to be the best linear unbiased estimator. A downside of doing analyses with small samples is that the likelihood of detecting breaches of assumptions is less than for larger samples, and the consequences are

[18] Due to the large number of models, the results of these tests for each specific model are not presented. The resulting models presented in the results chapter are adjusted if any of the assumptions are violated, and if no solution mitigated these violations, this is mentioned explicitly.

[19] The decision between different models which 'pass' the tests of assumptions is made based on the values of AIC and BIC, in addition to an ANOVA test (Finch, Bolin, and Kelley2014, 62-63).

more severe. Thus, the model diagnostics presented here are merely a supplement to the more important foundation- a theory-driven analysis (Midtbø 2012, 105).

Normally distributed residuals

The advantage of using an OLS model is that it estimates a regression line of best fit by minimizing the sum of squared residuals, which represents the model's error term. The residuals (the difference between observed and predicted value) are assumed to be normally distributed around the median and that the error term has a conditional mean of zero, which if this is not the case indicates that there are some observations which the model fails to account for. A normal distribution is required to make probabilistic inferences about the population from the sample (Imai 2017, 143, 147; Kellstedt and Whitten 2018, 208). As the sample in most of the issues is below thirty observations, the distribution of the data must be tested. A problematic aspect is that small samples most often pass normality tests. Therefore, the distribution of the residuals were plotted for visual inspection in addition to significance tests for each model.

Independently distributed data

An OLS regression assumes there is no correlation within the error term, which refers to the degree of correlation of values close to each other in time or space. Thus, it is more commonly a threat for cross-sectional time-series analyses (Kellstedt and Whitten 2018, 209). Nevertheless, correlation can happen for groups of units in cross-sectional data as well, if units within certain groups share common characteristics. The models in this thesis will be analyzed cross-sectionally, but as the data structure can be classified as an unbalanced panel, the commonly used Durbin–Watson test will be applied to test the presence of correlation.

Homoscedasticity

Another assumption is that the error term has the same variance across all observations and does not depend on the values of the predictor variables. Such a situation is described as "homoscedasticity". If the assumption does not hold, the situation reflects "heteroscedasticity", which indicates that the regression model fits some of the cases in the population better than others (Kellstedt and Whitten 2018, 208, 209). A Breusch-Pagan test is applied to test the presence of heteroscedasticity.

Multicollinearity

A situation of multicollinearity occurs when two or more explanatory variables in the models have high correlation with each other, such as the preferences of different age groups.

Multicollinearity is problematic as it does not prevent isolation of distinctive effects from each explanatory variable (Kellstedt and Whitten 2018). An estimation of the "Variation Inflation Factor", is applied to test the presence of multicollinearity. Results close to 1 indicates that multicollinearity is low. The VIF-test is affirmed by a correlation analysis. As shown in the correlation plots for all the issues (see Appendix C), the darker the color, the higher level of correlation.

Influential cases

Influential cases in the context of a regression model can be problematic in several ways, especially for small samples (Midtbø 2012, 115). They can have large leverage by having unusual values for the predictor variable, or for a combination of explanatory variables (*outliers*). They can also have large residual values (*too high leverage*), which can be detected by looking at the squared residuals. The *influence* of a case is determined by the combination of its leverage and residual values. To detect influential cases, Cook's Distance formula was applied. Detected cases were dealt with either by dropping the cases from the analysis or by 'dummying them out', an approach to identify and isolate the effect of the case. This was done to see whether the model estimates changed dramatically (Kellstedt and Whitten 2018, 259).

Additional assumptions for mixed models

For mixed linear models, a number of assumptions must be satisfied. The core assumptions to be checked are homogeneous residual variance, linearity, and normality of the random effects. I follow the visual inference methods presented by Loy, Hofmann, and Cook (2017) to test for these assumptions. The additional test for the equality of variance for the residuals, Levene's test, were also applied to ensure the assumption of homoscedasticity was met (Brown and Forsythe 1974, 364).

4.7 Considerations of inference

Kellstedt and Whitten establish four causal hurdles to overcome, in order to evaluate whether preferences (X) cause policy (Y) (2018, 56). First, is there a credible causal mechanism that connects X to Y? Second, is there covariation between X and Y? Third, can one eliminate the possibility that Y causes X? At last, are alternative explanations controlled for? These issues regarding causality are discussed below.

Considering the first hurdle, the theoretical framework establishes why one can expect preferences to affect policy. Although there are several factors that can explain a country's

policy and the mechanisms through which preferences become policy are complex, a principle of democratic decision-making is that public opinion is the main source of policy. As emphasized in the theory, there are many assumptions embedded in the chain of representation. One cannot be sure that preferences substitute action, although they are a prerequisite (Kyselá 2018; Bartels 2015, 3). However, just because the relationship between opinion and policy is credible, does not necessarily make it true or confirm the theory. The covariation between preferences and policy, the second hurdle, can be solved by simply calculating the bivariate correlation. These will be presented and commented in the next chapter. The third hurdle is more of a prominent issue for studies on the link between opinion-policy, which is why the arrow in the conceptual model by Dubrow (2014) points in both directions. As previously stated, preferences are shaped in a political context, where policy and opinion react to each other (Soroka and Wlezien 2010). Theoretically, the expectation is that opinion affect policy, and I model for this by using response-variables with a lag to explanatory variables (Gilens 2012, 66-67).

In this thesis, when looking at congruence and responsiveness with observational data, the concern is with the level of reflection of preferences in policy (change), i.e., a descriptive assessment, not causal (Achen and Bartels 2016, 313; Kellstedt and Whitten 2018, 98). The research design employed makes it impossible to gauge whether policy is a result of citizens' preference or the other way around. Accordingly, demonstrating empirical causality is not the main aim of this thesis. The available techniques to redress possible reverse causation are the Hausman tests and the choice to analyze the response implemented after preferences, which is the choice for the data (Schakel 2020, 134; Brooks and Manza 2007, 46, 57). I will proceed to the next hurdle, keeping in mind the possibility of endogeneity. The last hurdle is more difficult to assess as one cannot know for sure that all possible explanations are controlled for (Kellstedt and Whitten 2018, 98). The response variable is caused by more than one predictor. The approach taken to reduce this problem is to include theorized controls shown to affect the different climate policies this thesis considers.

4.8 Considerations of data and design

One of the most basic assumptions when trying to make inferences about the population model from the sample model is that the variables are measured without error. As such, any variability from the regression line is assumed to be due to the observed values, and not measurement problems. When considering survey data, there are some caveats worth mentioning. Survey questions are imperfect measures of citizens' preferences in many ways. A threat of validity is

misreported attitudes. As mentioned previously, climate policy is proven to be salient for the years considered, and one can reasonably expect people to be somewhat familiar to the general issues considered. Few of the policy questions in the dataset produce a proportion answering "don't know" greater than 10 percent, so the extent of hidden non-attitudes is considered too small to seriously distort the real information contained in the substantive survey responses that form the basis for the analyses. The exceptions are pollution (59 percent) and policy stringency for individuals (15 percent), for which the interpretation will be more careful (Gilens 2012, 36).

By aggregating preferences, the distortions inherent in survey data are small enough that this data can be considerably more reliable to partially gauge public opinion at the cost of heterogeneity within the public opinion (Gilens 2012, 65). Another potential caveat when utilizing survey data, is the sample's representativeness of the youngest and elderly groups. These groups are both often underrepresented among survey respondents (Kissau, Lutz and Rosset 2012, 76; see distribution of age in figure 4.1). In order to increase the validity, recommended design and post-stratification weights were applied when predicting preferences based on age. The validity is further increased by ensuring the groups are equally sized within each country-years context (Gilens 2012, 24; Ura and Ellis 2008, 785).

Survey responses present an oversimplified and partial picture of public support for policy in reality. However, they constitute an important source of information for researchers and policy makers (Kyselá 2018, 9-11). When examining unequal representation and influence, the measurement of representation remains to some extent hypothetical as they are latent rather than directly unobservable, and issues of conceptual validity cannot usually be tested empirically (Gerring 2012, 163). Representation is here used to loosely refer to the statistical association between opinion and policy (Bartels 2008, 281). Given the choice of calculating the explanatory variable as the difference between preferences in the analyses of unequal representation, the resulting variable is more abstract and the association to policy should be interpreted with caution.

The question remains whether these findings can be generalized to different countries or cultural contexts. The use of different measures and conceptualizations of key climate change dimensions in different surveys have found to significantly moderate effects analyzed. It is therefore possible that the reported findings is attributable to methodological (e.g., specific outcome measure or sampling strategy used) or contextual (e.g., country and period in which study was conducted) differences (Poortinga et al. 2019, 26, 27). In order to generalize, I check for outliers, which are dealt with in order to see whether there is a general pattern. I have tried

to decrease methodological sources of variation and increase the generalizability by using high-quality, comparable measures of the key variables of interest, and coordinated data collection according to the highest methodological standards (such as the ESS and ISSP) (Poortinga et al. 2019, 34).

As mentioned in the previous chapter, the thesis is not able to fully test the whole concept of political (in)equality. The response in terms of formal policy is only one aspect of it (Gerring 2012, 162). By including virtually all OECD member states and some more, it is possible to study countries with very different climate experiences. Given this small and heterogenous sample of democratic political systems, the statistical analyses must be taken as suggestive rather than definitive (Poortinga et al. 2019, 33). I try to increase the robustness of fragility of statistical findings by reporting the results of a variety of analyses, employing different explanatory variables, climate policy aspects, time horizons, and allowances for different countries in patterns of policy congruence and -responsiveness. For a subset of my survey questions, I approximate multiple measures by using alternative question wordings relating to the same policy collected around the same time (Gilens 2012, 64). Still, the scope of policies do not encompass all relevant aspects of the climate policy field. It is worth mentioning that some of the outputs are more "outcomes" than "outputs", meaning consequences of policy instead of the actual policy.

Regarding the model including the descriptive dimension, the result will to some degree be suggestive and need careful interpretation. Counting numbers of representatives in parliament without including data on information the representatives give about themselves regarding who and what they care about or the constituents' evaluation of the information-giving, represent a challenge to assessing the linkage between descriptive representation and the hypothesized information-giving mechanism (Celis and Erzeel 2020, 199). It seems unrealistic to expect that representatives at all times are updated and exclusively responsive to the preference of citizens, and that citizens' preferences are shaped without influence or manipulation by elites, interest groups or politicians.

In order to enhance the robustness of the findings, the results of some further analyses will be briefly discussed and compared to the main analyses in the results chapter. First, as discussed above, the models will be tested with preferences adjusted for gender, education, and income, and by employing age groups divided into four, measuring the 25 percent youngest and oldest. These last analyses are to underpin whether there is a disproportionate effect of the younger age

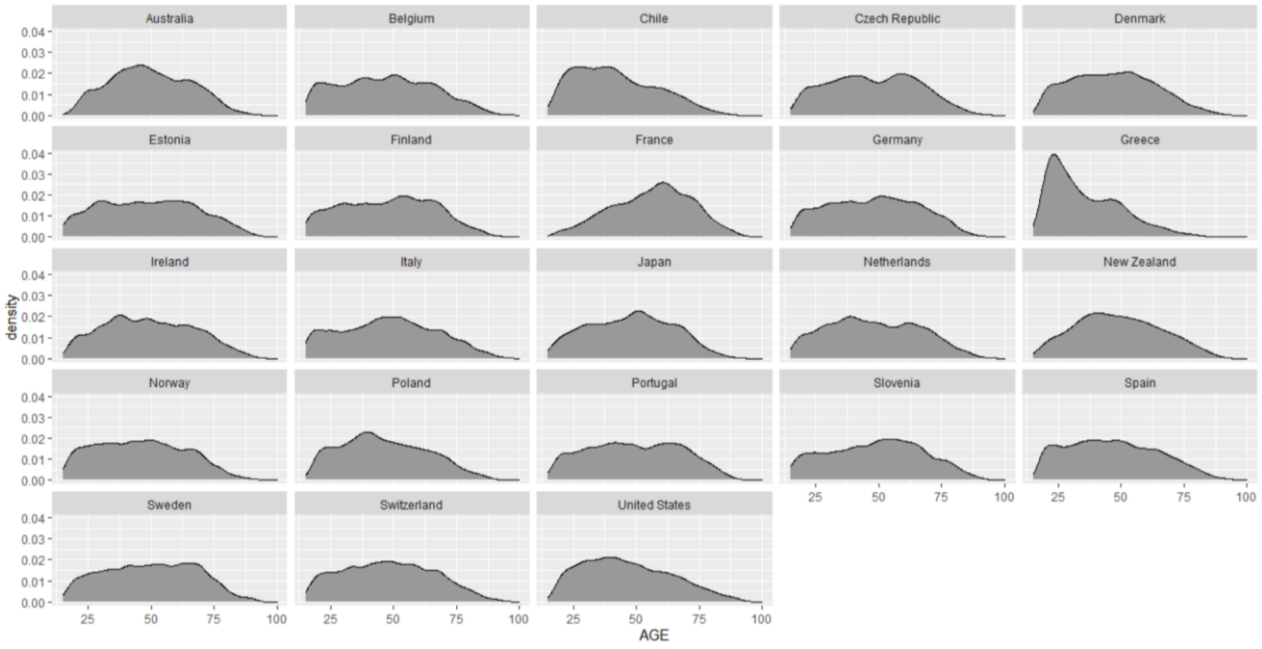
groups on policies, even when compared to different group sizes and the middle-aged group (Peters and Ensink 2015, 587).

4.9 Descriptive statistics

4.9.1 Age

The pooled individual-level dataset consists of 316 540 respondent-country-year-preference rows, which is the basis of the aggregate datasets. As stressed earlier, the advantage of using quantiles to create equally sized age groups is that the set of observations is divided into groups by country-year for each issue based on the magnitude of the variable (Imai 2017, 63). This way, one avoids having to choose an age interval for groups to be compared across the different countries' age compositions. In figure 4.1 the age composition of the the different countries' sample are demonstrated. Generally, the respondents' ages vary from 15 to 100 years with a median and mean (47.94) at 48 years. The lower and upper quartile values are at 33 and 62, meaning 50 percent of the respondents belong within this range (Imai 2017, 65). Of those respondents expressing a preference, 766 reported no value (approximately 0.25 percent of the total sample). In the country-plot one can see that the distributions vary, with the most notable exception being Greece which has a clear overweight of younger respondents. To correct for these differences and make the sample as equal to the real country-distribution as possible, recommended weights will be applied.

Figure 4.1. Age composition by country samples



4.9.2 Preferences

Table 4.4 reports the descriptive statistics of some of the main variables included in the analysis that are concerned with preferences of different age groups. In addition, the variation in preferences between the different issues and between age groups is demonstrated.

Table 4.4. Descriptive statistics of predicted preferences

Issue	**Group**	**Mean**	**Standard Deviation**	**Median**	**Minimum**	**Maximum**
Spending	Average	0.65	0.05	0.65	0.58	0.74
(N = 26)	Young	0.68	0.05	0.69	0.57	0.75
	Middle	0.65	0.05	0.64	0.57	0.72
	Old	0.61	0.06	0.59	0.55	0.71
	Young minus old	0.07	0.05	0.08	-0.03	0.12
	Young minus middle	0.03	0.03	0.03	-0.02	0.06
Pollution	Average	0.59	0.14	0.60	0.35	0.84
(N = 33)	Young	0.56	0.14	0.57	0.32	0.76
	Middle	0.59	0.14	0.61	0.36	0.77
	Old	0.62	0.13	0.62	0.43	0.80
	Young minus old	-0.06	0.06	-0.07	-0.12	0.06
	Young minus middle	-0.02	0.03	-0.03	-0.06	0.03
EPSI,	Average	0.93	0.03	0.93	0.87	0.98
business	Young	0.86	0.05	0.87	0.76	0.93
(N = 28)[20]	Middle	0.86	0.03	0.87	0.77	0.93
	Old	0.86	0.04	0.87	0.76	0.93
	Young minus old	-0.01	0.04	0.01	-0.06	0.06
	Young minus middle	-0.01	0.05	-0.00	-0.03	0.02
EPSI,	Average	0.79	0.09	0.80	0.58	0.90
individuals	Young	0.86	0.11	0.87	0.76	0.93
(N = 28)	Middle	0.86	0.08	0.87	0.77	0.93
	Old	0.86	0.10	0.87	0.76	0.93
	Young minus old	-0.01	0.05	-0.01	-0.06	0.06

[20] This variable could not be appropriately modelled with linear regression, as the original variable is dichotomous. The resulting values used to predict preference for the policy stringency issues reflect odds-ratio (Lander 2017, 289-291).

	Young minus middle	-0.01	0.07	-0.00	-0.03	0.02
Electricity,	Average	0.22	0.07	0.24	0.08	0.30
Coal	Young	0.58	0.07	0.57	0.52	0.65
(N = 12)	Middle	0.56	0.07	0.55	0.50	0.64
	Old	0.54	0.08	0.52	0.48	0.63
	Young minus old	0.04	0.04	0.04	-0.00	0.08
	Young minus middle	0.02	0.028	0.02	0.00	0.04
Electricity,	Average	0.43	0.05	0.43	0.35	0.50
Gas	Young	0.58	0.05	0.58	0.52	0.65
(N = 13)	Middle	0.56	0.05	0.55	0.50	0.64
	Old	0.55	0.06	0.53	0.48	0.63
	Young minus old	0.04	0.03	0.04	-0.00	0.08
	Young minus middle	0.02	0.047	0.02	-0.00	0.04
Electricity,	Average	0.71	0.09	0.73	0.52	0.85
Hydro-	Young	0.58	0.08	0.58	0.52	0.65
electric	Middle	0.56	0.09	0.55	0.50	0.64
(N = 13)	Old	0.70	0.10	0.71	0.50	0.86
	Young minus old	0.04	0.04	0.04	-0.00	0.08
	Young minus middle	0.02	0.04	0.02	-0.00	0.04
Electricity,	Average	0.26	0.09	0.25	0.13	0.36
Nuclear	Young	0.57	0.08	0.55	0.52	0.62
(N = 8)	Middle	0.55	0.10	0.53	0.50	0.60
	Old	0.53	0.09	0.51	0.48	0.60
	Young minus old	0.04	0.04	0.04	0.02	0.05
	Young minus middle	0.02	0.04	0.02	0.01	0.03
Electricity,	Average	0.80	0.08	0.81	0.67	0.90
Sun	Young	0.58	0.08	0.59	0.52	0.65
(N = 13)	Middle	0.56	0.07	0.55	0.50	0.64
	Old	0.55	0.08	0.53	0.48	0.63
	Young minus old	0.04	0.03	0.04	-0.00	0.08
	Young minus middle	0.02	0.02	0.02	-0.00	0.04
Electricity,	Average	0.76	0.08	0.77	0.61	0.88
Wind	Young	0.58	0.06	0.59	0.52	0.65

(N = 13)	Middle	0.56	0.08	0.55	0.50	0.64
	Old	0.55	0.09	0.53	0.48	0.63
	Young minus old	0.04	0.05	0.04	-0.00	0.08
	Young minus middle	0.02	0.03	0.02	-0.00	0.04
Electricity,	Average	0.60	0.06	0.61	0.51	0.69
Bio	Young	0.58	0.06	0.58	0.52	0.65
(N = 13)	Middle	0.56	0.07	0.55	0.50	0.64
	Old	0.55	0.07	0.53	0.48	0.63
	Young minus old	0.04	0.05	0.04	-0.00	0.08
	Young minus middle	0.02	0.04	0.02	-0.00	0.04

5. RESULTS

5.1 Outline of the analysis

The analysis will proceed as follows. First, the general representation of public opinion will be examined by using OLS regression to estimate the effects of average preferences on policy outputs. Second, the preferences of different age groups will act as explanatory variables to run regressions investigating whether these influence policy to differentially degrees. This is done to test whether government representation is biased toward the preferences of the older age group, as hypothesized. Third, an interaction model is used to estimate the effects of descriptive representation on the opinion-policy link, for the issue of electricity. Moreover, for all analyses regarding the electricity sources (referred to as "items"), the variation in congruence between the different items will be tested by applying mixed models with fixed and random effects.

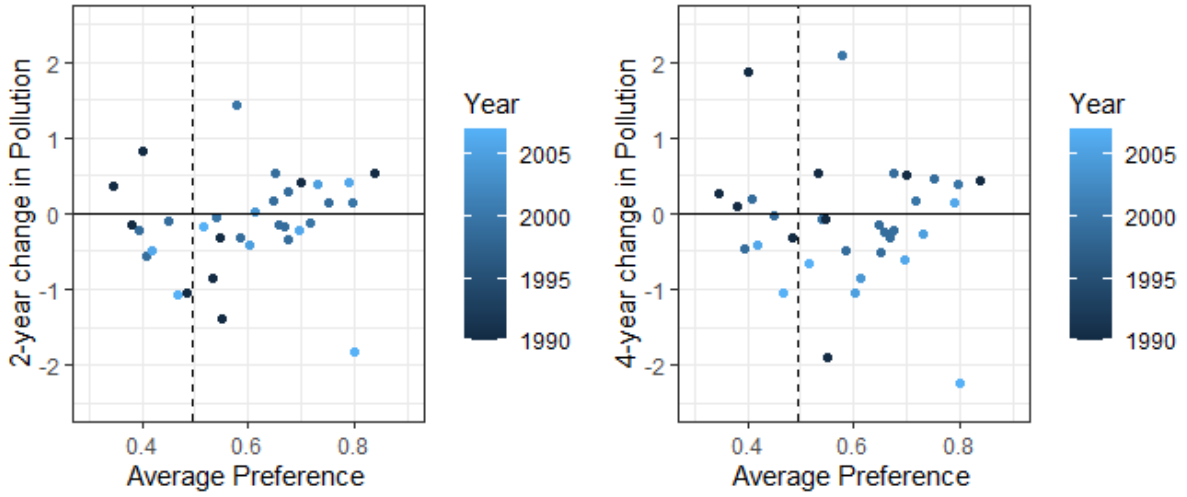
5.2 Representation of overall preferences in diverse issues

In the second chapter, I presented an argument regarding the influence of the average citizen on public policy under democracy. As several analyses of citizens' influence on policy have found that representation is real, and no analysis to my knowledge has indicated that this is the case for climate policy, I have no reason to expect that the average citizen is not influential. This resulted in the first hypothesis, where the results are expected to show responsiveness and congruence to the average preference on policy. This would imply negative coefficients for the issue of pollution (where preference for less pollution is associated with a reduction of pollution), and positive coefficients for the rest of the issues (where preferences for more output are associated with increased level of output). The results for the various policies will be presented subsequently.

5.2.1 Pollution

As a preliminary assessment, figure 5.1 presents a bivariate correlation plot to indicate whether there is a negative relationship between average preferences and a two- and a four-year change in pollution as expected. It shows that the direction of the relationship is not clear, and the spread of the observations is larger in a four-year perspective. The 24 of the 33 observations to the right of the vertical lines have an average preference wanting reduction. A stable pattern emerges, where 13 of the 33 country-years show an increase in pollution. The observations range from 1990 to 2007, and darker colors indicate "older" observations. Given the spread, there does not seem to be a clear change in congruence over time, except for the most recent observations in the four-year plot, where all but one show a decrease in pollution.

Figure 5.1- Bivariate correlation between average preference and change in pollution



Note: The correlation for the left plot is 0.13, and -0.10 for the right plot. The horizontal line demonstrating "no change", shows the amount of observations which level of pollution increased (above 0) or decreased (below 0). The dashed vertical line represents the preference for "no change" regarding level of pollution.

In table 5.1, the regression coefficients of the bivariate and multivariate models are presented. The average preference ('support') is positively related to both a two- and four-year change in level of pollution when including the control variables. This effect is significant in the second model. This relationship does not have the expected direction, indicating that if average preference increases with one unit (preferring less pollution), the level of pollution increases with approximately half a scale unit (model 1 and 4) or one scale unit (model 2). The third model exhibits the expected, negative coefficient, but once controls are included the effect of preference turns positive. The multivariate models clearly show the highest explanatory power when considering the adjusted r squared. An increase in GDP per capita and a higher level of manufacturing demonstrate positive values in both models but are significant only for the two-year model. This supports the theoretical view that states with a higher and more manufacturing-dependent economy pollutes more. An increase in vulnerability to climate change has a negative effect in the two-year model, which supports the theoretical expectation of vulnerable states being more responsive. The direction changes when considering the four-year change, making the finding less certain although it remains insignificant for both models. Overall, the results indicate that government efforts to reduce pollution are irresponsive to the preferences of citizens as the effect of preferences does not appear to affect policy- either at all or even in the opposite direction.

Table 5.1 – Responsiveness toward general preferences regarding pollution

	Dependent variable:			
	2-year-change in level of Pollution		4-year-change in level of Pollution	
	(1)	(2)	(3)	(4)
Support	0.584	1.007*	-0.589	0.562
	(0.826)	(0.488)	(1.090)	(0.932)
Change GDP pc		0.093**		0.086
		(0.037)		(0.074)
Vulnerability		-0.261		1.458
		(2.006)		(3.812)
Manufacturing		0.033**		0.030
		(0.012)		(0.026)
Finland 2000		1.287***		2.119***
		(0.258)		(0.509)
Spain 2007		-1.253***		-1.485**
		(0.350)		(0.691)
Ireland 1999				-0.829
				(0.554)
Constant	-0.480	-1.258	0.221	-1.605
	(0.503)	(0.730)	(0.664)	(1.373)
Observations	33	24	33	24
R^2	0.016	0.890	0.009	0.784
Adjusted R^2	-0.016	0.852	-0.023	0.689
Residual Std. Error	0.643 (df = 31)	0.229 (df = 17)	0.847 (df = 31)	0.430 (df = 16)
F Statistic	0.499 (df = 1; 31)	22.998*** (df = 6; 17)	0.292 (df = 1; 31)	8.293*** (df = 7; 16)

Note: *p<0.1; **p<0.05; ***p<0.01

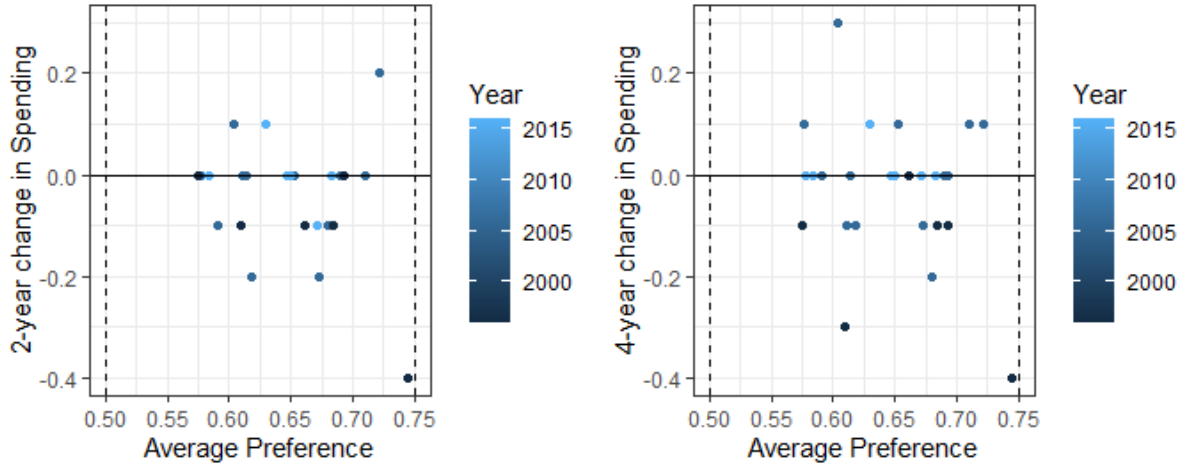
The control variables lacked data for some of the earliest observations (1990), which resulted in a lower sample in the multiple models (model 2 and 4). The support variable originally displayed a negative coefficient until influential outliers with high leverage were 'dummied out'. The model diagnostics showed significant improvement of fit and lower values of AIC and BIC when including the dummies for Finland 2000, Spain 2007, and Ireland 1999.

5.2.2 *Spending*

The bivariate correlation between the average preferences for spending on environment and the corresponding two- and four-year change of spending-level is displayed in figure 5.2. The expectation is a positive correlation, but this plot requires careful interpretation as the patterns may be biased. I.e., a perceived increase can actually remain stable if the size of the budget

increase. The spread of the observations are larger in a four-year perspective, indicating more change in the percentage of GDP used for environmental spending. Over half of the sample in the two-year plot show no change in spending, and about one third in the four-year plot. Three observations' level of spending increased over two years, and a total of six over four years. In both perspectives, nine observations showed a decrease. The observations range from 1996 to 2016, with darker colors demonstrating 'older' observations. There is an overweight of older observations below the horizontal line and no observation before year 2000 show increased levels. As all observations have an average preference for more spending, all observations which did not increase spending *appear* irresponsive to the average preferences.

Figure 5.2- Bivariate correlation between average preference and change in spending



Note: The correlation for the left plot is -0.22, and -0.23 for the right plot. The dashed vertical line at 0.5 represents 'spend same as now' and the line at 0.75 represent 'spend more'. The horizontal line indicates 'no change' in level of spending.

Table 5.2 displays the regression coefficients for the spending-models. Across all models, only the first did not violate any assumptions for OLS-models. As with the pollution-models, several models were tested, with exclusion of influential outliers or controlling them with dummies to remedy the violations. Although these models still breach the normality-assumption, OLS-models are considered robust enough to be considered despite of this and this assumption is also debated (Midtbø 2016, 114). The average preference ('support') is mostly negatively related to spending contrary to the expectations, except for in the second model. This model has the highest score for the adjusted r squared, which indicates that the model explains 55 percent of the change in level of spending, although the effect of support is insignificant. When keeping the growth in GDP constant, support is positively associated with spending in the second model and negatively in the fourth model, although the effects remain insignificant. This may be due to the sample size or too much heterogeneity of the response-variable. Another possibility is

that the models are insufficient, as many factors affect spending. Increased vulnerability to climate change shows a negative effect in both multiple models, which is in contrast to the expectations. Increased unemployment is negatively related to spending in the shorter perspective, which supports the theoretical expectation that states prioritize more "close to home"-issues when other crises appear. Overall, due to mixed support and little significance for the effect of preference, it is difficult to be certain whether government spending is responsive to the preferences of citizens.

Table 5.2. Responsiveness toward general preferences regarding spending

	Dependent variable:			
	2-year-change in level of Spending		4-year-change in level of Spending	
	(1)	(2)	(3)	(4)
Support	-0.513	0.680	-0.420	-0.085
	(0.466)	(0.715)	(0.499)	(0.800)
GDP change		-0.027		0.003
		(0.021)		(0.021)
Vulnerability		-1.774		-1.089
		(1.370)		(1.585)
Unemployment		-0.033		0.014
		(0.043)		(0.034)
Ireland 2006		0.137		
		(0.123)		
Netherlands 2006		0.171		
		(0.137)		
Poland 1996		-0.291**		
		(0.106)		
Spain 2006		0.101		
		(0.161)		
Year 1996			0.111	0.216
			(0.333)	(0.448)
Year 2006			0.288	0.421
			(0.325)	(0.436)
Year 2016			0.281	0.396
			(0.320)	(0.423)
Constant	0.294	0.091		
	(0.303)	(0.307)		
Observations	26	24	26	24

R^2	0.048	0.706	0.370	0.408
Adjusted R^2	0.008	0.550	0.255	0.165
Residual Std. Error	0.113 (df = 24)	0.076 (df = 15)	0.118 (df = 22)	0.128 (df = 17)
F Statistic	1.212 (df = 1; 24)	4.512*** (df = 8; 15)	3.225** (df = 4; 22)	1.676 (df = 7; 17)

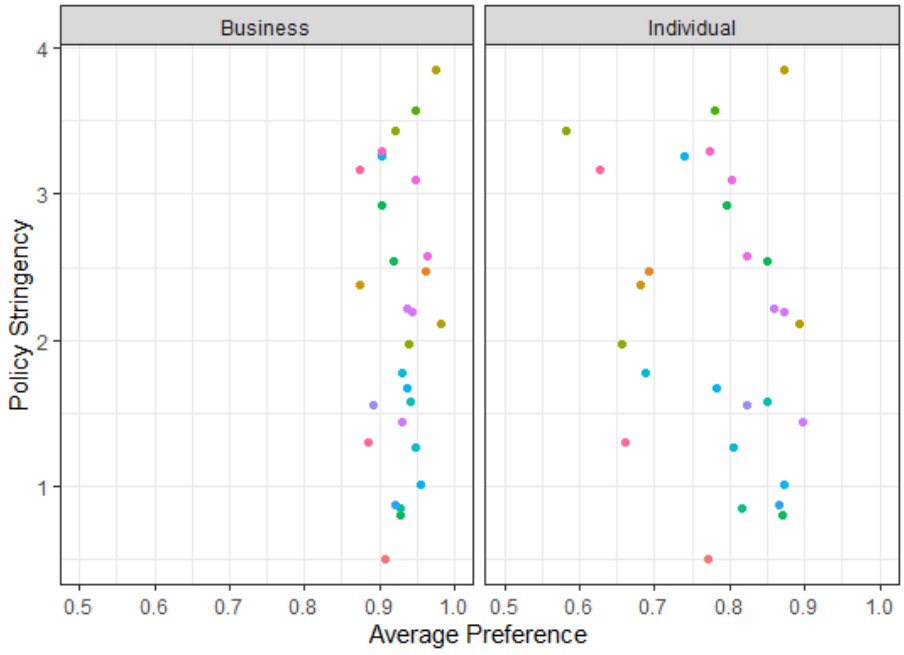
Note: *p<0.1; **p<0.05; ***p<0.01

The second model had outliers with too much influence over the analysis, which showed a significantly increased fit when these observations were included as a dummy. Both models for the four-year change in spending, demonstrated a better fit with fixed effects for the survey rounds.

5.2.3 Policy stringency

The bivariate correlations for the issues of policy stringency for individuals and businesses are displayed in figure 5.3. The expectation is here a positive correlation. The preference variables were originally dichotomous, where the value 1 represents agreement with the view that "government should pass laws to make individuals/businesses protect the environment". The spread of support is considerably larger for the issue of individuals in contrast to for businesses, where all show a position close to 1.

Figure 5.3. Bivariate correlation between average preference and policy stringency



Note: The correlation for business-issue is 0.05 and -0.29 for the individual-issue. The vertical axis represent the score on a policy stringency index, ranging from 1 (not stringent) to 6 (highest degree of stringency).

The regression coefficients regarding the policy stringency-issues considering individuals and businesses are presented in table 5.3. An increase in average preference ('support') for stricter policies regarding businesses is positively related to policy stringency, in accordance with the expectation, while the effect turns negative when including control variables regarding individuals (model 4). The effect decreases once controls are included but remain positive for the second model, indicating that the controls account for some of the effect in the bivariate models. An increase in GDP per capita (logged) is associated with less policy stringency, which may support the notion that states with higher economy prioritize economic growth over climate policy. The effect of being European show a positive association to increased stringency. The V-Dem score shows a positive, substantive coefficient for both models, and is the only significant control variable. This indicate that more liberal democracies may be more stringent in their environmental policies. According to the adjusted r squared, these models show little variation in their explanatory power, but a slight increase for the multivariate models. Overall, the results indicate that government efforts to implement stringent climate policy are congruent with the preferences of citizens when considering businesses. The findings are less certain for the issue concerning policy on individual.

Table 5.3. Congruence with general preferences regarding policy stringency

	Dependent variable:			
	European Policy Stringency Index			
	Business		Individual	
	(1)	(2)	(3)	(4)
Support	6.267*	2.380	1.181	-0.102
	(3.186)	(3.539)	(1.185)	(1.181)
GDP pc log		-0.054		-0.039
		(0.192)		(0.195)
Europe		0.058		0.133
		(0.274)		(0.264)
V-Dem		11.097**		12.019**
		(4.631)		(4.737)
Year 1993	-4.852	-9.951**	-0.014	-8.628**
	(2.974)	(3.742)	(1.024)	(3.231)
Year 2000	-4.015	-9.149**	0.895	-7.840**
	(2.975)	(3.756)	(0.951)	(3.253)
Year 2010	-2.721	-7.965**	2.179**	-6.709*
	(2.942)	(3.749)	(0.896)	(3.287)

Observations	28	28	28	28
R^2	0.966	0.975	0.962	0.974
Adjusted R^2	0.961	0.966	0.956	0.965
Residual Std. Error	0.461 (df = 24)	0.428 (df = 21)	0.487 (df = 24)	0.433 (df = 21)
F Statistic	172.123^{***} (df = 4; 24)	114.995^{***} (df = 7; 21)	153.744^{***} (df = 4; 24)	112.549^{***} (df = 7; 21)

Note: *p<0.1; **p<0.05; ***p<0.01

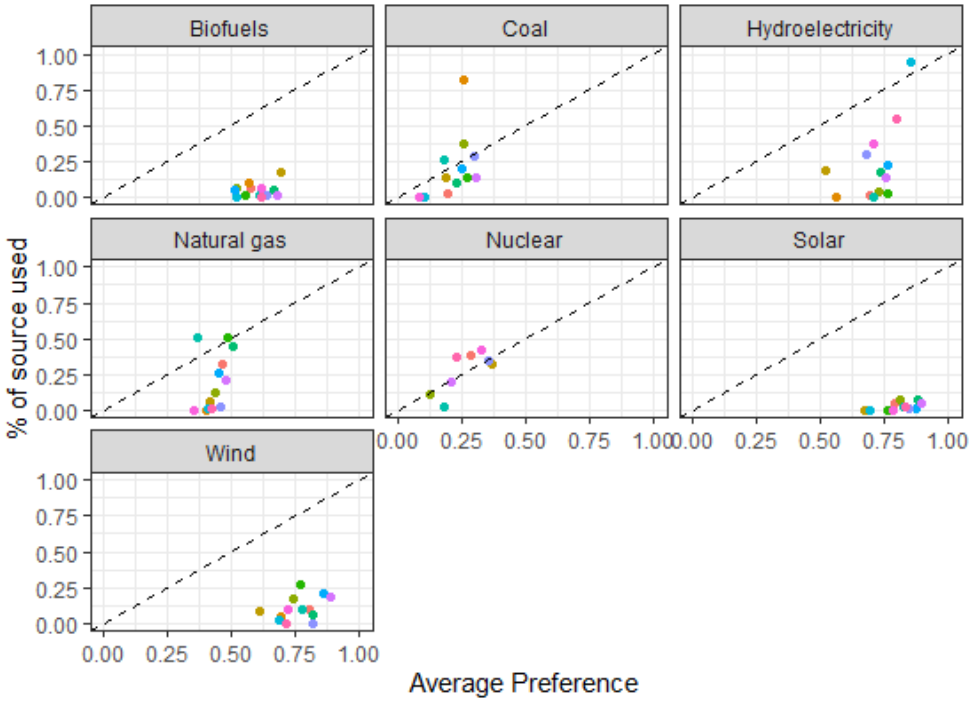
All models demonstrated the best fit when applying fixed effect controls for the survey rounds.

5.2.4 Electricity

When running a basic regression to assess the bivariate relationship between electricity-output and preferences across all issues, the effect of preferences is negative (showing a decrease of the electricity response at 0.14 for each unit increase in support). This suggests incongruence to the preferences of citizens, which is contrary to the expectations. Given the variations of the survey-questions asking respondents about their preference for the different electricity-issues, this issue provides the opportunity to investigate whether congruence is higher for certain issues. This is interesting to look at as earlier research has found that representation differ across policy issues (Hobolt and Klemmensen 2008).

As a preliminary analysis, the correlation between the response and the average preference for the different items are visualized in figure 5.3. The focus is not on the placement of each specific country, but to see the general trend of congruence for each issue. The dotted line is included to demonstrate where observations with perfect congruence would be placed. For example, if the average preference states that it wants "a medium amount" of a source to generate electricity (corresponding to the value 0.50 in the x-axis), then the observation should also be at 0.50 in the y-axis. Evidently, there are some issues where actual outcome is less congruent to average preference, especially the solar power-item. Here, all preferences cluster around 0.75 (preferring 'a very large amount of solar power in electricity production'), whereas all observations lie far from the plotted congruence-line (no observation score higher than 12.5 percent of solar power for electricity production).

Figure 5.4. Congruence with average preference and electricity sources



Note: The overall correlation are -0.17, and for the specific items 0.28 (biofuels), 0.47 (coal), 0.52 (hydroelectricity), 0.41 (natural gas), 0.77 (nuclear), 0.63 (solar), and 0.37 (wind). The x-axis represents the scale for the preferences regarding the amount of electricity that preferably would be produced by the specific sources. The y-axis represents the actual level of electricity production from the specific source.

To examine this further, I specified mixed models with random intercepts and slopes for the electricity items. The results reported below are insufficient as a basis for strong conclusions given the sample size. Nevertheless, it gives an indication of the variation between different issues. To model whether there is an association between preferences and the response after controlling for the variation in the different electricity items, the items are introduced as a random effect (as I suspect that they do influence the overall pattern). Once items are accounted for, it becomes clear that preferences are positively associated with output and that they do not explain all differences in the electricity output. The influence of items on the response is calculated by dividing the variance for items by the total variance. It shows that they explain 62.6 percent of the variance that is 'left over' after the variance explained by preferences. This indicate that although preferences explain some variations, items also matter substantively.

Table 5.4 demonstrate the results of the random intercepts models (1 and 2), and the random coefficient models (3 and 4). The model estimates are mostly larger than its associated error, meaning the slope (with a positive effect of support at 0.3) can be distinguished from zero. The exception is the second model, where the effect has decreased given the inclusion of controls.

For models 1 and 2, the slope is fixed while intercepts are allowed to vary for each level of the random effects. The subsequent two models introduces random slopes in addition to random intercepts, where response is modelled as a function of the preferences, knowing that the baseline and the effects (slopes) may vary across the items. After fitting random slopes and random intercept models, the effect of support is- and remains- positive in these models. The robustness of this finding is increased by its unchanged direction and significance, even when controlling for other variables. An increase of GDP and a higher level of manufacturing display positive effects, whereas an increase in the V-Dem score show negative coefficients.

Table 5.4. Congruence with general preferences and electricity production

	Dependent variable:			
	% of electricity-source used			
	(1)	(2)	(3)	(4)
Support	0.300**	0.102	0.427**	0.328*
	(0.149)	(0.136)	(0.192)	(0.196)
GDP log		0.007		0.011
		(0.010)		(0.010)
Manufacturing		0.002		0.002
		(0.002)		(0.002)
V-Dem		-0.553		-0.315
		(0.665)		(0.632)
Constant	-0.027	0.314	-0.035	-0.041
	(0.098)	(0.659)	(0.068)	(0.630)
Observations	82	82	82	82
Log Likelihood	50.107	42.942	51.558	44.283
Akaike Inf. Crit.	-92.215	-71.884	-91.116	-70.566
Bayesian Inf. Crit.	-82.588	-55.037	-76.676	-48.906

Note: *p<0.1; **p<0.05; ***p<0.01

The Akaike Information Criterion [AIC] the Bayesian Information Criterion [BIC], and Log Likelihood information are used for model comparisons. Lower values reflect a better fit to data (Finch, Bolin, and Kelley 2014, 47).

As can be seen in figure 5.5, the overall effect of average preference, based on model 1, is positive when controlling for items. How does the relationship vary between the different items? To illustrate the variation between the random slopes for the different items, based on model 3, their slopes are plotted in figure 5.6.

Figure 5.5. Overall effect of average preference on sources for electricity production

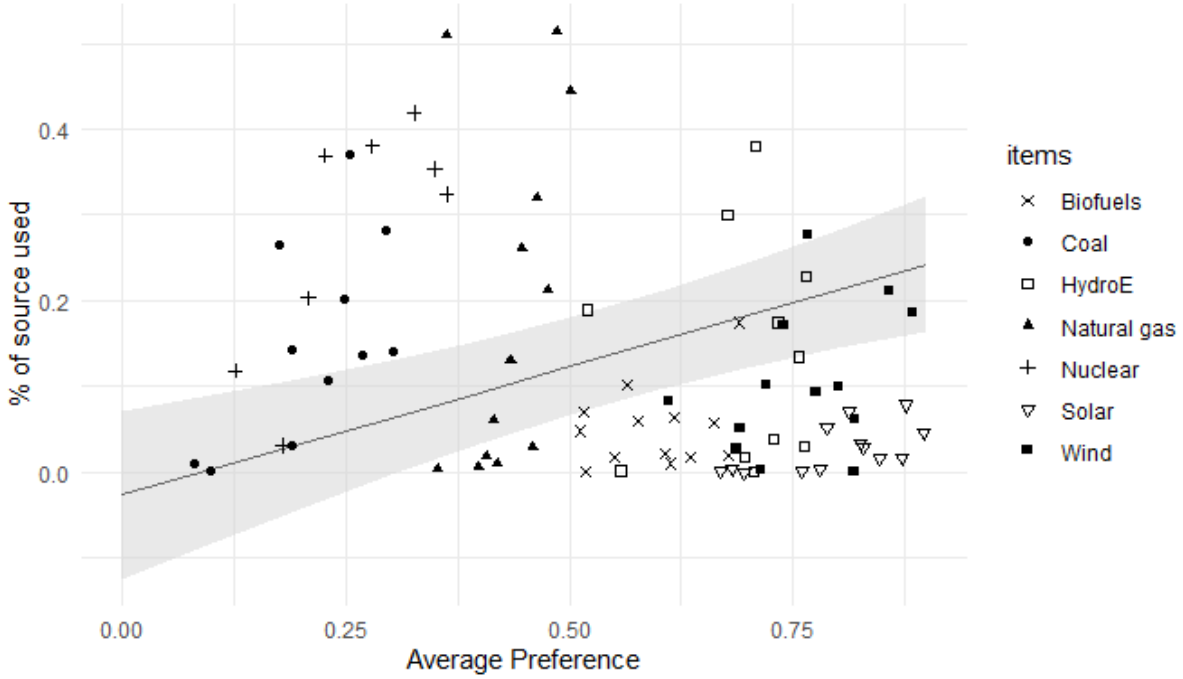


Figure 5.6. Random intercepts and slopes for congruence in electricity production

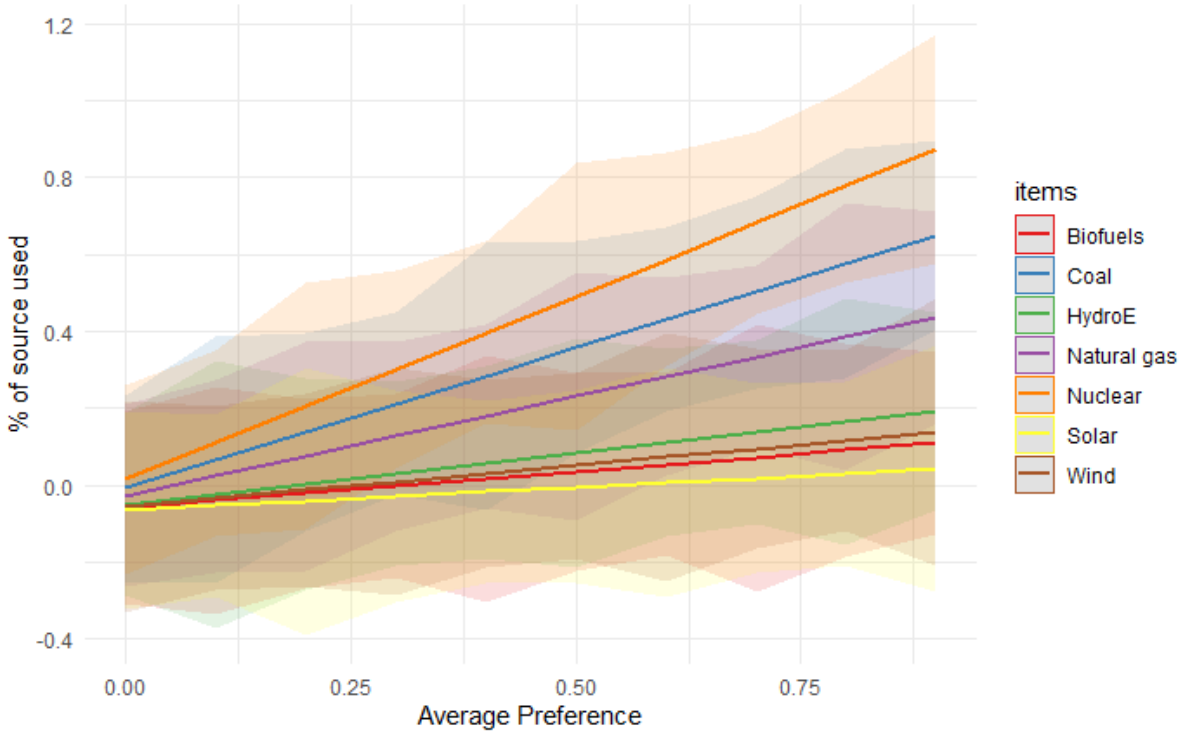
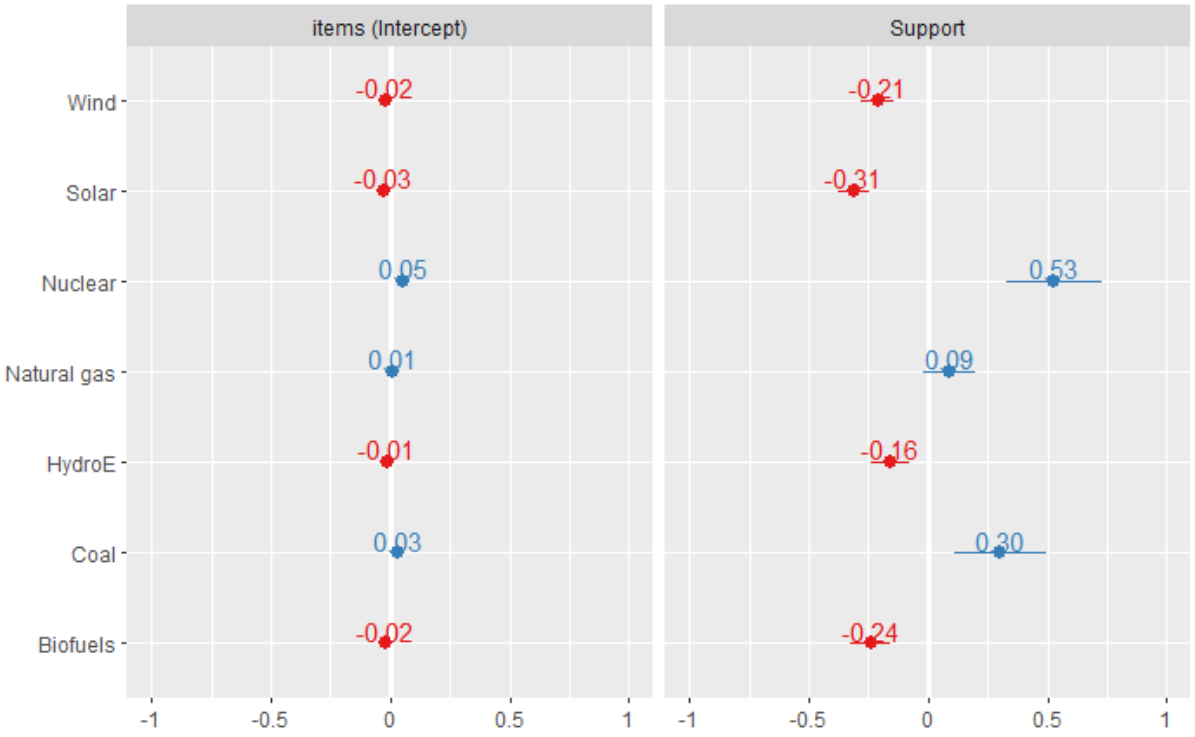


Figure 5.7 shows the random coefficients and random intercepts for the items, based on the third model. The values are relative to the general intercept and slope value from the model and estimate the difference for the specific level of each random effect. The 95 percent confidence intervals show whether the variability in the reported values are different from zero and whether

they are higher or lower than the fixed effects estimate. The estimates for the majority of the energy-items significantly differ from the fixed effect estimate (0.43). The only exception is natural gas. The figure indicates stronger congruence for average preferences in the nuclear- and coal sources, and lesser congruence for sources such as wind, solar power, hydroelectricity, and biofuels. Considering an analysis of variance and the AIC and BIC indicators of the models, the random slope models do not increase the fit of the data, as the random intercept models show lower values. In sum, the results indicate that the sources used for electricity production are congruent with the average preference, with some variation for the different sources.

Figure 5.7. Plot of random intercepts and coefficients



Generally, due to the low number of units, I refrain from drawing strong conclusions about the results for representation of average preferences and interpret these models as suggestive indications of congruence and responsiveness. The analyses have shown mixed results for the association between average preferences and corresponding policy outputs. Government efforts to reduce pollution appear irresponsive to average preference, while the results of preferences relation to government spending are more uncertain. The findings of the issues concerning congruence are more optimistic, where policy stringency for businesses and the sources used for electricity production appear to be overall congruent with average preference. The findings for policy stringency regarding individuals are less certain.

5.3 Unequal representation of age groups in diverse issues

An increasing number of emergent literature has demonstrated that government policy may be tilted toward certain groups when looking beyond public opinion as a heterogenous group, challenging the democratic principle of politically equal citizens and the median voter theorem. As argued in the theory section, this can be the case for age groups, where the older age groups preferences may be better represented. The main hypothesis laid out in the second chapter, which directly corresponds to this thesis' research question is that "*climate policy (outputs) tend to follow the preferences of older age groups rather than the preferences of lower age groups*". Before I assess this hypothesis, I will first consider whether there is diverging preferences between younger and older age-groups in climate policy (the second hypothesis).

Differential representation is problematic if one group's preferences are neglected in favor of the preferences of another group if this difference cannot be attributed to group size. In order to analyze whether this is the case, a prerequisite is that there is some extent of disagreement between the preferences of the younger and older age groups. To determine whether the potential differences are statistically significant, a difference of means test can be performed by applying a paired t-test (Imai 2017, 358). The test is performed by calculating the difference between each pair of value and then computing the mean and the standard deviation of the difference to compare the average difference to zero. A significant difference between the two pairs of samples increase the certainty of the difference being far from zero. As the sample size is less than 30 (except for the pollution-issue), an assumption is that the differences of the pairs follow a normal distribution. This was tested by applying a Shapiro-Wilk normality test. If the assumption was violated, I used the recommended nonparametric paired two-samples Wilcoxon test instead. This was relevant for the spending-issue.

In table 5.5 one can observe that a majority of the preferences differ significantly and that the results show some mixed results regarding which group prefers more climate friendly policies. While climate seems to preoccupy all age groups in a similar way, there is some variation across issues, with almost no disagreement on the policy stringency issues, to a clearer disagreement on the issues concerning spending and pollution. Positive values of difference indicate that the older age group had a higher total mean than the younger group, while negative values indicate the opposite. The issues where the older group expressed higher means are reduction in pollution and the issues regarding policy stringency. A note to this is that the policy stringency issues had several extreme outliers for the youth-group which may affect the means in a lower direction (see e.g., the outlier plot in Appendix D). Also, these differences of means are the

only ones which are insignificant. The pollution issue did not show any outliers but the question wording specifically states that a reduction in level of pollution should not cost the individual any money, which might affect the willingness of this group to express agreement.

Table 5.5. Differences in levels of support for different climate policies between age groups

Issue	**Preference**	**Mean (standard error)**	**Difference (standard error)**
Pollution	Young	0.563 (0.138)	-0.058*** (0.009)
	Old	0.621 (0.128)	
Spending	Young	0.679 (0.043)	0.066*** (0.007)
	Old	0.613 (0.050)	
Business (*policy stringency*)	Young	0.855 (0.047)	-0.008 (0.006)
	Old	0.863 (0.051)	
Individual *(policy stringency)*	Young	0.855 (0.047)	-0.008 (0.006)
	Old	0.863 (0.052)	
Biofuels (*electricity)*	Young	0.583 (0.043)	0.036*** (0.006)
	Old	0.546 (0.056)	
Coal *(electricity)*	Young	0.579 (0.043)	0.036*** (0.006)
	Old	0.543 (0.057)	
Hydroelectricity *(electricity)*	Young	0.583 (0.043)	0.037*** (0.006)
	Old	0.546 (0.056)	
Natural gas *(electricity)*	Young	0.583 (0.043)	0.037*** (0.006)
	Old	0.546 (0.056)	
Nuclear (*electricity)*	Young	0.567 (0.040)	0.037*** (0.003)
	Old	0.530 (0.046)	
Solar *(electricity)*	Young	0.583 (0.043)	0.037*** (0.005)
	Old	0.546 (0.056)	
Wind *(electricity)*	Young	0.583 (0.043)	0.037*** (0.006)
	Old	0.546 (0.056)	

The third hypothesis is that preferences of older age groups have a stronger effect on policy outputs than younger groups. To examine this, the highly correlated group preferences are disentangled by calculating the preference of the young subtracted to the preference of the old (with an alternative subtracted to the middle-preference) and use this as the independent

variable. This way, I can address collinearity without throwing away information. The alternative, analyzing the preference-variables from different age groups separately, would prevent controlling for the effect of other groups' opinion and could give results suffering from omitted variable bias. When the calculated variable (young-minus-old) demonstrates positive values, it reflect situations where the younger group would prefer more climate-friendly policy than the older group, while negative values would demonstrate the opposite. If the old are more influential than young, higher values of young-minus-old, when old prefer more change/level of output, should correlate *positively* with actual change in/level of output (Schakel, Burgoon, and Hakhverdian 2020, 154-155). The young-minus-old variable is in the subsequent models based on crude predicted preferences divided into five equally sized age-groups. As other individual-level characteristics or group sizes can affect differences in preferences the results are compared to alternative models with four equally sized groups and models where preferences are controlled for by education, gender, and income.

5.3.1 Pollution

As evident from the previous table, the difference between youth's and old's preference is a negative value, indicating that the old on average want more reduction of pollution. If there is responsiveness toward the old's preference, the young-minus-old variable would be positively correlated to the change in pollution (the response). In table 5.6 the results for the pollution-issue are presented. An increase in the preference of young minus old is mostly negatively related to a change in level of pollution, which indicates that the output is responsive towards the preferences of the young. The effect is insignificant but shows robustness in the direction of the effect when controls are included. The same pattern is repeated for preferences of young minus middle, where the coefficients are consistently larger. The controls of higher level of manufacturing and vulnerability to climate change are both positively correlated to the two-year change in response (where the former is significant), while the opposite is the case for the four-year change in response. Overall, the results do not indicate support for the expectation that change in pollution tends to follow the preferences of the old, as the results show mostly negative effects of the young-minus-old variable. The effect is insignificant, which makes it more difficult to be certain of these findings.

Table 5.6. Responsiveness toward preferences of the young regarding pollution

	Dependent variable:							
	2-year-change in level of pollution				4-year-change in level of pollution			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	0.337	-0.727			-3.408	-2.572		
	(2.268)	(2.185)			(2.898)	(2.858)		
Young minus middle			1.478	-1.037			-6.063	-5.444
			(5.236)	(5.145)			(6.741)	(6.815)
Vulnerability		4.101		4.075		-9.607		-9.528
		(3.807)		(3.862)		(5.740)		(5.858)
Manufacturing		0.073**		0.073**		-0.017		-0.019
		(0.025)		(0.026)		(0.033)		(0.033)
Finland 2000	1.464**		1.488**					
	(0.660)		(0.659)					
Switzerland 2007	1.272*		1.276*					
	(0.674)		(0.673)					
New Zealand 2004	0.015		0.004					
	(0.555)		(0.555)					
Year 1990	-0.160		-0.141					
	(0.237)		(0.235)					
Year 1999	-0.047		-0.029			3.218		3.244
	(0.226)		(0.220)			(2.215)		(2.244)
Year 2000	-0.007		-0.004			4.095*		4.127*
	(0.321)		(0.319)			(2.258)		(2.280)
Year 2004						2.625		2.621
						(2.121)		(2.144)
Year 2005	0.0003		0.006			2.741		2.743
	(0.392)		(0.391)			(2.154)		(2.184)
Year 2006	-0.073		-0.044			2.807		2.831
	(0.383)		(0.383)			(2.163)		(2.196)
Year 2007	-1.433***		-1.422***			1.522		1.530
	(0.399)		(0.397)			(1.850)		(1.876)
Constant		-2.637*		-2.619*	-0.325		-0.275	
		(1.336)		(1.350)	(0.221)		(0.218)	
Observations	33	24	33	24	33	24	33	24
R^2	0.488	0.327	0.489	0.324	0.043	0.685	0.025	0.681
Adjusted R^2	0.265	0.226	0.267	0.223	0.012	0.495	-0.006	0.490
Residual Std. Error	0.550 (df = 23)	0.523 (df = 20)	0.549 (df = 23)	0.524 (df = 20)	0.833 (df = 31)	0.562 (df = 15)	0.841 (df = 31)	0.566 (df = 15)
F Statistic	2.191* (df = 10; 23)	3.237** (df = 3; 20)	2.202* (df = 10; 23)	3.202** (df = 3; 20)	1.382 (df = 1; 31)	3.618** (df = 9; 15)	0.809 (df = 1; 31)	3.560** (df = 9; 15)

Note: *p<0.1; **p<0.05; ***p<0.01

Based on model fit comparisons, models 2 and 4 include outliers, while models 6 and 8 use survey wave fixed effects. The control of 'change in GDP per capita' is excluded as none of the models passed the normality tests.

5.3.2 Spending

The difference of means-table showed that youth want more spending on environment than the old. If there is responsiveness toward old's preference, the young-minus-old preference variable would be negatively associated with a change in the level of spending (the response). Table 5.7 presents the coefficients for the spending-models. With a two-year change in level of spending, an increase in the preference-variable shows positive coefficients for spending. The effect decreases slightly when controls are included (such as the change in GDP) but remains positive. The same pattern is repeated for the young minus middle-preference. Thus, the change in spending over two years seems to be responsive to the preferences of the young. In the two-year change models, an increase in GDP is negatively related to spending, supporting the notion that an increase in GDP does not necessarily mean more spending on environment. More vulnerability to climate change is here positively associated with spending which supports the notion that vulnerable states may have more incentive and to gain from implementing more climate-friendly policy and increase its spending.

The models with four-year change in spending levels show a slightly different pattern. The young-minus-old variable turns negative when controls are included, which is also the case for the young-minus-middle variable. This direction would indicate responsiveness toward preferences of the old. Increased unemployment is, in contrast to the expectations, positively related to spending, while the effect of being more vulnerable has changed to a negative coefficient. In sum, the results do not support the expectation that spending is more responsive to the preferences of the older age group. Due to little significance for the effect of the preference variable and mixed findings for the four-year-change models, there is some uncertainty regarding the findings.

Table 5.7. Responsiveness toward preferences of the young regarding spending

	Dependent variable:							
	2-year-change in level of spending				4-year-change in level of spending			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	0.403	0.330			0.468	-0.553		
	(0.508)	(0.576)			(0.643)	(0.553)		
Young minus middle			0.675	0.609			0.766	-1.015
			(0.964)	(1.088)			(1.231)	(1.033)
GDP change		-0.008		-0.008				
		(0.013)		(0.013)				
Unemployment						0.024		0.022
						(0.015)		(0.015)
Vulnerability		0.165		0.150		-0.112		-0.096
		(0.783)		(0.775)		(1.016)		(1.013)
Poland 1996	-0.351***	-0.332***	-0.355***	-0.333***		-0.422***		-0.420***
	(0.096)	(0.090)	(0.095)	(0.090)		(0.089)		(0.089)
Outlier*		0.182		0.184		-0.283***		-0.282***
		(0.116)		(0.118)		(0.090)		(0.090)
Norway 1996						0.293***		0.294***
						(0.093)		(0.093)
Year 1996					-0.197***		-0.191***	
					(0.064)		(0.063)	
Year 2006					-0.016		-0.010	
					(0.054)		(0.052)	
Year 2016					-0.016		-0.010	
					(0.061)		(0.060)	
Constant	-0.052	-0.091	-0.047	-0.084		0.080		0.071
	(0.039)	(0.264)	(0.037)	(0.259)		(0.335)		(0.332)
Observations	26	26	26	26	26	24	26	24
R^2	0.438	0.612	0.435	0.612	0.365	0.760	0.361	0.760
Adjusted R^2	0.389	0.516	0.386	0.515	0.249	0.676	0.244	0.675
Residual Std. Error	0.089 (df = 23)	0.079 (df = 20)	0.089 (df = 23)	0.079 (df = 20)	0.119 (df = 22)	0.080 (df = 17)	0.119 (df = 22)	0.081 (df = 17)
F Statistic	8.968*** (df = 2; 23)	6.321*** (df = 5; 20)	8.848*** (df = 2; 23)	6.314*** (df = 5; 20)	3.157** (df = 4; 22)	8.995*** (df = 6; 17)	3.101** (df = 4; 22)	8.973*** (df = 6; 17)

Note: *p<0.1; **p<0.05; ***p<0.01

*The models showed improved fit when influential outliers are included as dummies. *'Outlier' is for model 2 and 4, Ireland 2006, and for model 6 and 8, Norway 2006. Fixed effects for survey rounds are applied for these bivariate models (model 5 and 7).*

5.3.3 Policy stringency

The difference of means-table demonstrated that old on average want more policy stringency than the young, when considering both businesses and individuals. If policy is more congruent

with old, a higher value of the young-minus-old variable (moving toward a situation where old want less stringency) would show a negative coefficient. The coefficients for the policy stringency models are presented in table 5.8. The effect of the preference variables are consistently negative and insignificant across all models (including for young-minus-middle), regarding both businesses and individuals. The effects increase when controls are added, indicating that the effect was masked by a variable that is now controlled for. This indicate that the output is congruent with preferences of the old. GDP per capita (logged) is consistently positively related to stringency, which supports the notion that economic factors can have a weakening effect on climate policy. Increased level of vulnerability is expected to be positively related to more stringent climate policy, which it is not. To summarize, the results indicate support for the expectation that government efforts to implement stringent climate policy are congruent with the preferences of the old when considering businesses and individuals, but the effects remain insignificant.

Table 5.8. Congruence with preferences of the young regarding policy stringency

	Dependent variable:							
	European Policy Stringency Index							
	Business				Individual			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	-1.316	-1.939			-1.311	-1.915		
	(3.205)	(3.745)			(3.200)	(3.741)		
Young minus middle			-3.547	-5.209			-3.351	-4.935
			(6.827)	(7.790)			(6.773)	(7.740)
GDP pc log		0.142		0.155		0.141		0.151
		(0.237)		(0.231)		(0.237)		(0.231)
Vulnerability		-4.140		-4.058		-4.143		-4.086
		(3.759)		(3.695)		(3.763)		(3.701)
Year1993	0.991***	0.919	0.987***	0.763	0.991***	0.927	0.987***	0.804
	(0.202)	(3.069)	(0.202)	(2.992)	(0.202)	(3.071)	(0.202)	(2.998)
Year2000	1.813***	1.693	1.802***	1.519	1.814***	1.702	1.804***	1.564
	(0.155)	(3.204)	(0.159)	(3.125)	(0.155)	(3.206)	(0.159)	(3.131)
Year2010	3.048***	2.790	3.043***	2.619	3.048***	2.798	3.044***	2.664
	(0.152)	(3.277)	(0.153)	(3.192)	(0.152)	(3.279)	(0.153)	(3.198)
Observations	28	28	28	28	28	28	28	28
R^2	0.961	0.966	0.961	0.966	0.961	0.966	0.961	0.966
Adjusted R^2	0.955	0.956	0.955	0.956	0.955	0.956	0.955	0.956
Residual Std. Error	0.495 (df = 24)	0.487 (df = 22)	0.494 (df = 24)	0.485 (df = 22)	0.495 (df = 24)	0.487 (df = 22)	0.495 (df = 24)	0.486 (df = 22)
F Statistic	148.473*** (df = 4; 24)	102.748*** (df = 6; 22)	149.120*** (df = 4; 24)	103.604*** (df = 6; 22)	148.467*** (df = 4; 24)	102.720*** (df = 6; 22)	148.960*** (df = 4; 24)	103.410*** (df = 6; 22)

Note: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

All of the models showed the best fit with survey dummies, which proved to be significant in all the bivariate models and insignificant when controls are included.

5.3.4 Electricity

The preference of the younger group is on average consistently higher than the one of the older group, for all the sources used for electricity production, as demonstrated in table 5.5. The output is congruent to the preferences of the old if the coefficients of the preference variable show a negative correlation to the output. To model whether there is an association between preferences of the young and the response, after controlling for the variation in the different electricity items, the items are introduced as a random effect. Once the items are accounted for, the effect of preferences are negative, suggesting that the response is congruent with the preferences of the old. As demonstrated in table 5.9, the model estimates are larger than its associated error, meaning that the effect (with a negative effect of young-minus-old and young-minus-middle preferences) can be distinguished from zero. The effect is significant for the first three models. Model 1 to 4 displays the results of the models with random intercepts for each level of the random effects and a constant slope. The influence of items on the response is calculated by dividing the variance for items by the total variance. It shows that items explain 27.7 percent of the variance that is 'left over' after the variance explained by the preferences. This indicate that although items explain some variations, they do not explain a majority of the variation in outputs.

The subsequent four models introduce random slopes, where response is modelled as a function of the preferences. The effect of the young-minus-old variable is still negative and shows increased coefficients, still being different from zero. This pattern is also reflected in the models applying the young-minus-middle variable. In all models, the size of the explanatory variable increase when adding controls. This indicates that the effect was masked in the bivariate models by a variable that is now controlled for. The preference variables remain significant in all random slopes models. The GDP control (logged) shows a positive, weak effect, and manufacturing shows a negative, weak effect. They both remain insignificant. The bivariate models show lower values of the model diagnostics found in the lower part of the table, which suggests that these controls are perhaps not so powerful in these models. In neither case does the random slope models suggest a better fit of the data, compared to the random intercept models.

The overall effect of the comparatively best model for the main preference-variable 'young-minus-old' (model 1) is displayed in figure 5.8. A visualization of the comparatively best

random slope-model (model 5) is visualized in figure 5.9, and a plot comparing the random effects for the different electricity items are displayed in figure 5.10. Figure 5.7 shows the random coefficients and random intercepts for the items, based on the regression model in table 5.9. The estimates for some of the energy-items significantly differ from the fixed effect estimate. These stronger coefficients belong to the items regarding solar-, nuclear-, and biofuels sources. They indicate stronger congruence of preferences for the solar- and biofuels-sources, and lesser congruence for the nuclear source. This does not mean that the slope is positive for the two former items, but merely that their slope is less steep than the average slope, which is in concordance to the plot in figure 5.7. The steepest slope is for the nuclear item, while the least steep slopes, being almost parallel to a horizontal line, belongs to the solar- and biofuels-items. In sum, the results supports the expectation that output is congruent with the preferences of the older age group.

Table 5.9. Congruence with preferences of the young and electricity production

	Dependent variable:							
	% of electricity-source used							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	-1.285*	-1.667*			-1.743**	-2.053*		
	(0.703)	(0.995)			(0.872)	(1.116)		
Young minus middle			-2.445*	-3.044			-3.202*	-3.673*
			(1.422)	(1.971)			(1.728)	(2.191)
GDP log		0.007		0.008		0.009		0.010
		(0.011)		(0.011)		(0.010)		(0.010)
Manufacturing		-0.001		-0.001		-0.001		-0.001
		(0.003)		(0.003)		(0.003)		(0.003)
V-Dem		0.321		0.269		0.360		0.301
		(0.742)		(0.741)		(0.728)		(0.728)
Constant	0.180***	-0.253	0.178***	-0.243	0.196***	-0.311	0.190***	-0.304
	(0.040)	(0.676)	(0.041)	(0.680)	(0.055)	(0.664)	(0.055)	(0.668)
Observations	82	82	82	82	82	82	82	82
Log Likelihood	51.444	43.974	51.960	44.450	52.438	44.965	52.844	45.362
Akaike Inf. Crit.	-94.888	-73.947	-95.921	-74.901	-92.876	-71.930	-93.688	-72.723
Bayesian Inf. Crit.	-85.261	-57.100	-86.294	-58.054	-78.435	-50.270	-79.248	-51.063

*p<0.1; **p<0.05; ***p<0.01

Figure 5.8. Overall effect of average preference on sources for electricity production

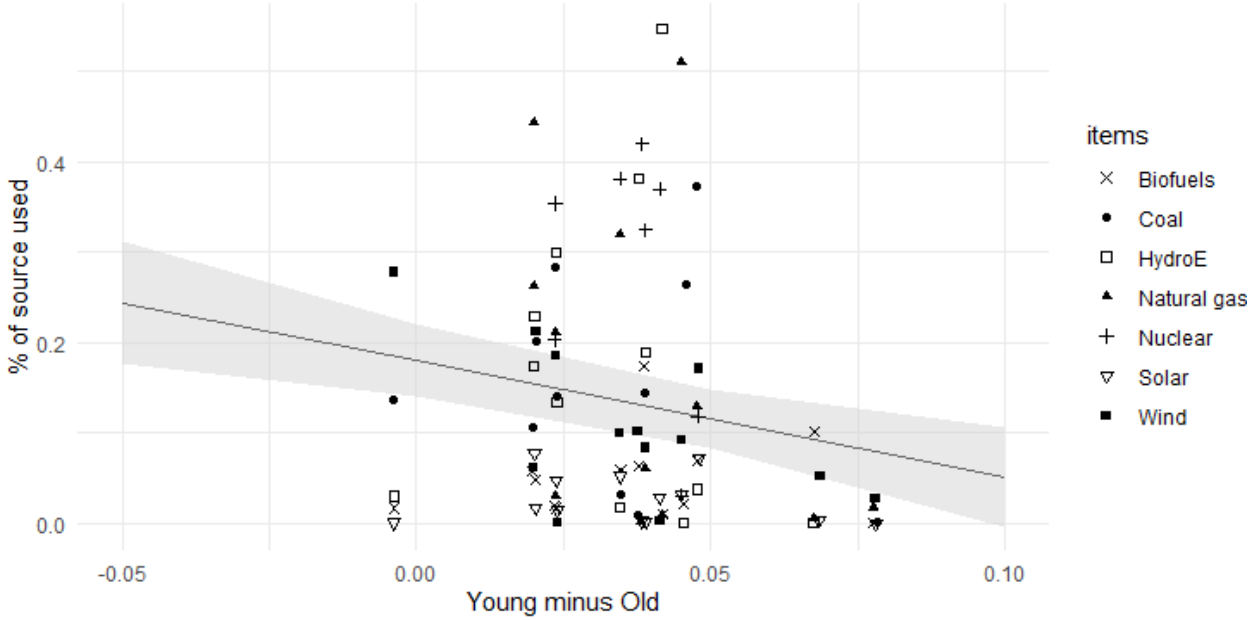


Figure 5.9. Random intercepts and slopes for congruence between preferences of young and sources for electricity production

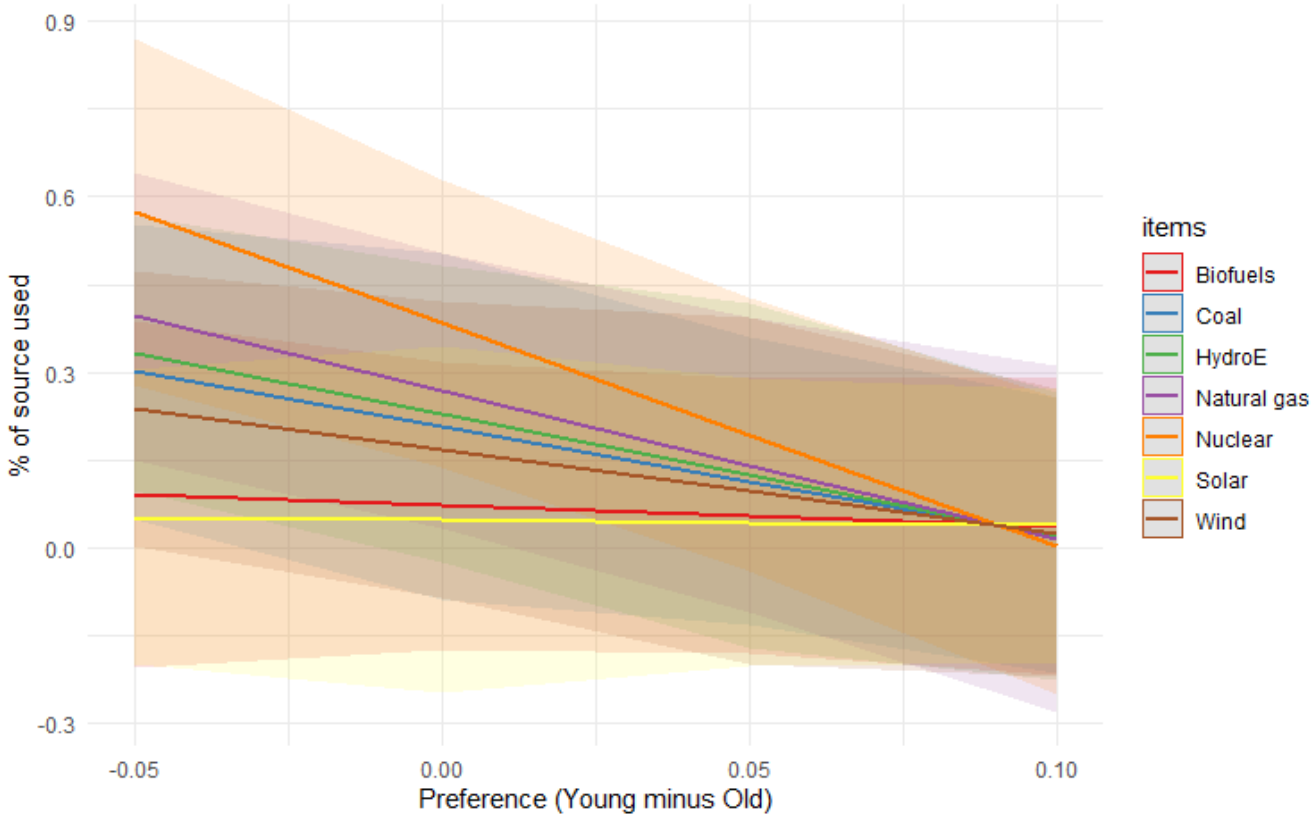
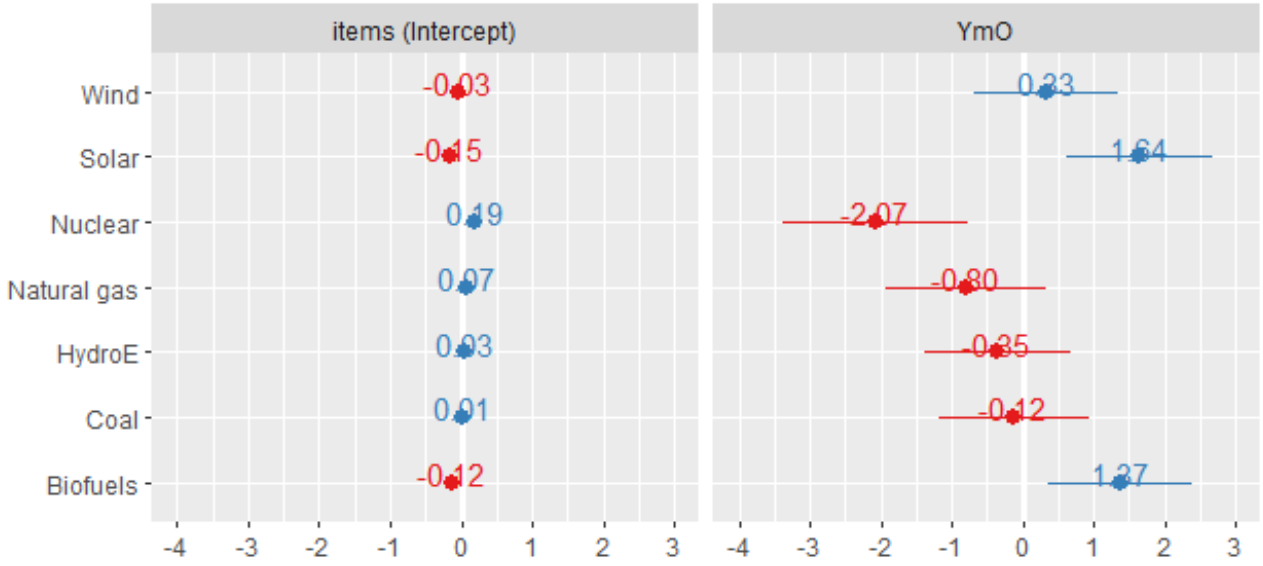


Figure 5.10. Plot of random intercepts and coefficients



5.4 Robustness tests

As stated earlier, all the models of unequal representation are repeated with an alternative divide of age groups (to see whether the results change when analyzing the 25 percent youngest and oldest, compared to the initial groups of the 20 percent youngest and oldest). Furthermore, an additional set of models will apply the initially divided groups, where the predicted preferences are controlled for other sociodemographic characteristics. Given missing values within some of the sociodemographic variables, the models with adjusted preferences have a somewhat smaller sample size but is nevertheless useful for the purpose of a robustness test of the results presented in this chapter. The models are presented in Appendix E.

The models using four age groups instead of five, show largely the same results in all models. Some coefficients are larger, and some diagnostic values are slightly smaller, indicating less explanatory power or a lesser degree of fit to the data. The models utilizing adjusted preferences for income, education and gender are also largely similar, with some notable changes. The direction of the variables remains the same for all preference variables, except for the young-minus-middle variable in the adjusted preference-model for pollution, which turned negative. As this is not the main variable of interest, it is not considered detrimental to the robustness of the results. Furthermore, the coefficients for the four-year change models in spending increase to almost double the size. Some controls with a weak effect, changed direction, but they are insignificant in both models. Diagnostics are similar, but the adjusted preference-model for pollution also had the most drastic change in adjusted r squared, which for the bivariate and multivariate two-year change models changed from 0.25, to approximately 0.60. This was only

valid for the young-minus-old variable and not the alternative with the young-minus-middle, which remained at 0.25. Regarding significance, some controls turn significant, and some outliers, survey wave fixed effects, and F-statistics become more or less significant. The adjusted preferences for the electricity issues lose significance, except for the preference variable in the bivariate random slopes model. Considering all this, the results did not show drastically different results and the main variables remained true to direction, which indicate robust results.

5.5 Descriptive representation

Lastly, I will assess the fourth and final hypothesis, which states that stronger presence of younger parliamentarians strengthens the representation of the preferences of the younger group compared to preferences of the older group, alleviating differential responsiveness. The expectation is that enhanced descriptive representation of 'youth', here meaning their presence in legislatures, is associated with an increase in the effect of preferences on response in climate policy. As mentioned, due to availability of data, the interaction is restricted to be tested for 66 of the country-year-items for the electricity issue[21]. A regression model where the preference-variable is interacted with the descriptive representation is constructed to test whether a higher level of youth descriptive representation displays stronger correlation of youth's preference to the response. Introducing random effects allows for an assessment of whether the interaction has different slopes for the different electricity-items. As presented in the theory chapter, the indicator for descriptive representation is the Youth Representation Index [YRI], measuring the share of youth in parliament in relation to the share of youth in the population. Here I have two alternative measures, one for those below 30 years (YRI 30) and one for those below 40 years (YRI 40).

The first and fourth model apply random intercepts, while the rest add random slopes for items as well. Models 3 and 6 include control variables, in order to see whether the effect of central variables are affected. The conclusions drawn from this table must be interpreted carefully, as the model includes many different components. When performing an analysis of variance, the random slopes models without controls show a significant increase of fit compared to the first, random intercept model. When comparing the models employing YRI 30 to YRI 40, the former shows a better fit of data. All models except the second and third, show too high

[21] Observations from Spain, Estonia, and Italy were removed due to missing data on parliamentarians for the relevant year (2016).

multicollinearity for the interaction-term (above 10), while models 2 and 3 do not show any VIF-score above 5.

The interaction term expresses the size and significance of the difference between the two variable-effects of young-minus-old and YRI. When considering the interaction term, one can see that it in the first three models are positive and insignificant. This implies that the difference between the effect of the preference-variable when the descriptive representation of those below 30 years is low and high, is approximately 4 to 7 scale units. Although the finding is not significant, the direction supports the expectation in the hypothesis. This is also true for the YRI 40 models, although the coefficients are smaller. The consistency of the direction of the interaction despite the absent significance and the large standard errors show some support for the hypothesized effect.

The first row reports the effect of the preference-variable when amongst others, the YRI variable is kept constant (at a low level). These coefficients are negative for all models, implying congruence with older preferences. In the first multivariate model (3), the effect of the preference variable decrease, implying that the multivariate model has controlled some of the effect caused by another variable. The opposite is the case for the sixth model, where the coefficient increase. This implies that the effect previously was masked by a variable that now is controlled for. The effect of the controls have a similar size and direction for both models. An increase in V-Dem score is positively associated with the output, while an increase in GDP (logged) is associated with a slight reduction of output. Some outliers which might influence the results are the observations of Norway in the item of hydroelectricity and that of Ireland regarding natural gas. In appendix F, the results of the models where these outliers are excluded are reported. They show that the preference variables all show positive coefficients, while the interaction terms are all negative. This suggests that the finding reported earlier may be biased, which decreases its robustness and reliability.

Table 5.10. Descriptive representation and congruence with preferences of the young

	Dependent variable:					
	% of electricity-source used					
	YRI 30			YRI 40		
	(1)	(2)	(3)	(4)	(5)	(6)
Young minus old	-1.201	-1.581	-1.470	-1.030	-1.777	-2.032
	(2.145)	(1.971)	(2.123)	(4.553)	(4.442)	(4.803)
YRI 30	-0.159	-0.258	-0.279			
	(0.294)	(0.272)	(0.278)			
GDP log			-0.008			-0.009
			(0.021)			(0.021)
V-Dem			0.447			0.409
			(0.941)			(1.094)
YmO:YRI30	4.111	6.848	6.760			
	(6.859)	(7.358)	(7.433)			
YRI 40				-0.102	-0.138	-0.172
				(0.254)	(0.237)	(0.251)
YmO:YRI40				1.801	2.696	3.378
				(7.543)	(6.939)	(7.354)
Constant	0.194**	0.209**	0.056	0.213	0.243	0.167
	(0.088)	(0.095)	(0.791)	(0.150)	(0.155)	(0.954)
Observations	66	66	66	66	66	66
Log Likelihood	22.759	31.594	29.574	22.765	26.370	24.547
Akaike Inf. Crit.	-33.518	-33.189	-25.149	-33.530	-22.740	-15.094
Bayesian Inf. Crit.	-20.380	-0.344	12.075	-20.392	10.105	22.130

*p<0.1; **p<0.05; ***p<0.01

Figure 5.11. Random effects of descriptive representation

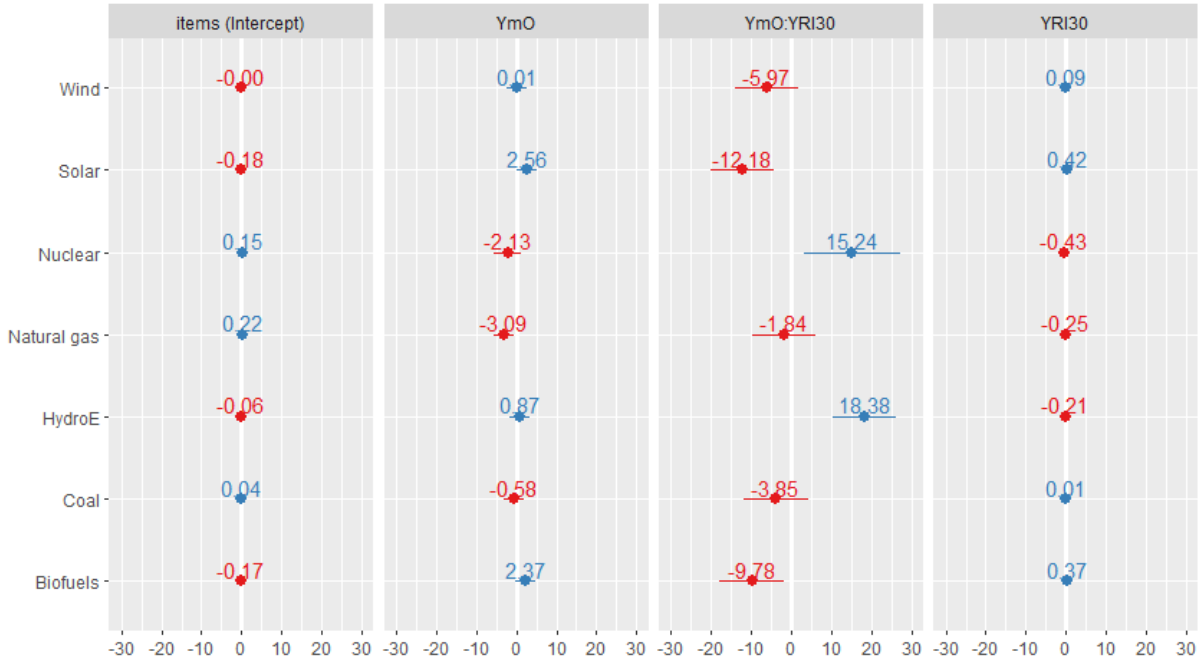


Figure 5.11 plots the random effects of the comparatively best 'random slope'-model (the second model in table 5.10). As one can see from the interaction term, the effect is significantly different for four items. The ones where the interaction term shows increased level of congruence (relative to the overall trend) is the nuclear and hydroelectric item (the latter may be a result of the outlier of Norway, which one can see in figure 5.3). The items indicating lesser congruence is solar power and biofuels.

Overall, I find partial support for the last hypothesis. The direction and effect is consistent for the models presented in this chapter, but this is not the case when to outliers are excluded. Therefore, the effect of descriptive representation is still uncertain.

5.6 Saliency of Issues

From the analyses above a very straightforward explanation for the pattern is that policy reflects the causal impact of average or a certain group's preference. However, there are a number of other factors that may account for a part of the association. One aspect that should be considered is the strength of preferences. What if one group feels more strongly about the opinions they do hold and holds opinions on a wider range of policy issues? A possible *indicator* of this pattern is the distribution of respondents who answer "don't know" (Gilens 2012, 88). Table 5.10 demonstrates the share of respondents answering 'don't know' for the different issues considered and the share within the sample and their age group.

From the first column one can see that the total share of respondents with missing values is largely below 10 percent, expect for the policy stringency for individuals, with approximately 15 percent, and pollution, with almost 60 percent. This suggests that the results for the pollution issue should be interpreted keeping in mind that a majority of respondents did not express an opinion. The predicted preferences for this issue are more uncertain as representative of the population. As one can see in the following columns, the shares of respondents from each age group are similarly high, the distribution is not too skewed for performing the analysis of unequal representation. Consistently throughout the table, the group with the largest share of respondents registered with 'don't know' is the older group, both as the share within that particular age group and as the share of the sample. The difference between the age groups vary, but the middle group is on average closer to the young. This suggests that there is no discernable difference between the strength of the opinions held by the young and the middle age group, and the distance to the older group is not drastically large. This assessment of saliency is not definitive but suggests that unequal representation cannot in large part be contributed to a tendency for one group to hold opinions or to feel more strongly about them, as the pattern for the groups are quite similar (Gilens 2012, 91).

Table 5.11. Proportion of respondents answering 'don't know' by issue and age groups

	Total	**Young**	**Middle**	**Old**
Pollution *% of group* *% of sample*	62 974 (of 106 729) 59%	12 365 (of 21 275) 58.12% 11.59%	12 329 (of 21 269) 57.97% 11.55%	13 139 (of 21 258) 61.81% 12.31%
Spending	2 727 (of 55 256) 4.94%	356 (of 11 015) 3.23% 0.64%	441 (of 11 006) 4.01% 0.80%	943 (of 10 999) 8.57% 1.71%
Business (*policy stringency*)	3 955 (of 45 374) 8.72%	785 (of 9 048) 8.68% 1.73%	641 (of 9 039) 7.09% 1.41%	1 079 (of 9 032) 11.95% 2.38%
Individual (*policy stringency*)	6 644 (of 45 374) 14.64%	1 423 (of 9 048) 15.73% 3.14%	1 179 (of 9 039) 13.04% 2.60%	1 521 (of 9 032) 16.84% 3.35%
Coal (*electricity*)	1 709 (of 24 782) 6.90%	328 (of 4 948) 6.63% 1.32%	271 (of 4 943) 5.48% 1.09%	525 (of 4 938) 10.63% 2.12%

Gas (*electricity*)	1 578 (of 24 782) 6.37%	274 (of 4 948) 5.54% 1.11%	236 (of 4 943) 4.77% 0.95%	525 (of 4 938) 10.63% 2.12%
Hydroelectricity *(electricity*)	924 (of 24 782) 3.73%	136 (of 4 948) 2.75% 0.55%	118 (of 4 943) 2.39% 0.48%	371 (of 4 938) 7.51% 1.50%
Nuclear (*electricity*)	1 404 (of 24 782) 5.67%	234 (of 4 948) 4.73% 0.94%	196 (of 4 943) 3.97% 0.79%	507 (of 4 938) 10.27% 2.05%
Sun (*electricity)*	582 (of 24 782) 2.35%	79 (of 4 948) 1.60% 0.32%	71 (of 4 943) 1.44% 0.29%	253 (of 4 938) 5.12% 1.02%
Wind *(electricity*)	682 (of 24 782) 2.75%	93 (of 4 948) 1.88% 0.38%	77 (of 4 943) 1.56% 0.31%	291 (of 4 938) 5.89% 1.17%
Bio *(electricity*)	2 064 (of 24 782) 8.33%	338 (of 4 948) 6.83% 1.36%	300 (of 4 943) 6.07% 1.21%	728 (of 4 938) 14.74% 2.94%

6. DISCUSSION AND CONCLUSION

In this thesis, I presented the concept of 'political inequality' and how it relates to (unequal) representation. In order to place my own research within the tradition, I gave a broad review of the field of representation, before going more in-depth on the more recent strand of research concerning unequal representation. Albeit many scholars within this tradition stated that there is a need for more research on unequal representation, few studies look beyond the rich-poor or gender cleavages in relation to social policy or spending in a comparative perspective. This was the departure for my research question: *To what extent does climate policy in advanced democracies respond equally to the preferences of people from different age groups?* I argue that policies aimed at mitigating climate change is a current, relevant, and unexplored field of policy, and that looking at age, as an independent factor and not merely a statistical control, is an interesting, new departure for the field of unequal representation. Climate change is a big challenge where insufficient action is concerning, especially for the young. After presenting the conceptual framework and the aim of the thesis, I introduced literature on climate policy and outlined arguments for why unequal representation can be related to age groups, with special attention toward one of the main explanations, descriptive representation. This resulted in a total of four hypotheses, which will be discussed in this chapter.

The purpose of the thesis is to examine whether climate policy systematically responds unequally to the preferences of the younger and older age groups. An additional test was whether higher levels of descriptive representation were associated with a lesser degree of unequal representation. The fourth chapter laid out the chosen research design to answer the research question, by explaining the different elements needed for the chosen approach of method for analysis. The strategy and criteria for collecting available data on preferences and policy outputs, their recoding, and the construction of a tailored dataset for the purpose of analysis are justified based on the available data and the challenges that had to be met, such as the impossibility of including both of the age groups' preferences in the same analysis. The chosen solution was to use the difference in preferences between old and young, which gives a more abstract, independent variable. In the discussion of the limitations and strengths of the data and research design, I emphasized that the interpretation of findings requires careful interpretation and that they should be considered as suggestive.

In this chapter, I will start out providing a final discussion of the findings presented in the previous chapter and their reliability and implication for the four hypotheses. Then I will return to the limitations of the thesis, before suggesting further avenues for research.

6.1 Does climate policy represent average preference of citizens?

The first hypothesis, which reflects the democratic norm and expectation, stated that 'climate policy is representative of the general public opinion'. Given the rising prominence, spread of information, and likelihood of conveyed preferences, I expected to see that the chain of representation functions as intended, where policy to a large extent follows average preference in advanced democracies (Lax and Phillips 2012, 148, 153). Overall, the models analyzing this association indicated mixed findings.

Concerning responsiveness, i.e., whether preferences for change are followed by a change in level of policy, the findings indicated irresponsiveness to average preference in the pollution models, where preferences does not appear to affect policy in either direction. The model with the highest explanatory power of the variation in change of pollution, shows that the effect of support is significant (and positive) for a two-year change in pollution, which is contrary to the expectation. For the spending issue, the effect is mostly negative, except for the multivariate model looking at a two-year change. This model, which is the only one indicative of responsiveness, is also the model with the highest explanatory power for the variation in the response and seems considerably better compared to the corresponding model with a four-year perspective. This may suggest that the models with two-year change in responses are more appropriate, as they show higher explanatory power, where four years may be too distant to the preferences. A concern regarding the reliability of the findings for the pollution-issue is the proportion of respondents registered with missing values, which is drastically higher compared to the other issues analyzed. This may have resulted in preferences which are less representative for the population.

The issues concerning congruence, i.e., whether a desired level of policy (output) is reflected by the actual level of policy (output), indicated that overall, policy stringency for businesses and the sources used for electricity production appear to be congruent with average preference. Regarding policy stringency for businesses, the effect of preferences decreases but remains positive when adding controls. This is not the case when looking at policy stringency for individuals, whose effect turns negative when adding controls. This is also the issue with the second highest number of respondents registered with missing values. For the electricity-issues, there seems to be congruence when controlling for the different electricity items considered. The different electricity-items indicated variation in effect by issue, where 'greener' items (solar power, wind, etc.) were less congruent. However, these variations are only suggestive.

Overall, the findings partly support the first hypothesis. The indication of irresponsiveness is somewhat uncertain, whereas the findings are suggestive of congruence with preferences. Due to little significance and low number of units, I abstain from drawing strong conclusions.

6.2 Do younger and older age groups show diverging preferences for climate policy?

The second hypothesis states that there is diverging preferences between younger and older age-groups in climate policy. As theory suggests there has been a parallel increase across age groups, I expected generally high levels of support for the policies. Younger generations were expected to show a larger share and higher levels of support, as they to a larger degree will experience the consequences of political action (Flynn et al. 2021; Lorenzini, Monsch, and Rosset 2021, 1). The t-test performed on the predicted preferences of the young and old showed that in a majority of the issues, this expectation is met, supporting the second hypothesis. The differences are significantly different for nine of the in total eleven issues. The exceptions are the issues concerning policy stringency, which showed very small differences. For the remaining issues, the difference were not necessarily very large or had the expected direction. For some issues, the preferences of the older group were more 'climate-friendly' than the younger group. An example is the question regarding pollution, where the mean of the older group is closer to the value indicating they 'agree that government should reduce pollution'.

Overall, climate seems to preoccupy all age groups in a similar way, which give support to the abovementioned argument of Lorenzini, Monsch, and Rosset (2021, 3). There is some variation across issues, with the least disagreement regarding the policy stringency issues, to a clearer disagreement on the issues concerning spending and pollution. Especially when considering climate, a majority of people may share the same position, but give different priority to that issue. It is therefore recommended to apply measures of concern that capture support for the climate as well as the cost of this action. This is for the same example (pollution) not the case, where the question asks respondents to indicate the degree of agreement to this statement: "Government should reduce environmental pollution, but it should not cost me any money". Thus, by looking at this issue one cannot know whether the old are willing to give up growth and some material well-being to promote climate change mitigation (Lorenzini, Monsch, and Rosset 2021, 7). The only issue where such a tradeoff is specified is for spending, where the statement asks: "Would you like to see more or less government spending in Environment? If you say "much more" it might require a tax increase". And for this issue, the young expressed a higher level of support, with the largest overall distance to the old's mean.

6.3 Does climate policy represent age groups' preferences equally?

The main focus of this thesis is whether the preferences of the young and the old (voice) are incorporated equally into political decisions (response), as political inequality can only be inferred from its outcome. The third hypothesis, which is directly related to the research question of this thesis, states that policy will tend to follow the preferences of older age groups more than the preferences of younger age groups. I anticipated that the output for the different issues would reflect older age groups' preferences to a greater extent, given the paradoxical nature of countries' performance in climate mitigation and the levels of public concern (Talbot 2016, 216). Youth generally place great weight on this issue and constitute the group not feeling represented politically across advanced democracies (Holmberg 2020, 424-428).

Surprisingly, for the responsiveness issues, the results did not indicate support for the expectation that change in pollution and spending tend to follow the preferences of the old. For the pollution issue, the effect is mostly negative and insignificant. For the spending issue, it was evident that youth on average want more spending than the old, and that the effect was mostly positive, indicating responsiveness towards the youth's preference. However, the model with the most explanatory power of the variation in spending is the only model where the effect of the difference is negative, which tends toward the older group's preference. Due to little significance of the main variables of interest and somewhat mixed findings, it is difficult to be certain of this conclusion. The support for the hypothesis is weakened by these findings.

When considering the congruence issues, the results show support for the hypothesis. For the policy stringency issues, the results indicate support for the expectation that government efforts to implement stringent climate policy are congruent with the preferences of the old when considering businesses and individuals, although the effects remain insignificant. The results for the electricity issue suggested that output is more congruent to preferences of the old, where the coefficients of the preference variable all are negative and significant.

Thus, the analyses of the preferences of 'young minus old' show mixed findings, which partially supports the third hypothesis. The congruence issues, policy stringency and electricity, indicate that the policy outputs tend toward the older group's preference, whereas the responsiveness issues, change in pollution and spending, indicate the opposite. Considering all this, one cannot conclude that there is a lack of representation of youth's preferences in climate policy, nor that older generations are over-represented by placing greater weight on e.g., economic growth over countering climate change. Talbot suggests that climate change might be a fundamentally undemocratic problem, which advanced democracies may be inadequate to meet (2016, 221).

Generally, assessing the connection between voice and response is complicated, since policies derive from many forces, not just citizen input (Verba 2006, 532). Additionally, there is a tension between representation and climate change, which might not point to a failure of democracy, but to nation-states. In relation to the conceptual framework by Dubrow (2014), *participation* may be unequal, where e.g., the tyranny of the majority fails to protect vulnerable minorities, which themselves often are marginalized. Considering *representation*, non-governmental, powerful interests groups block important legislation and policy that the public is willing to take. Climate change is a complex issue to tackle, mainly because of its objective urgency and threat, its future-oriented and international nature, and its call for expert rule rather than popular deliberation (Talbot 2016, 223, 225). "*Democratic states need to be responsive to their citizens and act according to states preferences, but with an extremely urgent issue such as climate change, we might wonder whether we can really afford to always act democratically*" (Talbot 2016, 225).

6.4 Does descriptive representation affect representation?

In the latest Human Development Report (2020), world leaders are urged to radically reduce the immense pressure exerted on the environment and the natural world, for which public support is argued to be essential (Kulin and Sevä 2019, 110; Conceição 2020). The lack of descriptive representation of youth is recognized as a problem in debates concerning the weak political response from lawmakers to mitigate climate change. It is also, in and of itself, a sign of political inequality (Sundström and Stockemer 2020, 1). The final hypothesis states that stronger presence of younger parliamentarians strengthens representation of the preferences of the younger compared to preferences of the older.

As the electricity issue showed incongruence to the preferences of the young, and there is data for the age of parliamentarians for most country-observations, the hypothesis were tested for this issue. For the sample, although young people (below 30 years) make up from about 16 to 22 percent of the population, their representation in parliament ranged from almost 10 to 56 percent relative to their proportion in the population. This demonstrate that this group is underrepresented in parliaments, which is theorized to possibly affect the underrepresentation of their preference (Kissau, Lutz, and Rosset 2012, 63-64) and their feeling of being represented (Ergas and York 2012, 965, 968). The findings showed support for the last hypothesis, but the robustness of this finding is uncertain. The direction and effect are consistent to the expectation, but these results may be influenced by some observations with more 'extreme' values, as were demonstrated by the alternative models.

6.5 Limitations of the thesis

A full discussion of whether there is (unequal) representation in climate policy might, goes beyond the scope of this thesis, but the thesis aimed to illustrate how the issues considered fit or contradict theoretical expectations about the relationship. A first limitation to this analysis, is that the hypotheses presented, even if they were supported or not by the findings, merely capture empirical regularities or pattern (correlations). The design employed is unfit to prove causality. In addition, although the issues presented account for various aspects of climate policy, a full account would include more aspects and should also consider policy that did not get implemented or even considered (Gilens 2012, 51). As policy is affected by many factors, the forth hurdle for reliably assessments may is perhaps not met in its totality, as some literature suggest the parties in government and the number of veto players matter for policy (Kellstedt and Whitten 2018, 66-69).

Another issue is that the preferences of the different age groups were similar. This prevented an analysis where both preferences could be included in the same model, due to multicollinearity. The resulting explanatory variable for the unequal representation analyses measured the difference between the groups' preferences, which is somewhat more abstract than preferences. If the preferences were more divergent, one has the opportunity to assess who gets what they want when there is conflict. Regarding the models and small samples, observations with large values tended to become influential outliers, and variables used for controls lacked data for some observations which resulted in an uneven number of observations within each issue and different outliers. This makes model comparison somewhat tricky. I tried to increase the robustness of the findings by changing the group size and controlling preferences predicted by age for other important characteristics.

There were many respondents excluded from the pollution-issue, due to the large number of people expressing 'don't know' for the preference-question. This is a problem for generalization of the findings, as the resulting sample (40 percent of the originally asked respondents) may not be representative for the population. Regarding generalization to advanced democracies generally, I check for outliers as one type of test which suggests that there may be general patterns. Of course, this may not be valid not necessarily beyond the country-set or the time period. The sample sizes for the analyses are relatively small, which makes it difficult to generalize.

6.6 Avenues for further research

Many studies have demonstrated that unequal representation is real, where some groups preferences are better represented in political outcomes and representative bodies. From this thesis, we cannot conclude that the former is the case for climate policy, although the data gathered for some of the observations support the argument from literature- that youth clearly is underrepresented in parliaments compared to its proportion of the population. A suggestion for future research is to find and analyze more data on preferences and climate policy. As climate policy will continue to be a topic in future surveys, it would be interesting to see whether a clearer divide on preferences by age exist and if it this is the case, who is represented when there is conflict. As emphasized by Lorenzini, Monsch, and Rossest, such preference formulations should include a weighting to material- and economic cost, in order to see the prioritization of this issue (2021, 7). The findings for the spending-issue, which included such a specification in the formulation, showed the expected direction, where youth prefer more than old. As mentioned, this was also the issue with the largest difference of preferences. In sum, this indicates that such relations may be even stronger when focusing on policy aspects where opinions diverge. Future research could apply cross-sectional time-series data in order to see the dynamics of this relationship.

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APPENDIX

A: Original variables and preference wordings

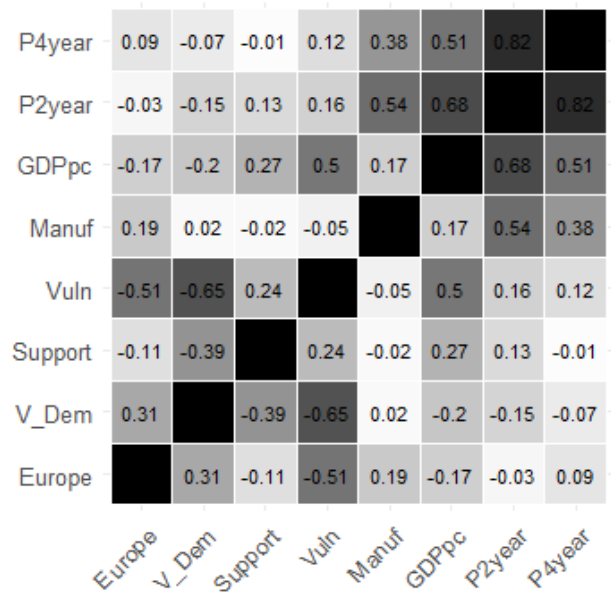
Data source	**Original variable**	**Preference wording**	**Original values**
ISSP Role of Government I II III IV V	 V82 V33 V25 V17 V13	Would you like to see more or less government spending in Environment? If you say "much more" it might require a tax increase.	1 (spend much more) 2 (spend more) 3 (same as now) 4 (spend less) 5 (spend much less)
WVS 2, 4, 5 EVS 2, 3	 B003 B003	Government should reduce environmental pollution, but it should not cost me any money	1 (strongly agree) 2 (agree) 3 (disagree) 4 (strongly disagree)
ISSP Environment I, II, III	 V54 V40 v46	If you had to choose, which one of the following would be closest to your views?	1. Government should let ordinary people/businesses decide for themselves how to protect the environment, even if it means they don't always do the right thing. 2. Government should pass laws to make ordinary people/businesses protect the environment, even if it interferes with people's rights to make their own decisions
ISSP Environment I, II, III	 V55 V41 v47		
ESS 8 ESS 8 ESS 8 ESS 8 ESS 8 ESS 8 ESS 8	elgcoal elgngas elghydr elgnuc elgsun elgwind elgbio	How much electricity in [country] should be generated from each energy source?	1. A very large amount 2. A large amount 3. A medium amount 4. A small amount 5. None at all

B: Country-year-items

Pollution		Policy Stringency (2 issues)		Spending		Electricity (7 items)		Descriptive Representation	
Australia	2005	Australia	1993	Czech Rep.	2006	Belgium	2016	Belgium	2016
Belgium	1999	Belgium	2010	Denmark	2006	Estonia	2016	Estonia	2016
Chile	2000	Czech Rep.	2010	Finland	2006	Finland	2016	Finland	2016
Chile	2006	Denmark	2000	Finland	2016	Germany	2016	Germany	2016
Denmark	1990	Denmark	2010	France	2006	Ireland	2016	Ireland	2016
Denmark	1999	Finland	2000	Germany	1996	Italy	2016	Italy	2016
Finland	1990	Finland	2010	Germany	2006	Netherlands	2016	Netherlands	2016
Finland	2000	France	2010	Germany	2016	Norway	2016	Norway	2016
Germany	1990	Germany	1993	Ireland	2006	Portugal	2016	Portugal	2016
Germany	1999	Germany	2000	Netherlands	2006	Slovenia	2016	Slovenia	2016
Germany	2006	Germany	2010	Norway	1996	Spain	2016		
Greece	1999	Ireland	2000	Norway	2006	Sweden	2016		
Ireland	1999	Japan	2000	Norway	2016	Switzerland	2016		
Japan	2000	Netherlands	1993	Poland	1996				
Netherlands	1990	Netherlands	2000	Poland	2006				
Netherlands	1999	Norway	1993	Portugal	2006				
New Zealand	2004	Norway	2000	Slovenia	2016				
Norway	1990	Norway	2010	Spain	1996				
Norway	2007	Poland	1993	Spain	2006				
Poland	1999	Portugal	2000	Spain	2016				
Poland	2005	Spain	1993	Sweden	1996				
Portugal	1990	Spain	2000	Sweden	2006				
Portugal	1999	Spain	2010	Sweden	2016				
Spain	1990	Sweden	2000	Switzerland	1996				
Spain	1999	Sweden	2010	Switzerland	2006				
Spain	2000	Switzerland	2010	Switzerland	2016				
Spain	2007	USA	2000						
Sweden	1990	USA	2010						
Sweden	1999								
Sweden	2006								
Switzerland	2007								
United States	1990								
United States	1999								
Total: Country-year	33	28		26		13		10	
Total: Country-year-items	33	56		26		85		66	

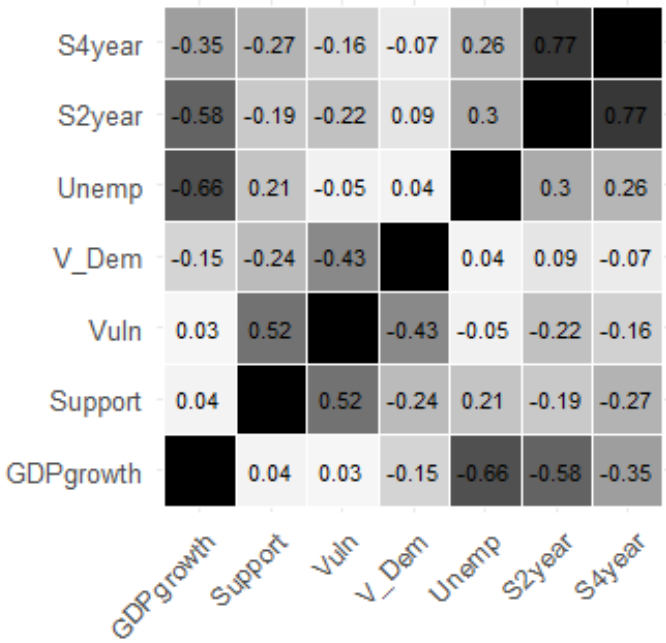
C: Correlation plots

Figure C1. Correlation plot for pollution



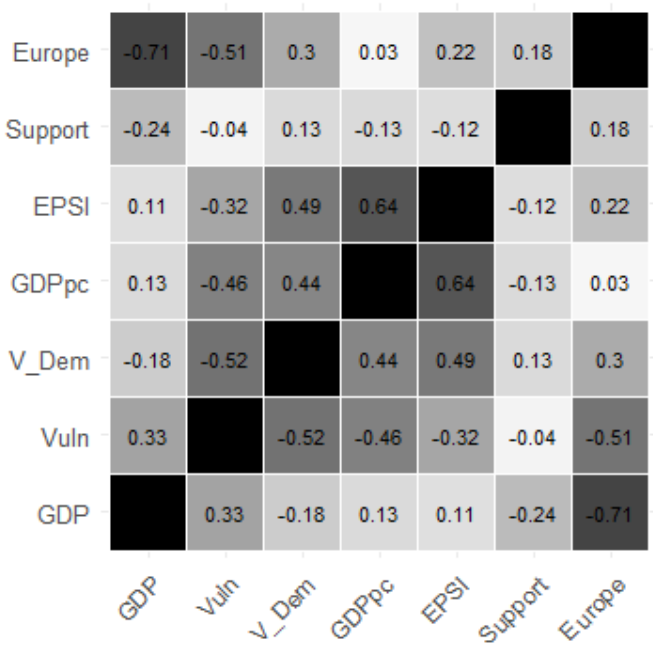
Note: Darker colors indicate higher correlation. The variables called "P2year" and "P4year" are the response-variables in these analyses.

Figure C2. Correlation plot for spending



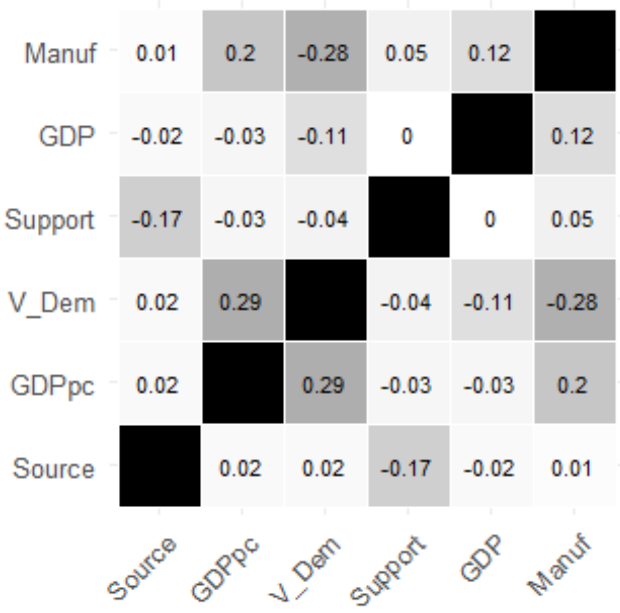
Note: Darker colors indicate higher correlation. The variables called "S2year" and "S4year" are the response-variables in these analyses.

Figure C3. Correlation plot for policy stringency



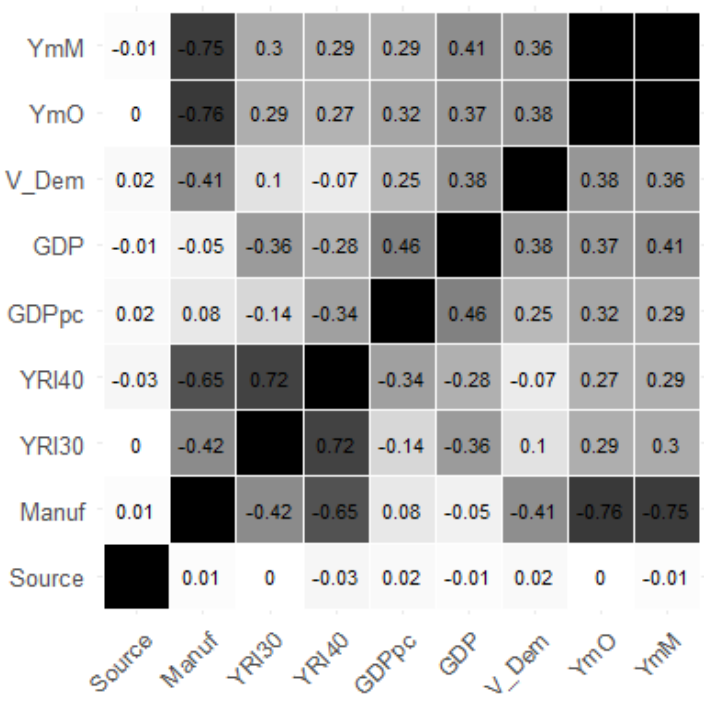
Note: Darker colors indicate higher correlation. The variable called "EPSI" is the response-variable in these analyses.

Figure C4. Correlation plot for electricity



Note: Darker colors indicate higher correlation. The variables called "Source" is the response-variable in these analyses.

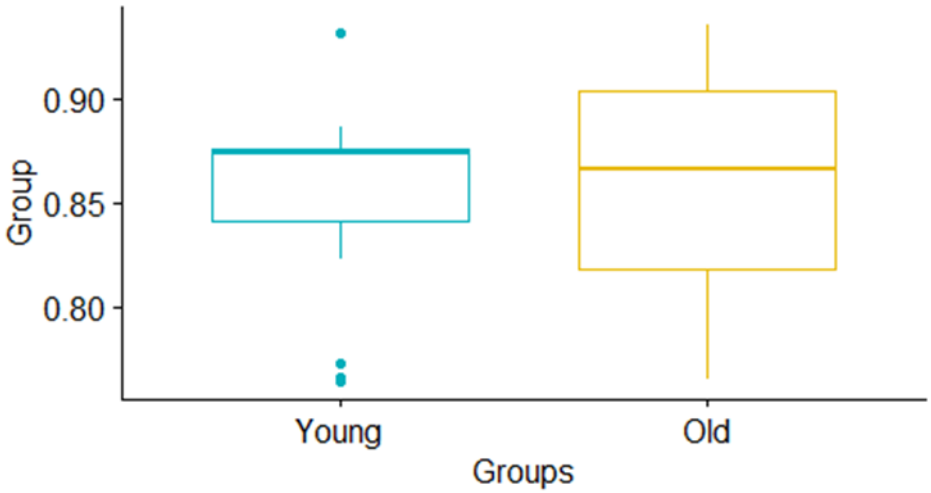
Figure C5. Correlation plot for ‘descriptive representation’ analyses



Note: Darker colors indicate higher correlation. The variables called “Source” is the response-variable in these analyses.

D: Outlier plot

Figure D. The differences in levels of support of policy stringency for businesses



E: Robustness models for unequal representation analyses

Table E1. Pollution (4 age groups)

	Dependent variable:							
	2-year-change in level of pollution				4-year-change in level of pollution			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	0.358	-0.802			-3.597	-2.794		
	(2.453)	(2.368)			(3.140)	(3.098)		
Young minus middle			1.029	-1.318			-6.598	-5.803
			(5.535)	(5.390)			(7.098)	(7.158)
Vulnerability		4.108		4.110		-9.598		-9.506
		(3.809)		(3.859)		(5.741)		(5.855)
Manufacturing		0.072**		0.073**		-0.017		-0.019
		(0.025)		(0.026)		(0.033)		(0.033)
Finland 2000	1.463**		1.471**					
	(0.660)		(0.660)					
Switzerland 2007	1.272*		1.275*					
	(0.674)		(0.674)					
New Zealand 2004	0.015		0.012					
	(0.555)		(0.555)					
Year 1990	-0.160		-0.155					
	(0.237)		(0.235)					
Year 1999	-0.047		-0.042			3.216		3.234
	(0.225)		(0.221)			(2.215)		(2.243)
Year 2000	-0.007		-0.008			4.094*		4.118*
	(0.321)		(0.319)			(2.258)		(2.280)
Year 2004						2.623		2.613
						(2.121)		(2.143)
Year 2005	0.0003		0.002			2.737		2.732
	(0.392)		(0.392)			(2.154)		(2.184)
Year 2006	-0.073		-0.064			2.804		2.816
	(0.384)		(0.386)			(2.164)		(2.198)
Year 2007	-1.433***		-1.430***			1.520		1.523
	(0.399)		(0.398)			(1.850)		(1.875)
Constant		-2.639*		-2.631*	-0.321		-0.280	
		(1.336)		(1.349)	(0.222)		(0.219)	
Observations	33	24	33	24	33	24	33	24
R^2	0.488	0.327	0.488	0.325	0.041	0.685	0.027	0.682
Adjusted R^2	0.265	0.226	0.266	0.224	0.010	0.495	-0.004	0.490
Residual Std. Error	0.550 (df = 23)	0.523 (df = 20)	0.550 (df = 23)	0.524 (df = 20)	0.834 (df = 31)	0.562 (df = 15)	0.840 (df = 31)	0.565 (df = 15)
F Statistic	2.191* (df = 10; 23)	3.239** (df = 3; 20)	2.193* (df = 10; 23)	3.211** (df = 3; 20)	1.313 (df = 1; 31)	3.619** (df = 9; 15)	0.864 (df = 1; 31)	3.567** (df = 9; 15)

*p<0.1; **p<0.05; ***p<0.01

Table E2. Spending (4 age groups)

	Dependent variable:							
	2-year-change in level of spending				4-year-change in level of spending			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	0.429	0.348			0.512	-0.573		
	(0.548)	(0.618)			(0.694)	(0.597)		
Young minus middle			0.738	0.633			0.879	-1.112
			(1.054)	(1.184)			(1.342)	(1.126)
GDP growth		-0.008		-0.008				
		(0.013)		(0.013)				
Unemployment						0.023		0.022
						(0.015)		(0.015)
Vulnerability		0.163		0.143		-0.093		-0.097
		(0.783)		(0.776)		(1.018)		(1.012)
Poland 1996	-0.351***	-0.332***	-0.355***	-0.333***		-0.422***		-0.420***
	(0.096)	(0.090)	(0.095)	(0.090)		(0.089)		(0.089)
Outlier*		0.181		0.182		-0.282***		-0.283***
		(0.116)		(0.117)		(0.090)		(0.090)
Norway 1996						0.294***		0.294***
						(0.093)		(0.093)
Year 1996					-0.198***		-0.193***	
					(0.065)		(0.063)	
Year 2006					-0.016		-0.011	
					(0.054)		(0.053)	
Year 2016					-0.017		-0.011	
					(0.061)		(0.060)	
Constant	-0.051	-0.090	-0.047	-0.081		0.073		0.072
	(0.039)	(0.263)	(0.037)	(0.259)		(0.335)		(0.332)
Observations	26	26	26	26	26	24	26	24
R^2	0.438	0.612	0.435	0.612	0.365	0.759	0.362	0.760
Adjusted R^2	0.389	0.515	0.386	0.515	0.250	0.675	0.246	0.675
Residual Std. Error	0.089 (df = 23)	0.079 (df = 20)	0.089 (df = 23)	0.079 (df = 20)	0.119 (df = 22)	0.081 (df = 17)	0.119 (df = 22)	0.081 (df = 17)
F Statistic	8.953*** (df = 2; 23)	6.316*** (df = 5; 20)	8.848*** (df = 2; 23)	6.300*** (df = 5; 20)	3.162** (df = 4; 22)	8.945*** (df = 6; 17)	3.117** (df = 4; 22)	8.979*** (df = 6; 17)

Note: *p<0.1; **p<0.05; ***p<0.01

**Outlier is for model 2 and 4, Ireland 2006, and for model 6 and 8, Norway 2006.*

Table E3. Policy stringency (4 age groups)

	Dependent variable:							
	European Policy Stringency Index							
	Business				Individuals			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	-1.408	-2.082			-1.451	-2.128		
	(3.464)	(4.053)			(3.465)	(4.051)		
Young minus middle			-3.519	-5.246			-3.665	-5.402
			(7.268)	(8.336)			(7.255)	(8.312)
GDP pc log		0.141		0.151		0.143		0.153
		(0.237)		(0.232)		(0.237)		(0.232)
Vulnerability		-4.144		-4.087		-4.127		-4.063
		(3.760)		(3.705)		(3.761)		(3.704)
Year 1993	0.990***	0.922	0.987***	0.803	0.990***	0.904	0.987***	0.775
	(0.202)	(3.072)	(0.202)	(3.009)	(0.202)	(3.071)	(0.202)	(3.006)
Year 2000	1.813***	1.697	1.805***	1.566	1.813***	1.678	1.804***	1.536
	(0.155)	(3.208)	(0.158)	(3.141)	(0.155)	(3.206)	(0.158)	(3.137)
Year 2010	3.048***	2.793	3.044***	2.664	3.048***	2.774	3.044***	2.634
	(0.152)	(3.281)	(0.153)	(3.210)	(0.152)	(3.279)	(0.153)	(3.205)
Observations	28	28	28	28	28	28	28	28
R^2	0.961	0.966	0.961	0.966	0.961	0.966	0.961	0.966
Adjusted R^2	0.955	0.956	0.955	0.956	0.955	0.956	0.955	0.956
Residual Std. Error	0.495 (df = 24)	0.487 (df = 22)	0.495 (df = 24)	0.486 (df = 22)	0.495 (df = 24)	0.487 (df = 22)	0.495 (df = 24)	0.486 (df = 22)
F Statistic	148.450*** (df = 4; 24)	102.728*** (df = 6; 22)	148.893*** (df = 4; 24)	103.360*** (df = 6; 22)	148.516*** (df = 4; 24)	102.786*** (df = 6; 22)	149.026*** (df = 4; 24)	103.485*** (df = 6; 22)

*p<0.1; **p<0.05; ***p<0.01

Table E4. Electricity sources (4 age groups)

	Dependent variable:							
	% of electricity-source used							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	-1.380*	-1.785*			-1.869**	-2.201*		
	(0.756)	(1.070)			(0.936)	(1.200)		
Young minus middle			-2.665*	-3.348			-3.501*	-4.048*
			(1.543)	(2.161)			(1.877)	(2.402)
GDP log		0.007		0.008		0.009		0.009
		(0.011)		(0.011)		(0.010)		(0.010)
Manufacturing		-0.001		-0.001		-0.001		-0.001
		(0.003)		(0.003)		(0.003)		(0.003)
V-Dem		0.321		0.282		0.363		0.319
		(0.743)		(0.745)		(0.729)		(0.731)

Constant	0.179***	-0.252	0.178***	-0.245	0.196***	-0.312	0.190***	-0.308
	(0.040)	(0.676)	(0.040)	(0.680)	(0.055)	(0.664)	(0.055)	(0.669)
Observations	82	82	82	82	82	82	82	82
Log Likelihood	51.512	44.034	52.055	44.550	52.497	45.019	52.943	45.460
Akaike Inf. Crit.	-95.023	-74.069	-96.110	-75.099	-92.995	-72.038	-93.887	-72.920
Bayesian Inf. Crit.	-85.396	-57.222	-86.483	-58.252	-78.554	-50.378	-79.447	-51.259

*p<0.1; **p<0.05; ***p<0.01

Table E5. Pollution (adjusted preferences)

	Dependent variable:							
	2-year-change in level of pollution				4-year-change in level of pollution			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	0.328	-0.702			-3.595	-2.798		
	(1.708)	(1.992)			(2.759)	(2.480)		
Young minus middle			-2.382	-3.651			-7.236	-7.538
			(3.327)	(3.948)			(5.556)	(4.711)
Vulnerability		3.823		3.459		-11.281*		-11.890**
		(3.986)		(3.913)		(5.692)		(5.490)
Manufacturing		0.072**		0.068**		-0.025		-0.032
		(0.027)		(0.026)		(0.034)		(0.034)
Finland 2000	1.450***		1.384***					
	(0.452)		(0.446)					
Switzerland 2007	1.299**		1.161**					
	(0.492)		(0.492)					
New Zealand 2004	0.018		0.103					
	(0.389)		(0.396)					
Year 1999	-0.039		-0.080			3.913*		4.328*
	(0.159)		(0.124)			(2.154)		(2.091)
Year 2000	-0.014		0.031			4.881**		5.346**
	(0.224)		(0.229)			(2.242)		(2.188)
Year 2004						3.257		3.728*
						(2.154)		(2.108)
Year 2005	0.002		-0.022			3.376		3.698*
	(0.278)		(0.270)			(2.139)		(2.071)
Year 2006	-0.083		-0.135			3.515		3.912*
	(0.251)		(0.224)			(2.084)		(2.021)
Year 2007	-1.459***		-1.357***			2.226		2.607
	(0.283)		(0.297)			(1.833)		(1.791)
Constant		-2.512*		-2.303	-0.359*		-0.230	
		(1.387)		(1.377)	(0.189)		(0.162)	
Observations	23	23	23	23	23	23	23	23
R^2	0.750	0.328	0.758	0.353	0.075	0.693	0.075	0.717
Adjusted R^2	0.590	0.222	0.603	0.251	0.031	0.496	0.031	0.535

Residual Std. Error	0.387 (df = 14)	0.536 (df = 19)	0.381 (df = 14)	0.526 (df = 19)	0.777 (df = 21)	0.572 (df = 14)	0.777 (df = 21)	0.549 (df = 14)
F Statistic	4.674*** (df = 9; 14)	3.095* (df = 3; 19)	4.885*** (df = 9; 14)	3.456** (df = 3; 19)	1.698 (df = 1; 21)	3.514** (df = 9; 14)	1.696 (df = 1; 21)	3.941** (df = 9; 14)

*p<0.1; **p<0.05; ***p<0.01

Table E6. Spending (adjusted preferences)

	Dependent variable:							
	2-year-change in level of spending				4-year-change in level of spending			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	0.490	0.122			0.234	-0.343		
	(0.538)	(0.592)			(0.714)	(0.589)		
Young minus middle			0.929	0.156			0.031	-0.660
			(1.105)	(1.177)			(1.506)	(1.212)
GDP growth		-0.014		-0.015				
		(0.014)		(0.013)				
Unemployment						0.019		0.018
						(0.016)		(0.016)
Vulnerability		-0.003		-0.032		0.119		0.147
		(0.800)		(0.789)		(1.031)		(1.023)
Poland 1996	-0.358***	-0.321***	-0.368***	-0.321***		-0.412***		-0.406***
	(0.094)	(0.094)	(0.093)	(0.096)		(0.090)		(0.090)
Outlier*		0.145		0.143		-0.280***		-0.275***
		(0.116)		(0.115)		(0.092)		(0.093)
Norway 1996						0.296***		0.293***
						(0.096)		(0.097)
Year 1996					-0.194**		-0.181**	
					(0.069)		(0.068)	
Year 2006					0.002		0.015	
					(0.054)		(0.046)	
Year 2016					0.001		0.014	
					(0.061)		(0.055)	
Constant	-0.054	-0.016	-0.046	-0.002		-0.007		-0.022
	(0.037)	(0.266)	(0.031)	(0.256)		(0.337)		(0.330)
Observations	25	25	25	25	25	23	25	23
R^2	0.443	0.620	0.440	0.619	0.350	0.759	0.347	0.759
Adjusted R^2	0.392	0.520	0.389	0.519	0.226	0.669	0.222	0.668
Residual Std. Error	0.090 (df = 22)	0.080 (df = 19)	0.090 (df = 22)	0.080 (df = 19)	0.122 (df = 21)	0.083 (df = 16)	0.122 (df = 21)	0.083 (df = 16)
F Statistic	8.743*** (df = 2; 22)	6.192*** (df = 5; 19)	8.638*** (df = 2; 22)	6.179*** (df = 5; 19)	2.829* (df = 4; 21)	8.412*** (df = 6; 16)	2.789* (df = 4; 21)	8.384*** (df = 6; 16)

Note: *p<0.1; **p<0.05; ***p<0.01

**Outlier is for model 2 and 4, Ireland 2006, and for model 6 and 8, Norway 2006.*

Table E7. Policy stringency (adjusted preferences)

	Dependent variable:							
	European Policy Stringency Index							
	Business				Individuals			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	-2.533	-1.998			-2.377	-1.934		
	(3.538)	(3.804)			(3.605)	(3.849)		
Young minus middle			-3.781	-2.398			-3.296	-2.170
			(5.765)	(6.032)			(6.020)	(6.218)
GDP pc log		0.085		0.065		0.083		0.061
		(0.233)		(0.226)		(0.233)		(0.226)
Vulnerability		-5.041		-5.238		-5.121		-5.358
		(4.101)		(4.084)		(4.074)		(4.040)
Year 1993	0.691**	1.552	0.660**	1.792	0.699**	1.604	0.670**	1.870
	(0.295)	(3.058)	(0.310)	(2.988)	(0.295)	(3.040)	(0.312)	(2.963)
Year 2000	1.794***	2.560	1.747***	2.804	1.797***	2.610	1.757***	2.884
	(0.160)	(3.184)	(0.199)	(3.117)	(0.160)	(3.169)	(0.203)	(3.093)
Year 2010	3.021***	3.664	2.970***	3.914	3.023***	3.714	2.984***	3.997
	(0.161)	(3.261)	(0.204)	(3.191)	(0.162)	(3.247)	(0.206)	(3.166)
Observations	25	25	25	25	25	25	25	25
R^2	0.964	0.968	0.964	0.968	0.964	0.968	0.963	0.968
Adjusted R^2	0.957	0.958	0.957	0.957	0.957	0.958	0.956	0.957
Residual Std. Error	0.503 (df = 21)	0.499 (df = 19)	0.504 (df = 21)	0.500 (df = 19)	0.504 (df = 21)	0.499 (df = 19)	0.506 (df = 21)	0.501 (df = 19)
F Statistic	139.810** (df = 4; 21)	95.344*** (df = 6; 19)	139.255*** (df = 4; 21)	94.743*** (df = 6; 19)	139.286*** (df = 4; 21)	95.225*** (df = 6; 19)	138.375*** (df = 4; 21)	94.557*** (df = 6; 19)

*p<0.1; **p<0.05; ***p<0.01

Table E8. Electricity (adjusted preferences)

	Dependent variable:							
	% of electricity-source used							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Young minus old	-1.077	-1.350			-1.554*	-1.749		
	(0.699)	(1.040)			(0.865)	(1.157)		
Young minus middle			-2.091	-2.488			-2.956*	-3.175
			(1.366)	(1.956)			(1.674)	(2.166)
GDP log		0.008		0.008		0.009		0.009
		(0.011)		(0.011)		(0.011)		(0.010)
Manufacturing		-0.001		-0.001		-0.0004		-0.0001

		(0.003)		(0.003)		(0.003)		(0.003)
V-Dem		0.256		0.208		0.302		0.238
		(0.768)		(0.754)		(0.754)		(0.741)
Constant	0.170***	-0.225	0.172***	-0.197	0.187***	-0.293	0.188***	-0.256
	(0.039)	(0.689)	(0.040)	(0.684)	(0.054)	(0.678)	(0.055)	(0.674)
Observations	82	82	82	82	82	82	82	82
Log Likelihood	50.966	43.466	51.620	44.064	51.844	44.368	52.457	44.933
Akaike Inf. Crit.	-93.932	-72.931	-95.239	-74.128	-91.688	-70.736	-92.914	-71.865
Bayesian Inf. Crit.	-84.305	-56.084	-85.613	-57.281	-77.248	-49.075	-78.473	-50.205

*p<0.1; **p<0.05; ***p<0.01

F: Alternative model for descriptive representation (without outliers)

	Dependent variable:					
	% of electricity-source used					
	YRI 30			YRI 40		
	(1)	(2)	(3)	(4)	(5)	(6)
Young minus old	1.534	1.842	1.666	3.833	4.297	3.804
	(1.767)	(1.701)	(1.890)	(3.666)	(3.655)	(3.954)
YRI 30	0.339	0.417	0.426			
	(0.240)	(0.268)	(0.290)			
GDP log			0.002			0.014
			(0.019)			(0.018)
V-Dem			0.352			0.051
			(0.876)			(0.930)
YmO:YRI30	-9.114	-11.182*	-11.301*			
	(5.666)	(5.892)	(6.230)			
YRI 40				0.296	0.344	0.381*
				(0.208)	(0.216)	(0.228)
YmO:YRI40				-8.297	-9.565	-9.542
				(6.052)	(6.201)	(6.529)
Constant	0.084	0.073	-0.259	0.007	-0.011	-0.441
	(0.073)	(0.066)	(0.733)	(0.125)	(0.119)	(0.807)
Observations	64	64	64	64	64	64
Log Likelihood	37.977	39.277	37.108	37.782	38.601	36.643
Akaike Inf. Crit.	-63.955	-48.553	-40.215	-63.563	-47.202	-39.286
Bayesian Inf. Crit.	-51.002	-16.170	-3.514	-50.610	-14.819	-2.585

Note: *p<0.1; **p<0.05; ***p<0.01

Model 1 and 4 are models with random intercept for electricity-items, while the rest of the models also has random slopes for the interaction-term. The models have high multicollinearity. The outliers deleted are Norway-2016-hydroelectricity and Ireland-2016-natural gas.