

Public attitudes toward climate change and climate policies: the role of political values and institutional contexts

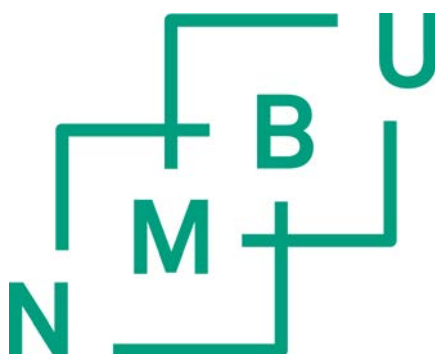
Holdninger til klimaendringer og klimapolitikk: betydningen av politisk verdiorientering og institusjonell kontekst.

Philosophiae Doctor (PhD) Thesis

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Table of contents

Summary iii

Sammendrag v

1. The public and its climate change problem 1

 1.1. The objectives of the thesis 1

 1.2. Research questions underlying the thesis 2

 1.3. The structure of the thesis..... 4

2. Theory and previous research..... 5

 2.1. Definitions of concepts applied in the analyses 5

 2.1.1 Political values..... 5

 2.1.2 Climate concern and attitudes toward policies 6

 2.1.3 Institutions 8

 2.2. Political values, climate concern, and attitudes toward climate policies 9

 2.2.1 Theorizing the relationship between political values and attitudes 9

 2.2.2 Political values and climate concern..... 10

 2.2.3 The importance of political values and climate concern for attitudes toward climate policies..... 12

 2.2.4 Knowledge gaps..... 13

 2.3. Institutions, rationalities, and attitudes toward climate policies..... 13

 2.3.1 The theory of institutions as rationality contexts..... 14

 2.3.2 Explicitly defined and informationally induced institutional contexts..... 16

 2.3.3 Studies on how varying the institutional context affects attitudes toward climate policies..... 17

 2.3.4 Knowledge gaps..... 19

3. The studies..... 20

 3.1. Methodological approach 20

 3.2. The papers and the methods applied 21

 3.2.1 Data and methods in papers I and II 21

 3.2.2 Findings in paper I..... 24

 3.2.3 Findings in paper II..... 25

 3.2.4 Data and methods in papers III and IV 25

 3.2.5 Findings in paper III 29

 3.2.6 Findings in paper IV 30

 3.3. How the papers relate to each other 31

4. Studying political values, institutions and attitudes..... 33

 4.1. Mixed methods and empirical insights..... 33

 4.2. When do institutional contexts affect attitudes?..... 35

5. Conclusion..... 38

 5.1. General findings 38

 5.2. Implications for research 39

References 41

Compilation of the four articles

Paper I

Aasen, Marianne, 2015. The polarization of climate concern in the Norwegian public. *Journal of Climate Policy*, published online: doi:10.1080/14693062.2015.1094727.

Paper II

Aasen, Marianne and Dokken, Therese, 2016. Acceptance of energy taxes across political divides? The importance of climate concern. Under review in *Ecological Economics*

Paper III

Aasen, Marianne and Vatn, Arild, 2016. Public attitudes toward climate policies: The effect of institutional contexts and political values. Under review in *Ecological Economics*

Paper IV

Aasen, Marianne and Vatn, Arild. The influence of institutional context and political value orientation on public attitudes toward climate policies: A mixed-methods study. *Manuscript ready for submission*.

Summary

For societies to create mitigation policies that achieve sufficient support for cutting greenhouse gas emissions, a better understanding of people's positions on climate change and climate policies is necessary. This thesis concentrates on two parts of this broader topic. Its two objectives are 1) to increase knowledge about the relationships between individuals' political value orientation, climate concern and attitudes toward climate policies, and 2) to provide insights into how institutional context may influence the relationships between political value orientation and attitudes toward climate policies.

Applying a weak constructivist perspective, the thesis combines insights from institutional theory, social psychology and theories regarding public attitudes and values. Institutional context refers to the conventions, norms and legal rules that influence which kind of rationality dominates in a situation (i.e., individual rationality (IR) or social rationality (SR)). "Political value orientation" refers in this thesis to people's positions on state involvement and regulation (the less supportive, the more individualist the orientation). Importantly, the same institutional context may influence individuals differently, depending on, for example, what values they hold. The thesis focuses both on individuals' political values and institutional context and on how these factors interact. It consists of four separate, but interrelated empirical studies, and applies a mixed-methods approach.

Using existing time-series data about the Norwegian population's climate concern, the first study explores the correlation between political values and climate concern over time. It identifies differences in climate concern depending on political value orientation. Regression analyses of data from the period 2003–2011 find that non-individualists are more concerned about climate change than individualists are. They also reveal a slight polarization in climate concern between political value groups toward the end of the period. However, the relatively higher levels of climate concern found in Norway in 2007 also apply to individualists.

The second study uses the same data source to investigate whether climate concern correlates with support for an increase in energy prices in groups holding different political values. Results from regressions of all sample years indicate that the more climate-concerned, the more positive toward an increase in energy prices, independent of political value orientation.

The third study explores the role of institutional contexts for attitudes toward policies aimed at reducing private car use, by analyzing quantitative data produced from a survey

experiment. Two groups of respondents received different texts about car emissions, and a control group received no such text. One text emphasized the individual health gain from reducing local air pollution (IR context), and the other emphasized effects of climate change in poor countries (SR context). Data was analyzed distinguishing between respondents with different political value orientations. The results from the survey experiment identify that institutional contexts' effects on attitudes depend on political value orientation. The SR context yielded higher support for an increase in petrol prices, but among non-individualists only, the group that was more positive. Hence, the SR context increased the differences in attitudes between the value groups. The IR context yielded higher support in both value orientation groups for a policy that reduces space for cars, but that support increased more in the group that was initially more negative (the individualists). The IR context decreased the differences in attitudes toward policies between the value groups.

In the fourth study, analyses of qualitative data obtained from semi-structured interviews offered insights into how such institutional contexts influence attitudes. We conducted thirty in-depth qualitative in-person interviews with equal representation from each value orientation group. The study shows how individuals may switch between individual and social rationalities depending on the institutional context. Moreover, it illustrates how individuals' identities are important for their interpretations of the contexts and for the contexts' influences on attitudes toward policies.

In conclusion, the thesis shows how better insights regarding the interactions between identity and institutional context can improve our understanding of public attitudes toward climate change and climate policies. It also offers insights regarding how societies, through changing the contexts under which people act, may influence people to be either more self-regarding or more other-regarding. This insight is important for climate policy, as climate change presently is one of our most challenging collective-choice problems.

Sammendrag

For å nå målet om å skape et lavutslippssamfunn og begrense klimaendringene trengs en bedre forståelse av folks syn på klimaendringer og klimapolitikk.

Denne avhandlingen fokuserer på to sider av dette emnet. Avhandlingens to mål er 1) å øke kunnskapen om forholdet mellom politisk verdiorientering, holdninger til klimaendringer og holdninger til klimapolitikk, og 2) bidra til innsikt i hvordan institusjonell kontekst kan påvirke forholdet mellom politisk verdiorientering og holdninger til klimapolitikk.

Avhandlingen anvender et «svakt» konstruktivistisk perspektiv, og kombinerer innsikter fra institusjonell teori og sosialpsykologi. Et sentralt begrep i institusjonell teori er «institusjonell kontekst», som refererer til konvensjoner, normer og juridiske regler som påvirker hvilken type rasjonalitet som dominerer i ulike situasjoner. Her skilles det mellom individuell rasjonalitet (IR) eller sosial rasjonalitet (SR). Videre refererer «politisk verdiorientering» til synet på statlig involvering og regulering – jo mindre positiv til statlig involvering og regulering, dess mer individualistisk er orienteringen. Samme institusjonelle kontekst kan påvirke individer forskjellig, avhengig av for eksempel hvilke verdier de har. Avhandlingen fokuserer både på enkeltpersoners politiske verdier og institusjonell kontekst og hvordan disse faktorene samvirker. Den består av fire empiriske studier, og både kvantitative og kvalitative data er analysert.

I den første studien undersøkes sammenhengen mellom politisk verdiorientering og klimabekymring over tid. Eksisterende tidsseriedata av den norske befolkningen ble analysert. Studien identifiserer forskjeller i klimabekymring i grupper med ulik politisk orientering. Analyser av data fra perioden 2003-2011 viser at ikke-individualister er mer opptatt av klimaendringer enn individualister. Studien finner også en viss polarisering vedrørende klimabekymring mellom grupper av ulik politisk verdiorientering, dvs. at forskjellen mellom dem øker over tid. Imidlertid følger begge grupper samme trend i klimabekymring, med en topp i 2007.

Den andre studien bruker den samme datakilden til å undersøke om klimabekymring korrelerer med støtte for en økning i energipriser i grupper med ulike politiske verdier. Regresjonsanalyser av data fra hvert år indikerer at jo mer klimabekymrede folk er, jo mer positive er de til en økning i energiprisene, uavhengig av politisk verdiorientering.

Den tredje studien utforsker betydningen av institusjonelle kontekster for holdninger til virkemidler for å redusere privat bilbruk. Dette gjøres ved å analysere kvantitative data

produsert fra et eksperiment lagt til en spørreundersøkelse. To grupper av respondenter mottok forskjellige tekster om bilutslipp, og en kontrollgruppe mottok ingen slik tekst. Den ene teksten handlet om individuelle helsegevinster ved å redusere lokal luftforurensning (IR-kontekst), og den andre handlet om effekter av klimaendringer i fattige land (SR-kontekst). Effektene av kontekstene i grupper med ulik politisk verdiorientering ble analysert. Studien viser at effekten av institusjonell kontekst på holdninger varierer med politisk verdiorientering. SR-konteksten ga høyere støtte til økt bensinpris, men kun blant ikke-individualister. Derfor økte SR-konteksten forskjellene i holdninger mellom verdigruppene. IR-konteksten ga høyere støtte i begge verdiorienteringsgruppene for virkemidler som reduserer plass til biler. Støtten økte mer i gruppen som i utgangspunktet var mer negativ (individualistene). IR-konteksten reduserte forskjellene i holdninger til politikk mellom verdigruppene.

I den fjerde studien analyseres kvalitative data innhentet gjennom semi-strukturerte intervjuer. Denne studien gir innsikt i hvordan slike institusjonelle kontekster påvirker holdninger. Vi gjennomførte tretti kvalitative, individuelle dybdeintervjuer av respondenter i begge verdigrupper. Studien viser hvordan enkeltpersoner kan bytte mellom individuell og sosial rasjonalitet avhengig av den institusjonelle konteksten. Studien illustrerer også hvordan enkeltpersoners identiteter er viktige for deres tolkning av kontekster og for kontekstenes betydning for holdninger til politikk.

Mer overordnet viser avhandlingen at innsikt i samspillet mellom identitet og institusjonell kontekst kan forbedre vår forståelse av folks holdninger til klimaendringer og klimapolitikk. Avhandlingen gir også innsikt i hvordan vi som samfunn, gjennom å endre kontekster mennesker opptrer i, kan påvirke om vi anvender en jeg-logikk eller en vi-logikk. Denne innsikten er viktig for klimapolitikken, siden klimaproblemet er et av de mest utfordrende sosiale koordineringsproblemene i vår tid.

1. The public and its climate change problem

1.1. The objectives of the thesis

Climate change is a major public policy issue, with related impacts likely to be extensive and potentially devastating. It is widely known that avoiding dangerous climate change will require significant societal changes to ensure necessary mitigation (IPCC, 2013, 2014). However, global emissions are increasing (Le Quéré et al., 2015), and individuals do little to reduce their own emissions. Anthropogenic climate change is a social dilemma characterized by serious coordination problems (Giddens, 1990; Wolf and Moser, 2011). This may explain individual non-action. Individuals' acts typically have limited consequences; effects on emissions follow from the sum of these acts (Dawes, 1980). This characteristic of the climate change problem demonstrates the necessity of political action to coordinate behavior.

Policies may coordinate action on a local or national level, and may ensure that burdens of pro-environment behavior are widely shared. However, gains from avoiding climate change are global, and furthermore distant in time. Hence, agreeing with local or national policies that involve some individual costs, for the sake of mitigating climate change, also represents a social dilemma, and may explain individuals' lack of support for climate policies.

Understanding public attitudes toward climate change and policies is important for several reasons. One reason is that public attitudes are crucial in determining policy change in democratic countries (Page and Shapiro, 1983; Burstein, 2003). Lack of broad public support is a major barrier to realizing a transition to a low-carbon economy (Wiseman et al., 2013). In the field of environmental policy, and climate policy in particular, governments often ground their reluctance to introduce climate policies in their perceived lack of public support for such policies (Höppner and Whitmarsh, 2010; Pietsch and McAllister, 2010). Another reason why insight into public attitudes toward policies is important is that attitudes may also influence the behavioral effect of the policy (Heller and Vatn, 2017). For instance, energy price elasticity may depend on the reason for the price change (Ghalwash, 2007). Past energy efficiency interventions indicate that responses to price changes can vary by a factor of 10, depending on the non-financial aspects of policy implementation (Stern, 1986).

To create mitigation policies that achieve sufficient support for cutting greenhouse gas emissions, a better understanding of public attitudes toward climate change and policies is

necessary. This thesis concentrates on two parts of this broader topic; hence, the main objectives of the thesis are two:

- To increase knowledge about the relationships between individuals' political value orientation, climate concern and attitudes toward climate policies.
- To provide insights into how institutional context may influence the relationships between political value orientation and attitudes toward climate policies.

In this thesis, the term “attitude” refers to an evaluation of a specific entity, or of an attitude object (Eagly and Chaiken, 1998). “Political value orientation” refers to positions on state involvement and regulation (Karlsen and Aardal, 2016). “Policy” refers to instruments or techniques (e.g., regulations, taxation or voluntary agreements) to attain policy goals (Hall, 1993).¹ “Institutional context” refers to the conventions, norms and legal rules that influence which kind of motivation dominates in a situation (Hodgson, 2007). Importantly, the same institutional context may influence individuals differently, depending on, for example, what values they hold (Weber et al., 2004). Hence, this thesis will focus on both institutional context and individuals' political values and on how these factors interact.

1.2. Research questions underlying the thesis

The dissertation consists of four empirical studies, presented in four papers, conducted to meet one or both of the above-defined objectives. Several authors (e.g., McCright et al., 2016; Tjernström and Tietenberg, 2008) have identified that political value orientation correlates with attitudes toward climate concern, but we know little about how this correlation develops in periods with varying levels of public concern. The first paper, entitled “The polarization of climate concern among the Norwegian public,” explores the correlation between political values and general climate concern over time. Specifically, it analyzes time-series data of the Norwegian population's climate concern and value orientation, to answer the following research questions:

1. To what extent do subgroups of people with different value orientations differ in their concern about climate change?

¹ Policy is often referred to as the sum of three sub-elements: the overall goals that guide policy interventions; the instruments or techniques by which these policy goals are attained and the calibration of these instruments (e.g., the level at which an emission standard or tax is set, and the period in which it applies, etc.). See for instance Hall (1993). This thesis refers to the second sub-element.

2. Have the subgroups of people with different value orientations become more or less polarized in their concern about climate change over time?

Climate concern does not necessarily transform into acceptance of mitigation policies. Conversely, skepticism about climate change does not necessarily prevent acceptance of policies (Zavestoski, 2002). It might be that attitudes toward policies are more dependent on peoples' political values than on their climate concern. I study this issue in paper II entitled "Acceptance across political divides? The relative importance of political values and climate concern for attitudes toward energy taxes." I analyze time-series data to answer the third research question of the thesis:

3. Does concern about climate change correlate with support for energy taxes in groups with different political value orientations?

Given that individuals often have quite stable political value orientations (Zaller, 1991; Aardal, 2011), it might be that it is easier for societies to change institutional contexts than to change the predominating set of values. Changes of institutional contexts may influence attitudes toward climate policies. One way societies could solve social dilemmas would therefore be to create institutional contexts where supporting a climate policy is emphasized as, for example, "the right thing to do" (March and Olsen, 1989). In paper III, entitled "Public attitudes toward climate policies: The effect of institutional contexts and political values," we investigate the effects of different institutional contexts on attitudes toward policies aimed at reducing emissions from cars. We also investigate whether these effects vary between different value groups, since people may perceive and evaluate contexts differently depending on their value orientations (Weber et al., 2004). In that paper we address the fourth and fifth research questions by analyzing results from a survey experiment:

4. Does institutional context affect attitudes toward policies to cut car emissions?
5. Does institutional context affect attitudes toward policies to cut car emissions differently among people with different political value orientations?

In the fourth paper, we investigate in what way institutional contexts influence attitudes toward climate policies. Several mechanisms may be at work and may affect attitudes. In that study, we analyze how respondents perceive and evaluate such institutional contexts, aiming at enhancing our understanding of the interplay between individuals' value orientation and institutional contexts. Paper IV is entitled "The influence of institutional context and political

value orientation on public attitudes toward climate policies: A mixed-methods study.” In addition to responding to the fifth research question (see above), we also address the sixth and final research question of the thesis in that paper by analyzing both survey experiment data and data from qualitative interviews:

6. How does institutional context influence attitudes toward policies to cut car emissions?

1.3. The structure of the thesis

The thesis consists of the four papers and this introductory chapter. The remainder of this introductory chapter is organized as follows: In the next section, I provide an overview of theoretical concepts and previous research that the studies build on. In section 3, I turn to reflections on the methods used, followed by presentations of the papers. In section 4, I discuss two issues identified through this thesis work. The first regards empirical insights gained in this thesis from mixing methods as compared to applying one method alone. The second issue concerns the complex dynamics between individual characteristics and institutional context, and the importance of understanding these dynamics for understanding attitudes. Section 5, the concluding section, discusses the implications from the answers to the two general objectives of the thesis.

2. Theory and previous research

I mainly draw on two theoretical traditions: the social psychology theory on public attitudes and values (e.g., Schwartz, 1992; Stern, 2000) and institutional theory (Hodgson, 1988, 2007; Vatn, 2015). The study of public attitudes toward climate change and policy is a cross-disciplinary research field, with contributions from political science, sociology, human geography and psychology (Pidgeon, 2012). I also draw on the theoretical, conceptual, and analytical insights from scholarship in this field of climate research. Common for all the theories I have used in the thesis is the underlying ontological perspective that individuals both constitute and are constituted by social systems (Berger and Luckmann, 1967). I moreover take a critical realist position, while the thesis work also rests on an understanding of social science that builds on a weak or moderate form of constructivism, emphasizing agency, but formed within structures (Elder-Vass, 2007). Critical realism places itself between law-seeking (nomothetic) social science, and an interpretative approach, associated with constructivism (Sayer, 2000).

2.1. Definitions of concepts applied in the analyses

Before outlining the theoretical and empirical work on the relationship between the concepts of political value orientation, attitudes and institutional contexts, I will briefly present the definitions I have applied in this thesis.

2.1.1 Political values

The concept of values is not clearly and consistently defined across the literature. Dietz and Stern (1995) write that one reason for this may be grounded in the very nature of values. One challenge is that values can only be postulated or inferred, because they are not visible or measurable directly. There is no empirically grounded theory of values, which stimulates efforts to distinguish values from closely-related concepts like attitudes, beliefs and opinions. The common notion, however, is that values are somehow more basic or more existential than these related concepts.² I apply Schwartz's (1994, 21) definition of values: "desirable trans-

² The literature that studies values and related concepts reveals a terminological jungle (see Rohan (2000) for a summary and discussion of applications and definitions). Worldviews and political value orientation or ideology are often used interchangeably. It is, however, common to think that ideologies, values and attitudes differ in abstraction (Rohan, 2000). People can possess attitudes toward concrete objects, whereas values focus on ideals, and ideologies subsume sets of values and attitudes. Worldviews are general beliefs about how the world is, in contrast to values, which are normative ideals.

situational goals varying in importance, which serve as guiding principles in the life of a person.”

Although they are also studied at the individual level, the values an individual holds are in social science understood to be a result of socialization and to be formed by an individual’s “cultural/institutional history” (Berger and Luckmann, 1967; Vatn, 2015). The most important phase of socialization and formation of an individual’s values occurs early in life. Yet, individuals’ values may change over time because of different life stages or particular events, etc. Nonetheless, values are commonly considered more resistant to change than, for instance, attitudes, and are considered to be the foundation of a person’s system of attitudes and beliefs (Hogg and Vaughan, 2011). Values are generally seen as central for individuals’ evaluations of actions and choices – they offer direction in life.

Rokeach (1973) argues that we can classify values in domains or spheres. Accordingly, political values can be defined as the category of values that pertain to the political sphere. Core political values are normative principles about government, citizenship and society that individuals would like to see implemented in the political system (McCann, 1997; Knutsen and Kumlin, 2005). Thus, political values can be seen as perceptions of a desirable order, and as determining “whether a political situation or a political event is experienced as favorable or unfavorable, good or bad” (Inglehart and Klingemann, 1979, 207). One dimension or value dichotomy in Western politics is referred to as the left/right dimension.³ Both the notions “left” and “right” are associated with issues like the (re-)distribution of income and wealth and the role of government in the economy and society. “Left” favors an equal distribution of income and wealth and welcomes state intervention to achieve this, while “right” stresses the principles of a free market economy and independent individuals, and thus favors a reduction of state control. Such a cleavage between left and right, despite being referred to as “old left-right” or “traditional” political values, is still relevant in today’s societies (Karlsen and Aardal, 2016). “Political value orientation” refers in this thesis to position on state involvement and regulation (Karlsen and Aardal, 2016).

2.1.2 Climate concern and attitudes toward policies

The term “attitude” is commonly referred to as the sum of evaluations, feelings, and behavioral tendencies (the classical tripartite conceptualization) toward an attitude object, for

³ See Knutsen (2006) for an outline of the historical development of the concepts.

instance a person or a policy (Eagly and Chaiken, 1993). Both climate concern and attitudes toward policies are considered to be types of a broader category of “attitudinal factors” in the literature, as are values (Stern, 2000). Typically, the term “attitude” is reserved for describing evaluation of a specific entity, or attitude object, and the term “value” can then be reserved for positions on general objects (Rohan, 2000).

There is a large literature on the public’s general position on environmental issues, but there is no uniform definition of environmental concern, nor of climate concern, in this literature. Instead, several meanings of the concept environmental concern can be found (Stern, 1992; Dunlap and Jones, 2002). Environmental concern has been treated as an evaluation of, or an attitude toward, facts, one’s own behavior, or others’ behavior with consequences for the environment (Fransson and Gärling, 1999). The meaning of the term “environmental concern” ranges from a specific attitude directly determining intentions, or more broadly to a general attitude or value orientation. An example of a well-established broader understanding of environmental concern is the New Environmental Paradigm (NEP), which is a measurement of a general view on the relationship between humans and the environment. NEP is most often referred to as a worldview, since in its original form it includes beliefs and evaluations (Dunlap and Van Liere, 1978). As noted, the distinction between political value orientation and attitude toward a specific policy regards the level of specification of the object, or entity. Similarly, a value orientation toward environmental protection in general can be distinguished from attitudes toward specific environmental issues, such as climate change. We can consider climate concern an environmental attitude.

However, according to the mentioned classical tripartite conceptualization of attitudes, they consist of cognitive, affective and conative dimensions (Eagly and Chaiken, 1993). Climate concern is often operationalized as the response to a question of “how worried are you” (e.g., McCright and Dunlap, 2011; Kvaløy et al., 2012). The term “climate concern” leans on the affective component of attitudes. On the other hand, attitudes toward policies more often signify the cognitive component, in that it often refers to what people think is correct. The operationalization of attitudes in this thesis does not include the behavioral dimension. The definition of attitudes (here both climate concern and attitudes toward a climate policy) refers to the affective and evaluative elements of the tripartite concept, which is a common approach (Finucane et al., 2000; Dunlap and Jones, 2002; Slovic et al., 2004).

2.1.3 Institutions

According to Hodgson (2006), the term “institutions” has a long history of usage in the social sciences, dating back at least to Giambattista Vico in his *Scienza Nuova* of 1725. The use of the term “institution” has become widespread in the social sciences in recent years, reflecting the increased use of the concept in several disciplines, including institutional economics, philosophy, sociology, politics, and geography. Contemporary institutional theory has captured the attention of a wide range of scholars across the social sciences and is employed to examine systems ranging from micro interpersonal interactions to macro global frameworks. The increasing acknowledgement of the role of institutions in social life involves the recognition that much of human interaction and activity is structured by overt or implicit rules. However, even today, there is no unanimity concerning the definition of this concept (Scott, 2014).

Different theorists tend to privilege one or another class of elements, and Scott (2004) distinguishes between the following three when categorizing the different applications: most rational choice theorists stress formal-regulative elements (e.g., Williamson, 1975; North, 1990); early sociologists favored normative elements (Hughes, 1939; Parsons, 1934/1990; Selznick, 1949); and more recent organizational sociologists and cultural anthropologists emphasize cognitive elements (e.g., DiMaggio and Powell, 1991; Douglas, 1986; Zucker, 1977).

“Classical institutional economics” may be seen as an attempt to integrate these perspectives (Vatn, 2015). I have taken the definition that I use in this thesis from this branch of the literature, implying that institutions are “the conventions, norms and formally sanctioned rules of a society. They provide expectations, stability and meaning essential to human existence and coordination. Institutions support certain values and produce and protect specific interests” (Vatn, 2015, 78). The cognitive element can be seen as the integrative perspective underlying this definition, implying that different contexts have the capacity to support or form different types of rationalities or logics. For instance, in some institutional contexts, like a market, the dominant logic may be to ensure what is best for the individual – “maximizing individual utility.” A family context is an example of a setting that may emphasize care/what is best for the group one belongs to. I elaborate further on the theory of institutions as rationality contexts in section 2.3.

I will make one clarification regarding the relationship between values and institutions before turning to the links between these concepts in the coming section. Scott (2014) and Vatn (2015) define values in ways similar to the one applied in this thesis. However, Scott (2014) sees values as institutions, whereas Vatn (2015) refers to institutions as supportive of values. For the purpose of this thesis, I distinguish between values and institutions according to Vatn's understanding.

2.2. Political values, climate concern, and attitudes toward climate policies

In this section, I start by outlining the theoretical explanations of the linkage between attitudes and values. Next, I summarize the empirical literature on the correlation between political values and climate concern, before I turn to the empirical literature on linkages between political values, climate concern and attitudes toward policies.

2.2.1 Theorizing the relationship between political values and attitudes

Generally, values are considered antecedents to attitudes (e.g., Schwartz, 1994; Stern, 2000). The linkages between political values and attitudes an individual holds are not necessarily due to deliberate consideration of a factual or philosophical connection between the value orientation and the attitude object. The linkages may stem from the way actors construct discourses, frames or story lines that engage competing knowledge, often by reference to core values (Simon, 1979; Schon and Rein, 1994). Some argue that the characteristics of climate change, the complexities involved, demands some reliance on others – e.g., experts or leaders – to provide knowledge or information. Whenever people have limited knowledge and little experience with an issue, and are exposed to ambiguous information, they tend to trust information from people with whom they can identify, people who share, for instance, their political values (e.g., Weber, 2010; Wood and Vedlitz, 2007).

Regarding how the above relationships between values and attitudes are established or sustained despite new information and scientific knowledge, the literature often mentions two mechanisms: information search bias (Frey, 1986; Schulz-Hardt et al., 2000) and information assimilation bias (Lord et al., 1979). The first mechanism is the propensity to search for information that confirms beliefs and/or initial attitudes. The second mechanism regards which information people care about and believe in when exposed to it. Individuals have a propensity to remember the strengths of confirming evidence and the weaknesses of disconfirming evidence, to judge confirming evidence as relevant and reliable and disconfirming evidence as irrelevant and unreliable.

Linkages between political values and attitudes have also gained attention on the aggregated level. Increases in cleavages in attitudes between groups of people holding different political values are referred to as polarization. DiMaggio et al. (1996) list several conceptualizations of polarization, one being intergroup differentiation, defined as the extent to which social groups (e.g., such as those sharing values) increasingly differ in their responses to a given question. One theory that seeks to explain polarization in the public's attitudes is the "party sorting" theory. This theory holds that political party activists drive a process of conflict extension among political elites, which next leads to sorting along ideological lines among the public (e.g., Fiorina and Abrams, 2008; Baldassarri and Gelman, 2008). Another proposed contribution to explain polarization in attitudes between social groups is that attitudes are affected by increased media pluralization (Bennett and Iyengar, 2008). The steady increase in availability and supply of information via greatly increased internet access, combined with receivers' greater choice over their media sources, makes searching for identity-confirming information easier. The greater availability of and ease of access to information may contribute to public polarization on controversial issues over time, even irrespective of elite polarization, because of a higher degree of self-selection of information sources and consequently an increase in effects from information search bias (Bennett and Iyengar, 2008).

There is a growing literature applying perspectives from several disciplines that investigates the linkages between political values and climate concern and between political values and attitudes toward climate policies. These empirical studies have different approaches, ranging from experimental studies revealing effects from information on an individual level, to large survey data analysis of correlations between political values and climate concern and attitudes. I will here first review the literature on political values and climate concern, before I turn to the empirical findings on how political values and climate concern correlate with attitudes toward climate policies.

2.2.2 Political values and climate concern

Regarding the link between political values and climate concern, several experimental studies reveal that individuals readily assign expert knowledge and trustworthiness to information sources who they perceive to share their values. By portraying information about climate change in experiments, these studies reveal that the link between climate concern and political value orientation may be strengthened (Mackie and Quellar, 2000; Siegrist et al., 2000). For instance, Krosnick et al. (2000) and Kahan et al. (2010, 2012) find that citizens rely

selectively on information from, for instance, elites (political leaders, organizations, media outlets) that they trust, using identity markers such as shared values.

Quite an extensive number of quantitative survey studies exist that include political values in statistical analyses of factors correlating with climate concern. This literature reveals evidence of a political divide in the publics in a large number of countries. Recent research from the United States finds a strong correlation between political value orientation and climate concern, whereby Liberals and Democrats report beliefs about climate change more consistent with mainstream climate science and express greater concern than do their Conservative and Republican counterparts (e.g., Malka et al., 2009; McCright and Dunlap, 2011; Hamilton and Saito, 2015). Tranter (2013) examines data from two Australian survey polls from 2010 and 2011, and finds that left-identifying Australians are more concerned about global warming than their right-identifying counterparts. Clements (2012) examines the influence of political party identification and left-right political ideology on climate change views. Using data from Eurobarometer, he finds that right-identifying British respondents report greater skepticism about climate change than their left-identifying counterparts. Similarly, using representative data from an autumn 2008 survey of residents of two English counties (Hampshire and Norfolk), Whitmarsh (2011) examines how socio-demographic characteristics, knowledge, and political values correlate with skepticism toward climate change. The skepticism scale consists of 12 items dealing with the causes and reality of climate change, the quality of the evidence for climate change, and the media coverage of climate change. They find that higher skepticism correlates with the right-leaning orientation. A study from Norway (Austgulen and Stø, 2011, in Norwegian) finds similarly that an index measuring the view on the state's role correlates with beliefs about the consequences of climate change.

Some cross-national analyses of pooled data from a wide range of countries confirm the mentioned pattern of divide (Tjernström and Tietenberg, 2008; Kvaløy et al., 2012), that is that a liberal political view increases the probability of the perceived dangerousness of climate change. These studies measure political value orientation as a self-identifying position on a left-right continuum. McCright et al. (2016) analyze data from the 2008 Eurobarometer survey, and examine whether there was a left-right divide on climate change views within the publics of 25 EU countries. They find that citizens on the left consistently reported stronger belief in climate change and stronger support for action to mitigate it than did citizens on the right in 14 Western European countries. There was, however, no such divide in 11 former

Communist countries, which they explain by the low political salience of climate change and the differing meaning of left–right identification in these countries.

The only study examining the development in correlation between political value orientation and climate concern over time is McCright and Dunlap (2011). They carried out this study in the United States, and examined polarization in climate concern over the period 2001–2010. They operationalized political values in two ways: party identification (Republican versus Democrat) and liberal versus conservative self-identification on a five-point scale. They find polarization in climate concern among Americans: a decrease in climate concern among the right-leaning along with an increase in climate concern among the left-leaning. Referring to elite polarization in the United States, they explain this development as being due to the political elite’s polarization on climate change (ibid.).

Brulle et al. (2012) include political orientation in their study of Americans’ evolving climate concern, investigating time-series data. By including factors such as media attention, political decisions and other contextual factors, they find that people’s climate concern was influenced by the communication of party elites, more than directly by individuals’ initial political value orientations (Brulle et al., 2012).

2.2.3 The importance of political values and climate concern for attitudes toward climate policies

We can summarize in two general conclusions the empirical literature on the relevance of political values and climate concern for attitudes toward climate policies that involve individual loss: left-leaning political value orientation correlates positively with support for restrictive policies and concern for climate change correlates positively with support for restrictive policies.

Empirical studies from the United States reveal that left-leaning political orientation is associated with support for climate policies (e.g., Leiserowitz, 2006; McCright, 2008; McCright et al., 2013; Park and Vedlitz, 2013; Zhao et al., 2011). These studies apply a self-reported left-right placement as an indicator of political value orientation. Also Dietz et al. (2007) and Smith and Leiserowitz (2013) reveal correlation between positive attitudes toward climate policies and left-leaning political values. In these two studies, political value orientation is constructed as an index from items revealing positions on state involvement. Similar findings are reported from other countries, such as Switzerland (Tobler et al., 2012)

and Sweden (Hammer and Jagers, 2006; Harring and Jagers, 2013). Left-leaning political orientation was also associated with favorable votes in referenda on energy taxes in Switzerland (Bornstein and Lanz, 2008; Thalmann, 2004). Kallbekken and Aasen (2010) find in a focus-group study that those supportive of general state involvement are also more positive toward environmental taxes than their ideological counterparts are.

Some empirical studies also analyze the relationship between climate concern and attitudes toward climate policies. Correlation between climate concern and positive attitudes toward climate policies is found in the United States (Leiserowitz, 2006; Dietz et al., 2007; Bostrom et al., 2012), in Austria, Bangladesh, Finland, Germany, and Norway (Bostrom et al., 2012), and in Sweden (Hammer and Jagers, 2006; Harring and Jagers, 2013). Similarly, some studies from the United States (McCright, 2008; Zahran et al., 2006) and a study from Malta (DeBono et al., 2012) identify specific belief in the negative consequences of climate change to be crucial in explaining public support for restrictive policies. Here, the general term “policies” includes imposing taxes (e.g., by increasing prices on fossil fuels) on emitting industries and individuals. Other studies from the United States and Australia find that policy support for a wide range of policies (including restrictive policies) is highest for the “alarmed” and lowest for the “dismissive,” when categorizing positions on climate change (Maibach et al., 2011; Morrison et al., 2013).

2.2.4 Knowledge gaps

In this thesis, I aim at responding to altogether three knowledge gaps (see also 2.3.4). I identify two of them from the literature summarized above. One gap is the lack of time-series analyses of the relationship between political values and climate concern. A second under-investigated issue is the relationship between climate concern and attitudes toward restrictive climate policies in subgroups holding different political value orientations. The studies summarized in 2.2.3 above give attention separately to the relevance of political values and of climate concern for attitudes toward climate policies. To my knowledge, no studies have investigated the effect of the two factors simultaneously.

2.3. Institutions, rationalities, and attitudes toward climate policies

Given the relative stability of individuals’ political values, several authors (Drews and van den Bergh, 2015; Hulme, 2009) request investigation of factors that may influence the linkages between political values and attitudes toward policies. Institutional theory, outlined in this section, provides a theoretical explanation for changes in such linkages. In particular,

this theory is relevant for this thesis in that it provides an explanation for individuals' contributions in social dilemmas (March, 1994) like climate change.

2.3.1 The theory of institutions as rationality contexts

In classical institutional economics, as specified by Vatn (2005), humans are regarded as multi-rational. The kind of rationality, or logic, that counts in a decision or for behavior is seen as influenced by the institutional context (see also Sjöstrand, 1995; Hodgson, 1988, 2007). Institutions are regarded as fundamental in creating expectations and in giving meaning to individual action. They influence action and attitudes by defining what is seen as the “natural” way to act (conventions), the right/appropriate way to act (norms), and/or the sanctioned form of action (the law). An institutional context is the sum of institutions in a specific choice situation.

According to institutional theory, all contexts include cues about what is the appropriate underlying logic. Simplified, and particularly relevant for solving social dilemmas, one may say that an individual rationality (IR) context emphasizes an “I” logic, and a social rationality (SR) context emphasizes a “we” or “they” logic (Vatn, 2009). Similarly, Weber et al. (2004) refer to the definition of the situation as central for choices: “Is this for instance a cooperative situation or a competitive situation?” (Weber et al., 2004, 285).

Individuals will search for such cues, consciously or unconsciously, to interpret the situation. The definition of the situation informs the person about what institutions apply. Some cues are clear and in sum unambiguous, and yield a constrained list of possible behaviors in a situation, while other cues are ambiguous and elicit a broader array of possible behaviors (Forgas, 1982). In addition, the situation may offer objective cues, but these may be interpreted differently depending on the person's history with similar situations, etc. According to Weber et al. (2004), “all the idiosyncratic factors that individuals bring with them into a social situation” can be referred to as identity (ibid, 283). Individuals' idiosyncratic dispositions may also affect which situational cues they attend to (Weber et al., 2004; Cialdini et al., 1991).

Little work has been done to categorize the different influences or carriers of cues⁴ defining the institutional context, perhaps because such possible cues are infinite in number (e.g., Messick, 1999; Scott, 2014). The institutional context may be established through instructions about which rationality should apply. For instance, an explicit request that one should behave other-regarding in an open office space may induce a set of norms and conventions regarding specific behavior, such as speaking softly so as not to disturb others. Institutional contexts may therefore be explicitly defined. But they may also be informationally induced.

Schwartz's (1977) reference to norm-activating information serves as an example of how institutional contexts can be established indirectly. For instance, new information about social consequences of an issue may lead to redefinition of a situation and in this way evoke social rationality (Schwartz, 1977; Dietz and Stern, 2002).

As mentioned above, institutions support values. For example, the norm of greeting people supports the value of respecting others. While people may hold different values, for example, an egoistic value orientation rather than an altruistic value orientation, the theory of plural rationality emphasizes that less altruistically oriented individuals may conform to demands for acting socially rational and vice versa. An individual who is generally against state involvement and regulation may support a specific regulation if it is in line with other values the individual holds, such as environmental values, or for other reasons, such as conforming to a group in a specific situation. One may conceptualize this flexibility to imply that people may support different values in different contexts. They simply balance values they hold differently in different situations. This flexibility may also be conceptualized as a result of unconscious behavior. For instance, by following routinized norms, one may implicitly support environmental values over individual benefit in one context, and conversely support individual benefit over environmental values in another, without deliberately thinking about what values these norms support. Therefore, changes in contexts may imply changes in attitudes and behavior without demanding changes of basic value priorities as captured in surveys.

⁴ Categorization of carriers of norms has received some attention. Biel and Thøgersen (2007) categorize two possible sources of norms: those elicited by other people's behavior and those elicited by the situation, the latter being illustrated by the differences in norms regarding equity in a market place versus in policy, for instance.

2.3.2 Explicitly defined and informationally induced institutional contexts

One example of explicitly defined institutional contexts are assigned roles – e.g., whether instructed to solve a task as a citizen or a consumer. Such roles may entail different sets of norms for specific behavior and may influence the contribution to a common good (e.g., Soma and Vatn, 2010, 2014).

An institutional context may also be informationally induced. One may learn that one's own action influences the situation of other people, which may activate other norms than if a behavior influences mainly one's own life. The information's content may also influence which aspect of an issue is emphasized, and hence change institutional context and rationality context without changing beliefs. The way information is presented may cause individuals to focus on certain characterizations of an issue over others. This mechanism is also referred to as the "issue framing effect" (Levin et al., 1998). One example of such an effect on attitudes toward a policy from emphasizing individual versus social rationality was found by Sniderman and Theriault (2004). They found that when increased government spending for the poor was characterized as enhancing poor people's opportunities, individuals tended to support increased spending. However, when increased spending was characterized as resulting in higher taxes, individuals tended to oppose it.

Small variations in wording may also influence what rationality is inferred, such as naming identical public goods games "Wall Street Game" or the "Community Game" as was done in an experiment (Lieberman et al., 2004). These labels may have influenced perceived institutional contexts by influencing rationality: whether individual or social rationality should apply. In Lieberman et al.'s experiment, the "Community Game" label yielded higher levels of willingness to cooperate.

Gneezy and Rustichini (2000a, b) provide examples of how introducing monetary incentive schemes may have served as cues for how to interpret situations. They report lower contributions to social dilemmas after introducing individual monetary incentives, which may be understood to signal that the situation is about individual benefits. The decrease in contributions indicates that the behavior was guided initially by a social rationality. Similarly, Tenbrunsel and Messick (1999) reported on a series of studies about how economic sanctions affected decision makers facing an environmental dilemma. Their research suggests that such sanctions changed the way decision makers understood their problem. For many participants, the presence of sanctions changed the problem from an ethical concern (e.g., what is our

responsibility here?) to a business concern (e.g., what are the costs involved?). The influence of external rewards on an individual's contribution to an organization's common goal is also well known from studies in the organizational field.⁵

2.3.3 Studies on how varying the institutional context affects attitudes toward climate policies

Empirical studies on the effects from what are here defined as institutional contexts on attitudes toward climate policies are relatively new. These studies do not apply a common theoretical basis; rather, they range from referring to effects from loss versus gain frames (applying Kahneman and Tversky's (1979) prospect theory) to, for instance, referring to effects from so-called issue framing, and the effects on attitudes from local versus global framing of climate change. Below, I summarize relevant findings from these studies.

One example of a study investigating how varying the institutional context affects attitudes toward climate policy is that of Bolsen et al. (2014). They found behavior intention was affected by a text treatment that both referred to a norm – that all individuals have a responsibility for making environmentally friendly choices – and described environmental benefits for society. Respondents who received this text treatment showed higher willingness to invest in energy conservation and to pay more for insulating homes than did respondents who received no such text treatment. Both the reference to a norm and/or the information about the environmental effect might have affected respondents' willingness. The information about the consequences of the environmental effect on other people may have influenced respondents to think that making an effort is correct.

Providing information about other peoples' behavior is also a way to vary the institutional context. For instance, Hurlstone et al. (2014) conducted an experiment where a group of respondents was exposed to information about a group of peers (perceived as an in-group, with similar social characteristics to those of the respondents) who had high acceptance of climate policies that entailed individual loss. Researchers found that informing respondents

⁵ For instance, the effect from incentives enhancing individual rationality is found to undermine initial work effort because this effort was initially not motivated by individual external benefits, but by other types of motivations (see e.g., Kuvaas et al., 2016; Selart et al., 2008).

about what their peers considered to be correct caused respondents' attitudes to be closer to the attitudes of their peers than the attitudes of a control group were.

Spence and Pidgeon (2010) asked one group of respondents to evaluate mitigation from a personal perspective only and asked another group to evaluate mitigation from a social perspective that is, as a member of society. Here, the answers given depended on the perspective emphasized. Those asked to evaluate policies from a social perspective were more positive toward mitigation policies than were those asked to evaluate policies from a personal perspective. Gifford and Comeau (2011) similarly investigated the effects of two text treatments in a survey experiment where one treatment emphasized social motivation and social benefits from mitigating climate change, and the other emphasized the individual sacrifice necessary to mitigate climate change. The first treatment consisted furthermore of statements referring to a relational "we," whereas the latter treatment consisted of a formulation with the word "I." Hence, they applied the distinction between an IR and an SR context. The experiment resulted in higher scores on climate change engagement (agreement with statements that individuals have a responsibility to mitigate climate change) among respondents receiving the SR treatment than among respondents receiving the IR treatment and a control group.

As mentioned earlier, there are some studies enquiring into the importance of value orientation for the effect of climate change information on climate concern (e.g., Kahan et al., 2012). There is, however, almost no research studying the influence of values for the effect of rationality contexts on attitudes toward climate policies. One exception is Petrovic et al. (2014), who provide two examples of how different institutional contexts affected attitudes toward mitigation policies differently in groups with different political value orientations. They conducted a survey experiment involving about 800 US residents, where they investigated how attitudes toward policies to reduce emissions were effected by emphasizing local individual health effects from emissions compared with emphasizing environmental consequences from climate change. They found that political value orientation determined how the two versions affected attitudes. The health frame elicited stronger support for policies among conservatives and the climate frame elicited stronger support among liberals. Another exception is the study of Wiest et al. (2015), who found that presenting different descriptions of climate change to groups having different political value orientations caused varying effects on behavior intention. For instance, presenting local effects (affecting the respondents)

from climate change yielded higher scores on behavioral intention among Republican and Independent respondents than did presenting global effects from climate change (not affecting the respondents) to these groups. They found no effects on behavioral intentions among Democrats (who reported stronger initial intentions than the other groups did).

2.3.4 Knowledge gaps

In section 2.2.4 I identified two knowledge gaps. The above overview points toward a third: institutional contexts' influences on attitudes toward restrictive climate policies, and potential differences in these influences, depending on political value orientation. The next section outlines the research strategy to contribute to filling those three knowledge gaps.

3. The studies

In addition to this introductory chapter, the dissertation consists of four papers, each of which answers research questions developed to meet one or both aims of the thesis. In this section, I first briefly present the methodological approach of the thesis. Next, I reflect on the method choices and then briefly present findings from the papers. Lastly, I summarize how the papers relate to each other.

3.1. Methodological approach

Different methods are required to answer the different research questions. The dissertation therefore uses a mixed-methods approach (Kelle, 2001). Three categories of data are analyzed using different methods. First, I analyze existing time-series data using logistic regressions (papers I and II). Second, we produce data from a survey experiment, which we analyze by applying logistic regressions (papers III and IV). Third, we obtain qualitative data from semi-structured interviews and analyze these by categorization, coding and interpretation (paper IV). As mentioned in section 2, my understanding of social science builds on a weak or moderate form of constructivism, and on an ontological and epistemological view anchored in critical realism.

Critical realism is a position that recognizes that there is a real world irrespective of our understanding of it. The social world is regarded as an open system, but any human organization is regarded as a pseudo-closed system. Regularities in social systems are time limited – social systems are neither stable nor universal. However, some may demonstrate considerable stability over time (Dewey, 1929). These differences of degree of openness of systems are considered by Danermark et al. (2001) to be the results of endeavors to make society more controllable in relation to various human purposes. Health services, transportation systems, families and factories are examples of pseudo-closed systems.

According to critical realism, the world is divided into three ontological layers: the “real,” the “actual” and the “empirical.” The domain of the empirical is a subset of the domain of the actual, which is a subset of the real. The “real” refers to the potentials of various objects. The “actual” refers to the events, behaviors, etc. that take place. The “empirical” refers to the observation or perception of such objects and events, the experiences we have. Potentials (the real) are such that patterns may appear, but as tendencies rather than as laws.

This perspective influences my understanding of results found using research methods. For example, I see regressions not as explanatory tools, but rather as evidentiary tools, enabling assessment of explanations (Næss, 2004). For instance, our ambition in the quantitative studies of times-series data in papers I and II is to explore or reveal patterns and relationships. In paper IV, we conducted the experiment to reveal whether the text treatments affected the attitudes, whereas we applied the qualitative interviews to understand how these text treatments affected attitudes. We use the latter method since we recognize the cognitive element of institutions and take into account not only the objective conditions that the experiments provide, but also the respondents' subjective interpretation of these conditions (Scott, 2014).

3.2. The papers and the methods applied

There is a gradual shift in the focus of the four papers, from identifying trends to explaining mechanisms. They hence also change in intensity, from an extensive approach in papers I and II, to a less extensive approach in paper III, and then to an intensive approach in paper IV. In the coming sections, I first present some reflections on the methods and then offer summaries of the papers.

3.2.1 Data and methods in papers I and II

In papers I and II we address research questions that require an extensive approach. We analyze a considerable amount of data: individual-level data from a national poll, Norwegian Monitor (NM), for the years 2003, 2005, 2007, 2009, and 2011. These samples were randomly drawn from telephone directories (Hellevik, 2016).⁶ The respondents filled in a self-administered questionnaire of about a hundred pages, and the number of respondents ranged from 3500 to 3900 each year. In addition to questions on socioeconomic background variables, the surveys included a range of questions on values, attitudes and behavior, such as media usage, policy issues, consumer behavior, eating habits, and political behavior. I/we chose the survey years because of relevant variables that were included in these surveys. This data source contains respondents' answers to questions about their positions on statements regarding the state's role, statements similar to those used in earlier studies of political value orientation – the degree of support for state involvement and regulation (e.g., Aardal, 2011; Kahan et al., 2010). The poll also contains a question revealing concern about climate change,

⁶ I will comment on response rates later in this section.

the dependent variable in paper I, and a question about respondents' positions on increasing energy prices, the dependent variable in paper II.

In both papers we operationalize political value orientation by creating an index from four items in the survey.⁷ The index ($\alpha > 0.70$ all years) ranges from 0 to 16 (the higher the score, the lower the support for state involvement and regulation). In paper 1, I also create another index, one measuring egalitarian values. This index must be treated with caution because of its low reliability ($\alpha > 0.30$ all years), and is given less attention.

Climate concern is revealed by responses to the question "How concerned are you about climate change?" The response categories were "Very concerned," "Quite concerned," "A little concerned," and "Not at all concerned." The operationalization of climate concern could ideally have been constructed from a broader set of items. However, the operationalization of the climate concern variable was given from the material, and resembles the operationalization of variables analyzed in other survey studies of public climate concern (e.g., McCright and Dunlap, 2011; Kvaløy et al., 2012).

In paper I, I investigate political polarization of the public's climate concern. The paper reports logistic regressions of a constructed binary variable instead of an ordered variable measuring climate concern (Agresti, 1996) to better communicate the results. However, I did run several other regressions to enhance the robustness of the findings.⁸ I examined polarization in climate concern by creating a "value orientation*year" interaction term, with year as a dummy variable for each year (e.g., Evans, 2002). This interaction variable made it possible to estimate the difference in climate concern for different scores on the value orientation index between years. The paper reports results from regressions where I treat the variable "year" as a continuous variable and as a dummy variable, and the results from the different approaches corroborate each other. Treating "year" as a dummy variable provides more details about differences in climate concern between each year and the reference year (2003), and I give this approach more attention in the paper than I do the former approach (i.e., treating "year" as a continuous variable).

⁷ These items are reported in the papers.

⁸ Including analyses of an ordered dependent variable, which corroborated the results of the other analyses.

Paper II is explorative in its design. As mentioned in section 2.1.2., there is a lack of studies that look at political value orientation and climate concern simultaneously, such as the subgroup of climate-concerned individualists and their attitudes toward policies. The dependent variable in paper II – attitudes toward an increase in energy prices – is dichotomized into 1 [partly agree/strongly agree with the statement] and 0 [partly disagree/strongly disagree with the statement], and logistic regressions were conducted. We ran several other regressions to enhance robustness, and results of these are referred to in the paper.

I should mention some issues regarding the external validity of the data analyzed in papers I and II. One concern regarding the database of NM is the decreasing response rates, and the possible non-response bias that such low response rates may represent. Consistent with the trend revealed in international poll research (Groves and Peytcheva, 2008), the response rates for these yearly samples have decreased over time, and are relatively low. The lowest response rate was 8%.⁹ They are, however, none lower than what other Gallup surveys experience (Hellevik, 2015). The topic of low response rates has gained increased attention in social survey research because of the general decrease in response rates internationally (e.g., PEW, 2016; Singer, 2006). However, there is not necessarily a correlation between a low response rate and skewness in Gallup data (Groves, 2006).

Hellevik (2015, 2016) investigates whether the low response rate represents any non-response bias in the NM data (the data we analyzed in papers I and II). He compares the answers from respondents that only participated in a telephone interview with the answers from respondents who completed the follow-up mail questionnaire (the full NM). He also compares results from the mail questionnaire with population statistics and high-response surveys. Overall, he concludes that low response rates do not represent a large problem of non-response bias.¹⁰ However, some of his findings are relevant for the studies in papers I and II. There is some underrepresentation of the age group 25–39, and there is some skewness regarding party votes when compared with the election results (Hellevik, 2015, 2016). Regressions with and without these variables as control variables, such as party affiliation and age, show the same

⁹ The samples were randomly drawn from telephone directories (Hellevik, 2016).

¹⁰ See also Groves and Peytcheva (2008) and Groves (2006) for general discussions of effects from low response rates in survey data.

trends, however. From these exercises we can conclude that selection bias is not a plausible explanation for the developments in correlations of variables as found in papers I and II

3.2.2 Findings in paper I

In this paper, I offer an appraisal of polarization in climate concern in the Norwegian public. I investigate whether there are differences in climate concern depending on the view of the state's role, and whether there are any trends toward less or more differences in climate concern depending on this political value orientation. I employed both contextual information about the climate change debate in Norway and theories on attitude polarization to hypothesize correlations between political values and climate concern, and furthermore to hypothesize an increase in the difference in concern between groups of different political value orientations.

The Gallup data show that there was an increase in climate concern 2003–2007 in the general population, and that climate concern peaked in 2007, and then started to decrease. The study reveals – not surprisingly – a divide in the level of concern about climate change between those with high support and those with low support for state involvement and regulation; the more individualistic the value orientation, the less climate concerned. There was a parallel development in climate concern until 2007. The regressions reveal a slightly stronger correlation between political value orientation and climate concern in 2009 and in 2011 than in 2003.

This study does not allow for identifying which of the specific psychological or social mechanisms are at work in Norway. I do discuss whether the increased focus on policy instruments in the political debate over the period investigated may explain that political values are increasingly salient. As I refer to in the paper I, other studies report that political parties' positions on climate change became more distinct and polarized in the period. The parties most eager to prioritize climate policies over other policy areas support cutting emissions domestically rather than abroad, and are more supportive of state involvement to cut emissions than are parties that give climate mitigation a lower priority. However, when compared with the only other academic study that investigates a similar development over time (2001–2010) – the above-mentioned study from the United States (McCright and Dunlap, 2011) – the polarization found in paper I is small.

3.2.3 Findings in paper II

Judging by the results in paper I, many of the individuals who are less supportive of general state involvement and regulation also reports climate concern. Paper II contributes to the literature by exploring whether in groups with different political value orientations concern about climate change correlates with support for energy taxes. Here, we explore whether attitudes toward increasing energy prices to reduce emissions differ in subgroups holding different political values and having different levels of climate concern.

The logistic regressions reveal that general support for energy taxes has increased over the period (2003–2011). Corroborating previous research, the results also indicate that non-individualistic value orientation and climate concern correlate positively with support for an energy tax. For all sample years, the results indicate that the more climate-concerned people were, the more positive they were toward such a tax, independent of political value orientation. Moreover, this tendency increases over time. The paper uses examples of scores to illustrate the results from the analyses. For instance, in years with high media attention and debate, such as in 2007 and 2009, the likelihood that a climate-concerned individualist with a score of 11 (medium individualistic) on the political value orientation index is positive to energy taxes is 44 and 47%. Whereas an individualist with the same score on the political value index (11) who is not climate concerned has a likelihood of –19 and 22% of being positive toward energy taxes in the same years.

Considering that individuals' political value orientations are quite stable, the revealed flexible linkages between political values and attitudes toward this mitigation policy give hope for the so-called “trapped governments.” The study cannot be used to draw any conclusions about causality between the variables. It might be that in the years 2007–2009, the policy attention to and the debate about climate change led to an increase in climate concern in the general population, accompanied by an increase in support for policies. Alternatively, a positive attitude toward a tax on energy because of other reasons may have made it possible to accept that climate change is a problem and to express concern (e.g., Kahan et al., 2012). Assuming that the first relationship is the more plausible, one should not ignore the relevance of increased attention to climate concern.

3.2.4 Data and methods in papers III and IV

In papers III and IV, we investigate whether varying the institutional context affects attitudes toward policies in groups holding different political values (i.e., holding a different view on

the state's role). In paper IV, we also analyze how the institutional contexts influence these attitudes. These two ambitions require employing different methods; hence, we employed both quantitative and qualitative methods. Given the scope of the PhD thesis and the lack of cases in the field suitable for inquiring about the effect of different institutional contexts on people's contributions to a social dilemma, we constructed the institutional contexts as text treatments. These text treatments were displayed to respondents in a survey experiment.

First, we ran a survey experiment, and second, we conducted qualitative interviews. Because of space limitations, there are some issues regarding the survey experiment and the qualitative interviews that we could not discuss in the papers themselves. I elaborate on these in the next sections.

3.2.4.1 The survey experiment

In both papers III and IV, we use data obtained from an experimental survey. This kind of survey is suitable to isolate and identify the effects from specific influences, referred to as treatments. Treatments can be texts, different pay-off structures, images, etc., and the effects of such treatments on a group can be compared with the behavior of a control group that does not receive the treatment. An experiment makes it possible to isolate effects from the treatments from other factors influencing attitudes. We chose a survey experiment as our method. We made this choice because we were interested in the potentially different effects from the institutional contexts on groups with different political values. In contrast to lab experiments, a survey experiment allows for a better representation of the population studied, and in addition, results have a higher degree of external validity than results from lab experiments have (Harrison and List, 2004).

To create different institutional contexts, one emphasizing individual and another emphasizing social rationality related to reducing climate gas emissions, we chose to focus on Oslo city residents, and emissions from cars. Emissions from private car transport in Oslo contribute substantially to individual health problems that are due to local air pollution (Norwegian Environmental Agency, 2015), and contribute to the social problem of global warming (Vågane, 2013). A strategic sample of 1500 car owners were surveyed, since they would experience an individual loss from policies aimed at reducing car emissions.

The motives for doing something with emissions from transport are presented such that they allude to two different rationalities. The contexts differ both regarding the content of the

information and by a sentence encouraging which perspective to take, individual or social. The IR context focuses on the individual gain from reducing emissions, and the SR context emphasizes the social responsibility for avoiding climate change. As such, we aimed to informationally induce different institutional contexts in the two treatments.

A survey company (Ipsos MMI) conducted the survey. They recruited participants from their register. Respondents in their register receive points for each survey they participate in. The respondents were randomly assigned to one of three groups: two groups received different text treatments and the control group received no such treatment. Subgroups of different political value orientations are represented in all three groups. Details on the procedures for the experiment and the operationalization of variables are described in the papers.

3.2.4.2 The qualitative interviews

In the fourth paper, we go one step further than in paper III in that we aim at explaining how the results in the survey experiment may have come about. In particular, we aim at gaining insight into the role that individuals' political values play in how the contexts affect the individuals' attitudes. One way to achieve a better understanding of the meanings of underlying statistical associations found in a quantitative study is to conduct qualitative interviews of subsamples (Brannen, 2005). The survey experiment provided the qualitative sample.¹¹ Eight months after we ran the survey, we conducted 30 semi-structured in-person interviews with equal representation from each value orientation group, securing a certain variation (regarding factors such as gender, age, and domicile) in both value groups. None of the respondents remembered the answers they gave in the survey experiment (not the treatment they received, nor the questions). The interviews lasted about an hour, in a place suitable for the interviewee (workplace, café, home, etc.). All respondents were asked about their positions on the policies,¹² exposed to both treatment texts, and asked to reflect on the texts and whether they influenced their attitudes.¹³

However, the ambitions of the qualitative study exceeds the ambition of explaining the quantitative results. An additional motivation regards enhancement, for instance,

¹¹ The recruitment procedure is described in paper IV.

¹² Because of time limitations, we focused on two of the three attitude statements in this study, namely the petrol price increase and decreasing the space for cars to develop more bike lanes and public transport.

¹³ Refer to paper IV and its Appendix for a thorough description of the interviews and the guide.

supplementing the findings in the statistical study (Bryman, 2008). The interviews therefore consisted of both structured and open-ended questions, thereby enabling us to justify the method choice. The interviews gave scope for categorizing the empirical material into predefined concepts, but also for exploring whether the results came about according to the theory of institutions as rationality contexts or not. One example of how we obtained the rationale of enhancement is that the qualitative interviews also accounted for statistical “non-findings” by asking questions aimed at revealing why the treatments sometimes did not yield an effect on attitudes toward policies. It is important to be aware that some mechanisms that may cause results in the quantitative study may not be revealed through qualitative interviews. For instance, information assimilation bias may be an unconscious mechanism (Lord et al., 1979; Cohen, 2003), which can be difficult to discover in an interview. Similarly, when an interviewee is asked to read and reflect upon a text in an interview, other interpretations of the text may come about than those that occur when the interviewee reads the text on a screen as an introduction to a web survey.

I was the sole researcher conducting the qualitative interviews. Conducting interviews alone was both advantageous and disadvantageous. One advantage was the equal numeric representation of researcher and respondent in the interview setting. Regardless of the number of interviewers, respondents’ proximity to researchers, for instance whether they view researchers as powerful parties, may influence their willingness to talk freely (Carr, 2010). Challenges regarding power relationships could have been more difficult in an imbalanced representation of parties where more than one researcher was present. However, being more than one interviewer can offer some advantages that I did not have. Researcher triangulation (when there is more than one interviewer) may, for instance, increase the validity of the data in that two researchers can gather data and then discuss and agree on categories and coding (Silverman, 2003). The presence of two researchers may also increase the reliability of the interpretation of the data. Being more than one researcher may increase the degree of consistency with which instances are assigned to the same category by different observers (Maxwell, 2013). To minimize the disadvantages of being only one interviewer, I employed several measures. To acquire validation of the data, I audio recorded the interviews, in order to control and expand on the handwritten notes. I also sought increased reliability of the interpretation of responses by asking follow-up questions with the aim to verify my understanding of respondents’ intended meanings (Silverman, 2003).

In the survey experiment, “variation in contexts” refers to the three different treatment groups. In the qualitative interview setting, the context went beyond the text treatments in that I was, as a researcher, also part of the context. I might have been a source of bias, in that respondents might have adapted their answers to what they thought I demanded or expected (e.g., Wikan, 1992). For instance, if they thought I was generally positive to the mitigation policies, since I had research interests in these issues, they might have answered more positively than if, for instance, I had represented an oil company. I used several means to minimize such potential biases. I emphasized that the purpose of the interview was to explore the diversity of perceptions and attitudes, and that there were no correct answers to the questions other than those of the respondent. I tried to appear as neutral as possible regarding outfit, and to play down or postpone answers to questions about myself after the interview was conducted (Carr, 2010). The variation in the responses to the different policies, and the negative positions on increasing petrol prices indicated that I had avoided such biases. Respondents also varied in how they grounded their responses. For instance, respondents mentioned both individual and social consequences as reasons for their positions, and this variation indicated that they were not influenced by an idea of what the researcher wished (the “experimenter demands” effect).

3.2.5 Findings in paper III

Paper III investigates the effect of different institutional contexts on car owners’ attitudes toward policies to cut car emissions. We investigated this effect by conducting a survey experiment involving 1500 car owners in Oslo, Norway, who received different text treatments. One text emphasized the individual health gain from reducing local air pollution (IR context), and the other emphasized the social responsibility for avoiding climate change (SR context); the control group received no such text treatment.

Using logistic regressions, we first analyze whether an IR context and/or an SR context affect attitudes toward policies to cut car emissions, when compared with attitudes of a control group. Furthermore, we analyze whether these effects differ in groups of different political values: individualists and non-individualists as measured in the previous studies in this thesis. We asked respondents to indicate whether they agreed or disagreed with three statements. The statements concerned 1) increasing petrol prices, 2) decreasing the space for cars to develop more bike lanes and public transport, and 3) voluntarily choosing public or bike transport despite longer travel time.

The analyses reveal several interesting findings. First, non-individualists are more positive toward all three policy statements than are individualists. Hence, political value orientation seems important for attitudes toward these policies. Second, this study demonstrates some effects of institutional contexts on attitudes toward emission-reducing policies. The SR context yielded higher support among non-individualists for increasing petrol prices. The IR context yielded higher support in both value orientation groups for decreasing space for cars, and higher support among individualists for voluntarily choosing public transport despite longer travel time. Third, it seems that the contexts work differently for different types of policies. The SR context affects non-individualists' attitudes toward increasing petrol prices, but not their attitudes toward decreasing space for cars. This difference may be because they perceive local policies to be irrelevant for mitigating climate change. One way of interpreting this result is that it demonstrates that people's initial associations with the policies – for instance whether people perceive them to be relevant for solving problems – are important for how contexts affect attitudes toward these policies.

In general, the findings indicate that it may be difficult to communicate across value divides the somewhat unpopular policy of raising petrol prices. However, the institutional contexts provided in this study are “weak” relative to all the information people receive. Therefore, the results also point to some potential for enhancing support for emission-reducing policies by varying the institutional contexts.

3.2.6 Findings in paper IV

Paper IV we devoted to exploring the effects of the institutional contexts on attitudes toward policies in different value groups. In general, the qualitative study revealed that both formulations about what perspective should apply and informationally induced institutional contexts influenced attitudes, the latter having more profound influence. The information content caused respondents to focus on certain characterizations of car emissions instead of on others. This effect seems to play an important role regarding the perspectives they grounded their attitudes on, whether individual or social. As such, this mixed-methods study supports the assumption that individuals may switch between social and individual rationalities, depending on the institutional context.

The qualitative data also indicate that the contexts' different effects on the two value groups were due to different evaluations of the contents. The results indicate that non-individualists were more affected by the effect from local air pollution on others' health (IR context) than

individualists were. Respondents in the two value groups deviated in their views on the two coordination problems, that of climate change and that of local air pollution. The relatively small size of each individual's contribution to the problem of climate change made individualists demotivated to act and accept the policies, whereas non-individualists did not question the relevance of their own behavior and local policies for the global problem of climate change.

In addition, the qualitative study revealed two results regarding the treatment texts' effects that were not due to the institutional contexts emphasized. First, respondents in both value groups reported that the IR context influenced their attitudes toward policies because of their firsthand knowledge about the problem presented (local air pollution). They related local air pollution to their experiences with dust in their noses and on their windows, which made the policies' relevance easier to grasp. This finding offers an important message for communicating policies; local and perceivable effects from policies may engage groups holding different political values. Second, some respondents in both value orientation groups rejected the two texts because of their perception that the texts were written by a political elite they felt distant from. This result illustrates the importance of identification with the messenger for the message to be accepted.

On a more general level, the study demonstrates the usefulness of mixing quantitative and qualitative methods. One can, for instance, achieve a better understanding of how the results from a regression analysis may have come about. More specifically, it reveals, as mentioned, both some challenges of and some potentials for creating institutional contexts to enhance contributions to solving social dilemmas.

3.3. How the papers relate to each other

To understand how the papers relate to each other, it is useful to think of the sequential logic of the research questions in this thesis. In the first paper I concentrate on the climate concern over time among people with different positions on state involvement and regulation. I identify a difference in climate concern depending on political value orientation, with non-individualists being more concerned. However, the relatively higher levels of climate concern found in Norway in 2007 also applied to those with individualist views on the state's role. In the second paper we ask a question which follows from the results from the first study: whether climate concern correlates with support for policies in groups with different political value orientations. The analyses reveal a support for increases in energy prices even among

the climate-concerned individualists, but at a lower rate than among climate-concerned non-individualists. For all sample years, the results indicate that the more climate-concerned, the more positive toward such a tax, independent of political value orientation. In the third paper, we investigate the effects of different institutional contexts on the relationship between political values and attitudes toward climate policies. We identify different effects in the different value groups. In paper IV we explore how such contexts are perceived, and seek to gain insights into how differences in the effects from such contexts in groups with different political value orientations comes about.

4. Studying political values, institutions and attitudes

The findings in this thesis raise several issues that warrant in-depth discussion. Two issues are particularly important. The first regards how we can gain empirical insights from mixing methods as compared to applying one method alone. The second concerns how the effect of institutional contexts on attitudes may depend on individual characteristics.

4.1. Mixed methods and empirical insights

The empirical results provide examples of a material that have grown out of a mixed-methods approach, where both quantitative and qualitative data have been obtained from surveys, experiments and qualitative interviews. These data provided insights that we would not have achieved from a single method alone. The quantitative results in papers III and IV led us to ask the questions formulated in the qualitative investigation (reported in paper IV). The qualitative investigation made it possible to explore the text treatments' influences on attitudes. This qualitative examination revealed, for instance, how the text treatments reminded respondents of issues they cared about, but did not think of as relevant until they read the texts. The qualitative inquiry disclosed how the contexts seemed to play a role regarding the perspectives respondents grounded their attitudes in, whether individual or social. These findings support the theoretical assumption that individuals may switch between social and individual rationalities, depending on the institutional context.

Another example of an empirical insight concerns the relevance of respondents' previous experiences for the IR context's effects on attitudes. Some individuals stated that information about local air pollution provided in the IR context made them change their minds about policies. The text reminded them of their own experiences with local air pollution; they spoke about black dust on their windows and in their noses, and said that picturing this black dust being gone was a motivation to support policies. The qualitative studies hence also gave insights about the texts' effects on attitudes that were not due to institutions, but yet were important, namely those of self-experienced and material reference. Although we cannot exclude the possibility that this observed change was related to changes in rationalities, respondents' explanations were grounded in references to something tangible: the black dust they had physically experienced. Other authors also point out that for people to support policies, it is important that they be able to imagine the effects of such policies (Scannel and Gifford, 2013). Such imaginable experiences are found to generally weigh much more in

influencing individuals' decision making than do descriptions which have no reference to the recipient's personal experience (e.g., Weber, 2010).

Quantitative investigations helped identify differences between groups of different political value orientations, whereas qualitative methods helped explain how certain perspectives became more salient in specific contexts. Qualitative methods also helped detect other individual characteristics than political values that influence how institutional contexts influence attitudes. For instance, in paper IV, individuals in both political value orientation groups, that is, individuals having low incomes and low levels of education and receiving social aid, said they thought the texts presented provocative messages. The qualitative interviews enabled us to understand these respondents' descriptions of who they perceived to be the messengers – a very distant elite – and to understand what they thought of this elite. These empirical data are important/interesting for two reasons. First, they illustrate the importance of individual characteristics for effects from institutional contexts, which I will elaborate on in the next section. The qualitative method therefore provided insight into potential reasons for non-effects in the quantitative experiment. Second, these empirical data illustrate very well what additional insight and unexpected results we can gain from qualitative inquires, and I will spend one more paragraph on this insight.

It has long been recognized that some forms of environmental activism are motivated as much by protest against incumbent or dominant ideologies as by concern for the environment per se (Stern et al., 1999). That environmentalism is a form of social protest is scarcely news. However, the converse is also true, and equally important: resistance to pro-environmental messages and politics must be understood, at least partly, in the context of social identities. Numerous studies have shown that highly educated groups, especially in the “non-productive” sectors of the economy (public services, teaching, etc.), feel a relatively strong affinity to the environmental movement and regard environmental problems as important (Eckersley, 1989; Kriesi, 1989). The texts and policy suggestions in study IV were by some respondents met with a cultural resistance, a resistance against what they referred to as the arrogant elite. The respondents refused to adjust to what they referred to as an elite's standard of what is correct. Such findings are clearly more problematic for decision makers seeking to introduce climate policies than is a finding indicating that individuals are open to consider the social benefits or other benefits of such policies. To overcome cultural resistance is less straight forward (e.g.,

Kahan et al., 2012). Government attempts to create emission-reducing policies must somehow confront the dynamics of individuals' identities if they are to be successful.

The qualitative method helps make empirical what people think and how they reflect upon their own perceptions of situations and their own choices. By interviewing respondents in the choice situation (here stating attitude toward policy), it is possible to immediately discern how identity interacts with the situation, and how this interaction further influences attitudes toward policies.

4.2. When do institutional contexts affect attitudes?

In this thesis, I use institutional theory proposing that institutional context influences choices, such as stating attitudes, as outlined in section 2.3. The findings in the thesis give some insights into the complex dynamics between situational factors and individual characteristics and their influence on attitudes. March's (1994) illustrative question formulation serves as a good description of what the theory says about those dynamics. March argues that a decision results from situational recognition, one's identity and rules. People ask themselves the question "What does a person like me (identity) do (rule) in a situation like this (recognition)?" (ibid.). Personal experience with similar situations, personality traits, and values (e.g., a preference for state involvement) may all affect how the situation is understood (e.g., as an SR context or an IR context) and what choices are regarded as appropriate (ibid.). Paper IV reveals that the influence of institutional contexts on attitudes depends on individual characteristics, or identities, in several ways. One example is already mentioned in the previous section, that of personal experience with black dust.

Another example is how several of the non-individualists mentioned that the SR context reminded them about the relevance of people in other countries and of global equity, issues that were important to them (paper IV). These respondents' answers about their position on increases in gasoline prices changed because of this reminder. For instance, some stated that the reason they opposed increases in gasoline prices before reading the SR or IR context was their worry about fellow Norwegians living in rural areas who had few transportation alternatives to their cars. When they read the SR context, they stated that they were reminded about the global responsibility we have to decrease emissions. They said they care more about global equity and about poor people elsewhere who are harmed by increased emissions than they care about spoiled Norwegians who are materially well-off compared to people in poor countries. These respondents explained that the text reminded them about this perspective,

their initial values, which was why they stated more positive attitudes toward increases in gasoline prices after reading this text. The text's influence can be interpreted along the appropriate framework. What became important aspects of the identity they referred to, the "person like me," changed with context. In this example, the identity which was referred to changed, from being a person concerned about equity nationally to being a person concerned with poverty in other countries and global equity.

In addition, other identities than political value orientations influenced how institutional context affected attitudes. As mentioned in the previous section, some respondents (both individualists and non-individualists) were provoked by the texts. These respondents interpreted the texts to be "typical" messages from an elite they did not trust; an elite they considered to be paternalistic and self-centered. As reported, the texts first provoked them, and next, the questions about their positions on the different policies increased their feeling of provocation. They referred to themselves as underpaid and overworked when compared with those they perceived to be the messengers. They described the messengers to most probably be privileged politicians, who ask respondents to restrict their already low consumption and emissions. These respondents were not positive toward the policies prior to reading the texts either, so they did not change from having positive to having negative attitudes. The ways they grounded their attitudes are hence, examples of how identities may make people "unresponsive" to certain institutional contexts.

The above examples indicate that whether an institutional context influences attitudes depends both on the strength of the cues and on how the cues resonate with personal characteristics. When a text is the "carrier" of cues, the cues may be weaker than if, for instance, a person is the "carrier" of cues (through, e.g., behaving in a certain way). Such descriptive norms (what others are doing) could be a more effective institutional context; individuals would easily assess what is regarded as appropriate. However, these contexts' influence may also depend on whether the recipient identifies with the person(s) who describe the norm through her/his(their) action. A challenge from using a survey experiment as in papers III and IV to gather empirical material on how institutional contexts influence attitudes toward policies is the lack of control of what particularly in the experimental treatment affects attitudes (or prevents an effect). As mentioned, this could, for instance, be the recipients' perceptions of the "messenger." It could also relate to the indirect institutional contexts being established by the recipient's identity.

The complexity of the dynamics between individual factors and situational factors is also illustrated by the potential institutional effects of particular policy questions. Questions about specific policies may evoke different logics, depending on the recipient's identity. The question about attitudes toward taxes may be an example of an unidentified influence: we do not know whether the question itself evokes social or individual rationality. For instance, differences in support for general policies vs. for specific taxes (support for the latter is often found to be lower) are often interpreted as due to a person's unwillingness to contribute to the social good of avoiding climate change if contributing involves individual sacrifices (e.g., Pidgeon, 2012).

However, questions about specific taxes may trigger an egoistic "mode of thinking" – an "I" logic – measuring the willingness to pay, which may result in a lower score than if "we" or "they" logic is triggered (Stern et al., 1993). For instance, egoistic values may become more salient when questions are framed regarding willingness to pay taxes to protect the environment – "questions that draw attention to the monetary and thus egoistic aspects of environmental problems" (ibid, 339). If the aim is to make individuals think about the social good, such effects on rationality or logic have implications for how we should raise and discuss questions about policies. Paper IV reveals that different presentations of a problem induce institutional context, context which influences rationality, whether social or individual. However, the question formulation that comes after the constructed context (treatment in the survey experiment) may also influence whether a respondent answers according to social or individual rationality.

The two related issues above – that of perceiving a messenger, and that of logic evoked by specific policy questions – point to the complexity of the interaction between contextual factors and individuals' identities. The implications of this understanding of the linkages between individual characteristics, context and attitudes toward restrictive policies are profound. Attitudinal responses depend critically on the salience of particular beliefs and values in contexts, as well as on identities.

5. Conclusion

In this section, I integrate the empirical findings into a conclusion with respect to the dissertation's two objectives. The first was to increase our knowledge about the relationships between individuals' political values, their climate concern and their attitudes toward climate policies. The second objective was to expand our insights into how institutional context may influence these relationships.

Given the results in this thesis, what can we say about the above relationships? The first section below presents a general summary about the relationships studied. Implications of the findings for future research follow in the second section.

5.1. General findings

The thesis reveals stable patterns regarding the relationships between political values, climate concern and climate policies, and the findings in the four papers corroborate each other. Political value orientation correlates with climate concern, and both political values and climate concern correlate with attitudes toward climate policies. Non-individualists are more climate concerned and more positive toward climate policies than are individualists. These findings are stable over time (papers I and II), for various policies (papers II, III and IV), and when various institutional contexts are emphasized (papers III and IV).

However, the thesis also shows that the strength of these relationships varies. Regarding the relationship between political values and climate concern, the thesis identifies a weak increase in difference between value groups over time (2007–2011) (paper I). In addition, climate concern correlates with positive attitudes toward climate policies irrespective of political values (paper II).

The thesis reveals that institutional contexts may influence the relationship between political values and attitudes toward climate policies; they both increased and decreased the differences in attitudes between the value groups. The institutional context that enhanced individual rationality had a stronger effect on individualists' attitudes than on non-individualists' attitudes toward two of the policies. The differences in attitudes towards these policies hence decreased. The institutional contexts that enhanced social rationality influenced only non-individualists' attitudes, and hence increased the differences in attitudes between the value groups (papers III and IV).

The thesis supports the theoretical assumption that individuals may switch between social and individual rationalities, depending on the institutional context. It also reveals that identities other than political value orientations influenced the institutional context's effect on attitudes. Both cultural resistance (toward what was characterized as an educated wealthy elite) and concrete experiences with pollution influenced text treatments' effect on attitudes toward policies. Attitudinal responses hence depend critically on the salience of particular institutional cues in contexts, as well as on the individuals' identities.

In conclusion, the thesis shows how better insights regarding the interactions between identity and institutional context can improve our understanding of public attitudes towards climate change and climate policies. It also offers insights regarding how societies, through changing the contexts under which people act, may influence people to be either more self-regarding or more other-regarding. This insight is important for climate policy, as climate change presently is one of our most challenging collective-choice problems.

5.2. Implications for research

In this thesis, I identify a number of topics worth further investigation. Here, I will concentrate on three broader topics of importance for improving our understanding of the relationships between political values, attitudes and institutional contexts. In particular, why these relationships exist and how they change would be relevant for solving the social dilemma of climate change, as solving it depends on popular support for policies. First, and generally, studies that enable analyses of causal mechanisms (e.g., path analyses of time-series data) would be valuable for examining whether changes in climate concern lead to changes in acceptance of policies independent of political values and other identity markers. Such studies would also be valuable for examining the relationship between institutional changes such as implementation of policies and attitudes toward policies.

Second, and more specifically, it would be interesting to survey the development of public attitudes toward climate change to see if the finding of slight polarization in concern represents the start of a trend. In particular, studies that include time-series analyses of elite polarization, media attention, policies implemented and societal trends such as economic development and employment rates should be included, to enable analyses of reasons for polarization or converging positions between subgroups.

Third, in this thesis, a limited type of cues, or carriers, is analyzed, namely texts as treatments in a survey experiment. Other carriers, such as persons or policy instruments, may be less ambiguous. In future studies, institutional contexts should involve other cues than the ones possible to include in a text. Future studies should include theoretical perspectives explaining the effects of interaction between identity and situational cues in social dilemmas. In quantitative analyses, measurements of identities other than political value orientation should be included to explore the magnitude of cultural resistance to policies.

References

- Aardal, B. (2011). Det politiske landskap. En studie av stortingsvalget i 2009 [The political landscape. A study of the Norwegian parliamentary election, 2009]. Oslo: Cappelen Damm Akademisk.
- Agresti, A. (1996). *An Introduction to Categorical Data Analysis*. John Wiley and Sons, New York.
- Austgulen, M.H. and Stø, E. (2013). Norsk skepsis og usikkerhet om klimaendringer [Norwegian skepticism and uncertainty about climate change]. *Tidsskrift for samfunnsforskning*, 124–150.
- Baldassarri, D. and Gelman, A. (2008). Partisans without Constraint: Political Polarization and Trends in American Public Opinion. *American Journal of Sociology*, 114:408–46.
- Bennett, W. L., and Iyengar, S. (2008). A new era of minimal effects? *Journal of Political Communication*, 58, 707–731.
- Berger, P. and Luckmann, T. [1967] (1991). *The Social Construction of Reality. A Treatise in the Sociology of Knowledge*. London: Penguin Books.
- Biel, A. and Thøgersen, J. (2007). Activation of social norms in social dilemmas: a review of the evidence and reflections on the implications for environmental behavior. *Journal of Economic Psychology* 28(1), 93–112.
- Bolsen, T., Druckman, J.N., Cook, F.L. (2014). Communication and Collective Actions: A Survey Experiment on Motivating Energy Conservation in the U.S. *Journal of Experimental Political Science* 1, 24–38.
- Bornstein, N., and Lanz, B. (2008). Voting on the environment: Price or ideology? Evidence from Swiss referendums. *Ecological Economics*, 67, 430–440. doi:10.1016/j.ecolecon.2007.12.026
- Bostrom, A., O'Connor, R. E., Böhm, G., Hanss, D., Bodi, O., Ekström, F., Halder, P., Jeschke, S., Mack, B., Qu, M., Rosentrater, L., Sandve, A., and Sælensminde, I. (2012). Causal thinking and support for climate change policies: International survey findings. *Global Environmental Change*, 22, 210–222.
- Brannen, J. (2005). Mixing methods: The entry of qualitative and quantitative approaches into the research process, *International Journal of Social Research Methodology*, 8:3, 173–184.
- Brulle, R.J., Carmichael, J. and Jenkins, J.C. (2012). Shifting public opinion on climate change: an empirical assessment of factors influencing concern over climate change in the US, 2002–2010. *Climatic Change*, 114, 169-188. doi: 10.1007/s10584-012-0403-y
- Bryman, A. (2008). *Social Research Methods*, (3rd ed.) Oxford: Oxford University Press.
- Burstein, P. (2003). The Impact of Public Opinion on Public Policy: A Review and an Agenda. *Political Review Quarterly*, 29–40.
- Carr, E.S. (2010). Qualifying the Qualitative Social Work Interview. *Linguistic Anthropological Approach. Journal of Qualitative Social Work*, Vol. 10(1), 123–143.
- Cialdini, R., Kallgren, C., and Reno, R. (1991). A Focus Theory of Normative Conduct: a theoretical refinement and re-evaluation of the role of norms in human behaviour. *Advances in Experimental Social Psychology* 24, 201–234.

- Clements, B. (2012). Exploring public opinion on the issue of climate change in Britain. *British Politics*, 7, 183–202. doi:10.1057/bp.2012.1
- Cohen, G. L. (2003). Party over policy: The dominating impact of group influence on political beliefs. *Journal of Personality and Social Psychology*, 85, 808–22.
- Corner, A., Whitmarsh, L., and Xenias, D. (2012). Uncertainty, scepticism and attitudes towards climate change: biased assimilation and attitude polarisation. *Climatic Change*, 463–478
- Danermark, B., Ekström, M., Jacobsen, L. and Karlsson, J. C. (2001). *Explaining Society. Critical Realism in the Social Sciences* (London: Routledge).
- March March, R., Vincenti, K., and Calleja, N. (2012). Risk communication: climate change as a human-health threat, a survey of public perceptions in Malta. *European Journal of Public Health*, 22, 144–149. doi:10.1093/eurpub/ckq181
- Dawes, R. M. (1980). Social dilemmas. *Annual Review of Psychology*, 31, 169–193.
- Dewey, John. (1929). *The Later Works of John Dewey, Volume 4, 1925 - 1953: 1929: The Quest for Certainty*. Ed. Jo Ann Boydston. Carbondale, Ill.: Southern Illinois University Press.
- Dietz, T., and Stern, P. C. (1995). Toward a theory of choice: socially embedded preference construction. *Journal of Socio-Economics*, 24, 261–79.
- Dietz, T. and Stern, P.C. (2002). Exploring new tools for environmental protection. In T. Dietz and P.C. Stern (Eds.), *New Tools for Environmental Protection. Education, Information and Voluntary Measures* (pp. 3–15). Washington, DC: National Academy Press.
- Dietz, T., Dan, A., and Shwom, R. (2007). Support for climate change policy: Some psychological and social structural influences. *Rural Sociology*, 72, 185–214. doi:10.1526/003601107781170026
- DiMaggio, Paul J., and Walter W. Powell (1991). “Introduction.” In Walter W. Powell and Paul J. DiMaggi (Eds.), *The New Institutionalism in Organizational Analysis* (pp. 1–38). Chicago: University of Chicago Press.
- DiMaggio, P., Evans, J.H. and Bryson, B. (1996). “Have Americans’ Social Attitudes Become More Polarized?” *American Journal of Sociology* 102:690–755.
- Douglas, M., and Wildavsky, A. B. (1982). *Risk and culture: An essay on the selection of technical and environmental dangers*. Berkeley: University of California Press.
- Douglas, M. (1986). *How Institutions Think*. Syracuse, NY: Syracuse University Press.
- Drews, S., and van den Bergh, J. C. J. M. (2015). What explains public support for climate policies? A review of empirical and experimental studies. *Climate Policy*, 16, 855–876. doi:10.1080/14693062.2015.1058240
- Dunlap, R., and Van Liere, K. (1978). The “new environmental paradigm:” A proposed measuring instrument and preliminary results. *Journal of Environmental Education*, 9, 10–18.
- Dunlap, R. E., and Jones, R. E. (2002). Environmental concern: Conceptual and measurement issues. In R. E. Dunlap and W. Michelson (Eds.), *Handbook of environmental sociology* (pp. 482-524). Westport, CT: Greenwood

- Eagly, A. H. and Chaiken, S. (1993). *The Psychology of Attitude*. Orlando, US: Harcourt Brace Jovanovich College Publishers.
- Eagly, A.H., and Chaiken, S. (1998). Attitude, Structure and Function. In Gilbert, D.T., Fisk, S.T. and Lindsey, G. (Eds.). *Handbook of Social Psychology* (pp. 269–322). New York: McGowan-Hill.
- Eckersley, R. (1989). Green politics and the new class: selfishness or virtue?, *Political Studies*, 2, pp. 205–223.
- Elder-Vass, D., (2007). Re-examining Bhaskar’s three ontological domains: the lessons from emergence. In Lawson, C., Latsis, J. and Martins, N. (Eds.) *Contributions to social ontology* (pp. 160–176). London: Routledge.
- Evans, J. H., (2002). Polarization in Abortion Attitudes in U.S. Religious Traditions 1972–1998. *Sociological Forum*, 17, 397–422.
- Finucane, M.L., Alhakami, A., Slovic, P. and Johnson, S.M. (2000). The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making* 13, 1–17.
- Fiorina, M. and Abrams, S. (2008). Political Polarization in the American Public. *Annual Review of Political Science*, 11, 563–88.
- Forgas, J. P. (1982). Episode cognition: Internal representations of interaction routines. In L. Berkowitz (Ed.), *Advances in experimental social psychology* 15 (pp. 59–103). New York: Academic.
- Fransson, N. and Gärling, T. (1999). Environmental concern: Conceptual definitions, measurement methods, and research findings. *Journal of Environmental Psychology* 19, 369–382.
- Frey, D. (1986). Recent research on selective exposure to information. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 41–80). New York: Academic Press.
- Ghalwash, T. (2007). Energy taxes as a signaling device: An empirical analysis of consumer preferences. *Energy Policy* 35, 29–38.
- Giddens, A. (2009). *The Politics of Climate Change*. Cambridge. UK: Polity Press.
- Gifford, R., Comeau, L.A. (2011). Message framing influences perceived climate change competence, engagement, and behavioral intentions. *GEC* 21, 1301–1307.
- Gneezy, U. and Rustichini, A. (2000a). Pay enough or don’t pay at all. *Quarterly Journal of Economics*, 115(3): 791–810.
- Gneezy, U. and Rustichini, A. (2000b). A fine is a price. *The Journal of Legal Studies*, 29(1): 1–17.
- Groves, R. M. (2006). Nonresponse Rates and Nonresponse Bias in Household Surveys. *Public Opinion Quarterly*, 70(5), 646–675.
- Groves, R. M. and Peytcheva, E. (2008). The Impact of Nonresponse Rates on Nonresponse Bias. A Meta-Analysis. *Public Opinion Quarterly*, 72(2), 167–189.
- Hall, P. (1993). Policy Paradigms, Social Learning, and the State: The Case of Economic Policymaking in Britain. *Comparative Politics*, 25(3): 275–296.
- Hamilton, L.C. and Saito, K. (2015). A four-party view of US environmental concern. *Environmental Politics*, 24 (2), 212–227. doi:10.1080/09644016.2014.976485

- Hammar, H., and Jagers, S. (2006). Can trust in politicians explain individual' support for climate policy? The case of CO2 tax. *Climate Policy*, 5, 613–625. doi:10.1080/14693062.2006.9685582
- Harring, N., and Jagers, S. (2013). Should we trust in values? Explaining public support for pro-environmental taxes. *Sustainability*, 5, 210–227. doi:10.3390/su5010210
- Harrison, G.W. and List, J.A. (2004). Field experiments. *Journal of Economic Literature*, 42(4), 1009–1055.
- Heller, M. and A. Vatn, 2017. The divisive and disruptive effect of a weight-based waste fee. *Ecological Economics*, 131:275–285
- Hellevik, Ottar (2016). Extreme nonresponse and response bias: A “worst case” analysis. *Quality and Quantity*. doi: 10.1007/s11135-015-0246-5.
- Hellevik (2015). Hva betyr respondentbortfallet i intervjuundersøkelser? *Tidsskrift for samfunnsforskning*, 212–231 [The implications of nonresponse in survey research] (https://www.idunn.no/tfs/2015/02/hva_betyr_respondentbortfallet_i_intervjuundersoekelser)
- Hodgson, G.M. (1988). *Economics and Institutions: A Manifesto for a Modern Institutional Economics*. Cambridge, UK: Polity Press.
- Hodgson, G.M. (2006). ‘What are institutions?’, *Journal of Economic Issues*, 40(1), 2–4.
- Hodgson, G.M. (2007). The revival of Veblenian institutional economics. *Journal of Economic Issues*, 2, 325–40.
- Hogg, M.A. and G. M. Vaughan, G. M. (2011). *Social psychology*. Edinburgh, UK: Pearson Education Limited.
- Höppner C. and Whitmarsh, L., (2010). Public engagement in climate action: policy and public expectations. In: Whitmarsh L, O’Neill S, Lorenzoni I, eds. *Engaging the Public with Climate Change: Behaviour Change and Communication*. London: Earthscan.
- Hulme, M. (2009). *Why We Disagree About Climate Change*. Cambridge, UK: Cambridge University Press.
- Hurlstone, M.J., Lewandowsky, S., Newell, B.R., Sewell, B. (2014). The effect of framing and normative messages in building support for climate policies. *PLoS ONE* 9(12), e114335. doi:10.1371/journal.pone.0114335.
- Inglehart, R., and Klingemann, H.D. (1979). Ideological conceptualization and value priorities. Pp. 203-214, In *Political Action: Mass participation in Five Western Democracies*, ed. S.M. Burnes, M. Kaase, et al. Beverly Hills, Calif: Sage.
- IPCC, International Panel on Climate Change (2013). *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker. T.F., D. Qin. G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press. Cambridge. United Kingdom and New York. NY. USA.

- IPCC, International Panel on Climate Change (2014). Summary for policymakers. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1–32.
- Kahan, D. M., Jenkins-Smith, H. and Braman, D. (2010). Cultural cognition of scientific consensus. *Journal of Risk Research*, 14, 147–174.
- Kahan, D. M., Peters, E., Wittlin, M., Slovic, P., Larrimore Quелlette, L., Braman, D. and Mandel, G. (2012). The polarizing impact of science literacy and numeracy on perceived climate change risk. *Nature Climate Change*, 2, 732–735.
- Kahneman, Daniel; Tversky, Amos (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*. 47 (2): 263. doi:10.2307/1914185.
- Kallbekken, S., and Aasen, M. (2010). The demand for earmarking: Results from a focus group study. *Ecological Economics*, 69, 2183–2190. 10.1016/j.ecolecon.2010.06.003
- Karlsen, R., and Aardal, B. (2016). Political values count but issue ownership decides? How stable and dynamic factors influence party set and vote choice in multiparty systems. *International Political Science Review*, 37(2), 261–276. doi: 10.1177/0192512114558456
- Kelle, Udo (2001). Sociological Explanations between Micro and Macro and the Integration of Qualitative and Quantitative Methods [43 paragraphs]. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, 2(1), Art. 5, <http://nbn-resolving.de/urn:nbn:de:0114-fqs010159>.
- Knutsen (2006). The end of traditional political values?. Pp. 115–50 in *Globalization, Value Change, and Generations*, ed. P. Ester, M. Braun and P. Mohler. Leiden: Brill.
- Knutsen, O., and Kumlin, S. (2005). Value orientations and party choice. In: J. Thomassen (Ed.) *The European Voter* (pp.125–166). Oxford: Oxford University Press.
- Kriesi, H. (1989). New social movements and the new class in the Netherlands. *American Journal of Peasant Studies*, 20, 389–419.
- Krosnick, J. A., Holbrook, A. L., and Visser, P. S. (2000). The impact of the fall 1997 debate about global warming on American public opinion. *Public Understanding of Science* 9, 239–260.
- Kuvaas, B., Buch, R., Gagne', M., and Dysvik, A., (2016). Do you get what you pay for? Sales incentives and implications for motivation and changes in turnover intention and work effort. *Motiv. Emot.* 40, 667–680. DOI 10.1007/s11031-016-9574-6
- Kvaløy, B., Finseraas, H. and Listhaug, O. (2012). The Publics' concern for global warming: A cross-national study of 47 countries. *Journal of Peace Research*, 49, 11–22.
- Leiserowitz, A. (2006). Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Climatic Change*, 77, 45–72. doi: 10.1007/s10584-006-9059-9

- Levin, Irwin P., Sandra L. Schneider, and Gary J. Gaeth. All frames are not created equal: A typology and critical analysis of framing effects. *Organizational behavior and human decision processes* 76.2 (1998): 149–188.
- Le Quéré, C. et al. (2015). Global Carbon Budget 2015. *Earth System Science Data* 7, 349–396.
- Lieberman, V. Samuels, M.S., Ross, L. (2004). The Name of the Game: Predictive Power of Reputations Versus Situational Labels in Determining Prisoner's Dilemma Game Moves. *Personality and Social Psychology Bulletin*, 30, 1175–1185.
- Lord, C.G., Ross, L., and Lepper, M.R. (1979). Biased assimilation and attitude polarization: Effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, 37, 2098–109.
- Mackie, D. M., and Quellar, S. (2000). The impact of group membership on persuasion: Revisiting "Who says what to whom with what effect? In D. J. Terry and M. A. Hogg (Eds.), *Attitudes, behavior, and social context: The role of norms and group membership*. Mahwah, NJ: Lawrence Erlbaum Associate Publishers, 135–155.
- Maibach, E. W., Leiserowitz, A., Roser-Renouf, C., and Mertz, C. K. (2011). Identifying like-minded audiences for global warming public engagement campaigns: An audience segmentation analysis and tool development. *PLoS ONE*, 6, e17571. doi:10.1371/journal.pone.0017571
- Malka, A., Krosnick, J.A., and Langer, G. (2009). The association of knowledge with concern about global warming: trusted information sources shape public thinking. *Risk Analysis*, 29, 633–647. doi:10.1111/j.1539-6924.2009.01220.x
- March, J.G. and Olsen, J.P. (1989). *Rediscovering Institutions. The Organizational Basis of Politics*. New York: Free Press.
- March, J.G., 1994. *A Primer on Decision Making. How Decisions Happen*. New York: Free Press.
- McCann, James A (1997) Electoral choices and core value change: The 1992 presidential campaign. *American Journal of Political Science* 41(2): 564 - 583.
- McCright, A., Dunlap, R. and Marquart-Pyatt, S.T. (2016). Political ideology and views about climate change in the European Union, *Environmental Politics*, 25:2, 338-358, DOI: 10.1080/09644016.2015.1090371
- McCright A.M., and Dunlap, R.E. (2011). The Politicization of Climate Change and Polarization in the American Public's Views of Global Warming, 2001–2010. *The Sociological Quarterly*, 52, 155–194.
- McCright, A. M. (2008). Social bases of climate change knowledge, concern, and policy support in the U.S. general public. *Hofstra Law Review*, 37(4), 1017–1046.
- McCright, A. M., Dunlap, R. E., and Xiao, C. (2013). Perceived scientific agreement and support for government action on climate change in the USA. *Climatic Change*, 119, 511–518. doi:10.1007/s10584-013-0704-9.
- Maxwell, J. A. (2013). *Qualitative Research Design: An Interactive Approach*. Los Angeles, Sage.

- Messick, D. M. (1999). Alternative logics for decision making in social settings. *Journal of Economic Behavior and Organization*, 39(1), 11–28.
- Morrison, M., Duncan, R., and Parton, K. A. (2013). Targeting segments in the Australian community to increase support for climate change policy. *Australasian Marketing Journal*, 21, 212–217. doi:10.1016/j.ausmj.2013.09.001
- Norwegian Environmental Agency (2015) Local Air pollution, retrieved from 13.08 2015: http://www.miljodirektoratet.no/no/Tema/Luft/Lokal_luftforurensning/
- Næss, P. (2004). Prediction, Regressions and Critical realism. *Journal of critical realism*, 133–164.
- Page, B. I., and Shapiro, R. Y. (1983). Effects of public opinion on policy. *The American Political Science Review*, 77, 175–190.
- Park, H. S., and Vedlitz, A. (2013). Climate hazards and risk status: Explaining climate risk assessment, behavior, and policy support. *Sociological Spectrum*, 33, 219–239. doi:10.1080/02732173.2013.732900
- Pidgeon, N. F. (2012). Public understanding of, and attitudes to, climate change: UK and international perspectives and policy. *Climate Policy*, 12, 85–106.
- Pietsch J. and McAllister, I. (2010). A diabolical challenge’: public opinion and climate change policy in Australia. *Environmental Politics*, 19: 217–236.
- Petrovic, N., Madrigano, J., and Zaval, L. (2014). Motivating mitigation: When health matters more than climate change. *Climatic Change*, 126, 245–254. doi:10.1007/s10584-014-1192-2
- PEW Research Center (2012). Methodology Study. Assessed April 2017 at <http://www.people-press.org/2012/05/15/assessing-the-representativeness-of-public-opinion-surveys/>
- Rohan, M. J. (2000). A rose by any name? The values construct. *Personality and Social Psychology Review*, 4, 255–277.
- Rokeach, M. (1973). *The nature of human values*. New York, NY: Free Press.
- Sayer, A. (2000). *Realism and Social Science*. London: Sage Publications Ltd.
- Selart, M., Nordström, T., Kuvaas, B., Takemura, K. (2008). Effects of reward on self-regulation, intrinsic motivation and creativity. *Scandinavian Journal of Educational Research*, 52 (5), 439–458.
- Scannell, L. and R. Gifford (2013). Personally Relevant Climate Change. The Role of Place Attachment and Local Versus Global Message Framing in Engagement. *Environment and Behavior*, 45, 60–85.
- Schulz-Hardt, S., Frey, D., Luthgens, C., and Moscovici, S. (2000). Biased information search in group decision making. *Journal of Personality and Social Psychology*, 78, 655–669.
- Schwartz, S. H. (1992). Universals in the content and structure of values: Theory and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 25) (pp. 1–65). New York: Academic Press.
- Schwartz, S.H. (1977) Normative Influences on Altruism. In: Berkowitz, L., Ed., *Advances in Experimental Social Psychology*, Academic Press, New York, 221–279.

- Schwartz, Shalom H. (1994), "Are there Universal Aspects in the Structure and Content of Human Values?" *Journal of Social Issues*, 50, 19–45.
- Scott, W. R. (2004). Institutional theory: Contributing to a theoretical research program. In Smith, K.G. and Hitt, M. A. (Eds.). *Great minds in management: The process of theory development* (pp. 460–484). Oxford: Oxford University Press.
- Scott, W.R. (2014). *Institutions and Organizations: Ideas, Interests and Identities*. 4th edition. Los Angeles, CA: Sage Publications.
- Siegrist, M., Cvetkovich, G., and Roth, C. (2000). Salient value similarity, social trust, and risk/ benefit perception. *Risk Analysis*, 20, 353–62.
- Schon, D. A., and Rein, M. (1994). *Frame reflection. Toward the resolution of intractable policy controversies*. New York, NY: Basic Books.
- Simon, H.A., (1979). Rational Decision Making in Business Organizations. *The American Economic Review*, 69, 493–513.
- Singer, E. (2006). Introduction. Nonresponse Bias in Household Surveys. *Public Opinion Quarterly*, 70(5), 637–645.
- Sjöstrand, S-E. (1995). Towards a Theory of Institutional Change. In Groenewegen, J., C. Pitelis and S-E. Sjöstrand (Eds.), *On Economic Institutions. Theory and Application* (pp. 19–44). Cheltenham: Edward Elgar.
- Slovic, P., Finucane, M., Peters, E. and MacGregor, D.G. (2004). Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality. *Risk Analysis* 24, 1–12.
- Smith, N., and Leiserowitz, A. (2013). The role of emotion in global warming policy support and opposition. *Risk Analysis*, 34, 937–948. doi:10.1111/risa.12140
- Sniderman, P. M., Theriault, S.M. (2004). The Structure of Political Argument and the Logic of Issue Framing, in: Saris, W.E., Sniderman, P.M. (Eds.), *Studies in Public Opinion*. Princeton University Press, Princeton, pp. 133–165.
- Soma, K. and Vatn, A. (2010). Is there anything like a citizen? A descriptive analysis of instituting a citizen's role to represent social values at the municipal level. *Environmental Policy and Governance*, 20, 30–43.
- Soma, K. and Vatn, A. (2014). Representing the common goods – stakeholders vs. citizens. *Land Use Policy*, 41, 325–333.
- Spence, A. and Pidgeon, N. (2010). Framing and communicating climate change: the effects of distance and outcome manipulations. *GEC* 20, 656–667.
- Stern, P. C., (1986). Blind spots in policy analysis: What economics doesn't say about energy use. *Journal of Policy Analysis and Management*, Volume 5, Issue 2, Pages 200–227.
- Stern, P. C. (1992). Psychological dimensions of global environmental change. *Annual Review of Psychology*, 43, 269–302.

- Stern, P. C., Dietz, T., and Kalof, L. (1993). Value orientations, gender, and environmental concern. *Environment and Behavior*, 25, 322–348.
- Stern, P., Dietz, T., Abel, T., Guagnano, G. and Kalof, L. (1999). A Value-Belief Norm Theory of Support for Social Movements: the case of environmental concern. *Human Ecology Review* 6, 81–97.
- Stern, P.C. (2000). Toward a Coherent Theory of Environmentally Significant Behavior, *Journal of Social Issues*, Vol. 56, No. 3, 407–424.
- Schulz-Hardt, S., Frey, D., Luthgens, C., and Moscovici, S. (2000). Biased information search in group decision making. *Journal of Personality and Social Psychology*, 78, 655–69.
- Silverman, D. (2006), *Interpreting Qualitative Data*, (3rded.) London: Sage.
- Tenbrunsel, A. E., and Messick, D. M. (1999). Sanctioning systems, decision frames, and cooperation. *Administrative Science Quarterly*, 44(4), 684–707.
- Thalmann, P. (2004). The public acceptance of green taxes: 2 million voters express their opinion. *Public Choice*, 119, 179–217. doi:10.1023/B:PUCH.0000024165.18082.db
- Tjernström, E. and Tietenberg, T., 2008. Do differences in attitudes explain differences in national climate change policies? *Ecological Economics*, 65, 315–324. doi:10.1016/j.ecolecon.2007.06.019
- Tobler, C., Visschers, V. H. M., and Siegrist, M. (2012). Addressing climate change: Determinants of consumers' willingness to act and to support policy measures. *Journal of Environmental Psychology*, 32, 197–207. doi:10.1016/j.jenvp.2012.02.001
- Tranter, B. (2013). The Great Divide: Political Candidate and Voter Polarisation over Global Warming in Australia. *Australian Journal of Politics and History*, 59(3), 397–413.
- Vatn, A. (2005). *Institutions and the Environment*. Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing.
- Vatn, A. (2009). Cooperative behavior and institutions. *Journal of Socio-Economics* 38, 188–196.
- Vatn, A. (2015). *Environmental Governance. Institutions, policies and action*. Edward Elgar, Cheltenham.
- Vågane, L. (2013). *Transportytelser i Norge 1946–2012 [Transportation in Norway 1946-2012] TØI rapport 1277/2013* (retrieved from <https://www.toi.no/getfile.php?mmfileid=33392>, 23.09.2015)
- Weber, E. (2010). What shapes perceptions of climate change? *Wiley Interdiscip. Rev. Clim. Change*, 1, 332–342.
- Weber, J.M., Kopelman, S., and Messick, D.M. (2004). A Conceptual Review of Decision Making in Social Dilemmas: Applying a Logic of Appropriateness. *Personality and Social Psychology Review*, 8, 281–307.
- Whitmarsh, L. (2011). Skepticism and uncertainty about climate change: perceptions and change over time. *Global Environmental Change*, 21, 690–700.
- Wiest, S.L., Raymond, L., Clawson, R.A. (2015). Framing, partisan predispositions, and public opinion on climate change. *GEC* 31, 187–198.

- Wikan, U. (1992). Beyond the Words: The Power of Resonance. *American Ethnologist. A Journal of the American Anthropological Association* 19 (3), 460–482.
- Wiseman, J., Edwards, T. and Luckins, K. (2013). Post Carbon Pathways: A Meta analysis of 18 large scale post carbon economy strategies, *Environmental Innovation and Societal Transitions*, 8, 76–93.
- Wolf, J., Moser, S. C. (2011). Individual understandings, perceptions, and engagement with climate change: Insights from in-depth studies across the world. *Wiley Interdisciplinary Reviews: Climate Change*, 2, 547–569. doi:10.1002/wcc.120
- Wood, B.D., and Vedlitz, A. (2007). Issue Definition. *Information Processing and the Politics of Global Warming. American Journal of Political Science*, 51, 552–568.
- Zahran, S., Brody, S. D., Grover, H., and Vedlitz, A. (2006). Climate change vulnerability and policy support. *Society and Natural Resources*, 19, 771–789. doi:10.1080/08941920600835528
- Zaller, John R (1991). *The Nature and Origins of Mass Opinion*. Cambridge: Cambridge University Press.
- Zhao, X., Leiserowitz, A. A., Maibach, E. W., and Roser-Renouf, C. (2011). Attention to science/environment news positively predicts and attention to political news negatively predicts global warming risk perceptions and policy support. *Journal of Communication*, 61, 713–731. doi:10.1111/j.1460-2466.2011.01563.x
- Zavestoski, S. (2002). The Social-Psychological Bases of Anticonsumption Attitudes. *Psychology and Marketing* 19(2), 149–165.

Paper I

■ research article

The polarization of public concern about climate change in Norway

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This article contributes to the existing literature by investigating the importance of value orientations for the Norwegian public's climate change concern, by analysing data from a national Gallup Poll from 2003 to 2011. Logistic regressions were conducted to investigate the importance of individualistic and egalitarian values for climate concern, and whether the groups of different value orientations have polarized in their climate concern over time. Respondents who hold less individualistic values and those holding egalitarian values are found more likely to be concerned about climate change than are those holding individualistic and less egalitarian values. Furthermore, the analyses find polarization in climate concern in the period for both value orientations. Increased focus on policy instruments in the political debate may be one explanation for values being increasingly salient. Future research should focus on studying ways to formulate policies given variations in values. One way would be to develop solutions that have co-benefits across groups of different value orientations. However, not all mitigation policies have immediate co-benefits for everyone. Research on how changes in the institutional setting may enhance the logic of social responsibility seems crucial.

Policy relevance

It is an important social science contribution to increase our understanding of public positions on climate change for developing effective responses to this vexing problem. This study identifies polarization over time between subgroups of different value orientations in their climate change concern. This may have implications for policies, as political solutions may be increasingly dependent on the composition of political leadership. Society and politicians should look for mitigation policies that have co-benefits across groups of different value orientations when possible. However, not all mitigation policies have immediate co-benefits for everyone. One option then is to change the institutional settings from enhancing the logic of individual benefits to enhancing the logic of social benefits for behaviour crucial for mitigating climate change. Finally, narratives about a low-emitting society that are attractive for all groups of value orientations should be emphasized.

Keywords: attitude polarization; concern about climate change; public perception; value orientation

1. Introduction

Scientific evidence of and scientific concern about anthropogenic climate change have accumulated steadily over recent decades (IPCC, 2013, 2014). However, the development of climate change concern in the public deviates from the development of scientific consensus, and this is one reason for the claim that one must look at social and cultural influences when analysing public climate

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concern (e.g. Hulme, 2009). There are many influences on public concern about climate change, scientific facts and media attention being two. However, value orientation and identity are often crucial to the selection and perception of information about complex challenges, and can be more important than the cognitive ability to understand such issues (e.g. Kahan et al., 2012).

According to Pidgeon (2012), there is some evidence that attitudes towards climate change are influenced both by people's ideological beliefs and by their beliefs about its threats to their values. Several studies have found that concern about climate change increases with egalitarian value orientation and decreases with individualist value orientation (e.g. Clements, 2012; Kahan, Jenkins-Smith, & Braman, 2011; Zia & Todd, 2010).

An important contribution from social science is to increase the understanding of public positions on climate change in order to develop effective responses to this vexing problem (Beck, 2010; Dietz, Dan, & Shwon, 2007). If this topic becomes an identity marker for subgroups, information about it may lead to a greater polarization of views (Kahan et al., 2012; Hindman, 2009). A potential divergence in climate change concern between subgroups has implications for policies – political solutions will be dependent on the composition of the political leadership, and whether they represent voters with high or low climate concern. The reluctance of governments to introduce emission-reducing policies is often grounded in a lack of support among voters (Bruvoll, Dalen, & Larsen, 2012; Giddens, 2009), resulting in a 'governance trap' (Compston & Bailey, 2008).

This article contributes to the existing literature by investigating the importance of individualistic and egalitarian values¹ for the Norwegian public's concern about climate change over time. Scholarship on the importance of values for concern informs the analysis of Gallup data. It further contributes to the discussion of whether a change in value orientation or in the framing of climate change is needed to engage the broader public (Hulme, 2009; Kahan et al., 2012; O'Brian & Wolf, 2010). Specifically, two research questions are addressed:

1. To what extent do subgroups of people with different value orientations differ in their concern about climate change?
2. Have the subgroups of people with different value orientations become more or less polarized in their concern about climate change over time?

Polarization is defined as an increase in difference in concern between groups of different value orientations. In the US, there is now an increasing gap between subgroups of different value orientation regarding climate change concern (McCright & Dunlap, 2011). Hitherto, no studies have investigated the relationship between general environmental concern and views on individualist or egalitarian values over time in Norway. The period investigated is 2003–2011, which was chosen because relevant data were available. Analysing public climate change concern over this particular period allows for the importance of value orientations to be investigated in a changing context of varying levels of media attention and political and scientific concern (Tjernshaugen, Aardal, & Gullberg, 2011).

The remainder of this article is organized as follows. In Section 2 a brief outline of climate change in Norwegian politics and media in the period 2003–2011 is outlined. In Section 3 a review of relevant theoretical perspectives is presented, which also inform the hypotheses presented in this section. In Section 4 the methods are described, in Section 5 the results. In Section 6 the results are discussed,

and in Section 7 conclusions and implications of the findings for climate change communication and policy making are presented.

2. Background

Climate change has increasingly become an important part of the environmental debate in Norway in the period 2003–2011 (Tjernshaugen et al., 2011). According to Ryghaug (2006), relatively few newspaper articles from 2001 to 2005 discussed the responsibility for climate change or the responsibility for mitigating it. In 2005, the Kyoto Protocol entered into force (UNFCCC, n.d.), and the discussions about how to cut emissions intensified. The debate increasingly concentrated on specific policy instruments (Eckersley, 2013). Environmental politics, and climate politics in particular, is a policy area where the political parties have diverging positions (Gloppen, Rakner, & Vibe, 2014; Tjernshaugen et al., 2011). In the period analysed here, the parties' positions on climate change became more distinct and polarized.

One of the conflicts in the period studied concerns how much Norway should reduce its emissions through domestic emission cuts versus paying for emission cuts abroad. The two positions are characterized as the 'national action' and 'thinking globally' discourses (Hovden & Lindseth, 2004). In 2008, the Norwegian Parliament negotiated a cross-partisan² compromise stating a national commitment to reducing emissions by 30% by 2020 (from the 2005 level), of which a certain share should be domestic reductions (Norwegian Government, 2008). Despite this compromise, the size of domestic reduction commitments was disputed until 2015.³ A challenge has been to minimize tensions between Norway's role as a climate leader and its role as an offshore petroleum and gas producer (Eckersley, 2013). Labour, the Conservatives, and the Progress Party have emphasized the importance of cost-effective GHG emissions reductions outside Norway, while the Socialist Left Party, the Liberal Party, the Christian Democratic Party, and the Centre Party have insisted on achieving two-thirds of GHG emissions reductions domestically (Tellmann, 2012).

Two other political conflicts that have become increasingly apparent during the period investigated concern the importance of the climate change problem and mitigation policies. The Socialist Left Party and the Liberal Party have been most eager to prioritize emission cuts, followed by the Christian Democratic Party and the Centre Party. The Labour Party, the Conservative Party, and the Progress Party have been less willing to do so (Gullberg & Skodvin, 2011). The former parties are more positive regarding state involvement and restrictive policies to reduce emissions, while the latter are more oriented towards market solutions and less state involvement (Tjernshaugen et al., 2011). Representatives from the Progress Party and the Conservative Party are the most eager to promote market solutions with minimal state involvement (Gloppen et al., 2014).

The amount and content of media coverage of climate change peaked in 2007⁴, mostly because of the launch of the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), Al Gore's release of the movie *An Inconvenient Truth*, and the awarding of the Nobel Peace Prize to Al Gore and the IPCC, all that same year⁵ (Tjernshaugen et al., 2011). Despite the decrease in media attention from 2007 to 2009, the amount of election-related media coverage on climate change was substantially higher prior to the election in 2009 than in 2005 (Tjernshaugen et al., 2011). In late 2009, the Conference of the Parties (COP 15) in Copenhagen gained massive media attention. After COP 15, which to many appeared to be a failure, media attention dropped. Thereafter,

technicalities in the international negotiations, the effects of climate change in developing countries, and Norway's image as the 'global hero' saving the poor by investing to reduce rainforest deforestation dominated the climate-related content in the media (Johannessen, 2014).

3. Importance of values for concern about climate change

In social science theory and research, attention has been given to the linkages between values and public concern, and to the effect of framing an issue such that certain values become relevant for it (e.g. Axelrod, 1973; Schon & Rein, 1994; Simon, 1979). In psychology, values are commonly referred to as central in a person's system of attitudes and beliefs – they are considered more resistant to change than, for instance, beliefs and concerns, and they influence these (e.g. Hogg & Vaughan, 2011). Schwartz defines a value as 'a desirable trans-situational goal varying in importance, which serves as a guiding principle in the life of a person' (Schwartz, 1992, p. 21).

The link between values and concern about climate change may be established through several mechanisms, leading to information search bias and information assimilation bias. Individuals tend to search for information that fits with their cultural predispositions, such as values (Schulz-Hardt, Frey, Luthgens, & Moscovici, 2000). The importance of values for information searching may be explained by people's interest in protecting their identity and social standing by conforming their beliefs and concern to those of like-minded others (Cohen, 2003). They are, moreover, likely to pay attention to the information that reinforces their prior beliefs and affective orientation (Jenkins-Smith, 2001).

Values may also influence concern via information assimilation bias, affecting which information people care about and believe in when exposed to it. The same facts are understood differently, and given different weight, by people with different values (Lord, Ross, & Lepper, 1979). The biased assimilation processes underlying this effect may include a propensity to remember the strengths of confirming evidence and the weaknesses of disconfirming evidence, to judge confirming evidence as relevant and reliable but disconfirming evidence as irrelevant and unreliable. Corner, Whitmarsh, and Xenias (2012) found that the rate of change in attitudes to climate change depended on one's initial position.

Individuals also readily assign expert knowledge and trustworthiness to information sources that they perceive to share their values (Earle & Cvetkovich, 1995; Mackie & Quellar, 2000; Siegrist, Cvetkovich, & Roth, 2000). Values often influence concern when people have limited knowledge, are exposed to ambiguous information, and have little experience with an issue. Citizens' selective reliance on information from elites (political leaders, organizations, and media outlets) that they trust applies typically to politically controversial issues such as climate change (Krosnick, Holbrook, & Visser, 2000; Wood & Vedlitz, 2007). This bias may also stem from affective appraisals of information (Jenkins-Smith, 2001). Elite polarization about an issue may hence also lead to polarization among the public. The 'party sorting' theory holds that political party activists drive a process of conflict extension among political elites, which then leads to sorting along ideological lines among the public (e.g. Fiorina & Abrams, 2008). This issue sorting among the public transfers the elite polarization to the public. The sociologists Baldassarri and Gelman (2008) similarly confirm that when parties diverge and polarize in their positions on an issue, the public also polarizes, based on value orientation. In addition, with a steady increase in pluralization of availability and supply of information via greatly

increased internet access, receivers exercise greater choice over their media sources (Bennett & Iyengar, 2008; Strömbäck, 2015). This development makes the search for identity-confirming information easier, and may contribute to public polarization on controversial issues over time.

Kahan et al. (2011) couple insights from social psychology with the cultural theory of risk to explain the relevance of certain values for public responses to threats such as climate change. The cultural theory of risk posits that persons whose values are individualistic and less egalitarian are sceptical of environmental risks, as widespread acceptance would justify restricting commerce and industry, which people with these values defend. By contrast, persons with less individualistic and more egalitarian values more readily accept scientific information about environmental problems, as they accept regulation that restricts the activity that causes these problems (Douglas & Wildavsky, 1982).

The operationalization of the index measuring the degree of individualistic values (Kahan et al., 2011, 2012) consists of questions regarding the degree of support for state regulation and control. They reveal the degree of egalitarian values through respondents' positions on wealth distribution and discrimination. Kahan et al. (2011, 2012) find that people exposed to the same information diverge in their views on climate change depending on their value orientations, and they further identify respondents scoring low on individualistic values and high on egalitarian to be more concerned than their individualistic and less egalitarian counterparts. Political psychologists also find that the individualistic oriented are more likely to express system-justification tendencies, while the less individualistic are more amenable to critiques of the established order (e.g. Feygina, John, & Goldsmith, 2010). Egalitarian values regarding the global distribution of wealth, as referred to in social psychology, are also found to correlate with environmental concerns. This correlation of social values and environmental concerns is typically explained by the fact that environmental issues are often social dilemmas that involve consequences for others (Schultz et al., 2005; Stern, 2000).

We have developed two hypotheses to research question (1) – the question regarding the importance of value orientations for climate concern. On the basis of the characteristics of climate change (being distant in time and place), theories about the influence of values on concern (regarding information search and assimilation bias), and the cultural theories of risk (Kahan et al., 2011; Wildavsky & Dake, 1990), we expect the following:

1. People that hold less individualistic values are more likely to be concerned about climate change than are people that hold individualistic values.
2. People that hold egalitarian values are more likely to be concerned about climate change than are people that hold hierarchical values.

Concerning research question (2) – regarding polarization in climate concern between groups of different value orientations – we have also developed two hypotheses. The political parties' diverging positions on specific policy instruments in Norway, and the theories of public polarization (issue sorting among the elite leads to issue sorting among the public based on value orientation), make us expect the following:

3. An increase in the difference regarding concern about climate change between those holding individualistic values and those holding less individualistic values will be found between 2003 and 2011.

4. An increase in the difference regarding concern about climate change between those holding egalitarian values and those holding less egalitarian values will be found between 2003 and 2011.

4. Method

In this study, secondary Gallup data from a national poll⁶ for the years 2003, 2005, 2007, 2009, and 2011 were analysed. The size of the respondent group ranged from 3500 to 3900 for each year, and consisted of a representative random sample of the Norwegian population. Respondents filled in a self-administered questionnaire of about 300 questions, digitally or on paper. In the sample analysed, $N = 16,362$ out of 19,290, because of missing answers and because for some items 'do not know' answers were coded as missing (listwise deletion).

The dependent variable, concern about climate change, was measured by asking the question 'How concerned are you about climate change?' The response categories were 'Quite concerned', 'Very concerned', 'A little concerned', and 'Not at all concerned', and these were dichotomized (1 = 'Quite concerned' and 'Very concerned', 0 = 'A little concerned' and 'Not at all concerned'). Regarding variables of interest, two additive indexes measuring value orientations were constructed by summarizing scores of relevant items. Individualistic value orientation – the degree of support for state regulation and control – was measured using items similar to items used in previous studies of the importance of values for climate concern (e.g. Kahan et al., 2011). An index ($\alpha > 0.70$ all years) from 0 to 16 (the higher the score, the more individualist the value orientation) was created based on four items. Respondents indicated their positions on the following statements: 'Many tasks would be handled better and less expensively if they were transferred from the public entities to private companies'; 'There is too much government interference and regulation in today's society'; 'It is necessary to have a high level of taxes to maintain the public sector' (reversely coded); and 'It is ok to have private schools or hospitals, such that those who want better education and health care can receive them by paying something extra'. Response options were listed in the order 'Strongly disagree', 'Partly disagree', 'Partly agree', 'Strongly agree', and 'Do not know', and the latter was coded as mid-category.

The index measuring the degree of egalitarian values ($\alpha > 0.30$ all years) is based on two items and ranges from 0 to 8 (the higher the score, the more egalitarian the value orientation). This index is narrower than, for example, the operationalizations of Kahan et al. (2011, 2012) because of limitations in the polling data. It covers the respondents' positions on aspects regarding economic distribution only (e.g. Olli, Grendstad, & Wollebæk, 2001), and not their positions on discrimination based on ethnicity, which Kahan et al. (2011, 2012) include. Respondents indicated their positions on two questions. The first was 'Which option would you prefer, if you were to have to make a choice? A: Increasing affluence in the country? B: Allocating affluence more evenly?' The response categories were listed in the order 'Certainly A', 'Doubtful A', 'Do not know', 'Doubtful B', and 'Certainly B'. Second, they indicated their position on the statement 'We should solve the problems in our own country before we spend money on helping people in other countries'. The response categories for this question were listed in the order 'Strongly disagree', 'Partly disagree', 'Strongly agree', 'Partly agree', 'Do not know', and the latter was coded as mid-category. This item was reversely coded. The

first item measured respondents' position on economic distribution in Norway, and the latter measured their position on distribution between Norway and other countries. For all items, the response categories were coded from 0 to 4, and the 'Do not know' category was coded as mid-category with value 2.

The importance of value orientations for concern about climate change (research question (1)) was examined by analysing the results of a binary logistic regression model. To rigorously examine the polarization in concern about climate change from 2003 until 2011 (research question (2)), the operationalization of polarization from Evans (2002) was applied. According to Evans, polarization during a period can be examined by creating a 'value orientation*year' interaction term.

Several variables sometimes found to correlate with concern about climate change were controlled for.⁷ First, positive attitudes towards new technology have been found to influence environmental concern and concern for climate change, because the belief that new technologies will reduce environmental damage reduces the need to worry (Kellstedt, Zahran, & Vedlitz, 2008; Meijers & Rutjens, 2014). Respondents' declared interest in politics was included, as a positive relationship between interest in politics and climate concern was found by Kvaløy et al. (2012). A variable measuring respondents' evaluation of the economic situation at society level was also included (e.g. Durr, 1993; Haring, Jagers, & Martinsson, 2011). Concern about nature conservation was included, as people concerned about other environmental challenges are often also concerned about climate change (e.g. McCright & Dunlap, 2011). Respondents were asked which political party they voted for in the last election to reveal their political party affiliation (e.g. Lorenzoni & Pidgeon, 2006; Whitmarsh, 2011). Females are expected to be more concerned than males (Kellstedt et al., 2008; McCright, 2010), so a gender variable was included. Age was coded as age-groups dummies, as the relationship with age has been found to be curvilinear in other studies; the age group of 30–60 years perceives the problem to be more serious than do the young and the very old (e.g. Kvaløy, Finseraas, & Listhaug, 2012). Income, education, and urban residence were included (e.g. Poortinga et al., 2011). There are some limitations regarding the precision of the operationalization of variables – some items would have been added and some questions would have been formulated differently if the survey had been constructed for the purpose of this article.

5. Analysis

The description, coding, mean, and standard error for each of the variables employed in the analyses are described in Table 1.

The reference category for survey years is 2003. Age group 4 (45–54 years) is the reference category for the age groups, and voters of the Conservative Party is the reference group for political party affiliation. Calculations of variance inflation factors (VIFs) for the independent variables resulted in satisfying levels.⁸ Table 2 displays the odds ratios of the stepwise binary logistic regressions on concern for climate change. Models 1–4 display the influence of value orientation on concern about climate change when adding blocks of control variables. Model 5 includes interaction variables. The interaction variables consist of the index of value orientations multiplied by a dummy for the years.

In Models 2–4, both value orientations have significant odd ratios, and they do not change much from Model 2 to 4. In Model 4, the coefficients for the survey years show that in year 2007 the

Table 1. Coding, mean, and standard error for variables in the study ($N = 16,362$)

Variable	Coding	Mean	Std.E
Concern for climate change	1 (quite/very concerned) to 0 (not/little concerned)	0.49	.004
Individualistic value orientation	0 (not individualistic) to 16 (individualistic)	8.29	.032
Egalitarian value orientation	0 (not egalitarian) to 8 (egalitarian)	5.05	.018
Techno-positive	0 (anti-technology) to 8 (pro-technology)	5.93	.014
Interest in politics	1 (not at all interested) to 4 (very interested)	2.27	.006
Evaluation of economic future, society level	1 (better) to 5 (worse)	2.94	.005
Concern for nature conservation	1 (not concerned) to 4 (very concerned)	2.14	.007
Socialist Left Party	1 (voted for this party) to 0 (all other values)	0.10	.002
Labour Party	1 (voted for this party) to 0 (all other values)	0.28	.003
Centre Party	1 (voted for this party) to 0 (all other values)	0.05	.002
Liberal Party	1 (voted for this party) to 0 (all other values)	0.05	.002
Christian Party	1 (voted for this party) to 0 (all other values)	0.06	.002
Conservative Party	1 (voted for this party) to 0 (all other values)	0.15	.003
Progress Party	1 (voted for this party) to 0 (all other values)	0.11	.002
Other	1 (don't know, no vote or party outside Parliament) to 0 (all other values)	0.09	.002
Female	1 (female) to 0 (male)	0.54	.004
Household's annual income	1 (<100,000 NOK) to 9 (>1 million NOK)	5.70	.016
Education	1 (more than secondary school) to 0 (less than secondary school)	0.45	.004
Urban	1 (urban/ big city, self-reported) to 0 (all other values)	0.44	.004
Age, six groups	Dummies for 6 groups*	3.79	.011

*1, 15–24 years; 2, 25–34 years; 3, 35–44 years; 4, 45–54 years; 5, 55–69 years; 6, 70 years or more.

general level of concern is significantly higher than in 2003, and that in 2011 it is lower than in 2003. For reasons of space, the results of the control variables are reported in Appendix 3.

In Model 5, there is no significant effect of the interaction variables 'individualistic orientation*year' in 2005, or in 2007, compared to 2003. In 2009 and 2011, the effect of the individualist orientation differs from that in 2003. The interaction effects of egalitarian values and year indicate a larger effect of value orientation in 2007, 2009, and 2011, than in 2003. Regressions with interaction variables 'value orientation*year', with 'year' as a continuous variable instead of years as dummies, were also run, and the results did not change. The odds ratios were 1.008 ($p = 0.014$) for the individualist value orientation*year, and 1.035 ($p = 0.000$) for the egalitarian value orientation*year. Hence, there was polarization in climate concern over time for high and low scores on both value orientations. However, the results of interaction variables with dummy coded 'year' are presented here because this regression gives more information, due to the varying levels of concern in the period. Post estimations⁹ of Model 5 in Table 2 yield the magnitudes of the interaction effects, as displayed in Figure 1. The

Table 2. Logistic regressions explaining concern about climate change

	Model 1	Model 2	Model 3	Model 4	Model 5
Year 2005	1.160*** (0.058)	1.090* (0.056)	1.096* (0.058)	1.102* (0.061)	0.892 (0.131)
Year 2007	1.705*** (0.084)	1.611*** (0.081)	1.654*** (0.087)	1.707*** (0.093)	0.984 (0.141)
Year 2009	1.119** (0.056)	1.053 (0.054)	1.079 (0.058)	1.063 (0.059)	0.531*** (0.079)
Year 2011	0.833*** (0.041)	0.750*** (0.038)	0.799*** (0.043)	0.813*** (0.046)	0.265*** (0.041)
Individualistic value orientation		0.931*** (0.004)	0.942*** (0.004)	0.956*** (0.005)	0.974** (0.011)
Egalitarian value orientation		1.126*** (0.009)	1.106*** (0.009)	1.087*** (0.010)	1.010 (0.019)
<i>Interaction variables</i>					
2005* Individualistic					0.993 (0.015)
2007* Individualistic					0.986 (0.014)
2009* Individualistic					0.971** (0.015)
2011* Individualistic					0.957*** (0.014)
2005* Egalitarian					1.036 (0.027)
2007* Egalitarian					1.093*** (0.029)
2009* Egalitarian					1.097*** (0.029)
2011* Egalitarian					1.159*** (0.032)
Techno-positive Interest in politics			0.966*** (0.009)	0.961*** (0.009)	0.961*** (0.009)
Evaluation of economic future, society level			1.218*** (0.029)	1.246*** (0.032)	1.244*** (0.032)
Concern about nature conservation			1.027 (0.025)	1.041 (0.026)	1.038 (0.026)
Socialist Left Party			1.892*** (0.037)	1.848*** (0.036)	1.858*** (0.037)
Labour Party				1.664*** (0.122)	1.667*** (0.123)
Centre Party				0.995 (0.051)	0.990 (0.051)
Liberal Party				1.058 (0.091)	1.058 (0.091)
Christian Party				1.426*** (0.125)	1.414*** (0.124)
Progress Party				0.905 (0.070)	0.901 (0.070)
Other				0.724*** (0.047)	0.718*** (0.047)
Female				0.887*** (0.060)	0.889*** (0.060)
				1.195*** (0.043)	1.196*** (0.043)

Continued

Table 2. Continued

	Model 1	Model 2	Model 3	Model 4	Model 5
Household's annual income				1.008(0.010)	1.006(0.010)
Education				1.122*** (0.042)	1.137*** (0.042)
Urban				1.112*** (0.039)	1.108*** (0.039)
Age1				1.722*** (0.136)	1.720*** (0.137)
Age2				1.146** (0.070)	1.132** (0.069)
Age3				1.018(0.054)	1.016(0.054)
Age5				1.055(0.052)	1.045(0.052)
Age6				1.281*** (0.090)	1.279*** (0.090)
Constant	-0.840*** (0.029)	0.844** (0.061)	0.139*** (0.020)	0.093*** (0.015)	0.116*** (0.025)
LR χ^2	232.60	1130.41	2422.40	2676.61	2755.26
Δ LR χ^2		897.81***	1291.99***	254.22***	78.65***
Pseudo R^2	0.01	0.05	0.11	0.12	0.12

Notes: $N = 16,362$. Predictor estimates are odds ratios. Standard errors are in parentheses. The odds ratios indicate the contribution each predictor variable makes to the likelihood that a subject will select 'Quite concerned' or 'Very concerned' to the statement 'How concerned are you about climate change?' as opposed to 'A little concerned' or 'Not at all concerned'. LR, Log likelihood ratio.

* $p < 0.1$;

** $p < 0.05$;

*** $p < 0.01$.

graphs illustrate the development of the likelihood of being concerned about climate change for different positions on the two value orientation indexes, *ceteris paribus*.

The index on individualistic value orientation ranges from 0 to 16 (the higher, the more individualistic). Figure 1 shows that in 2007, a person who scores 11 on this index¹⁰ has 6% points lower likelihood of being concerned than a person who scores 5.¹¹ In 2009 this difference is 9% points, and significantly larger than in 2003. This difference continues to increase in 2011. The bottom graph illustrates the development in concern for respondents with different scores on the egalitarian value index, ranging from 0 to 8. In 2007, the difference in concern about climate change between those with a high score and those with a low score on the egalitarian value index increased, compared to 2003. This trend in increased difference continued until 2011. The likelihood of being concerned about climate change in 2011 was 14% points lower for a person that scored 2 on the index¹² than for a person scoring 6 on this index.¹³ People with different scores on the value indexes polarize in climate concern. Their climate concern changes in the same direction, but at different rates.

6. Discussion

The first hypothesis, stating that people that score low on individualistic values are more likely to be concerned about climate change than people that hold individualistic values, is confirmed. A common explanation is that those being less individualistic are more positive to state-led initiatives that restrict activities causing these problems. The reluctance of individualistically oriented people

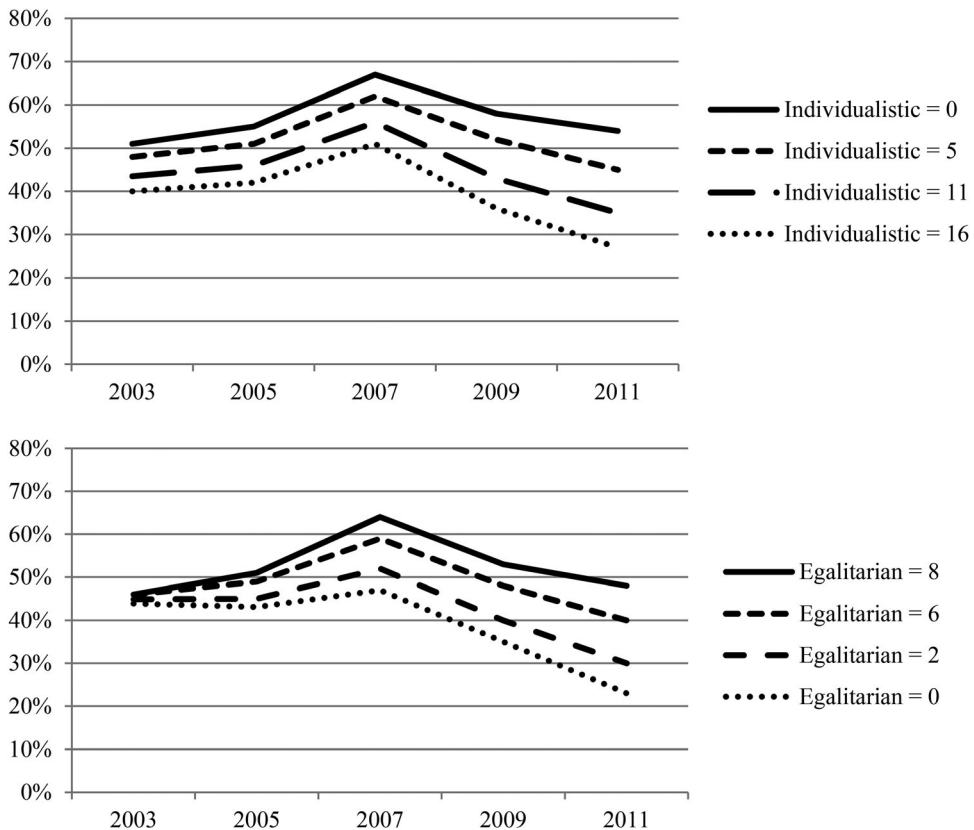


Figure 1. Development of the likelihood of being concerned about climate change for different positions on the value orientation indexes

to worry about climate change may also be rooted in a narrative about the power of the educated elite, where capitalists and workers hand-in-hand resist the ‘suppressing state and the cultural class’ and refuse to conform to their concern about the environment (Skogen, 1996).

The second hypothesis, that people holding egalitarian values are more likely to be concerned about climate change than those who do not, is also confirmed. Kahan et al. (2011) argue that egalitarian individuals accept regulation for the sake of reducing the inequitable distribution of the consequences of climate change. One of the two items in the index on egalitarian value orientation reveals the respondents’ position on prioritizing national challenges before helping people outside Norway. The effects of climate change are more challenging for poor countries than for wealthier countries (IPCC, 2014) and this fact has been a central part of the media coverage in Norway. This may be the reason for the result.

The hypothesized increases in the differences in climate concern between subgroups holding different values are also confirmed (hypotheses 3 and 4). The difference in climate concern between people scoring low and those scoring high on individualistic value orientation increased between 2003 and

2011. The increase in difference appeared from 2007. The rate of decrease in concern from 2007 was faster among the individualist than among the less individualistic. The impact of egalitarian value orientation on concern increased in importance from 2003 to 2007 and onward until 2011. The rate of both increase and decrease in concern from 2007 was faster among the less egalitarian than among the egalitarian.

This study does not allow for identifying which of the specific psychological or social mechanisms are at work in Norway. Two trends may have contributed to public polarization. First, debates have increasingly concentrated on mitigation politics (Eckersley, 2013). The cultural theory of risk and social psychology posit that the individualistic and less egalitarian oriented are less concerned because solutions to the problem do not correspond with their values. An increased salience of the political parties' positions regarding policy instruments to climate change may have affected public polarization in climate concern. Increased debate about policy instruments may have made values increasingly relevant.¹⁴ The public's value orientations may lead them to perceive this politically contentious issue of mitigating climate change quite differently, because they take cues from favoured ideological elites that reinforce their pre-existing views on what policy solutions are best. The increased attention to climate change effects in poor countries may have contributed to the polarization in concern between the egalitarian and the less egalitarian. Second, increased pluralization of and access to information via social media during the period may have made the search for identity-confirming information easier (Bennett & Iyengar, 2008). This trend may have made the mechanisms of biased information search and assimilation of information about climate change more effective, and may further have led to a different rate of change in concern between people holding different values.

To our knowledge, the only other academic study that investigates similar development over time (2001–2010) was carried out in the US. It also finds polarization in climate concern between people holding different positions on the state's role (McCright & Dunlap, 2011). Here, the groups diverge in their concern about climate change over time. The authors find a decrease in climate concern among the right-leaning along with an increase in climate concern among the left-leaning. In the current study, the groups of different value orientations change in the same directions, but at different rates. The contexts are different, however, with the elite and media polarization being stronger in the US than in Norway, and a large share of the right-leaning contesting all the natural science about climate change (McCright & Dunlap, 2011).

Changes in value orientations are slow processes, and a very strong influence of values on climate concern would be worrisome, considering the calls from IPCC (2014) for urgent political action. Given that key political values seem to have a moderate influence on such concern in Norway, there may be some space for political action with broad support. However, as other studies show, the topic of climate change is far from relevant to people's everyday lives (Norgaard, 2006, 2011). Making it more relevant may counteract the slight trend of polarization discovered in this study.

7. Conclusion

In this article, the importance of value orientations for concern about climate change in the Norwegian public is described. More specifically, it asks to what extent individualistic and egalitarian values affect

public concern about this issue, and whether the importance of value orientations has increased or decreased in the period 2003–2011. Analysis of Gallup data from a national poll revealed a divide in the level of concern about climate change between people holding different values in the Norwegian public: those holding less individualistic values being more concerned than those holding individualistic values, and those holding egalitarian values being more concerned than those holding less egalitarian values. Furthermore, the divide increases over time, perhaps due to the increased focus on policy instruments.

These results add to other findings of the importance of value orientation for concern about climate change (e.g. Kahan et al., 2011, 2012; Pidgeon, 2012; McCright & Dunlap, 2011). A relevant question to ask is whether an increase in concern about climate change leads to acceptance of climate policies in all groups of value orientations.

Two additional areas for further research can be identified. First, to avoid the possibility that mitigating climate change be perceived as a threat to values people wish to preserve in everyday life (e.g. Ryghaug, Sørensen, & Næss, 2011), societies should look for mitigation policies that have co-benefits across groups of different value orientations. For instance, health benefits may be put forward as an argument for reducing polluting transportation.

However, not all mitigation policies have immediate co-benefits for everyone. Societies may have to change the institutional settings, from enhancing the logic of individual benefits to enhancing the logic of social benefits. Although people have certain values they favour when responding to surveys, different value orientations may co-exist in one person (Stern, Dietz, & Kalof, 1993). The current situation – the institutional setting – also defines which values should count and which logic people should follow, ‘me’ or ‘us’ or ‘them’ (Vatn, 2009). For instance, Soma and Vatn (2014, 2010) find that giving people the task of judging political solutions to an environmental issue resulted in higher willingness to contribute to a social good, compared to a setting where the question was what the individual would be willing to sacrifice. The second area of research should hence be about how to establish ‘we’ settings for behaviour crucial for mitigating climate change, that make it appropriate for all groups of value orientations to contribute to a common good.

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Notes

1. See Section 3 for definitions.
2. All political parties in the Parliament except for the Progress Party.
3. This year the Parliament decided to follow the EU target; see Gullberg and Aakre (2015).
4. See Figure A1 in Appendix 1, data from the media survey by Tjernshaugen et al. (2011).
5. The terms ‘greenhouse effect’ and ‘climate change’ show a similar development (Krøvel, 2012).
6. Norwegian Monitor.

7. All question formulations and response categories are reported in Appendix 2.
8. Between 1.07 and 1.79
9. Probability $p = 1/1 + e^{-(b_0+b_1 \times 1+\dots+b_n x_n+e)}$ where b_0 is the coefficient of variable x_0 .
10. The percentage of the sample scoring 11 and higher on the index was 31% in 2003, 29% in 2005, 28% in 2007, 27% in 2009, and 24% in 2011.
11. The percentage of the sample scoring 5 and lower on the index was 27% in 2003, 31% in 2005, 34% in 2007, 33% in 2009, and 36% in 2011.
12. The percentage of the sample scoring 2 and lower on the index was 16% in 2003, 14% in 2005, 13% in 2007, 16% in 2009, and 16% in 2011.
13. The percentage of the sample scoring 6 and higher on the index was 35% in 2003, 43% in 2005, 43% in 2007, 43% in 2009, and 43% in 2011.
14. See, e.g., Kallbekken and Aasen (2010) for an example of the importance of political value orientation for public attitudes towards environmental taxes in Norway.

References

- Axelrod, R. (1973). Schema theory: An information processing model of perception and cognition. *The American Political Science Review*, 67, 1248–1266.
- Baldassarri, D., & Gelman, A. (2008). Partisans without constraint: Political polarization and trends in American public opinion. *American Journal of Sociology*, 114, 408–446.
- Beck, U. (2010). Climate for change, or how to create a green modernity? *Theory, Culture & Society*, 27, 254–266.
- Bennett, W. L., & Iyengar, S. (2008). A new era of minimal effects? *Journal of Political Communication*, 58, 707–731.
- Bruvoll, A., Dalen, H. M., & Larsen, B. M. (2012). Political motives in climate and energy policy (Discussion Paper No. 721, December 2012). Oslo: Statistics Norway. Retrieved from <http://www.ssb.no/a/publikasjoner/pdf/DP/dp721.pdf>
- Clements, B. (2012). Exploring public opinion on the issue of climate change in Britain. *British Politics*, 7, 183–202.
- Cohen, G. L. (2003). Party over policy: The dominating impact of group influence on political beliefs. *Journal of Personality and Social Psychology*, 85, 808–822.
- Compton, H., & Bailey, I. (Eds.). (2008). 'Political strategy and climate policy', *Turning down the heat: The politics of climate policy in affluent democracies* (pp. 263–288). Basingstoke: Palgrave Macmillan.
- Corner, A., Whitmarsh, L., & Xenias, D. (2012). Uncertainty, scepticism and attitudes towards climate change; biased assimilation and attitude polarization. *Climatic Change*, 114, 463–478.
- Dietz, T., Dan, A., & Shwon, R. (2007). Support for climate change policy: Some psychological and social structural influences. *Rural Sociology*, 72, 185–214.
- Douglas, M., & Wildavsky, A. B. (1982). *Risk and culture: An essay on the selection of technical and environmental dangers*. Berkeley, CA: University of California Press.
- Durr, R. H. (1993). What moves policy sentiment? *American Political Science Review*, 87, 158–170.
- Earle, T. C., & Cvetkovich, G. (1995). *Social trust: Toward a cosmopolitan society*. Westport, CT: Praeger.
- Eckersley, R. (2013). Poles apart?: The social construction of responsibility for climate change in Australia and Norway. *Australian Journal of Politics and History*, 59, 382–396.
- Evans, J. H. (2002). Polarization in abortion attitudes in U.S. religious traditions 1972–1998. *Sociological Forum*, 17, 397–422.
- Feygina, I., John, T. J., & Goldsmith, R. E. (2010). System justification, the denial of global warming, and the possibility of 'system-sanctioned change'. *Personality and Social Psychology Bulletin*, 36, 326–338.
- Fiorina, M., & Abrams, S. (2008). Political polarization in the American public. *Annual Review of Political Science*, 11, 563–588.
- Giddens, A. (2009). *The politics of climate change*. Cambridge: Polity Press.

- Gloppen, S., Rakner, L., & Vibe, V. (2014). Stortingsklima [Climate in the Parliament]. In E. Eide, D. Elgesem, S. Gloppen, & L. Rakner (Eds.), *Klima, medier og politikk [Climate, media and politics]* (pp. 135–156). Oslo: Abstrakt forlag.
- Gullberg, A. T., & Aakre, S. (2015). Norsk klimapolitikk: 2030-målene og tilknytningen til EU [Norway's climate policy: The 2030 target and the relations with the EU] CICERO Policy Note 2015:01. Retrieved September 1, 2015, from <http://hdl.handle.net/11250/284757>.
- Gullberg, A. T., & Skodvin, T. (2011). Cost effectiveness and target group influence in Norwegian climate policy. *Scandinavian Political Studies*, 34(2), 123–142.
- Harring, N., Jagers, S. C., & Martinsson, J. (2011). Explaining ups and downs in the public's environmental concern in Sweden: The effects of ecological modernization, the economy, and the media. *Organization & Environment*, 24, 388–403.
- Hindman, D. B. (2009). Mass media flow and differential distribution of politically disputed beliefs: The belief gap hypothesis. *Journalism and Mass Communication Quarterly*, 86, 790–808.
- Hogg, M. A., & Vaughan, G. M. (2011). *Social psychology*. Edinburgh: Pearson Education Limited.
- Hovden, E., & Lindseth, G. (2004). Discourses in Norwegian climate policy: National action or thinking globally? *Political Studies*, 52, 63–81.
- Hulme, M. (2009). *Why we disagree about climate change*. Cambridge: Cambridge University Press.
- IPCC. (2013). *Climate Change 2013: The physical science basis. Contribution of working group I to the fifth assessment report of the intergovernmental panel on climate change* [Stocker, T. F., D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P. M. Midgley (eds.)]. Cambridge: Cambridge University Press, 1535 pp..
- IPCC. (2014). Summary for policymakers. In C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, ... L. L. White (Eds.), *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 1–32). Cambridge/New York, NY: Cambridge University Press.
- Jenkins-Smith, H. (2001). Modeling stigma: An empirical analysis of nuclear waste images of Nevada. In J. Flynn, P. Slovic, & H. Kunreuther (Eds.), *Risk, media, and stigma: Understanding public challenges to modern science and technology* (pp. 107–32). London/Sterling: Earthscan.
- Johannessen, J. (2014). Norge utaskjærs [Norway abroad]. In E. Eide, D. Elgesem, S. Gloppen, & L. Rakner (Eds.), *Klima, medier og politikk [Climate, media and politics]* (pp. 135–156). Oslo: Abstrakt forlag.
- Kahan, D. M., Jenkins-Smith, H., & Braman, D. (2011). Cultural cognition of scientific consensus. *Journal of Risk Research*, 14, 147–174.
- Kahan, D. M., Peters, E., Wittlin, M., Slovic, P., Larrimore Ouellette, L., Braman, D., & Mandel, G. (2012). The polarizing impact of science literacy and numeracy on perceived climate change risk. *Nature Climate Change*, 2, 732–735.
- Kallbekken, S., & Aasen, M. (2010). The demand for earmarking: Results from a focus group study. *Ecological Economics*, 69, 2183–2190.
- Kellstedt, P. M., Zahran, S., & Vedlitz, A. (2008). Personal efficacy, the information environment, and attitudes toward global warming and climate change in the USA. *Risk Analysis*, 28, 113–126.
- Krosnick, J. A., Holbrook, A. L., & Visser, P. S. (2000). The impact of the fall 1997 debate about global warming on American public opinion. *Public Understanding of Science*, 9, 239–260.
- Kvaløy, B., Finseraas, H., & Listhaug, O. (2012). The publics' concern for global warming: A cross-national study of 47 countries. *Journal of Peace Research*, 49, 11–22.
- Krøvel, R. (2012). Setting the agenda on environmental news in Norway. *Journalism Studies*, 13, 259–276.
- Lord, C. G., Ross, L., & Lepper, M. R. (1979). Biased assimilation and attitude polarization: Effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, 37, 2098–2109.
- Lorenzoni, I., & Pidgeon, N. F. (2006). Public views on climate change: European and USA perspectives. *Climatic Change*, 77, 73–95.

- Mackie, D. M., & Quellar, S. (2000). The impact of group membership on persuasion: Revisiting "Who says what to whom with what effect? In D. J. Terry & M. A. Hogg (Eds.), *Attitudes, behavior, and social context: The role of norms and group membership* (pp. 135–155). Mahwah, NJ: Lawrence Erlbaum Associate Publishers.
- McCright, A. (2010). The effects of gender on climate change knowledge and concern in the American public. *Population and Environment*, *32*, 66–87.
- McCright, A. M., & Dunlap, R. E. (2011). The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. *The Sociological Quarterly*, *52*, 155–194.
- Meijers, M. H. C., & Rutjens, B. T. (2014). Affirming belief in scientific progress reduces environmentally friendly behaviour. *European Journal of Social Psychology*, *44*, 487–495.
- Norgaard, K. M. (2006). 'We don't really want to know'. Environmental justice and socially organized denial of global warming. *Organization and Environment*, *19*, 347–370.
- Norgaard, K. M. (2011). *Living in denial. Climate change, emotions, and everyday life*. Cambridge: The MIT Press.
- Norwegian Government. (2008). Avtale om klimameldingen. Retrieved from http://www.regjeringen.no/Upload/MD/Vedlegg/Klima/avtale_klimameldingen.pdf
- Olli, E., Grendstad, G., & Wollebæk, D. (2001). Correlates of Environmental Behaviors. Bringing Back Social Context. *Environment and Behavior*, *33*, 181–208.
- O'Brian, K., & Wolf, J. (2010). A values-based approach to vulnerability and adaptation to climate change. *Climate Change*, *1*, 232–242.
- Pidgeon, N. F. (2012). Public understanding of, and attitudes to, climate change: UK and international perspectives and policy. *Climate Policy*, *12*, S85–S106.
- Poortinga, W., Spence, A., Whitmarsh, L., Capstick, S., & Pidgeon, N. F. (2011). Uncertain climate: An investigation into public scepticism about anthropogenic climate change. *Global Environmental Change*, *21*, 1015–1024.
- Rygghaug, M. (2006). 'Some like it hot' – Konstruksjon av kunnskap om klimaendringer i norske aviser [Some like it hot' – Construction of knowledge about climate change in Norwegian newspapers]. *Norsk Medietidsskrift [Norwegian Journal of media]*, *13*, 197–219.
- Rygghaug, M., Sørensen, K. H., & Næss, R. (2011). Making sense of global warming: Norwegians appropriating knowledge of anthropogenic climate change. *Public Understanding of Science*, *20*, 778–795.
- Schon, D. A., & Rein, M. (1994). *Frame reflection. Toward the resolution of intractable policy controversies*. New York, NY: Basic Books.
- Schultz, P. W., Gouveia, V. V., Cameron, L. D., Tankha, G., Schmuck, P., & Franek, M. (2005). Values and their relationship to environmental concern and conservation behavior. *Journal of Cross-Cultural Psychology*, *36*, 457–475.
- Schulz-Hardt, S., Frey, D., Luthgens, C., & Moscovici, S. (2000). Biased information search in group decision making. *Journal of Personality and Social Psychology*, *78*, 655–669.
- Schwartz, S. (1992). Universals in the content and structure of human values: Theoretical advances and empirical tests in 20 countries. In M. Zanna (Ed.), *Advances in experimental social psychology*, *25* (pp. 1–65). New York, NY: Academic Press.
- Siegrist, M., Cvetkovich, G., & Roth, C. (2000). Salient value similarity, social trust, and risk/benefit perception. *Risk Analysis*, *20*, 353–362.
- Simon, H. A. (1979). Rational decision making in business organizations. *The American Economic Review*, *69*, 493–513.
- Skogen, K. (1996). Young environmentalists: Post-modern identities or middle-class culture. *Sociological Review*, *44*, 452–473.
- Soma, K., & Vatn, A. (2010). Is there anything like a citizen? A descriptive analysis of instituting a citizen's role to represent social values at the municipal level. *Environmental Policy and Governance*, *20*, 30–43.
- Soma, K., & Vatn, A. (2014). Representing the common goods – stakeholders vs. citizens. *Land Use Policy*, *41*, 325–333.
- Stern, P. C., Dietz, T., & Kalof, L. (1993). Value orientations, gender, and environmental concern. *Environment & Behavior*, *25*, 322–348.

- Stern, P. C. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3), 407–424.
- Strömbäck, J. (2015). Demokratin och det förändrade medielandskapet. Mot ökade kunskapsklyftor och deltagande klyftor? [Democracy and the changing media landscape. Towards increased knowledge gaps and participation gaps?]. Retrieved from <http://miun.diva-portal.org/smash/get/diva2:803440/FULLTEXT01.pdf>
- Tellmann, S. M. (2012). The constrained influence of discourses: The case of Norwegian climate policy. *Environmental Politics*, 21, 734–752.
- Tjernshaugen, A., Aardal, B., & Gullberg, A. T. (2011). Det første klimavalget? Miljø- og klimaspørsmålenes plass ved valget i 2009 [The first climate election? Environmental and climate issues in the 2009 election]. In B. Aardal (Ed.), *Det politiske landskap. En studie av stortingsvalget i 2009*[engelsk] (pp. 291–362). Oslo: Cappelen Damm Akademisk.
- UNFCCC. (n.d.). Status of ratification of the Kyoto Protocol. Retrieved from http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php
- Vatn, A. (2009). Cooperative behavior and institutions. *Journal of Socio-Economics*, 38, 188–196.
- Wood, B. D., & Vedlitz, A. (2007). Issue definition. Information processing and the politics of global warming. *American Journal of Political Science*, 51, 552–568.
- Wildavsky, A., & Dake, K. (1990). Theories of risk perception: Who fears what and why? *Daedalus*, 114, 41–60.
- Whitmarsh, L. (2011). Scepticism and uncertainty about climate change: Dimensions, determinants and change over time. *Global Environmental Change*, 21, 690–700.
- Zia, A., & Todd, A. M. (2010). Evaluating the effects of ideology on public understanding of climate change science: How to improve communication across ideological divides? *Public Understanding of Science*, 19, 743–761.

Appendix 1.

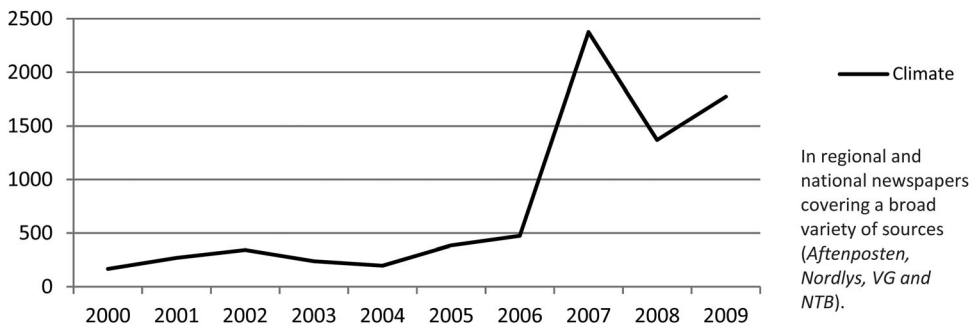


Figure A1 Number of instances where 'climate' is mentioned in Norwegian newspapers
Source: Tjernshaugen et al. (2011).

Appendix 2. Question formulations and response categories for control variables

Position on new technology

The index on techno-optimism ($\alpha > 0.40$ all years) is here operationalized as degree of agreement to two statements: 'Computers and other modern technology are frightening to me' and 'I like to be among the first to adopt advanced technology' [Strongly agree, Partly agree, Partly disagree, Strongly disagree, Do not know].

Interest in politics

'In general, how interested are you in politics?' [Very interested, Quite interested, Not very interested, Not at all interested].

Evaluation of future economic situation: society level

'In your opinion, how will the general economic situation evolve over the next 12 months?' [Be significantly improved, Be slightly improved, Be about as now, Be somewhat deteriorated, Be significantly deteriorated, Do not know].

Concern about nature conservation

'How concerned are you about development of rivers and mountain areas?' [Very concerned, Quite concerned, A little concerned, Not at all concerned].

Political party affiliation

Party affiliation is measured by which party the respondent voted for in the last election. The polls are conducted a few weeks after the elections every second year. In 2003, 2007, and 2011 there were local elections. In 2005 and 2009, there were parliamentary elections.

Appendix 3. Result of control variables

People who are more politically interested are also more concerned about climate change. They may be more exposed to information concerning this issue, as they most probably acquire more information on societal issues in general (Kvaløy et al., 2012). The lack of correlation between concern about climate change and concern about the general economic situation in Norway may be explained along the lines of Haring et al. (2011). They find a decrease in the correlation between concern about economic situation and concern about the environment in the Swedish public, and attribute this decrease to the influence of an elite discourse about ecological modernization, which may apply also in Norway. Regarding political party affiliation, voters are in line with the political parties' positions as outlined earlier. Voters of the Socialist Left Party and the Liberal Party deviate from Conservative Party voters in being more concerned about climate change, and the Progress Party voters are less concerned than Conservative Party voters. Interestingly, there is no significant difference in concern between the voters of the largest left-leaning and the largest right-leaning political parties (Labour Party and Conservative Party, respectively). The gender difference, women being found to be more concerned about climate change than men, is often reported in public opinion analyses on environmental concern. The explanations are often hypothesized to be gender differences in socialization, that women may be socialized to be more concerned about social issues such as climate change (McCright, 2010).

Paper II

Acceptance of energy taxes across political divides? The importance of climate concern

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Abstract

Lack of broad public support for climate policies is a major barrier to realizing a transition to a low-carbon economy. Studies in a wide range of contexts identify a right-leaning political value orientation (an individualistic view on state involvement and regulation) and lack of concern about climate change as two important factors that correlate with opposition to climate policies. This article contributes to the literature by exploring whether concern about climate change correlates with support for energy taxes in groups with different political value orientations. This exploration is done by analysing Norwegian Gallup data for the period 2003–2011. This period is particularly interesting since the level of climate concern varied in the population, with a peak in 2007. Corroborating previous research, the results indicate that a non-individualistic value orientation and climate concern correlate positively with support for energy taxes. For all sample years, the results indicate that the more climate concerned one is, the more positive toward energy taxes one is, independent of political value orientation. Political value orientation moderates, but does not deter support for energy taxes among the climate concerned individualists. Therefore, to gain support, one should not ignore the relevance of an increase in climate concern.

1. Introduction

Lack of broad public support is recognized as a major barrier to realizing a transition to a low-carbon economy (Wiseman, Edwards, & Luckins, 2013). Furthermore, it is a consistent finding across nations that position on state involvement and regulation – e.g., on a left-right scale – is an important factor when explaining the level of opposition to climate policies (Drews & van den Bergh, 2015). This political divide indicates that implementation of political solutions to mitigate climate change may be dependent on the composition of political leaderships, and furthermore on whether leaders represent voters having high or low support for such policies.

On the other hand, there is some empirical evidence that concern about climate change correlates with positive attitudes toward restrictive climate policies. Although climate concern is generally found to be lower among the politically right-oriented, some level of climate concern is found among these individuals as well (Pidgeon, 2012; Aasen, 2015). Yet, climate concern does not necessarily transform into acceptance of mitigation policies. It might be that right-oriented individuals believe in technology development and oppose other policies. Conversely, it might as well be that they agree with taxing energy, a type of policy (state intervention) that they generally resist, for the case of climate mitigation. Such relationships between specific concerns and political value orientation and policies are interesting to analyse for a range of policy issues, and for different climate policies. This study concentrates on attitudes toward energy taxes.

There is high consensus among economists that higher prices on fossil energy have to be part of a path to a low-carbon society (Portney & Stavins, 2012). One way to increase prices is by adding taxes on energy. For instance, where CO₂ taxes have been imposed, they have clearly reduced emissions (Ministry of Climate and Environment, 2014; Sterner, 2007). However, it has

proven politically difficult to impose these kind of taxes. The literature is uniform in its findings of general public opposition to restrictive policies such as energy taxation. This is particularly the case among individuals sceptical of state involvement (Drews & van den Bergh, 2015).

Previous studies give attention, but separately, to the relevance of political values and climate concern for attitudes toward climate policies. To our knowledge, no studies have investigated the effect of the two factors simultaneously. This study contributes to the literature by exploring attitudes toward energy taxes in subgroups holding different political value orientations and different levels of climate concern. It asks: Does concern about climate change correlate with support for energy taxes in groups with different political value orientations? This question is addressed by analysing Norwegian Gallup data for the period 2003–2011. This period is particularly interesting since the level of climate concern varied in the population, with a peak in 2007. If policy support is linked to political value orientation, there is less room for gaining policy support from increasing the attention on climate change, given the quite stable nature of political values (Aardal, 2011; Zaller, 1991). However, if climate concern correlates with support for policies across ideological divides, one should not ignore the relevance of increasing climate concern to gain policy support.

The article proceeds as follows: Section 2 positions the study in the theoretical and empirical literature in the field. The method and data applied are presented in section 3, and the results in section 4. Section 5 discusses the results before conclusions are drawn in section 6.

2. Political values, climate concern and positions on policies

2.1. Theoretical approach

In the social science literature on public attitudes, concepts like political values, political ideology and political worldviews are often used interchangeably, sometimes with similar meaning and operationalization.¹ The theoretical underpinning of the importance of values for attitudes comes from social psychology. Here values are generally seen as central for evaluations of individuals' actions and choices – they offer direction in life – and are defined as 'desirable trans-situational goals varying in importance, which serve as guiding principles in the life of a person' (Schwartz, 1994, p. 21). As such, values are the basis in a person's system of attitudes, beliefs, and concerns. They can be classified in domains or spheres, hence political values can be defined as the category of values that pertain to the political sphere. Core political values are normative principles about government, citizenship and society (Knutsen & Kumlin, 2005). 'Political value orientation' refers to the classical political value dimension that are often termed 'left-right', defined as the positions regarding state intervention in the economy and society (Karlsen & Aardal, 2016).

'Attitudes' is commonly understood as a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour (Eagly & Chaiken, 1998). The 'entity', or attitude object, may, for instance, be a person, or a policy. The term 'value' can then be reserved for positions on more general, abstract and trans-situational entities (Hogg & Vaughan, 2011). Values are commonly considered more resistant to change than attitudes are.

Kahan, Jenkins-Smith & Braman (2011) couple insights from social psychology with the cultural theory of risk (Douglas & Wildavsky, 1982) and argue that persons who hold a value orientation

less supportive of state involvement are sceptical of environmental risks such as climate change. They do so, Kahan et al. (2011) argue, because acceptance of human-induced climate change would justify restricting commerce, industry, and consumption, which people with this value orientation oppose. On the contrary, persons with left-oriented political values more readily accept scientific information about environmental problems, because they accept regulation that restricts the activity that causes these problems. However, this relationship may depend on the different solutions to, for instance, emission cuts that are available or that one believes in. One may, for instance, avoid cognitive dissonance (Festinger, 1957) in values, beliefs and attitudes by combining a right-leaning political orientation and climate concern with technology-optimistic beliefs, and consequently reject policies that imply state intervention.

The links between political values and attitudes an individual holds are not necessarily due to deliberate consideration of a factual or philosophical connection between the value orientation and the attitude object. The links may stem from the way actors construct discourses, frames or story lines that engage competing knowledge, often by reference to core values (Schon & Rein, 1994; Simon, 1979). Typically, citizens rely on information from elites (political leaders, organizations, and media outlets) that they trust and identify with. They readily assign expert knowledge and trustworthiness to information sources that they perceive share their values (Brulle, Carmichael, & Jenkins, 2012). An individual who is generally against state involvement and regulation may hence support a specific regulation if it is in line with other values this individual holds, or if a person this individual identifies with supports it. Identity salience can hence transform people's attitudes, even when their attitudes are antithetical to their own values (Cohen, 2003).

2.2. Empirical studies

There is substantial evidence that political value orientation relates to attitudes toward restrictive climate policies in a range of contexts. For instance, support for energy taxes is found to be higher among the left-oriented in Switzerland (Tobler, Visschers, & Siegrist, 2012) and Sweden (Hammar & Jagers, 2006; Haring & Jagers, 2013). Left political ideology is also clearly associated with favourable votes in referenda on energy taxes in Switzerland (Bornstein & Lanz, 2008; Thalmann, 2004). Evidence from the United States, which includes some large-scale surveys, reveals that Democratic Party affiliation and left-wing political orientation are strongly associated with support for climate policies, including restrictive policies (e.g., Leiserowitz, 2006; McCright, 2008; McCright, Dunlap, & Xiao, 2013; Park & Vedlitz, 2013). Similarly, Kallbekken and Aasen (2010) find in a focus-group study from Norway that those who are supportive of general state involvement are also more positive toward environmental taxes than their ideological counterparts are.

Empirical findings are also uniform regarding the relationship between concern about climate change and positive attitudes toward climate policies, including energy taxation. Such relationships are found in the United States (Leiserowitz, 2006; Dietz, Dan, & Shwom, 2007; Bostrom et al., 2012), in Austria, Bangladesh, Finland, Germany, and Norway (Bostrom et al., 2012), and in Sweden (Hammar & Jagers, 2006; Haring & Jagers, 2013). Similarly, some studies from the United States (McCright, 2008; Zahran, Brody, Grover, & Vedlitz, 2006) and a study from Malta (DeBono, Vincenti, and Calleja, 2012) identify belief in the negative consequences of climate change to be important in explaining public support for restrictive policies (e.g., by increasing prices on fossil fuels). Other studies from the United States and Australia find that policy support (for a wide range of policies, including restrictive policies such

as taxing fuel) is highest for the ‘alarmed’ and lowest for the ‘dismissive’, when categorizing positions on climate change (Maibach, Leiserowitz, Roser-Renouf, & Mertz, 2011; Morrison, Duncan, & Parton, 2013).

The empirical literature is largely consistent in the findings that left-leaning individuals report higher support for emission-reducing policies, and in the findings that higher engagement with climate change (whether expressed as concern or issue importance or beliefs) correlates with support for climate policies. Common for the empirical literature in this field is that it looks at the relevance of political values and climate concern for attitudes toward climate policies separately.

3. Method and data

3.1. Logistic regressions of attitudes toward energy taxes

The research question is answered by analysing individual-level data from a national poll (Norwegian Monitor) for the years 2003, 2005, 2007, 2009, and 2011. The respondents filled in a self-administered questionnaire of about hundred pages of questions, and the number of respondents ranged from 3500 to 3900 each year. In addition to questions on socioeconomic background variables, the surveys included a range of questions on values, attitudes and behaviour, such as media usage, policy issues, consumer behaviour, eating habits, political behaviour, etc. Consistent with the trend revealed in international poll research (Groves & Peytcheva, 2008), the response rate to the Norwegian Monitor survey is decreasing over time. The samples were randomly drawn from telephone directories (Hellevik, 2016). At the lowest, it was 8%. It is not necessarily a correlation between a low response rate and skewness in Gallup data (Groves, 2006). Hellevik (2015) has carefully analysed whether the low response

rate in the data set analysed in this study represents any non-response bias of the data source, and concludes that it does not. However, there is some over- and under-representation of groups in the samples. This issue is addressed in the paragraph on inclusion of control variables below.

The main variable of interest is attitude to adding taxes on energy as a means to reduce emissions. This attitude is measured by asking ‘How strongly do you agree or disagree with this statement? We should increase the price of all kinds of energy sources in order to reduce consumption and consequently environmental pollution’. In reality, such an increase would mean adding a Pigouvian tax² on energy. The choices given to the respondents were i) strongly agree, ii) partly agree, iii) partly disagree, iv) strongly disagree, and v) do not know.

The dependent variable is dichotomized and takes the value 0 if the respondent partly/strongly disagrees and the value 1 if the respondent partly/strongly agrees. ‘Do not know’ answers are coded as missing.³ For simplicity, the dependent variable is referred to as ‘attitude toward adding taxes on energy’. The regression model used is binary logistic regression.

Concern about climate change was measured by asking the question ‘How concerned are you about climate change?’ Responses to this question are also collapsed into a binary variable, whereby 0 refers to ‘not at all/a little concerned’ and 1 refers to ‘quite/very concerned’. A regression with an alternative dichotomization was run as a robustness test, with the response alternative ‘a little concerned’ included in the 1 value.

Political value orientation – the degree of support for state regulation and control – was measured using items similar to items used in earlier studies of political value orientation (Aardal 2011; Kahan et al., 2011). An index ($\alpha > 0.70$ all years) from 0 to 16 was created using four items. Respondents indicated their positions (strongly agree, partly agree, partly disagree,

strongly disagree, do not know) on the following statements: 1) ‘Many tasks would be handled better and less expensively if they were transferred from the public entities to private companies’; 2) ‘There is too much government interference and regulation in today’s society’; 3) ‘It is necessary to have a high level of taxes to maintain the public sector’ (reverse coded); and 4) ‘It is ok to have private schools or hospitals, such that those who want better education and healthcare can receive them by paying something extra’. The ‘don not know’ response category was coded as a mid-category. The higher the score, the less support for state regulation and control. Respondents scoring lower than 8 on the index more often agree with state involvement and regulation than disagree, and are referred to as non-individualists. Respondents scoring above 8 on the index are referred to as individualists.

Because of the skewness in representation in the sample, socioeconomic characteristics expected to correlate with the variables of interest are controlled for by including them in the regression models. There is a slight over-representation of female respondents in the samples in the younger age groups (Hellevik, 2015). Thus, a gender variable is included since female respondents are expected to be more concerned about environmental issues than males (e.g., McCright, 2010). A variable measuring urban versus rural residence (self-reported large city or not) is also included, because urban respondents are found to be more positive toward energy taxes (Hammar and Jagers, 2006). University education is slightly over-represented in the sample (Hellevik, 2015). Education may have an effect on the position on energy taxes (Thalmann, 2004). Education is included as a dummy variable indicating whether the respondent has a university degree (1) or not (0). The sample has a slight over-representation of older age groups relative to younger, when compared with population data from national statistics (Hellevik, 2015). Age was coded as age-group dummies, because the relationship with age has been found to be curvilinear in other

studies; the old and the young perceive climate change to be more serious than do those 35–54 years old (e.g., Aasen, 2015). Furthermore, the income level is included in the regressions, because some studies find a marginally more positive attitude toward energy taxes in higher-income groups than in low-income groups (e.g., Rienstra, Rietveld, & Verhoef, 1999).

In the sample, the number of respondents (N) was reduced from 19 290 to 17 590 because of coding as missing ‘do not know’ answers to the dependent variable and non-responses on other items. Table 1 summarizes the descriptive statistics of the variables included in the analysis.

Table 1. Descriptive statistics. Means and standard errors (S.E.) of the variables, by year

	2003		2005		2007		2009		2011	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
Positive toward energy taxes	0.230	0.007	0.287	0.008	0.433	0.008	0.398	0.009	0.355	0.008
Individualism (0–16)	8.241	0.066	7.829	0.070	7.593	0.071	7.639	0.074	7.260	0.069
Climate concern (1, 0)	0.454	0.008	0.494	0.008	0.590	0.008	0.482	0.009	0.413	0.008
Urban (1 if city, otherwise 0)	0.448	0.008	0.425	0.008	0.425	0.008	0.443	0.009	0.432	0.008
University degree (1 if yes)	0.429	0.008	0.469	0.009	0.494	0.008	0.523	0.009	0.602	0.008
Female (1, 0)	0.534	0.008	0.559	0.008	0.528	0.008	0.557	0.009	0.529	0.008
Age group 1 (18–24 yrs.)	0.088	0.005	0.079	0.005	0.052	0.004	0.107	0.005	0.068	0.004
Age group 2 (25–34 yrs.)	0.190	0.007	0.137	0.006	0.082	0.005	0.139	0.006	0.095	0.005
Age group 3 (35–44 yrs.)	0.229	0.007	0.230	0.007	0.198	0.007	0.173	0.007	0.180	0.006
Age group 4 (45–54 yrs.)	0.208	0.007	0.212	0.007	0.215	0.007	0.175	0.006	0.230	0.007
Age group 5 (55–69 yrs.)	0.211	0.007	0.257	0.007	0.328	0.008	0.304	0.008	0.327	0.008
Age group 6 (70+ yrs.)	0.073	0.004	0.085	0.005	0.125	0.006	0.102	0.005	0.100	0.005
Income 1 (>100K NOK*)	0.022	0.002	0.016	0.002	0.009	0.002	0.015	0.002	0.012	0.002
Income 2 (100K–199K NOK)	0.074	0.004	0.065	0.004	0.053	0.004	0.042	0.004	0.031	0.003
Income 3 (200K–299K NOK)	0.142	0.006	0.122	0.006	0.114	0.005	0.075	0.005	0.062	0.004
Income 4 (300K–399K NOK)	0.167	0.006	0.158	0.006	0.155	0.006	0.132	0.006	0.100	0.005
Income 5 (400K–499K NOK)	0.151	0.006	0.160	0.006	0.016	0.006	0.133	0.006	0.102	0.005
Income 6 (500K–599K NOK)	0.163	0.006	0.153	0.006	0.133	0.006	0.123	0.006	0.114	0.005
Income 7 (600K–799K NOK)	0.176	0.006	0.209	0.007	0.202	0.007	0.212	0.007	0.200	0.007
Income 8 (800K–999K NOK)	0.063	0.004	0.075	0.004	0.111	0.005	0.144	0.006	0.189	0.006
Income 9 (> 1 million NOK)	0.041	0.003	0.056	0.004	0.079	0.004	0.120	0.006	0.184	0.006
N	3547		3429		3616		3270		3647	

*100,000 NOK was equivalent to 12,825 EUR in 2011.

Figure 1 illustrates graphically development of climate concern and attitude toward adding taxes on energy from 2003–2011 in the sample. Support for taxes peaks in 2007, with 43% of the sample agreeing with taxes on energy. The share of climate concerned in the sample is higher, at 59% in 2007.

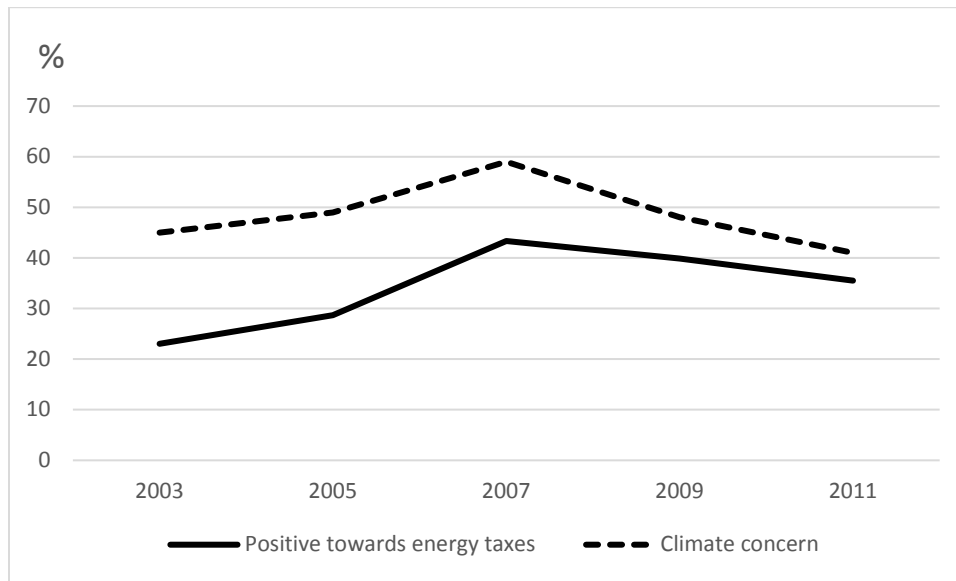


Figure 1. Percentage of the sample that agree/partly agree to add taxes on energy, and percentage of the sample that report climate concern, by year (N = 17 509)

3.2. The Norwegian context

The amount and content of media coverage of climate change during 2003–2011 varied, and the attention peaked in 2007 in Norway, as in many other countries (McCright & Dunlap, 2011; Pidgeon, 2012). This attention peak was most probably due to the launch of the ‘Fourth Assessment Report’ of the Intergovernmental Panel on Climate Change (IPCC), Al Gore’s release of the movie *An Inconvenient Truth*, and the awarding of the Nobel Peace Prize to Al Gore and the IPCC, all of which happened in 2007 (Tjernshaugen, Aardal & Gullberg, 2011).

Norway is a small contributor to the total of global greenhouse gases (GHGs), but it has high per capita emissions. Emissions have increased over the period studied here, and are still rising⁴ (Statistics Norway, 2014). In 2008, the Norwegian Parliament negotiated a cross-partisan⁵ compromise stating a national commitment to reducing emissions by 30% by 2020 (from the

2005 level), of which a certain share should be domestic reductions (Norwegian Government, 2008).⁶

The Norwegian climate policy debate has been influenced by various governments' attempts to minimize tensions between Norway's role as a leader in climate mitigation in international negotiations and its role as an offshore petroleum and gas producer. In the Norwegian policy debate in the period studied, the potential of consumption-related measures to reduce GHG emissions has received less attention than has the potential of production-related measures (Aall & Hille, 2010). The debate has been dominated by an ecological modernization discourse in that it has mainly been concentrated on quota trade and carbon capture and storage at gas plants (CCS), emission cuts abroad through, for example, reducing emissions from deforestation and forest degradation (REDD), and has focused less on policies influencing consumption (Eckersley, 2013).

The political parties that during the period studied expressed greatest willingness to prioritize climate policies before other policy areas were also more positive than the other parties were toward state involvement and restrictive policies such as taxation to reduce emissions. The same parties were more willing to cut domestic emissions and not only meet the national emission targets by contributing to emission cuts abroad (Gullberg & Skodvin, 2011; Gloppen, Rakner & Vibe; Tjernshaugen et al., 2011).

The focus on technological measures and market mechanisms used to cut emissions abroad rather than on restrictive policies may have made it easier to combine an individualistic value orientation with concern for climate change and to oppose policy instruments restricting private consumption, such as energy taxes, without uncomfortable dissonance between attitudes and

political values. It may as well be that climate concern is associated with support for energy taxes in both value groups.

4. Analyses and results

Logistic regression models were used to investigate the correlation between climate concern and political values and attitudes toward energy taxes. Table 2 displays the results of the logistic regressions on attitudes toward adding taxes on energy for the year 2011. The regressions for the other years yield similar results. The coefficients reported in Table 2 are marginal effects on the probabilities of being positive toward energy taxes from an increase of one unit in the variable, all other variables at means.⁷ Model 1 includes the variables political value orientation and climate concern only, while Models 2 to 4 include socioeconomic variables stepwise. The coefficients of the variables of interest, political value orientation (denoted ‘individualism’ in the table) and climate concern, do not change much from Model 2 to Model 4, indicating that the results are robust to alternative model specifications.⁸

Table 2. Results of stepwise inclusion of variables in logistic regressions on attitude to adding an energy tax, marginal effects (sample year 2011)

	Model 1	Model 2	Model 3	Model 4
Individualism	-0.028***(0.002)	-0.026***(0.002)	-0.027***(0.002)	-0.027***(0.002)
Climate concern	0.240***(0.012)	0.228***(0.012)	0.227***(0.012)	0.226***(0.012)
Urban		0.055***(0.014)	0.053***(0.014)	0.046***(0.014)
University degree		0.104***(0.015)	0.112***(0.015)	0.098***(0.016)
Female			-0.015(0.015)	-0.008(0.015)
Age group 1 (18–24 yrs.)			0.073**(0.031)	0.079**(0.033)
Age group 2 (25–34 yrs.)			-0.004(0.027)	0.007(0.028)
Age group 3 (35–44 yrs.)			0.025(0.022)	0.024(0.022)
Age group 5 (55–69 yrs.)			0.013(0.020)	0.025(0.020)
Age group 6 (70+ yrs.)			0.050*(0.027)	0.083***(0.029)
Income 1 (> 100K NOK)				0.085(0.070)
Income 2 (100K–199K NOK)				0.053(0.047)
Income 3 (200K–299K NOK)				-0.041(0.038)
Income 4 (300K–399K NOK)				0.043(0.031)
Income 6 (500K–599K NOK)				0.036(0.031)
Income 7 (600K–799K NOK)				0.051*(0.027)
Income 8 (800K–999K NOK)				0.050*(0.028)
Income 9 (> 1 million NOK)				0.100***(0.028)
LR χ^2	748.51	816.81	825.19	845.09
Δ LR χ^2		68.30***	8.38	19.91**
Pseudo R	0.15	0.17	0.17	0.18
N	3647	3647	3647	3647

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$, standard error in brackets, reference group for age groups is age group 4 (45–54 yrs.), the reference category for income is income group 5 (400K–499K NOK). LR denotes likelihood ratio.

The results of regressions of the control variables are as expected. Education, income and urban residence correlate positively with support for energy taxes. Older and younger age groups are slightly more positive toward energy taxes than the reference group of 45–54 years is.

Table 3 below displays the results from Model 4 for each year, 2003–2011, for the two variables of interest. The full results, including the socioeconomic characteristics, are included in Appendix A.

Table 3. Results from logistic regressions on attitude toward adding an energy tax, marginal effects

	2003	2005	2007	2009	2011
Individualism	-0.020***(0.002)	-0.022***(0.002)	-0.028***(0.002)	-0.025***(0.002)	-0.027***(0.002)
Climate concern	0.144***(0.013)	0.155***(0.014)	0.216***(0.014)	0.262***(0.013)	0.226***(0.012)
N	3547	3429	3616	3270	3647

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$, standard error in brackets, controls for socioeconomic characteristics are included in the model, but not reported.

As expected, the likelihood of being positive toward energy taxes decreases with an increase in the score on the political value orientation index, and the likelihood of being positive toward energy taxes is higher among the climate concerned than among the not climate concerned.

The most straightforward way to assess the practical significance of the coefficients in Table 3 is through statistical simulation using the regressions (King, Tomz, & Wittenberg, 2000). Post estimates⁹ of regressions in Table 3 yield the results presented in the graphs in Figure 2. The graphs illustrate the likelihood of being positive toward energy taxes for four example combinations of scores on the index of political value orientation and climate concern. As noted in section 3, a score above 8 on the political value orientation index indicates an individualistic view on the role of the state, and a score below 8 indicates a non-individualist view on the role of the state. For the purpose of illustration, respondents with a score of 5 are used to represent non-individualists, and respondents with a score of 11 are used to represent individualists. Thus, the four groups represent the mean values of: 1) individualists (scoring 11 on the index) who are not climate concerned, 2) non-individualists (scoring 5 on the index) who are not climate concerned, 3) individualists who are climate concerned, and 4) non-individualists who are climate concerned. It is important to note that the sizes of the four example groups vary over the years (refer Figure 2), and that the figure does not present the share of the population in the different

groups, but rather presents probabilities. See Appendix B for distribution of climate concern and political value orientation in the samples.

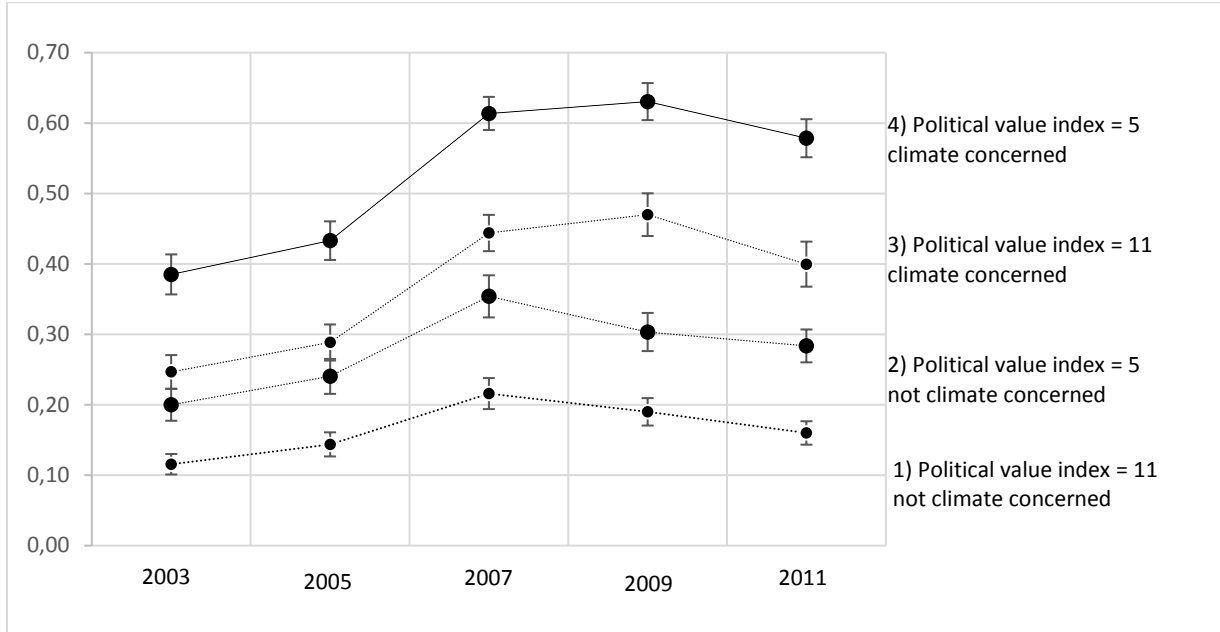


Figure 2. Likelihood of partly/strongly agreeing to add energy taxes for different scores on climate concern and the political value orientation index, with a 95% confidence interval

As expected, individualists that are not climate concerned (line 1) are the ones least likely to be positive toward imposing taxes on energy to increase prices and thereby reduce consumption and consequently reduce environmental pollution, while climate concerned non-individualists (line 4) are the ones most likely to be positive. In 2003, the likelihood that an individualist who is concerned about climate change agrees with imposing energy taxes is about 25%. For a person with an equivalent score on the individualist index, who is not climate concerned, the likelihood of being positive toward energy taxes is 12%. That same year, the likelihood that a non-individualist who is not concerned about climate change agrees with imposing energy taxes is 20%. The relative sorting of the groups is constant over time, indicating that the more climate

concerned one is, the more positive toward energy taxes one is, independent of political value orientation. This pattern is robust to alternative specifications of the groups.

The trends in support for energy taxes are the same across the example groups over time. From 2003 to 2007, the likelihood of support for adding energy taxes increase for all groups. Note too that those labelled ‘not climate concerned’ include those that reported ‘a little concern’, which may explain why the group in 1) has any support for energy taxes at all. Analyses of alternative dichotomization of climate concern yield similar results.

5. Discussion

The finding that the degree of political value orientation is correlated with attitude toward energy taxes is in line with previous research. That concern for climate change correlates with support for energy taxes is not surprising either. That climate concern is associated with a degree of support for energy taxes among the individually oriented is more interesting. There is a significant difference between climate concerned individualists and individualists that are not climate concerned regarding attitude toward energy taxes for the sample years, and the magnitude is substantial. In years with high media attention and debate, such as in 2007 and 2009, the likelihood that an individualist with a score of 11 on the index who is climate concerned will be positive toward energy taxes is 42–50%. The share of the sample that are climate concerned and have a score of 11 or higher on the individualist index account for about 13% in 2007.

Not surprisingly, climate concerned non-individualists are substantially more supportive of energy taxes than climate concerned individualists are. Although there is some support for energy taxes among climate concerned individualists, they are more likely to be negative than

positive toward taxes for all years. This likelihood applies to all scores above 8 on the political value index. The results indicate, however, that energy taxes gain some support across the political value divide.

One could expect that the domination of an ecological modernization discourse in the Norwegian climate policy debate, a discourse which focuses heavily on technical solutions and focuses little on restrictive policies, may have made it easier to combine an individualistic position with concern for climate change and to resist policies such as taxing energy. However, it may be that information about and media attention on climate change influenced attitudes toward energy taxes in the broader public. Energy taxes have quite high support in the general population (above 40%) when climate concern is high (about 60% of the total sample are concerned), as it was in 2007.

The models cannot be used to draw any conclusions about causality between the variables. It might be that the policy attention to and the debate about climate change the years 2007–2009 led to an increase in climate concern in the general population, accompanied by an increase in support for policies. Alternatively, a positive attitude toward taxes on energy because of other reasons may have made it possible to accept the problem of climate change and to express concern (e.g., Kahan et al., 2011). Assuming that the first relationship is the more plausible, a recommendation to gain policy support would be to increase the attention to climate change in the media.

Some have argued that more specific question formulations about taxes would receive more resistance, as opposed to general formulations about an energy price increase as formulated in the question used here (e.g., Pidgeon, 2012). The general question formulation of the dependent

variable is a weakness, but since we are interested in differences in levels of support for different levels of climate concern and different political value orientations, the problem is less pertinent.

It might be that climate concern and value orientation differ in relevance among different types of policies. It would be interesting to investigate these relationships for other climate policies. It is worth mentioning that taxation is the type of climate policy that in general receives the least support (Drews & van den Bergh, 2015), which means that one may find stronger support for other policies among climate concerned.

When interpreting the results of the analyses, it is important to keep in mind that the attitude toward taxes can be explained by more factors than we are able to control for. The aim of this study was primarily to investigate whether climate concerned individualists hold positive attitudes toward energy taxes. What it does show is that individualists who are concerned about climate change can support adding taxes on energy. It seems that an individualistic political value orientation moderates, but does not deter support for energy taxes among climate concerned.

6. Conclusion

This paper explores whether concern about climate change correlates with support for energy taxes in groups with different political value orientations. This is done by analysing Norwegian Gallup data for the period 2003–2011. This period is particularly interesting since the level of climate concern varied in the population, with a peak in 2007. The regression models reveal that some of the individualists (with low support for government involvement and regulation) who are concerned about climate change agree with adding taxes on energy to reduce consumption. This study finds that individualistic political value orientation moderates, but does not deter

support for energy taxes among climate concerned. For all sample years, the results indicate that the more climate concerned one is, the more positive toward energy taxes one is, independent of political value orientation.

This study indicates that to gain support, the relevance of an increase in climate concern should not be ignored. Future studies should include investigation of more specific alternative climate policies, to see if political value orientation is more important for some policies than for others. Such studies should apply mixed-methods approaches, combining surveys and qualitative interviews. Using qualitative interviews can help us understand the rationale for attitudes expressed in surveys, and inform us about the mechanisms that establish or weaken the links between values, climate concern and attitudes.

¹ See, for instance, Rohan (2000) for a discussion on concepts and meanings.

² A Pigouvian tax is a tax levied on market activity that generates externalities, such as emissions, to reduce such externalities (Pigou, 1920).

³ In total, this resulted in 480 observations being deleted from our analysis: Year 2003: 2.5% (97 obs.), 2005: 3% (116 obs.), 2007: 2.6% (101 obs.), 2009: 2% (74 obs.), 2011: 2.3% (92 obs.).

⁴ From 1990 level, the baseline year of the IPCC accounting system.

⁵ All political parties in the Parliament except for the Progress Party.

⁶ Despite this compromise, the size of domestic reduction commitments was disputed until 2015. That year the Parliament decided to follow the EU target (see Gullberg & Aakre, 2015).

⁷ Similar regressions were run for the other years and yielded similar results, but are not reported for the reason of space.

⁸ The pseudo R-square for Model 5 yields satisfying levels (all values from 0.2 to 0.4 are considered an excellent fit (e.g., McFadden, 1974). Multicollinearity was checked for and all variance inflator factors (VIFs) were below 2.00, hence within acceptable limits (Menard, 1995).

⁹ Probability $p = 1/1 + e^{-(b_0 + b_1x_1 + \dots + b_nx_n + e)}$, where b_0 is the coefficient of variable x_0 .

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References

- Aall, C., & Hille, J. (2010). Consumption – a missing dimension in the climate debate. In R. Bhaskar, C. Frank, K. G. Høyer, P. Næss, & J. Parker (Eds.), *Interdisciplinarity and climate change: Transforming knowledge and practice for our global future* (pp. 85–99). London and New York, NY: Routledge.
- Aardal, B. (2011). *Det politiske landskap. En studie av stortingsvalget i 2009* [The political landscape. A study of the Norwegian parliamentary election, 2009]. Oslo: Cappelen Damm Akademisk.
- Aasen, M. (2015). The polarization of public concern about climate change in Norway. *Climate Policy*. doi:10.1080/14693062.2015.1094727
- Bornstein, N., & Lanz, B. (2008). Voting on the environment: Price or ideology? Evidence from Swiss referendums. *Ecological Economics*, 67, 430–440. doi:10.1016/j.ecolecon.2007.12.026
- Bostrom, A., O'Connor, R. E., Böhm, G., Hanss, D., Bodi, O., Ekström, F., Halder, P., Jeschke, S., Mack, B., Qu, M., Rosentrater, L., Sandve, A., & Sælensminde, I. (2012). Causal thinking and support for climate change policies: International survey findings. *Global Environmental Change*, 22, 210–222. doi:10.1016/j.gloenvcha.2011.09.012
- Brulle, R. J., Carmichael, J., & Jenkins, J. C. (2012). Shifting public opinion on climate change: an empirical assessment of factors influencing concern over climate change in the US, 2002–2010. *Climatic Change*, 114, 169–188. doi:10.1007/s10584-012-0403-y
- Cohen, G. L. (2003). Party over policy: The dominating impact of group influence on political beliefs. *Journal of Personality and Social Psychology*, 85, 808–822. doi:10.1037/0022-3514.85.5.808

- Dietz, T., Dan, A., & Shwom, R. (2007). Support for climate change policy: Some psychological and social structural influences. *Rural Sociology*, *72*, 185–214.
doi:10.1526/003601107781170026
- Douglas, M., & Wildavsky, A. B. (1982). *Risk and culture: An essay on the selection of technical and environmental dangers*. Berkeley: University of California Press.
- Dresner, S., Jackson, T., & Gilbert, N. (2006). History and social responses to environmental tax reform in the United Kingdom. *Energy Policy*, *34*, 930–939. doi:10.1016/j.enpol.2004.08.046
- Drews, S., & van den Bergh, J. C. J. M. (2015). What explains public support for climate policies? A review of empirical and experimental studies. *Climate Policy*, *16*, 855–876.
doi:10.1080/14693062.2015.1058240
- Eagly, Alice H., & Shelly Chaiken. (1998). Attitude, Structure and Function. In D.T. Gilbert, Susan T. Fisk, and G. Lindsey (Eds.), *Handbook of Social Psychology* (pp. 269–322). New York: McGowan-Hill.
- Eckersley, R. (2013). Poles apart?: The social construction of responsibility for climate change in Australia and Norway. *Australian Journal of Politics and History*, *59*, 382–396.
doi:10.1111/ajph.12022
- Festinger, L. (1957). *A Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press.
- Gloppen, S., Rakner, L., & Vibe, V. (2014). Stortingsklima [Climate in the Parliament]. In E. Eide, D. Elgesem, S. Gloppen, & L. Rakner (Eds.), *Klima, medier og politikk* [Climate, media and politics] (pp. 135–156). Oslo: Abstrakt forlag.
- Groves, R. M. (2006). Nonresponse rates and nonresponse bias in household surveys. *Public Opinion Quarterly*, *70*, 646–675. doi:10.1093/poq/nfl033
- Groves, R. M., & Peytcheva, E. (2008). The impact of nonresponse rates on nonresponse bias. a meta-analysis. *Public Opinion Quarterly*, *72*, 167–189. doi:10.1093/poq/nfn011

- Gullberg, A. T., & Aakre, S. (2015). *Norsk klimapolitikk: 2030-målene og tilknytningen til EU* [Norway's climate policy: The 2030 target and the relations with the EU]. (CICERO Policy Note 2015:01). Retrieved from: <http://hdl.handle.net/11250/284757>
- Gullberg, A. T., & Skodvin, T. (2011). Cost effectiveness and target group influence in Norwegian climate policy. *Scandinavian Political Studies*, 34, 123–142. doi:10.1111/j.1467-9477.2011.00266.
- Hammar, H., & Jagers, S. (2006). Can trust in politicians explain individual' support for climate policy? The case of CO2 tax. *Climate Policy*, 5, 613–625. doi:10.1080/14693062.2006.9685582
- Harring, N., & Jagers, S. (2013). Should we trust in values? Explaining public support for pro-environmental taxes. *Sustainability*, 5, 210–227. doi:10.3390/su5010210
- Hellevik, O. (2016). "Extreme nonresponse and response bias. A "worst case" analysis". *Quality & Quantity*, 50–5, 1969-1991.
- Hellevik, O. (2015). Hva betyr respondentbortfallet i intervjuundersøkelser? [The implications of nonresponse in survey research]. *Tidsskrift for samfunnsforskning*, 212–231. Retrieved from: https://www.idunn.no/tfs/2015/02/hva_betyr_respondentbortfallet_i_intervjuundersoekelser
- Hogg, M. A., & Vaughan, G. M. (2011). *Social psychology*. Edinburgh: Pearson Education.
- Kallbekken, S., & Aasen, M. (2010). The demand for earmarking: Results from a focus group study. *Ecological Economics*, 69, 2183–2190. 10.1016/j.ecolecon.2010.06.003
- Kahan, D. M., Jenkins-Smith, H., & Braman, D. (2011). Cultural cognition of scientific consensus. *Journal of Risk Research*, 14, 147–174. doi: 10.1080/13669877.2010.511246
- Karlsen, R., & Aardal, B. (2016). Political values count but issue ownership decides? How stable and dynamic factors influence party set and vote choice in multiparty systems. *International Political Science Review*, 37(2), 261–276. doi: 10.1177/0192512114558456

- King, G., Tomz, M., & Wittenberg, J. (2000). Making the most of statistical analyses: Improving interpretation and presentation. *American Journal of Political Science*, 44, 347–61.
- Knutsen, O., & Kumlin, S. (2005). Value orientations and party choice. In: J. Thomassen (Ed.) *The European Voter* (pp.125–166). Oxford: Oxford University Press.
- Leiserowitz, A. (2006). Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Climatic Change*, 77, 45–72. doi: 10.1007/s10584-006-9059-9
- Maibach, E. W., Leiserowitz, A., Roser-Renouf, C., & Mertz, C. K. (2011). Identifying like-minded audiences for global warming public engagement campaigns: An audience segmentation analysis and tool development. *PLoS ONE*, 6, e17571. doi:10.1371/journal.pone.0017571
- McFadden, D. (1975). Quantitative methods for analyzing travel behaviour on individuals: Some recent developments. In D. Hensher & P. Stopher(Eds.), *Behavioural travel modelling* (pp. 279–318). London: Croom Helm London.
- McCright, A. M., Dunlap, R. E., & Xiao, C. (2013). Perceived scientific agreement and support for government action on climate change in the USA. *Climatic Change*, 119, 511–518. doi:10.1007/s10584-013-0704-9
- McCright, A. M., & Dunlap, R. E. (2011). The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. *The Sociological Quarterly*, 52, 155–194. doi:10.1111/j.1533-8525.2011.01198.x
- McCright, A. M. (2010). The effects of gender on climate change knowledge and concern in the American public. *Population and Environment*, 32, 66–87. doi:10.1007/s11111-010-0113-1
- McCright, A. M. (2008). Social bases of climate change knowledge, concern, and policy support in the U.S. general public. *Hofstra Law Review*, 37, 1017–1046. Retrieved from: <http://scholarlycommons.law.hofstra.edu/hlr/vol37/iss4/7>

Menard, S. (1995). *Applied logistic regression analysis* (Sage university paper series, 07–106). Thousand Oaks, CA: Sage.

Ministry of Climate and Environment. (2014). *Norway's sixth national communication under the framework convention on climate change*. Ministry of Climate and Environment. Retrieved from: <https://www.regjeringen.no/contentassets/efed292ce1d5456cb1eae2ffc8ebd72d/t-1543.pdf>

Morrison, M., Duncan, R., & Parton, K. A. (2013). Targeting segments in the Australian community to increase support for climate change policy. *Australasian Marketing Journal*, 21, 212–217. doi:10.1016/j.ausmj.2013.09.001

Norwegian Government. (2008). *Avtale om klimameldingen* [Agreement on the climate report].

Retrieved from:

https://www.regjeringen.no/contentassets/fbe5a5829a5d468fab6e4eec0a39512d/avtale_klima_meldingen_2008_01_17.pdf

Park, H. S., & Vedlitz, A. (2013). Climate hazards and risk status: Explaining climate risk assessment, behavior, and policy support. *Sociological Spectrum*, 33, 219–239. doi:10.1080/02732173.2013.732900

Pidgeon, N. F. (2012). Public understanding of, and attitudes to, climate change: UK and international perspectives and policy. *Climate Policy*, 12, 85–106. doi:10.1080/14693062.2012.702982

Pigou, A. C. (1920). *The economics of welfare*. London: Macmillan.

Portney, P., & Stavins, R. (2012). *Public policies for environmental protection* (2nd ed.). Hoboken, NJ: Earthscan.

- Rienstra, S. A., Rietveld, P., & Verhoef, E. T. (1999). The social support for policy measures in passenger transport. A statistical analysis for the Netherlands. *Transportation Research*, 4, 181–200. doi:10.1016/S1361-9209(99)00005-X
- Rohan, M. J. (2000). A rose by any name? The values construct. *Personality and Social Psychology Review*, 4, 255–277. doi:10.1207/S15327957PSPR0403_4
- Schon, D. A., & Rein, M. (1994). *Frame reflection. Toward the resolution of intractable policy controversies*. New York, NY: Basic Books.
- Schwartz, S. H. (1994). Are there universal aspects in the structure and content of human values? *Journal of Social Issues*, 50, 19–45. doi:10.1111/j.1540-4560.1994.tb01196.x
- Simon, H. A. (1979). Rational decision making in business organizations. *The American Economic Review*, 69, 493–513. Retrieved from: <http://www.jstor.org/stable/1808698>
- Statistics Norway. (2016). *Emissions of green house gases*. Retrieved from: <https://www.ssb.no/en/natur-og-miljo/statistikker/klimagassn/aar-foreloepige/2016-05-20>
- Sternner, T. (2007). Fuel taxes: An important instrument for climate policy. *Energy Policy*, 35, 3194–3202. doi:10.1016/j.enpol.2006.10.025
- Thalmann, P. (2004). The public acceptance of green taxes: 2 million voters express their opinion. *Public Choice*, 119, 179–217. doi:10.1023/B:PUCH.0000024165.18082.db
- Tjernshaugen, A., Aardal, B., & Gullberg, A. T. (2011). Det første klimavalget? Miljø- og klimaspørsmålenes plass ved valget i 2009 [The first climate election? Environmental and climate issues in the 2009 election]. In B. Aardal (Ed.), *Det politiske landskap. En studie av stortingsvalget i 2009* [The political landscape. A study of the Norwegian parliamentary election, 2009] (pp. 291–362). Oslo: Cappelen Damm Akademisk.

- Tobler, C., Visschers, V. H. M., & Siegrist, M. (2012). Addressing climate change: Determinants of consumers' willingness to act and to support policy measures. *Journal of Environmental Psychology, 32*, 197–207. doi:10.1016/j.jenvp.2012.02.001
- Wiseman, J., Edwards, T., & Luckins, K. (2013). Post carbon pathways: A meta-analysis of 18 large-scale post carbon economy transition strategies. *Environmental Innovation and Societal Transitions, 8*, 76–93. doi: 10.1016/j.eist.2013.04.001
- Zahran, S., Brody, S. D., Grover, H., & Vedlitz, A. (2006). Climate change vulnerability and policy support. *Society & Natural Resources, 19*, 771–789. doi:10.1080/08941920600835528
- Zaller, J. R. (1991). *The nature and origins of mass opinion*. Cambridge: Cambridge University Press.

Appendix A: Result from regressions on attitude toward energy taxes, full models

	2003	2005	2007	2009	2011
Individualism	-0.020***(0.002)	-0.022***(0.002)	-0.028***(0.002)	-0.025***(0.002)	-0.027***(0.002)
Climate concern	0.144***(0.013)	0.155***(0.014)	0.216***(0.014)	0.262***(0.013)	0.226***(0.012)
Urban	0.019(0.014)	0.086***(0.014)	0.054***(0.015)	0.041***(0.016)	0.046***(0.014)
University degr.	0.073***(0.014)	0.111***(0.015)	0.088***(0.016)	0.063***(0.017)	0.098***(0.016)
Female	0.008(0.014)	0.006(0.015)	0.022(0.015)	0.013(0.016)	-0.008(0.015)
Age group 1	0.063**(0.026)	0.040(0.030)	0.053(0.037)	0.015(0.031)	0.079**(0.033)
Age group 2	-0.039*(0.022)	-0.092***(0.026)	-0.032(0.031)	-0.038(0.028)	0.007(0.028)
Age group 3	-0.054***(0.021)	-0.013(0.022)	-0.017(0.024)	-0.034(0.026)	0.024(0.022)
Age group 5	0.040**(0.020)	0.018(0.021)	0.033(0.021)	-0.000(0.023)	0.025(0.020)
Age group 6	0.052*(0.029)	0.074**(0.029)	0.118***(0.028)	0.072**(0.032)	0.083***(0.029)
Income 1	-0.042(0.048)	0.051(0.060)	0.075(0.083)	0.034(0.067)	0.085(0.070)
Income 2	-0.047(0.032)	0.035(0.034)	0.010(0.038)	-0.084*(0.044)	0.053(0.047)
Income 3	-0.055**(0.026)	0.001(0.029)	-0.012(0.031)	0.016(0.035)	-0.041(0.038)
Income 4	-0.037(0.024)	0.010(0.026)	0.020(0.028)	-0.020(0.030)	0.043(0.031)
Income 6	-0.017(0.024)	0.019(0.027)	0.022(0.029)	-0.028(0.031)	0.036(0.031)
Income 7	0.025(0.023)	-0.010(0.025)	0.002(0.026)	-0.004(0.027)	0.051*(0.027)
Income 8	0.064**(0.030)	0.045(0.032)	0.083***(0.030)	0.051*(0.029)	0.050*(0.028)
Income 9	0.086**(0.034)	0.066*(0.035)	0.104***(0.034)	0.074**(0.031)	0.100***(0.028)
N	3547	3429	3616	3270	3647

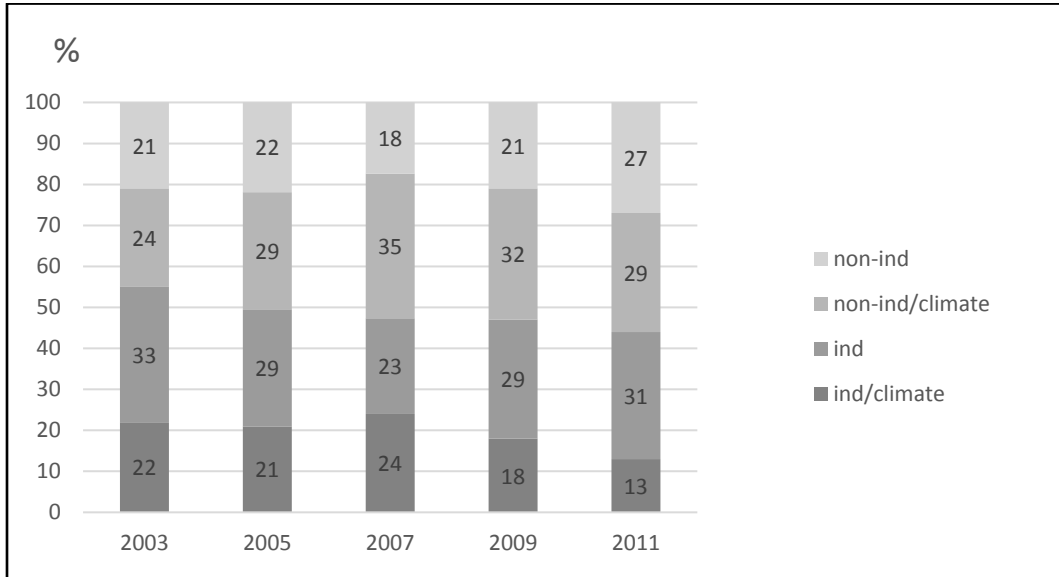
Numbers are marginal effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Standard error in brackets. Reference group for age groups is age group 4 (45–54 yrs.), the reference category for income is income group 5 (400K–499K NOK).

Appendix B: Sample shares of climate concern and political value orientation

The shares of the yearly samples that has a score of 11 or more on the political value index, and a response of ‘quite concerned’ or ‘very concerned’ on the question ‘How concerned are you about climate change?’

2003: 12%, 2005: 12%, 2007: 13%, 2009: 9%, 2011: 6%

Figure A.1: Distribution of four subgroups over sample years



‘non-ind’: score below 8 on the political value orientation index and response of ‘a little’ or ‘not at all concerned’ on the question ‘How concerned are you about climate change?’

‘non-ind/climate’: score above 8 on the political value orientation index and response of ‘quite concerned’ or ‘very concerned’ on the question ‘How concerned are you about climate change?’

‘ind’: score below 8 on the political value orientation index and response of ‘a little’ or ‘not at all concerned’ on the question ‘How concerned are you about climate change?’

‘ind/climate’: score above 8 on the political value orientation index and response of ‘quite concerned’ or ‘very concerned’ on the question ‘How concerned are you about climate change?’

Paper III

Public attitudes toward climate policies: The effect of institutional contexts and political values

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Abstract

We conducted a survey experiment involving 1500 car owners in Oslo, Norway, to investigate the effects of institutional contexts on attitudes toward policies aimed at reducing private car use. A key aspect of institutional theory is that the institutional context influences whether “individual rationality” (IR) or “social rationality” (SR) is a relevant basis for choice. Two groups received different texts about car emissions, and a control group received no such text. One text emphasized the individual health gain from reducing local air pollution (IR context), and the other emphasized the social responsibility for avoiding climate change (SR context). We analyzed the data, distinguishing between respondents holding an individualistic value orientation and those holding a non-individualistic value orientation (measured as position on state involvement and regulation). We found effects of the contexts on attitudes toward emission-reducing policies, and that the effects vary across individuals with different value orientations. The SR context yielded higher support for an increase in petrol prices, but among non-individualists only. The IR context yielded higher support for a decrease in space for cars among both non-individualists and individualists. The IR context also increased individualists’ support for choosing public transport. Implications for policy communication are discussed.

1 Introduction

Climate change is a major public policy issue, with related effects likely to be extensive and potentially devastating (IPCC, 2013, 2014). It is widely accepted that avoiding dangerous climate change will require urgent mitigation and significant societal changes. However, recent studies emphasize that public support for climate policies is crucial to the viability of such policies (Bruvoll et al., 2012; Wiseman et al., 2013).

Several researchers¹ identify people's degree of political value orientation – that is, position on state involvement and regulation – to be important for their attitudes toward climate policies. It seems thus crucial to create policies that are supported by people holding different political values.

Two approaches to increasing public support for emission-reducing policies across groups holding different values are suggested in the literature. For instance, emphasizing health benefits may result in increased support for policies facilitating a shift toward less polluting transportation. This approach uses the assumption that we support policies that enhance individual benefits (Olson, 1965). Another is to create contexts where individual contribution to a social good is emphasized as correct. This approach uses the assumption that different rationalities may co-exist in one person. It further builds on the proposition that the institutional context influences what is considered to be the right thing to do in response to a social dilemma (March and Olsen, 1989). The context may emphasize individual rationality. It may, however, be formed to support social rationality (Vatn, 2015).

The effect of institutional contexts on environmentally relevant choices and attitudes is particularly interesting in an era of unsolved environmental problems. Despite extensive commentary on this issue in the policy and academic literatures (Devine-Wright et al., 2015; Spence and Pidgeon, 2010), relatively little field research has examined the effects of such contexts on attitudes toward policies aimed at solving social dilemmas, such as climate change. This study contributes to this field by investigating the effect of different institutional contexts on car owners' attitudes toward policies to cut car emissions. Specifically, we ask:

- 1) Does institutional context affect attitudes toward policies to cut car emissions?

- 2) Does institutional context affect these attitudes differently among people with different political value orientations?

In a survey experiment involving 1500 car owners in Oslo, Norway, we asked about their attitudes toward policies aimed at reducing emissions from private car use. We vary the institutional contexts experimentally by randomly assigning the participants to one of three groups receiving different text treatments. One text emphasized the individual health gain from reducing local air pollution (IR context), and the other emphasized the social responsibility for avoiding climate change (SR context); the control group received no such text treatment. “Attitudes toward policies” refers to disagreement or agreement with statements about policies that involve different degrees of individual loss and social gain: 1) increasing petrol prices, and 2) decreasing the space for cars to develop more bike lanes and public transport, and 3) respondents’ willingness to voluntarily choose public or bike transport despite longer travel time. We also analyzed the data from this survey distinguishing between respondents holding an individualist value orientation and those holding a non-individualist value orientation, measured as position on state involvement and regulation.

In section 2 we present the theoretical perspective applied in this study. In section 3 we review previous studies of the effect of institutional context on public support for climate policies. The method is presented in section 4, and the analysis and its results in section 5. In section 6 we conclude.

2 Institutional contexts and values

Institutions are here understood as conventions, norms, and legal rules of a society. They influence attitudes and action by defining what is seen as the “natural” way to act (conventions), the right way to act (norms), and/or the sanctioned form of action (the law) (Vatn, 2015). According to institutional theory, humans are regarded as multi rational (Hodgson, 2007, 1988; Sjöstrand, 1995). Moreover, the kind of rationality involved is understood to be influenced by the institutional context. Institutions create expectations and give meaning to individual action. Such expectations and meanings can vary between institutional contexts such as for instance the market, the community, and the family (Scott, 2014).

Institutional contexts define the expected rationality or logic as specific to various arenas of human action and interaction. Institutional contexts may for instance support individual rationality (IR), what is best for the individual, or social rationality (SR), what is best for a group or for others (Vatn, 2009). An IR context emphasizes an “I” logic and a SR context emphasizes “we” or “they” logic. For instance, in some contexts, such as a market, choosing what is best for the individual – “maximizing individual utility” – is emphasized. In a family context, care is a dominant norm. When being faced with a ‘situation’, people will, consciously or unconsciously, look for information that specify what kind of context they are confronted with and what type of action is expected. The definition of the situation informs the person about what institutions apply (Weber et al., 2004).

Assigning roles – for instance citizen or consumer, mother or teacher – is a way to define a set of conventions and norms regarding what is expected actions. As such, these roles support specific forms of rationality (e.g., Soma and Vatn, 2014, 2010; Liberman et al., 2004). Ostrom (2000), Biel and Thøgersen (2007), and Vatn (2015) offer examples from different experiments and areas of life supporting this type of relationship between rationality and institutional context.

While the institutional context may thus be explicitly defined by reference to, for example, norms or sets of norms which may follow from being assigned a role. An institutional context may also be informationally induced. For instance, the content of information offered about an issue may activate a norm. One may learn something new that alters beliefs and next what is considered correct to do (Dietz and Stern, 2002). Learning that an issue influences mainly one’s own life may evoke other norms than if one learns that one’s own action influences the situation of other people. In the latter case, norms regarding social responsibility may be evoked. Information may also induce institutional context without changing beliefs or knowledge. The content may emphasize a certain aspect of an issue, and cause individuals to focus on this aspect instead of on others (Nisbet, 2009).² For instance, Sniderman and Theriault (2004) found that when information about government spending for the poor was characterized as enhancing poor people’s opportunities, individuals tended to support increased spending. However, when such spending was characterized as resulting in higher taxes, individuals tended to oppose the increased spending.

Institutional context may thus influence attitudes toward policies. Attitudes, the dependent variable analyzed in this study, are commonly understood as psychological tendencies that are expressed by evaluating a particular entity with some degree of favor or disfavor (Eagly and Chaiken, 1998). The entity may be for instance a person, or a policy. However, a person's attitude toward policies is also dependent on individual characteristics like values, as partly formed by an individual's "institutional history" (Vatn, 2015). The values that individuals hold may be important for how they interpret information in situations and define the institutional contexts (Weber et al., 2004).

Values are in social science seen as central for evaluations of individuals' actions, choices, and attitudes. They are "desirable trans-situational goals varying in importance, which serve as guiding principles in the life of a person" (Schwartz, 1994, p. 21). Values are commonly referred to as the basis in a person's system of attitudes and beliefs – they are considered more resistant to change than, for instance, attitudes, and they may influence these (Hogg and Vaughan, 2011).

Values may be important for interpreting contexts in that they influence which information people care about and believe in when exposed to it. The same information may be understood differently, and may be given different weight, by people holding e.g. different values (Weber et al, 2004). Such influence of values may be explained by people's interest in protecting their identity and social standing by conforming their beliefs to those of people perceived to share their values (Cohen, 2003). This effect of values on information assimilation processes may include a propensity to judge evidence supporting one's values and initial position as relevant and reliable, and a propensity to judge disconfirming evidence as irrelevant and unreliable (Lord, Ross, and Lepper, 1979).

However, few individuals hold only one set of values entirely at the expense of other sets (Stern et al., 1993). For instance, a person who is generally against state involvement and regulation may support a specific regulation if it supports other values which that individual holds. Such support for a policy may increase without changes in value orientation as measured in surveys. Institutional context may change the relevance of a value for an attitude, which may manifest itself in changes in correlations between the value and the attitude in a statistical analysis.

3 Previous studies

Hurlstone et al. (2014) provide evidence that varying the institutional context influences the public support for climate policies. A group of respondents in an experiment was exposed to information about a group of peers that had high acceptance of climate policies that entailed individual loss. The peer group was perceived to be an “in-group” that had similar social characteristics to the respondents. Researchers found that the information about what their peers considered to be correct policies influenced responses from the respondents in a direction that was closer to responses of their peers (the “in-group”) compared to responses from a control group.

Spence and Pidgeon (2010) conducted a survey experiment, and asked one group of respondents to evaluate mitigation from a personal perspective only and asked another group to evaluate mitigation from a social perspective that is, as a member of society. Here, the answers given depended on the perspective emphasized. Those asked to evaluate policies from a social perspective were more positive toward mitigation policies than were those asked to evaluate policies from a personal perspective. Gifford and Comeau (2011) similarly investigated the effects of two text treatments in a survey experiment where one treatment emphasized “collective motivation” (Gifford and Comeau, 2011, p. 1303) and social benefits from mitigating climate change and the other emphasized the individual sacrifice necessary to mitigate climate change. The latter treatment consisted of a formulation with “I” in contrast to the first treatment, which consisted of statements referring to a relational “we.”³ The authors found a higher score on climate change engagement among respondents receiving the first treatment (emphasizing an SR context) than among respondents receiving the second treatment and the control group. Here, the “engagement” refers to agreement with statements that individuals have a responsibility to mitigate climate change.

Bolsen et al. (2014) found effects on behavior intention from presenting a text treatment that combined a reference to a norm – that all individuals have a responsibility for making environmentally friendly choices – with an emphasis on environmental benefits for society. The respondents that received this treatment showed higher willingness to invest in energy conservation and to pay more for insulating homes than did a group of respondents that received no such text. There may have been both an effect from the perspective they were instructed to

use and/or an effect from the information of environmental effect (informationally induced institutions). The information about the consequences of the environmental effect on other people may have activated a norm/influenced respondents to think that making an effort is correct.

There are some studies of the role of value orientations on the effect of climate change information on climate concern (e.g., Feinberg and Miller, 2011; Kahan et al., 2011), but not of values' role in the effect of institutional context on attitudes toward climate policies or behavior. Two exceptions are Wiest et al. (2015) and Petrovic et al. (2014). Wiest et al. (2015) found that the effect on behavior intention from presenting different descriptions of climate change varied in groups of political value orientation. For instance, presenting local effects (affecting the respondents) from climate change yielded higher scores on behavioral intention among Republican and Independent respondents, than presenting global effects from climate change (not affecting the respondents) to these groups. There were no effects on behavioral intentions among Democrats (who reported stronger initial intentions than the other groups did). Petrovic et al. (2014) conducted a survey experiment of about 800 US residents. They investigated how providing different information affects attitudes toward emission reducing policies. One group received information emphasizing individual health effects from air pollution while another group received information that emphasized the environmental consequences of climate change. They found that the effects on attitudes from the two versions depended on political value orientation. The health frame elicited stronger support for policies among conservatives and the climate frame elicited stronger support among liberals.

To identify contexts that affect attitudes toward emission-reducing policies across individual characteristics, such as value orientations, seems crucial. Given the often found importance of quite stable correlation between political value orientations and attitudes toward such policies (Drews and Van den Bergh, 2015) it may be easier to change institutional contexts than individuals' values. The next section describes the methods designed to explore these issues.

4 Material and methods

In September 2014 we conducted a split-sample web-based survey of car owners in Oslo. The survey included an experimental element. We chose a strategic sample of car owners, since they

will experience an individual loss from the policies aimed at reducing car emissions. To be able to create both an IR and a SR context we chose Oslo city residents. Emissions from private car transport in this city contribute substantially to individual health problems that are due to local air pollution (Norwegian Environmental Agency, 2015), and to the larger social problem of global warming (Vågane, 2013). In this way, the IR context focused on the individual gain from reducing emissions, whereas the SR context emphasized the effects from climate change on poor countries. We sent an email with a web link to the survey, which they completed in their own time. The median time taken to complete the survey was 10 minutes. All respondents received an introduction to the survey, informing about the aim of the study, and that they could not go backwards in the web survey. Part one of the survey introduced the treatments. In part two, we asked questions about the respondents' attitudes toward the three policies. In part three, we mapped socioeconomic variables, beliefs about emissions, and political value orientation.

4.1 The experimental part – the treatments

We randomly assigned participants to one of three groups of approximately 500 respondents each. One group received the text emphasizing the IR context, one group received the text emphasizing the SR context, and a third group (the control group) received no such texts, only the general introduction. We instructed the participants who received a text treatment to read it carefully because later in the survey, we would ask questions about it. The two texts were of the same length, and both concerned emissions from private car transport.⁴ Both texts had three parts. Part 1 stated the institutional context explicitly, and parts 2 and 3 aimed at informationally induce institutional contexts.

- 1) An introduction stated the topic (emissions from private car transport). The IR treatment asked respondents to reflect on what is best for themselves, enhancing an “I” logic. The SR treatment asked respondents to reflect on what is a collective good for society, enhancing a “they” logic (SR treatment).
- 2) An informational part presented the issue in five bullet points. The IR treatment contained numbers and facts about the contributions of car transport to local air pollution. In being a local environmental problem, this topic concerns unavoidably other people in the local environment. However, we highlighted the individual consequences from local air pollution in the IR treatment. The emphasis in this text was that the effect from

emissions hit “you” (the reader), that local pollution reduces the length and quality of life not only for those who are considered vulnerable (such as asthmatics and persons with heart diseases). The SR treatment informed about the contributions of private car emissions to the total national climate-gas emissions. The emphasis in this text was contributions to global emissions by rich, respectively poor nations, and the differences between the abilities of such nations to deal with climate change. The IR treatment emphasized the personal benefits of reducing emissions from private car use. The SR treatment, on the other hand, emphasized the social benefits of reducing emissions from private car use.

- 3) The texts ended with some sentences emphasizing the importance of reducing car emissions. The IR treatment focused on the health benefit “you” (the reader) would achieve from reduced exposure to local air pollution, such as less vulnerability to heart and lung diseases, and better health from walking and biking. The SR treatment focused on the normative aspect that a “we” in the rich world have a greater responsibility to cut more of per capita emissions than the poor do, and it also emphasized the benefits from reducing car emissions for future generations and for people in countries more vulnerable to climate change.

4.2 Measures

We asked the respondents that received a text treatment questions to test whether they had read the text (see Appendix B for formulations). Apart from the texts and these control questions, the surveys were identical for all respondents. After the treatments and the control questions, we asked respondents to answer whether they agreed or disagreed with three statements. For the control group, these questions were the first questions asked in the survey:

- 1) We ought to make petrol and diesel so expensive that we choose to drive less.
- 2) We ought to develop bicycle lanes and public transport, even if doing so means less space for driving cars.
- 3) You have the opportunity to cycle/take public transport to work. It will take longer than driving by car. How strongly do you agree or disagree with this statement? “I would choose public transport or cycling rather than driving a car.”

The response alternatives were “strongly agree,” “partly agree,” “partly disagree,” “strongly disagree,” “don’t know.” We created dummies of the attitude variables (1 = “strongly agree” and “partly agree,” 0 = “partly disagree” and “strongly disagree,” and “don’t know” was coded as missing), and ran logistic regressions. For simplification, we will refer to these three dependent variables as “increase in petrol prices,” “less space for cars,” and “choose public transport,” respectively.

We measured political value orientation⁵ – the degree of support for state involvement and regulation – using items similar to those used in previous studies of the correlation between political values and attitudes toward climate change (Kahan et al., 2012). Respondents indicated their positions concerning statements like “Many tasks would be handled better and less expensively if they were transferred from the public entities to private companies.” We created an additive index from 0 to 24 (the higher the score, the less support to state involvement and regulation) using six items (alpha = 0.86). We asked the questions on value orientation after the attitude questions to ensure that making these values salient did not affect the dependent variables.⁶ To answer research question 2, we split the sample into two groups: one scoring above 12 on the political value orientation index, and one scoring below 12 on the same index (we coded mid score of 12 as missing). We refer to the group scoring high on this index as individualists, and to the group scoring low on this index as non-individualists.

Although we randomly assigned respondents to one of the three groups, we wanted to be able to test for variation among the groups regarding gender, age, income, and education. We thus included questions to measure these characteristics. Moreover, we included two questions concerning their beliefs about the effect of car emissions on local air quality and on climate change, to reveal any effect from the treatments on these beliefs. All items and response categories are shown in Appendix B.

4.3 The sample

A survey company (Ipsos MMI) operated the survey. This company recruited participants from their register. Respondents in their register receive points for each survey they participate in.⁷ From a sample of car owners (using petrol as fuel), the response rate was about 40%. Number of initial respondents (1516) was reduced by 62, who answered “don’t know” to the two questions formulated to test whether they had read the treatments. N is also reduced because we coded

“don’t know” answers for the dependent variables as missing (list-wise deletion).⁸ For the analyses of the effect of treatments in the two groups of value orientation, N is reduced by an additional 105 because we coded the mid score of 12 as missing.

5 Analysis and Results

We first report the analyses of the general sample, followed by the analyses of the effects of the treatments on the two groups of value orientations. Third, we report the effects from the treatments on beliefs about car emissions.

5.1 Effect from the treatments on attitudes toward policies

We tested for variation in the groups regarding gender, age, income, education, and political value orientation, and found no significant differences between the groups regarding these characteristics.

Table 1 displays the descriptive statistics of the responses to the statements about the three policies for each treatment group (the control group, the group receiving the IR treatment, and the group receiving the SR treatment).

Table 1: Agreement/disagreement with the statements per treatment group.

	“Increase in petrol prices”			“Less space for cars”			“Choose public transport”		
	Control	IR	SR	Control	IR	SR	Control	IR	SR
Partly/strongly agree	28%	29%	32%	77%	83%	80%	66%	71%	70%
	(152)	(135)	(145)	(422)	(381)	(358)	(359)	(324)	(316)
Partly/strongly disagree	70%	69%	66%	22%	17%	20%	31%	24%	27%
	(385)	(315)	(295)	(121)	(75)	(89)	(171)	(112)	(122)
Don’t know	2%	2%	2%	1%	0%	0%	3%	5%	3%
	(11)	(7)	(9)	(5)	(1)	(2)	(18)	(21)	(11)
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%
	(548)	(457)	(449)	(548)	(457)	(449)	(548)	(457)	(449)

Note: Absolute numbers in brackets. IR = individual rationality treatment, SR = social rationality treatment.

We see that the options “less space for cars” and “choose public transport” received quite high support in all three groups, and that the policy “increase in petrol prices” was less popular. The

control group had a higher share of respondents that disagree strongly/partly with all three policies than did the two groups that received a treatment.

Table 2 summarizes the results from the logistic regressions on the attitudes toward the policies. The table displays the marginal effects of the treatments. The coefficients indicate the contribution each treatment makes to the likelihood that a subject will select “strongly” or “partly agree” as opposed to “partly” or “strongly disagree.” Standard errors are in brackets. The reference category for the treatment groups is also indicated in brackets (“C” denotes “control group”).

Table 2: Results of logistic regressions on attitude toward policies, marginal effects

	“Increase in petrol prices”		“Less space for cars”		“Choose public transport”	
	Marginal effects	p-values	Marginal effects	p-values	Marginal effects	p-values
SR (C)	0.047(0.029)	0.115	0.022(0.025)	0.363	0.043(0.029)	0.136
IR (C)	0.017(0.029)	0.559	0.059**(0.026)	0.021	0.066**(0.029)	0.025
SR (IR)	0.029(0.030)	0.342	-0.037(0.027)	0.177	-0.023(0.031)	0.470
N	1427		1446		1404	

Note: The coefficients indicate the contribution each treatment makes to the likelihood that a subject will select “strongly agree” or “partly agree” as opposed to “partly disagree” or “strongly disagree” to the statements. “C” denotes control group. Estimates are marginal effects in probabilities. Standard errors are in brackets. * p < 0.1; ** p < 0.05 ***; p < 0.01.

Regarding “increase in petrol prices,” the p-value for a difference in attitudes between the respondents receiving the SR treatment and the respondents in the control group is 0.115. The difference between these groups is thus slightly insignificant at a p-value level of 0.1. When compared with the control group, the group receiving the IR treatment reported about a 6 percentage-point higher likelihood (p = 0.021) of being positive toward “less space for cars.” The group receiving the SR treatment did not deviate from the control group in its attitude toward this policy (p = 0.363). Regarding “choose public transport,” the group receiving the IR treatment yielded a 7 percentage-point higher likelihood of being more positive than the control group (p = 0.025).

5.2 Effects from the treatments in the two groups of value orientations

Table 3 below displays the descriptive statistics of responses in the two groups of value orientation, non-individualists and individualists. There were quite large differences between the

groups regarding their attitudes to “increase in petrol prices” and “less space for cars”; the non-individualists were more positive than the individualists were. Standard errors are in brackets. The reference category for the treatment groups is indicated in brackets.

Table 3: Agree/disagree to the policy statements in the two value orientation groups

	“Increase in petrol prices”		“Less space for cars”		“Choose public transport”	
	Non-individualists	Individualists	Non-individualists	Individualists	Non-individualists	Individualists
Partly/strongly agree	43%	15%	90%	68%	76%	60%
	(313)	(96)	(649)	(430)	(551)	(377)
Partly/strongly disagree	54%	84%	10%	31%	20%	36%
	(390)	(524)	(70)	(193)	(146)	(228)
Don’t know	3%	1%	0%	1%	4%	4%
	(19)	(7)	(3)	(4)	(25)	(22)
Total	100%	100%	100%	100%	100%	100%
	(722)	(627)	(722)	(627)	(722)	(627)

Note: Absolute numbers in brackets.

Table 4 below displays the results from the logistic regressions on the attitudes toward policies, for the non-individualists and the individualists separately. The reference category for the treatment groups is indicated in brackets.

Table 4: Results of logistic regressions on attitudes toward policies in the two value orientation groups, marginal effects (cont.)

	“Increase in petrol prices”				“Less space for cars”			
	Non-individualists		Individualists		Non-individualists		Individualists	
	Marg. eff.	p-values	Marg. eff.	p-values	Marg. eff.	p-values	Marg. eff.	p-values
SR (C)	0.081*(0.045)	0.071	0.015(0.045)	0.404	0.008(0.026)	0.799	0.054(0.044)	0.214
IR (C)	0.015(0.045)	0.742	0.013(0.036)	0.716	0.047*(0.028)	0.095	0.089**(0.045)	0.049
SR (IR)	0.066(0.047)	0.158	0.016(0.036)	0.716	-0.039(0.030)	0.187	-0.034(0.048)	0.476
N	703		620		719		623	

Note: Dependent variables are agreement or disagreement with the three attitude statements. Estimates are marginal effects in probabilities. Standard errors are in brackets. The coefficients indicate the contribution each variable makes to the likelihood that a subject will select “Strongly agree” or “Partly agree” to the statements as opposed to “Partly disagree” or “Strongly disagree.” * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 4: Results of logistic regressions on attitude toward policies the two value orientation groups, marginal effects (cont.)

	“Choose public transport”			
	Non-individualists		Individualists	
	Marg. eff.	p-values	Marg. eff.	p-values
SR (C)	-0.037(0.037)	0.313	0.054(0.046)	0.247
IR (C)	0.049(0.037)	0.196	0.081*(0.048)	0.094
SR (IR)	-0.010(0.040)	0.796	-0.027(0.051)	0.592
N	703		605	

We see from the results of the regressions that the SR treatment significantly affected attitudes toward an increase in petrol prices ($p = 0.071$) among the non-individualists. They reported an 8 percentage-point higher likelihood of agreeing with the statement than did respondents in the control group. There was no effect from the treatments on attitudes toward “increase in petrol

prices” among the individualists. Regarding “less space for cars,” there was an effect of the IR treatment on the attitudes of the non-individualists. The non-individualists were about 5 percentage points more likely to agree with the statement than the control group was ($p = 0.095$). The individualists who received the IR treatment were also more likely to agree with “less space for cars” than the individualists in the control group were ($p = 0.049$). The difference between these two groups in the likelihood of agreeing with the statement about “less space for cars” was about 9 percentage points. The IR treatment also affected the non-individualists attitudes toward the option “choose public transport.” This group yielded a 9 percentage-points higher likelihood of agreeing with the statement than did the control group. The effect of the treatments on attitudes seems thus to depend on the value orientation.

5.3 Effect on beliefs from the treatments

We also tested whether the treatments affected beliefs about car emissions. The SR treatment did not affect beliefs about the effect of car emissions on climate change (SR: $M = 3.05$, $SE = 0.055$, control: $M = 3.08$, $SE = 0.049$, $N = 1417$, $t = -0.41$, $p = 0.682$). However, we found an effect from the IR treatment on beliefs about private car emissions’ effect on local air pollution (IR: $M = 3.33$, $SE = 0.044$, control: $M = 3.20$, $SE = 0.041$, $N = 1443$, $t = 2.13$, $p = 0.033$). The IR treatment did not affect beliefs about the effect of car emissions on climate change, nor did the SR treatment affect beliefs about the effect of car emissions on local air pollution.

We conducted the same analyses of each group of value orientation. In contrast to what we found in the full sample, we found no effect of any of the treatments on beliefs about the effect of car emissions on local air pollution in the group of non-individualists. On the other hand both treatments increased individualists’ score on the beliefs about effects on local air pollution from car emissions (SR treatment: $M_{\text{belief air, ind}} = 3.12$, $SE = 0.063$, $p = 0.009$, IR treatment: $M_{\text{belief air, ind}} = 3.11$, $SE = 0.065$, $p = 0.026$, control: $M_{\text{belief air, ind}} = 2.90$, $SE = 0.65$). We found no effect on beliefs about effects of private car emissions on climate change among the individualists from any of the treatments (SR treatment: $M = 2.69$, $SE = 0.081$, $p = 0.761$, IR treatment: $M = 2.85$, $SE = 0.075$, control: $M = 2.72$, $SE = 0.08$, $N = 712$). The non-individualists generally reported a higher score on beliefs about the effects of car emissions on climate change than the individualists did ($M_{\text{belief climate, non-ind}} = 3.46$, $SE = 0.034$; $M_{\text{belief climate, ind}} = 2.76$, $SE = 0.048$). The non-individualists also reported a higher score on beliefs about effects from emissions from

cars on local air pollution than the individualists did ($M_{\text{belief air, non-ind}} = 3.49, SE = 0.03; M_{\text{belief air, ind}} = 3.05, SE = 0.041$).

6 Discussion

While one should not expect strong effects from asking people to read a text, our study nevertheless demonstrates the effects of different institutional contexts on attitudes toward emission-reducing policies. Our research moreover shows that the effects from these contexts can vary across individuals with different value orientations. The SR context yielded higher support among non-individualists for increasing petrol prices. The IR context yielded higher support in both value orientation groups for decreasing space for cars. The IR context also influenced individualists' attitudes toward the statement about choosing public transport. These effects may be due to the texts encouraging respondents to think in terms of individual or social logic. Respondents may also have been reminded of or learned about the effects of car emissions on local air pollution or climate change (informationally induced institutional contexts).

6.1 Social rationality context

Regarding “increase in petrol price,” the effect on attitudes from receiving the SR treatment was slightly insignificant when analyzing the full sample. When distinguishing between respondents holding an individualist value orientation and those who do not, there was a significant effect of the SR context on attitudes toward “increase in petrol prices” among the non-individualists. The treatment did not affect the non-individualists' belief about the effect of car emissions on climate change. The score on this belief was higher among the non-individualists than among the individualists (refer to section 5.3).

The difference in the effect on attitudes in the two value orientation groups may have occurred because of the non-individualists generally being more concerned with global environmental issues than individualists are (e.g., Dunlap et al., 2001). The individualists, on the other hand, are often found to be more skeptical about taxes (Dreus and van den Bergh, 2015; Kallbekken and Aasen, 2010). The non-effect on attitudes in this group may be due to less trust in the state or in the effect of such instruments (Harring and Jagers, 2013). However, the general emphasis on social consequences in the SR treatment may also have reminded respondents about effects for a local “they.” The SR treatment may, for instance, have reminded respondents about effects from

increased petrol prices on people with few alternatives to private car use. Therefore, arguments using social rationality context may have prevented an increase in support for this policy.

The SR treatment affected only attitudes toward “increase in petrol prices.” The non-individualists’ attitude toward “less space for cars” was influenced by the IR treatment, but not by the SR treatment. This difference means that the SR treatment’s failure to affect this attitude cannot be explained by a “ceiling effect” (Wiest et al., 2015) among the non-individualists – that is, that the potential support to “less space for cars” in this group from the texts is reached. The lack of effects from the SR treatment on attitudes toward the other two policy statements may be due to these policies being comprehended as irrelevant for mitigating climate change. To decrease car driving locally – on the city level – may have been perceived to result in too small an effect on climate-gas emissions and thus also to be an insignificant effort.

Norgaard (2011, 2006) identifies in her ethnographic study in Norway that individuals’ nonresponse to climate change is partially a matter of socially organized denial. The information about climate change is not necessarily rejected, but the political or moral implications of it are not followed. She indicates that collectively ignoring these implications maintains Norwegian economic interests, because Norwegian economic prosperity is tied to oil production. One example of how this denial is sustained is through the narrative that Norwegians’ actions are particularly insignificant because Norway is a small country. It may be that this narrative, and several other ways in which denial is socially organized, uphold not only the norm of inaction, but also people’s disbelief in effects from local climate policies.

The SR treatment affected individualists’ beliefs about car emissions’ effects on local air pollution. The text described an increase in private car use in Norway, which may have made respondents think of local air pollution. It may be that the information about climate change was not new to any of the respondents, and that the information about car emissions and local air pollution was less known to the individualists. The SR treatment thus affected individualists’ beliefs about emissions but did not affect their attitudes toward policies.

These results indicate that referring to global climate change is less effective to increase support for local policies such as to reduce space for cars in order to build bike lanes. The results also

indicate that communicating emission-reducing policies entailing individual costs across groups of different value orientations is challenging.

6.2. Individual rationality context

The results indicate moreover that a context enhancing IR increases support for a policy that includes some individual benefits in addition to the social benefits (more bike lanes and public transport). Before splitting the sample into the two value orientation groups, regressions revealed an effect from the IR treatment on respondents' attitudes toward both "less space for cars" and "choose public transport." When splitting the sample into non-individualists and individualists, we found effects on both groups' attitudes toward "less space for cars" from this treatment. Only individualists became more positive to the statement "choose public transport".

The analyses revealed a difference in effect on the stated behavior intention in the two value orientation groups. The IR contexts influenced the individualists' attitudes toward "choose public transport," but not the non-individualists' attitudes toward this policy. This difference may be due to a ceiling effect among the non-individualists; this group had a higher score on this item than the individualists did (see Table 4). Alternatively, the distinctive effect on the individualists may be due to the novelty of information for these subjects. The effects from the treatments on individualists' beliefs about car emissions corroborate this interpretation. The IR treatment may have encouraged individualists to think about effects from car driving that they had not previously considered, leading to a change in attitude toward "less space for cars" and toward "choose public transport."

There might also be an alternative or additional interpretation of the effects of the IR context, other than that of institutional theory. Some researchers (Maio and Haddock, 2007; Scannell and Gifford, 2013) have found a larger effect on public climate change concern and attitudes toward climate policies from presenting local effects from climate change, when compared with presenting global effects from climate change. The researchers explain their finding by citing the fact that local consequences are close in time and place, and thus concrete to and perceivable by the respondents.

6.3 Limitations of the study and future work

It would be interesting to know more about why we obtained the results we did. From this study we cannot distinguish between the effects from the explicitly formulated institutional contexts and those from the informationally induced institutional contexts. It would be interesting to explore this distinction further. This could be done by isolating the different elements in the treatments and increasing the number of treatments and groups.⁹

However, only qualitative research would make it possible to grasp respondents' perceptions of such contexts. We have no control over how respondents interpret the contexts. A second area of research is thus to conduct qualitative studies of respondents' experiences with intended institutional contexts, to reveal the mechanisms at work.

7 Conclusion

In this paper we ask two questions. First, does institutional context affect attitudes toward policies to cut car emissions? Second, does institutional context affect these attitudes among people with different value orientations? We investigated the effect from varying the institutional context on public attitudes toward policies to cut emissions from private car use. This investigation was done by conducting a split-sample survey involving 1500 car owners who received different text treatments. One text emphasized the individual health gain from reducing local air pollution (IR context), and the other emphasized the social responsibility for avoiding climate change (SR context); the control group received no such text treatment. We also analyzed the data distinguishing between respondents holding an individualist value orientation and those who do not, measured as their position on state involvement and regulation (individualists value orientation means low support for state involvement and regulation).

Regarding the first research question, our study demonstrates the effect of institutional contexts on attitudes toward emission-reducing policies. We found an effect from the institutional contexts on attitudes in the general sample. The group receiving the IR context was more positive toward developing bike lanes and public transport at the expense of cars, and was more positive toward the statement about choosing public transport, than was the control group.

Regarding the second question, our research also shows that the effects from these contexts can vary across individuals with different value orientations. We found that the SR context yielded

higher support for an increase in petrol prices among non-individualists. The IR context resulted in increased support for decreasing space for cars in both value orientation groups. The IR context also influenced individualists' attitudes toward the statement about choosing public transport. In general, our study demonstrates the effect of institutional contexts on attitudes toward emission-reducing policies. It seems that presenting the issue of car emissions in an IR context – as a local air pollution problem – engages individuals across political value orientation. On the other hand, presenting emissions in a larger SR context – as a contributor to the global climate problem – engages only the non-individualists.

Our findings moreover indicate that the contexts work differently for different types of policies. That the SR context affects non-individualists' attitudes toward “increase in petrol prices” but not their attitudes toward “less space for cars” may be because they perceive local policies to be irrelevant for mitigating climate change. One way of interpreting this is that people's initial associations with the policies – for instance whether people perceive the policies to be relevant for the problems they are proposed to solve – are important for how contexts work on attitudes toward these policies.

This study indicates that it may be difficult to communicate the somewhat unpopular policy of raising petrol prices across value divides. The institutional contexts provided in this study are, however, “weak” relative to all the information people receive. Therefore, the results demonstrate some of the potential for creating institutional contexts to enhance support for policies aimed at solving social dilemmas.

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References

- Biel, A., Thøgersen, J., 2007. Activation of social norms in social dilemmas: A review of the evidence and reflections on the implications for environmental behavior. *Journal of Economic Psychology* 28(1), 93–112.
- Bolsen, T., Druckman, J.N., Cook, F.L., 2014. Communication and Collective Actions: A Survey Experiment on Motivating Energy Conservation in the U.S. *Journal of Experimental Political Science* 1, 24–38.
- Bruvoll, A., Dalen, H. M., Larsen, B.M., 2012. Political motives in climate and energy policy. Discussion paper Statistics Norway. No. 721 December 2012.
<http://www.ssb.no/a/publikasjoner/pdf/DP/dp721.pdf>. (accessed 01.08.15)
- Cohen, G.L., 2003. Party over policy: The dominating impact of group influence on political beliefs. *Journal of Personality and Social Psychology* 85, 808–22.
- Devine-Wright, P., Price, J., Leviston, Z., 2015. My country or my planet? Exploring the influence of multiple place attachments and ideological beliefs upon climate change attitudes and opinions. *GEC* 3, 68–79.
- Dietz, T., Stern, P.C., 2002. Exploring new tools for environmental protection, in: T. Dietz, T., Stern, P.C. (Eds.), *New Tools for Environmental Protection. Education, Information and Voluntary Measures*. National Academy Press: Washington DC, pp. 3–15.
- Drews, S., van den Bergh, J.C.J.M., 2015. What explains public support for climate policies? A review of empirical and experimental studies. *Climate Policy*, 1469-3062.
- Dunlap, R. E., Xiao, C., McCright, A.M., 2001. Politics and Environment in America. *Environmental Politics* 10(4), 23–48.
- Eagly, Alice H., and Shelly Chaiken. 1998. "Attitude, Structure and Function." In *Handbook of Social Psychology*, ed. D.T. Gilbert, Susan T. Fisk, and G. Lindsey. New York: McGowan-Hill, pp. 269–322.
- Feinberg, M., Willer, R., 2013. The Moral Roots of Environmental Attitudes. *Psychological Science* 24, 55–62.
- Gifford, R., Comeau, L.A., 2011. Message framing influences perceived climate change competence, engagement, and behavioral intentions. *GEC* 21, 1301–1307.
- Harring, N. and Jagers, S.C., 2013. Should We Trust in Values? Explaining Public Support for Pro-Environmental Taxes. *Sustainability* 5, 210–227.

- Hodgson, G.M., 1988. *Economics and Institutions: A Manifesto for a Modern Institutional Economics*. Polity Press, Cambridge.
- Hodgson, G.M., 2007. The revival of Veblenian institutional economics. *Journal of Economic Issues* XLI (2), 325–40.
- Hogg, M.A., Vaughan, G. M., 2011. *Social psychology*. Pearson Education Limited, Edinburgh.
- Hurlstone, M.J., Lewandowsky, S., Newell, B.R., Sewell, B., 2014. The effect of framing and normative messages in building support for climate policies. *PLoS ONE* 9(12), e114335. doi:10.1371/journal.pone.0114335.
- IPCC, 2013. *Climate Change 2013: The physical science basis. Contribution of working group I to the fifth assessment report of the intergovernmental panel on climate change* [Stocker, T. F., D. Q., in: G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P. M. Midgley (Eds.)]. Cambridge University Press: Cambridge.
- IPCC, 2014. Summary for policymakers, in: C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, . . . L. L. White (Eds.), *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press: Cambridge/New York, pp. 1–32.
- Kahan, D. M., Peters, E., Wittlin, M., Slovic, P., Larrimore Ouellette, L., Braman, D., Mandel, G., 2012. The polarizing impact of science literacy and numeracy on perceived climate change risk. *Nature Climate Change*, 2, 732–735.
- Kallbekken, S., Aasen, M., 2010. The demand for earmarking: Results from a focus group study. *Ecological Economics* 69, 2183–2190.
- Lieberman, V. Samuels, M.S., Ross, L., 2004. The Name of the Game: Predictive Power of Reputations Versus Situational Labels in Determining Prisoner’s Dilemma Game Moves. *Personality and Social Psychology Bulletin* 30, 1175–1185.
- Lord, C.G., Ross, L., Lepper, M.R., 1979. Biased assimilation and attitude polarization: Effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology* 37, 2098–109.
- Maio, G.R., Haddock, G., 2007. Attitude change, in Higgins, E.T., Kruglanski, A.W. (Eds.), *Social psychology: A handbook of basic principles*. Guilford, New York, pp. 565–586.

- March, J.G., Olsen, J.P., 1989. *Rediscovering Institutions. The Organizational Basis of Politics*. Free Press, New York.
- Nisbet, M.C., 2009. Communicating climate change: Why frames matter for public engagement. *Environment. Science and Policy for Sustainable Development* 51 (2), 12–23.
- Norwegian Environmental Agency, 2015. Local Air pollution. http://www.miljodirektoratet.no/no/Tema/Luft/Lokal_luftforurensning/ (accessed 13.08.15)
- Norgaard, K. M., 2011. *Living in denial. Climate Change, Emotions, and Everyday Life*. The MIT Press, Cambridge.
- Norgaard, K. M., 2006. “We don’t really want to know”. *Environmental justice and Socially Organized Denial of Global Warming. Organization and Environment* 19, 347–370.
- Olson, M., 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups*. Harvard University Press, Cambridge.
- Ostrom, E., 2000. Collective action and the evolution of social norms. *Journal of Economic Perspectives* 14(3), 137–58.
- Petrovic, N., Madrigano, J., Zaval, L., 2014. Motivating mitigation: When health matters more than climate change. *Climatic Change*, 126, 245–254.
- Scannell, L., Gifford, R., 2013. Personally Relevant Climate Change. The Role of Place Attachment and Local Versus Global Message Framing in Engagement. *Environment and Behavior* 45, 60–85.
- Schwartz, S. H., 1994. Are there Universal Aspects in the Structure and Content of Human Values?. *Journal of Social Issues*, 50, 19–45.
- Scott, W.R., 2014. *Institutions and organizations: Ideas, Interests and Identities*, fourth ed. Sage Publications: Los Angeles.
- Sjöstrand, S-E., 1995. Towards a Theory of Institutional Change, in: Groenewegen, J., C. Pitelis and S-E. Sjöstrand (Eds.), *On Economic Institutions. Theory and Application*. Edward Elgar, Cheltenham, pp. 19–44.
- Spence, A., Pidgeon, N., 2010. Framing and communicating climate change: the effects of distance and outcome manipulations. *GEC* 20, 656–667.

- Sniderman, P. M., Theriault, S.M., 2004. The Structure of Political Argument and the Logic of Issue Framing, in: Saris, W.E., Sniderman, P.M. (Eds.), *Studies in Public Opinion*. Princeton University Press, Princeton, pp. 133–165.
- Soma, K., Vatn, A., 2010. Is there anything like a citizen? A descriptive analysis of instituting a citizen’s role to represent social values at the municipal level. *Environmental Policy and Governance* 20, 30–43.
- Soma, K., Vatn, A., 2014. Representing the common goods – stakeholders vs. citizens. *Land Use Policy* 41, 325–333.
- Stern, P. C., Dietz, T., Kalof, L., 1993. Value orientations, gender, and environmental concern. *Environment and Behavior* 25, 322–348.
- Unsworth, K.L., Fielding, K.S., 2014. It’s political: How salience of one’s political identity changes climate change beliefs and policy support. *GEC* 27, 131–137.
- Vatn, A., 2015. *Environmental Governance. Institutions, policies and action*. Edward Elgar, Cheltenham.
- Vatn, A., 2009. Cooperative behavior and institutions. *Journal of Socio-Economics* 38, 188–196.
- Vågane, L., 2013. *Transportytelser i Norge 1946-2012 [Transportation in Norway 1946-2012]* TØI rapport 1277/2013 (retrieved from <https://www.toi.no/getfile.php?mmfileid=33392>, 23.09.2015)
- Weber, J.M., Kopelman, S., Messick, D.M., 2004. A Conceptual Reviw of Decision Making in Social Dilemmas: Applying a Logic of Appropriateness. *Personality and Social Psychology Review*, 8, 281–307.
- Wiest, S.L., Raymond, L., Clawson, R.A., 2015. Framing, partisan predispositions, and public opinion on climate change. *GEC* 31, 187–198.
- Wiseman, J., Edwards, T., Luckins, K., 2013. Post Carbon Pathways: A Meta analysis of 18 large scale post carbon economy strategies, *Environmental Innovation and Societal Transitions*, 8, 76–93.

¹ See for instance Drews and van den Bergh (2015) for a review of studies.

² This effect of information is often referred to as a “framing effect” (Nisbet, 2009).

³ For example, one of the statements was “We help solve climate change when we take transit, compost or buy green energy” (Gifford and Comecau, 2011, p. 1303).

⁴ See the text treatments in Appendix A.

⁵ Note the differences between the similar concepts “individual value orientation” versus “individual rationality context,” the first referring to the view on the role of the state, the second to situations where enhancing individual benefit is perceived as the correct thing to do.

⁶ See Unsworth et al. (2014) about the effect on attitudes toward policies from making political values salient.

⁷ Respondents can accumulate points and exchange them for various items.

⁸ Don't know scores: "Increase in petrol prices" 1.9% (27), "Less space for cars" 0.6% (8), "Choose public transport" 3.4% (50).

⁹ Which requires a larger budget than the budget for this study.

Appendix A: The treatments

IR treatment:

In this survey we are interested in hearing your views on different ways of reducing emissions caused by road transport. What is best for you? Some information is provided below. Later you will be asked some questions related to this information. Read it carefully, but do not spend more than around 2 minutes.

- Emissions from road traffic in Norway increased by 30 percent between 1990 and 2013. These emissions cause harmful air pollution in towns and cities.
- Norway has set national limits for local air pollution, but these are exceeded in most towns and cities. Oslo has exceeded these limits significantly for the past 10 years. This is particularly a problem during winter time.
- Pollution from road traffic is the dominant source of local air pollution. By reducing emissions from road transport in the cities, few people will develop diseases caused by local air pollution.
- Exposure to air pollution from road traffic increases the risk of various respiratory conditions, cardiovascular diseases, and leukemia.
- Air pollution from road traffic affects not only people with lung diseases, cardiovascular diseases and asthma; healthy people may also be affected by poor air quality.

You breathe in around 10,000 liters of air every day, so the quality of that air is therefore vital to your health. People living in Oslo may derive significant health benefits from reducing emissions from road transport.

If we reduce emissions locally, the risk of health problems will decrease and you will be able to breathe in the air where you live without having to worry about whether it may be harmful. If you switch to using a bicycle, both you and your heart will be healthier. There will be fewer cars on the road, fewer traffic jams, and less noise pollution.

SR treatment:

In this survey we are interested in hearing your views about different ways of reducing emissions caused by road transport. What do you think would be best for society as a whole? Some information is provided below. Later you will be asked some questions related to this information. Read it carefully, but do not spend more than around 2 minutes.

- The level of emissions of greenhouse gases in Norway and worldwide is increasing. It will continue to rise unless new measures are implemented.
- In Norway, the level of Norwegian greenhouse gas emissions is around 53 million tons annually. Emissions from transport account for 13.8 million tons, and emissions from passenger cars is the primary source. Since 1960, the level of car use has increased more than twelve fold.
- If we reduce emissions now, we could avoid several challenges in the future. such as lower food production levels, poorer water supplies, more frequent extreme weather events, and changes in ecosystems.
- Emission levels in Norway and other developed countries are far higher per person than in poor countries. In Norway, each person accounts for 10 tons of greenhouse gas emissions per inhabitant. In Bangladesh, each person accounts for 0.4 tons.
- Both the World Bank and the UN stress that developing countries are more vulnerable to climate change than developed countries. These countries are located in regions that are most vulnerable to negative impacts of climate change. They also have fewer resources to deal with the impacts of climate change.

A key point made in the report prepared by the UN's Intergovernmental Panel on Climate Change is that those of us living today will determine how severe the climate changes will be for future generations and other regions of the world, and that there are close links between economic development, energy consumption, lifestyle, and greenhouse gas emissions.

We cannot expect poorer countries with lower emissions per person to reduce emissions more than us

Appendix B: Measures

Control for having read the text treatment

How strongly do you agree or disagree with each of these statements? [Strongly agree, partly agree, neither agree nor disagree, partly disagree, strongly disagree, do not know].

The information on the preceding page dealt with local air pollution in Oslo.

The information on the preceding page dealt with climate change.

Individual value orientation index

How strongly do you agree or disagree with each of these statements? [Strongly agree, partly agree, neither agree nor disagree, partly disagree, strongly disagree, do not know].

Many tasks would be handled better and less expensively if they were transferred from the public entities to private companies.

A high tax level is necessary for maintaining key public-sector services.

We ought to allow commercially run private schools.

If society is unable to control private business and industry, the leading banks and industrial actors will gain too much influence.

There is too much state intervention and regulation in today's society.

Full employment could be achieved more easily if the state had more influence over banks and businesses.

Beliefs emissions from cars

How strongly do you agree or disagree with each of these statements? [Strongly agree, partly agree, neither agree nor disagree, partly disagree, strongly disagree, do not know].

Car transport leads to local air pollution.

Emissions from car transport do not contribute to man-made climate changes.

Paper IV

The influence of institutional context and political value orientation on public attitudes toward climate policies: A mixed-methods study

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Abstract

In a mixed-methods study, we investigated the effect of institutional contexts on public attitudes toward climate policies. Institutional contexts may support individual rationality – what is best for the individual – or social rationality – what is best for a group or for others. We conducted a survey experiment involving 1500 car owners in Oslo, Norway, to investigate the effect of such contexts on attitudes toward policies to reduce car emissions. We distinguished between respondents with different political values, measured as positions on state involvement and regulation. We conducted thirty in-depth qualitative interviews to probe the findings from the quantitative material. The institutional contexts was found to affect respondents' attitudes toward policies, and the effects varied with respondents' value orientation. The study contributes to 1) our understanding of how individuals may switch between individual and social rationalities depending on the institutional context and 2) the relevance of individuals' experiences with environmental issues for their attitudes to policies.

1 Introduction

A growing literature on public positions on climate policies identifies political value orientation – that is, positions on state involvement and regulation – to be important for the public’s attitudes toward climate policies (Drews & van den Bergh, 2015; Unsworth & Fielding, 2014). Several authors stress the need for creating policies that are supported by people holding different values, since public support for climate policies is crucial to the viability of such policies (Bruvoll, Dalen & Larsen, 2012; Hulme, 2009).

One suggestion to increase support to climate policies across value divides in the public is to create institutional contexts emphasizing emission-reduction as the right thing to do (March & Olson, 1989). The context may emphasize social rationality – what is best for a group or for others, for instance, by stressing individuals’ contributions to climate change and its effect on others. The context may also be formed to support individual rationality – what is best for the individual. Such context formation may be done by, for instance, emphasizing individual health benefits from policies facilitating emission cuts.

Some studies identify the effect on attitudes toward policies from varying the contexts, but there has been relatively little field research examining such effects in groups with different value orientations. Specifically, qualitative studies are needed that aim at understanding how various institutional contexts may be perceived. People may perceive and evaluate contexts differently depending on their value orientations (Weber, Kopelman & Messick, 2004).

This study contributes to this field. We analyze the effect of different institutional contexts on attitudes toward policies aimed at reducing private car use in groups with different value orientations. We also explore group members’ perceptions of the different contexts. We ask two research questions:

- 1) Does institutional context affect attitudes toward policies to cut car emissions differently among people with different political value orientations?
- 2) How does institutional context influence these attitudes?

We applied quantitative and qualitative analyses sequentially. The former helped establish whether institutional contexts affected attitudes toward climate policies (research question 1).

The latter provided insight into how the institutional context influenced attitudes; the respondents' perceptions and evaluations of the contexts; and the role of individuals' values (research question 2).

The remaining of this section presents the theoretical perspectives applied in this paper, and relevant literature. Section 2 presents the methods and the results of the quantitative study - a survey experiment asking 1500 car owners about their attitudes toward policies aimed at reducing car emissions. Section 3 presents the methods and results of the qualitative study – in-depth interviews with 30 respondents. In the presentation of the results of study 2, we also relate these findings to the findings in study 1. Section 4 discusses the results and concludes.

2 The relative importance of individual values and institutional contexts on attitudes

A basic proposition in institutional theory is that humans are regarded as multi-rational (Hodgson 1988, 2007; Sjöstrand, 1995). The kind of rationality or logic involved is understood to be influenced by the institutional context. Institutions are here defined as the conventions, norms and formally sanctioned rules of a society. Institutions influence action and attitudes by defining what is seen as the “natural” way to act (conventions), the right way to act (norms), and/or the sanctioned form of action (the law). Institutions create expectations and give meaning to individual action (Vatn, 2009). Simplified, institutions may support individual rationality (IR), what is best for the individual, or social rationality (SR), what is best for a group or for others. An IR context emphasizes an “I” logic, and a SR context emphasizes “we” or “they” logic. For instance, in some contexts such as the market, choosing what is best for the individual – “maximizing individual utility” – is facilitated, while in a family context, care is the dominant norm. Individuals will search for e.g., cues, consciously or unconsciously, to interpret the situation. Defining it helps the person clarify what institutions apply. An institutional context may be explicitly defined or informationally induced.

2.1 Explicitly defined and informationally induced institutional contexts

Assigning roles – for instance as citizen or consumer – is a way to specify the institutional context and hence, affect which rationality is expected (Soma & Vatn, 2010, 2014). Spence and Pidgeon (2010) provide an example of such an effect from varying the instruction of what role one should take on in a survey experiment on attitudes toward climate policies. They asked one

group of respondents to evaluate climate policies in terms of personal considerations only (“consumer”), and another group to evaluate the policies “in social terms,” that is, as a member of society (“citizen”). The different roles assigned resulted in different answers. Those who were asked to evaluate policies in social terms were more positive toward mitigation policies than were those asked to consider policies from an individual viewpoint. Providing information about other peoples’ behavior is also a way to influence the institutional context. For instance, in Hurlstone et al.’s (2014) experiment, informing respondents about what their peers considered to be correct influenced the respondents’ attitudes. Their peers had high acceptance of climate policies that entailed individual loss, and this information influenced the respondents’ attitudes to be closer to the attitudes of their peers than to the attitudes of a control group.

The institutional context may also be informationally induced. One may learn something new that alters beliefs and what is considered right to do (Dietz & Stern, 2002). Information may also induce institutional context without changing beliefs. The informational content may influence which aspect of an issue is emphasized, and cause individuals to focus on certain characterizations of an issue over others. This effect of information is often referred to as a framing effect (Nisbet, 2009).

The kind of rationality induced is thus expected to influence attitudes and behavior. Attitudes are commonly understood as psychological tendencies that is expressed by evaluating a particular entity with some degree of favor or disfavor (Eagly & Chaiken, 1998). However, a person’s attitude toward policies is not dependent only on the institutional context, but also on individual characteristics, such as values.

2.2 The role of values

Although they are often studied at the individual level, values are in social science understood to be a result of socialization and to be formed by an individual’s “cultural/institutional history” (Vatn, 2015). The most important phase of socialization and formation of an individual’s values occurs early in life. Yet, values may change over time because of different life stages or particular events, etc. Nonetheless, values are considered more resistant to change than, for instance, attitudes, and are considered to be the basis in a person’s system of attitudes and beliefs (Hogg & Vaughan, 2011). Values are seen as central for evaluations of individuals’ actions and choices, and they are commonly referred to as “desirable trans-situational goals, varying in

importance, that serve as guiding principles in the life of a person or other social entity” (Schwartz, 1994, p. 21).

The values individuals hold may thus be important for individuals’ interpretations of institutional contexts. Values may, for instance, influence the effect of a context on attitudes by affecting which information people care about and believe in when exposed to it. The same facts may be understood differently, and may be given different weight, by people holding different values. The biased assimilation processes underlying this effect may include a propensity to judge evidence supporting one’s values and initial position as relevant and reliable, but a propensity to judge disconfirming evidence as irrelevant and unreliable (Lord, Ross, & Lepper, 1979). This bias may also be explained by people’s interest in protecting their identity and social standing, by for instance conforming their beliefs to those of people perceived to share their values (Weber et al., 2004).

An individual’s support for a specific policy may change without her changing her values as measured in surveys. Institutional context may cause such changes in support, and they may be measured as changes in the correlation between the value and the attitude in a statistical analysis (Stern, Dietz, & Kalof, 1993). Wiest et al. (2015) and Petrovic et al. (2014) provide two examples of how institutional contexts affected attitudes toward mitigation policies differently in groups with different political value orientations. Yet, these studies does not answer why and how institutional contexts cause such changes, which can be studied by applying qualitative methods (Brannen, 2005).

3 The survey experiment: Study 1

To be able to create both an IR and a SR context for the same policies, we chose a strategic sample of Oslo City residents. This sample was chosen because emissions from increasing private car transport in Oslo City contribute substantially both to individual health problems caused by local air pollution (Norwegian Environmental Agency, 2015), and to the larger social problem of global warming (Vågane, 2013). The IR context could hence focus on the individual gain from reducing emissions, and the SR context could focus on the social gain. We wanted the emission-reducing policies to include an individual loss. Therefore, we chose a strategic sample

of car owners, because they will experience some individual loss from the policies proposed compared with non-owners.

3.1 Method

In September 2014 we conducted a web-based survey experiment of about 1500 respondents. We randomly assigned participants to one of three groups of approximately 500 respondents each. All respondents received a general introduction containing information about the study, explaining its aim. We informed them that they could not go backwards in the web survey, since we wanted to avoid that questions asked later in the survey influence answers to questions asked early in the survey. In the first part of the survey, we introduced the institutional contexts – the experimental elements. Second, we asked the attitude questions about policies. In part three, we surveyed beliefs about emissions, socioeconomic variables to be able to test for variation in the groups regarding gender, age, income, education, and political value orientation.

3.1.1 The experimental elements

One group received the text emphasizing the IR context, a second group received the text emphasizing the SR context, and a third group (the control group) received no such texts, only the general introduction. We instructed the participants who received a treatment to read the texts carefully because they would later be asked questions about the information. The two texts were of the same length, and both concerned emissions from private car transport (see the texts in Appendix A). The texts varied in the way the issues were presented. The IR context focused on the individual gain from reducing emissions, and the SR context emphasized the social responsibility for avoiding climate change. The texts also encouraged which perspective to take, individual or social. The IR treatment asked respondents to reflect on what is best for themselves, and SR treatment asked respondents to reflect on what is a collective good for society, enhancing a “they” logic (SR treatment). The IR treatment contained numbers and facts about the contributions of car transport to local air pollution. In being a local environmental problem, this topic concerns unavoidably other people in the local environment. However, in the IR treatment we emphasized that the effects from emissions hit “you” (the reader), that local pollution reduces the length and quality of life not only for those who are considered vulnerable (such as asthmatics and persons with heart diseases). The SR treatment informed about the contributions of private car emissions to the total national climate-gas emissions, and the respective shares of rich and

poor nations in contributing to global emissions. It also emphasized the benefits from mitigating climate change for future generations and for people in countries more vulnerable to climate change.

3.1.2 Measures

The surveys were identical for all three groups apart from the texts and some control questions testing whether respondents had read the text (see all items and response categories in Appendix B). After the treatments and these control questions, we asked the respondents to answer whether they agreed or disagreed with two statements which measured attitudes toward two policies: 1) “We ought to make petrol and diesel so expensive that we choose to drive less,” and 2) “We ought to develop bicycle lanes and public transport, even if doing so means less space for driving cars.” The response alternatives were “strongly agree,” “partly agree,” “partly disagree,” “strongly disagree,” and “don’t know.” We created dummies of the attitude variables (1 = “strongly agree” and “partly agree,” 0 = “partly disagree” and “strongly disagree,” and “don’t know” was coded as missing), and ran logistic regressions. We refer to these two dependent variables as “increase in petrol prices,” and “less space for cars.”

We measured political value orientation – the degree of support for state involvement and regulation – using items similar to those used in previous studies of the correlation between such value orientation and climate concern (e.g., Kahan et al., 2012; Aardal, 2011). Respondents indicated their positions concerning statements like “Many tasks would be handled better and less expensively if they were transferred from the public entities to private companies.” We created an additive index from 0 to 24 (the higher the score, the more individualist the value orientation) using six items ($\alpha = .86$). Note the differences between the similar concepts “individualistic value orientation” versus “individual rationality context,” the first referring to low support to state involvement and regulation, the second to situations where enhancing individual benefit is perceived as the correct thing to do. We asked the questions on value orientation after the attitude questions to ensure that making these values salient did not affect the dependent variables (see Unsworth and Fielding (2014) about effects on attitudes toward policies from making political values salient).

We also included two questions asking about their beliefs about effects from car emissions on local air quality and on climate change to reveal any effect of the treatments on these beliefs.

3.1.3 The sample

The survey was operated by the survey company Ipsos MMI. They recruited participants from a group of people who register to express their interest in participating in surveys; they receive points for each survey they participate in (respondents can accumulate points and exchange them for them for various items). From a sample of car owners (using petrol as fuel), the response rate was 40%. The median time taken to complete the survey was 10 minutes. Although we randomly assigned the respondents to one of the three groups (IR context, SR context, and control), we also tested for variation in the groups regarding gender, age, income, education, and political value orientation. We found no significant differences between the groups regarding these characteristics.

Number of respondents (N = 1516) was reduced by 62 respondents who answered “don’t know” to the two questions formulated to test whether they had read the treatments. We coded “Don’t know” answers for the dependent variables (attitudes toward policies) as missing when dichotomizing these (list-wise deletion). “Don’t know” scores for the three: “increase in petrol prices” 1.9% (27), “less space for cars” 0.6% (8). We split the sample in two groups: those who scored above 12 on the political value index (individualists) and those who scored below 12 (non-individualists). In the dichotomization of the value orientation index, N was reduced by an additional 105.

3.2 Results: Study 1

From Table 1 on next pagewe see that the non-individualists indicated a stronger support for both policies than did the individualists.

Table 1: Agreement/disagreement with the policy statements in the two value orientation groups

	“Increase in petrol prices”		“Less space for cars”	
	Non-individualists	Individualists	Non-individualists	Individualists
Partly/strongly agree	43% (313)	15% (96)	90% (649)	68% (430)
Partly/strongly disagree	54% (390)	84% (524)	10% (70)	31% (193)
Don’t know	3% (19)	1% (7)	0% (3)	1% (4)
Total	100% (722)	100% (627)	100% (722)	100% (627)

Note: Absolute numbers in brackets.

Table 2 displays the results from the logistic regressions on the attitudes toward policies, for the non-individualists and the individualists separately. Standard errors are stated in brackets. The reference category for the treatment groups (“C” denotes “control group”) is indicated in brackets.

Table 2: Results of logistic regressions on attitude toward policies in the two value orientation groups, marginal effects

	“Increase in petrol prices”				“Less space for cars”			
	Non-individualists		Individualists		Non-individualists		Individualists	
	Marg. eff.	p-values	Marg. eff.	p-values	Marg. eff.	p-values	Marg. eff.	p-values
SR (C)	0.081*(0.045)	0.071	0.015(0.045)	0.404	0.008(0.026)	0.799	0.054(0.044)	0.214
IR (C)	0.015(0.045)	0.742	0.013(0.036)	0.716	0.047*(0.028)	0.095	0.089**(0.045)	0.049
SR (IR)	0.066(0.047)	0.158	0.016(0.036)	0.716	-0.039(0.030)	0.187	-0.034(0.048)	0.476
N	703		620		719		623	

Note: Estimates are marginal effects in probabilities. Standard errors are in brackets. The coefficients indicate the contribution each variable makes to the likelihood that a subject will select “Strongly agree” or “Partly agree” to the statements as opposed to “Partly disagree” or “Strongly disagree.” * p < 0.1; ** p < 0.05; *** p < 0.01.

Table 2 shows that the SR treatment significantly affected the non-individualists' attitudes toward an increase in petrol prices ($p = .071$). The group receiving the SR treatment reported about an 8 percentage-point higher likelihood of agreeing with the statement than did the control group. The treatments did not affect attitudes toward "increase in petrol prices" among the individualists. The IR treatment affected attitudes toward "less space for cars" in both value orientation groups. The non-individualists who received this text were about 5 percentage points more likely to agree with the statement than the respondents in the control group were ($p = .095$). The group of individualists who received the IR treatment were about 9 percentage points more likely to agree with the statement than the respondents in the control group were ($p = .049$). The effect of the treatments seems thus to have been dependent on the value orientation.

We also tested whether the treatments affected beliefs about car emissions. Both treatments increased individualists' score on the beliefs about effects on local air pollution from car emissions (SR treatment: $M_{\text{belief air, ind}} = 3.12$, $SE = 0.063$, $p = .009$; IR treatment: $M_{\text{belief air, ind}} = 3.11$, $SE = 0.065$, $p = .026$; control: $M_{\text{belief air, ind}} = 2.90$, $SE = 0.65$). We found no effect of either of the treatments on the beliefs of non-individualists. Non-individualists generally reported a higher score on beliefs about the effects of car emissions on climate change ($M_{\text{belief climate, non-ind}} = 3.46$, $SE = 0.034$) and on local air pollution ($M_{\text{belief air, non-ind}} = 3.49$, $SE = 0.031$) than the individualists did ($M_{\text{belief climate, ind}} = 2.76$, $SE = 0.048$; $M_{\text{belief air, ind}} = 3.05$, $SE = 0.041$).

4 The qualitative interviews: Study 2

To gain deeper insight into the above results – regarding which mechanisms may have led to the differences and changes in attitudes – we conducted a set of qualitative interviews. We aimed specifically at understanding respondents' perceptions and evaluations of the treatments and the role of values versus the role of institutional contexts.

4.1 Method

Eight months after the survey was run, we conducted 30 semi-structured in-person interviews with equal representation from each value orientation group.

4.1.1 The sample

Study 1 provided the sample for Study 2; we selected respondents from a group of 309 individuals who had indicated in the survey that they were willing to be contacted for an interview. We sent emails to 47 respondents scoring higher than 12 on the index (most of them above 17) measuring political value orientation, and we sent emails to 47 respondents scoring lower than 12 (most of them below 7) on the same index. As we did not have contact information about the respondents due to confidentiality, the survey company aided us in recruiting respondents from the two groups. We received 19 positive answers in the first group, and 21 in the second, and selected 15 respondents from each group, ensuring a certain spread in both groups regarding gender, age (30–59 years), and geographical distribution (east/west in Oslo). In total, we interviewed 14 women and 16 men: a few more men than women in the individualist group. The interviews took place where the respondents preferred (work place, home, etc.). We compensated the interviewees with a universal gift card worth 400 Norwegian kroner. Each interview lasted about an hour. We took detailed notes during the interviews, and all were recorded. We used the recorded material to control and expand the notes.

4.1.2 The interview guide

The interviews consisted of structured and open-ended questions giving scope for probing. The interview guide consisted of five parts (Appendix C). In an introduction we explained the aim of the study, and asked whether the interviewees remembered Study 1. In the first part of the interview we asked about their background, education, work situation, family, etc. We furthermore asked them about their general engagement with environmental issues and about their car use. We devoted the second part of the interview to their thoughts on emissions from road traffic (Whether it is a problem; How? What to do; Who are responsible to solve it? etc.). Thereafter we asked about their attitudes toward the two statements about policies as formulated in the survey in Study 1: “increase in petrol prices” and “less space for cars.” Here, we asked about their positions concerning these statements, and asked them to elaborate on their answers.

In part three, we introduced one of the two texts used in Study 1 to the respondents. We asked them to read it carefully and give their thoughts on the text (Was the issue well-known to them? Did they agree with the way the topic was presented? Did it make sense? Why/why not?). We also asked whether the text made them think differently about car emissions from what they

answered earlier in the interview; What do they think about solutions and about the responsibility for emission cuts (if they considered these emissions to be a problem) after having read the text? We moreover asked if the text influenced their attitudes toward “increase in petrol prices” and “less space for cars,” and to elaborate on their answers. We then asked them to read the other text, and we repeated the questions we asked to the first text.

We devoted the fourth part of the interview to the respondents’ perceptions of the texts, and their reflections on texts’ contents. We moreover wanted to expand the qualitative investigation of the influence of the treatments beyond their effect on attitudes toward the two specific policies. We therefor asked respondents to elaborate on which of the texts would motivate them the most to reduce their own car use and to accept restrictions on car use in general.

In part five we asked them to indicate their general view on state involvement and regulation. We drew a line and explained that the mid-point indicated a neutral position, that non-individualistic value orientation was placed to the left of the mid-point and individualistic value orientation to the right of the mid-point. We asked them to indicate their position by pointing on this line. We also asked about their view on the state’s role in the area of environmental policies compared with its role in other policy areas.

4.2 Results: Study 2

None of the respondents remembered the answers they gave in the survey experiment (not the treatment they received, nor the questions). When reflecting on emissions from car transport in their city, respondents from both groups – individualists and non-individualists – mentioned local pollution and climate change as problems. One of the non-individualist was concerned about environmental issues, but not about local air pollution. Two of the individualists and one of the non-individualists did not worry about climate change, or about local air pollution. The non-individualists reported in general stronger environmental engagement, and a stronger individual effort to minimize environmental damage, for instance through recycling and taking fewer flights. All respondents, both individualists and non-individualists, that held some concern about environmental issues stressed that politicians (in both local and national governments) have the main responsibility for facilitating low-emitting transportation, but also mentioned each individual’s responsibility to reduce his or her own emissions.

Regarding attitudes before introducing the texts, 5 of the non-individualists stated positive attitudes toward an increase in petrol prices and 10 stated negative attitudes. Among the individualists 3 were positive and 12 were negative toward an increase in petrol prices. Regarding attitudes toward less space for cars, 10 of the 15 non-individualists were positive, as were 11 of the 15 individualists. The changes in attitudes due to the treatments in the two groups are summarized in Table 3. Note that we report whether the treatments influenced attitudes, not how many respondents the treatments affected. For instance, 3 non-individualists reported their changes in attitudes, and one of them reported that both the SR and the IR treatment had an effect. This means that we count 4 changes in attitudes toward “increase in petrol prices” among non-individualists, as the upper-left quadrant in the table shows.

Table 3: Changes in attitudes in the two value orientation groups

	Increase in petrol prices	Less space for cars
Non-individualists	3 changes due to SR 1 change due to IR	2 changes due to SR 3 changes due to IR
Individualists	2 changes due to IR	1 change due to SR 3 changes due to IR

Given the small samples, we cannot draw conclusions regarding general effects of the treatments on attitudes. We note, however, that the results are in line with the results from Study 1. More importantly, the diverse results in the qualitative sample make it possible to probe whether there were differences in how the two groups perceived the texts, and in how the texts affected respondents’ attitudes.

4.2.1. Reasons for changes in attitudes toward an “increase in petrol prices”

Non-individualists

Regarding changes in attitudes toward an increase in petrol prices, one of the three non-individualists that became more positive answered that both treatments affected her attitudes. The other two respondents said that only the SR treatment affected their attitudes. When asked to elaborate on how the texts affected them, and on which element(s) in the treatments influenced their attitudes, all respondents referred to informationally induced institutional contexts as important. One of them referred also to the sentence in the SR treatment that encourage a social perspective. All three respondents said that the texts did not influence their attitudes because of

learning or changes in beliefs, but because the texts reminded them of what was important to them.

For instance, one of the respondents described how she initially was negative to an increase in petrol prices because of distributional concerns: that people who are dependent on car driving will experience increased costs and may become less mobile. The rationale for being negative about an increase in petrol prices was social, she had a local “they” (people more dependent on car use than this respondent was) in mind. Reading the SR treatment reminded her about a “distant they,” and she stated that she became strongly positive about an increase in petrol prices from reading the text. It was a reminder of how climate change may put other people’s livelihoods at risk, she said. “It’s downright unfair. [...] It feels a bit pathetic complaining about high fuel prices when our emissions are affecting people’s basis of existence.” “We can resolve the issue of distribution in Norway.” Nothing in the information provided in the treatment was new to her, she said. The normative sentence in the SR treatment stating that “We cannot expect poorer countries with lower emissions per person to reduce emissions more than we do” influenced her attitude by shifting her focus.

Another respondent expressed similarly that the SR treatment engaged her because of both the sentence emphasizing which perspective to take, and because of the information in the text. She said she was initially skeptical about an increase in petrol prices because it might negatively influence the lives of people with low income and with few alternatives to car transportation. The text made her think about the consumption levels of people outside Norway, and these thoughts made her change her mind about an increase in petrol prices.

The third respondent had a similar change from a “local they” logic to a more “distant they” logic. She was also concerned about distributional effects from an increase in petrol prices in Norway. This argument fell short, she said, when compared with the argument about the consequences to others’ (local and distant) health and wellbeing, and this shortfall became clearer to her from reading both treatments. She interpreted the IR treatment to emphasize individual benefits. However, this interpretation did not influence her initial perspective: “It concerns me; not because of concern for my own health, but for others’ health.” The texts made the social gains from cutting emissions from car use more clear to her, without her being able to pinpoint any new facts or normative sentences as the reasons for change. The IR treatment reminded her of the

effects of emissions on fellow citizens' health. Therefore, it seems that her attitude was influenced by an informationally induced institutional context.

Individualists

The two individualists who became more positive toward an increase in petrol prices said that only the IR treatment affected them. One respondent was initially partly positive toward an increase in petrol prices because of the societal gains from reduced health risk and reduced emissions of greenhouse gases, but hesitated because of the negative effects for car users. The reason he gave for becoming strongly positive was that the IR treatment provided convincing additional arguments. Although he was familiar with them, they did not come to mind when he considered increased petrol prices. He pointed to the benefits for his own health from breathing better air. He said the text reminded him about individual benefits, and that these outweighed the negative effects from an increase in petrol prices. He also said that both the explicit emphasis on which perspective to take and the general focus on individual benefits in the IR treatment influenced his attitude.

The other initially negative respondent mentioned the concreteness of the information in the IR treatment when elaborating on how the text influenced his position on an increase in petrol prices. He did not refer to the sentence emphasizing explicitly which perspective to take. The text reminded him of how he had experienced finding black dust in his eyes and nose some winter days. He was worried about climate change, but said it was easier to accept policies when they were connected to local circumstances, not because he was more concerned about his own health or locals' health more than the health of people outside Norway. This respondent referred to the perceivable descriptions and how they helped him grasp both the problem and the effects of reduced emissions.

4.2.2 Reasons for changes in attitudes toward “less space for cars”

Non-individualists

Regarding attitudes toward “less space for cars,” both the IR and the SR treatment influenced non-individualists' attitudes. The content of the information presented, and the perspective emphasized in the texts, seem to have influenced their attitudes.

One of the non-individualists was initially negative to reducing space for cars, because she believed that society would be dependent on cars in the future, and because she liked the comfort of driving. Both the SR treatment and the IR treatment made her change her mind, but not from learning anything new. Reading the IR treatment made the benefits to others and to herself from reducing emissions more concrete to her, although they were not new to her, she said. She pointed to both the emphasis on which perspective to take and to the information in the IR treatment as having influenced her attitude. However, she stressed that the IR text also reminded her about others' health, which was important to her. The SR treatment made her think that "we need to do something, now." She stated, "I like the comfort of driving, but I realize I shouldn't drive." The texts worked as a reminder of aspects she considered important, she said.

Another respondent was more concerned about climate change than about local air pollution, even after having read the texts. Nonetheless, the IR treatment affected him more regarding attitudes toward policies, since it was "concrete and local," and relevant for his life and his city, he said. Regarding the SR treatment, he said that effects on climate change from this small change in car space in Oslo were difficult to perceive. Both the individual health gains and other people's health gains emphasized in the IR treatment were important for the change in his attitude toward "less space for cars." The answers from this respondent are one more example of activation of both social and individual perspectives from reading the IR treatment. However, he said that the concrete and perceivable effects from a decrease in emissions as described in the IR treatment were also important for the change in his attitude. He could easily imagine the change from polluted to clean, local air, he said, and referred to his windows with and without black dust on them.

A third non-individualist said that both the IR treatment and the SR treatment made her change her mind. Regarding the IR treatment, she referred to both emphasize on what perspective to take and to the information in the texts as having affected her attitude toward "less space for cars." The IR treatment made her think of her own benefits, which made her more positive. She was the only respondent who stated that she learned something about the severity of local air pollution from the text. This respondent was also influenced by the SR treatment. She said it reminded her that she should do more: "The small things that I can do, like using a bike more, are very small contributions compared with what poor people lose because of climate changes." She thus

switched between individual rationality and social rationality depending on which treatment she read.

Individualists

All three individualists who became positive toward “less space for cars” referred to emphasizes on what perspective to take, but also to the information in the texts in their elaboration about what influenced them. One of them was influenced by both the IR treatment and the SR treatment. Two of them reported that only the IR treatment influenced their attitudes.

One of them was initially negative toward “less space for cars” because he thought that the car should be part of the future transport alternatives. The SR treatment made him think of his own car use as unnecessary, when reminded about its effect on the global climate. Furthermore, he mentioned that people in other countries need to increase their consumption and emissions to enhance their standard of living, which is not necessary in Norway; he said, “Quite a lot of Norwegians’ car use is a luxury.” This respondent was also affected by the IR treatment, saying that it made him think differently than if he had not read it. The treatment’s information content was in general well known to him, and he had concrete associations with the text’s content; he pictured the street outside his house with less cars and more bikes, and that the black dust on his windows was gone.

Another respondent was generally against all policies that restricted her individual choices, and initially negative to reducing space for cars. She uses a car four times a week, and was initially negative because this policy would make car driving more difficult for her. Both the explicitly formulated institutional context and informationally induced institutional context in the IR treatment affected her attitude: “This text [IR treatment (author’s note)] makes me think about the consequences this has for me personally.”; “I think it’s embarrassing to say it, but it’s sheer selfishness.” She said the individual benefit to her health from biking more and breathing clean air outweighed the negative effect on her life from having “less space for cars.”

The third individualist who changed his mind was also influenced by the IR treatment. This respondent was more concerned about climate change than local air pollution, he said, and there was nothing new to him in the texts. But he considered private car use to be of little relevance to mitigating climate change, and referred to large structural changes such as international trade

agreements and energy production from coal in other countries as being important to solve the issue of climate change. He pointed to the sentences that encouraged him to think of himself and his own health, both to the explicit institutional context and to the informationally induced institutional context. Being reminded about the positive consequences for himself from reduced air pollution and more biking made him supportive of “less space for cars,” he stated.

4.2.3 Distancing in both value groups

Four respondents, two individualists and two non-individualists, said they were provoked by the content and that they discarded the texts. These respondents did not deny the existence of environmental problems, but they were not so worried about such issues. They expressed distance from and distrust of what they referred to as the political elite, who they associated with the texts. Three of these respondents said that they themselves were doing more for the environment than any politician in having low private consumption levels. Common for three of these respondents were low education and low income, and thus little flexibility in their own lives, and two of them received social benefits because of health problems.

4.2.4 The role of value orientation versus institutional context

The respondents’ positions on general state involvement and regulation as indicated in the qualitative interviews are consistent with their scores as found in Study 1. This value orientation seems thus to be quite stable throughout the data collection period. When we asked respondents – including those who did not change attitude toward the two policies – to compare the treatments, we found no differences between the value groups in how they perceived the texts. When elaborating on how the texts affected them, however, the two groups deviated in their answers.

Equal perceptions of the treatments

Both individualists and non-individualists noted that they perceived the IR treatment to encourage them to think of how policies would benefit them personally, while the SR treatment encouraged them to think of global injustice and the negative effects on others from car driving. They referred to both the emphasis on what perspective to take and the content of the information in this respect. Most respondents found the texts unproblematic, although they did not necessarily agree with the formulations. They were familiar with the content and although none of them knew the exact numbers referred to in the texts, the general messages were not new to them, except in one case.

Different evaluations of the texts' content

In addition to questions about influences from the treatments on respondents' attitudes toward the two policy statements, we asked respondents about which of the texts was most appealing to them. We also asked which of the texts was most motivating for the respondents in accepting other kinds of policies that restrict car use than the two mentioned, and in reducing car use voluntarily. The individualists mentioned the IR treatment as being generally more appealing than the SR treatment was. The non-individualists found both texts appealing, but they said that they were more motivated to act because of climate change than because of local air pollution.

Respondents in both value orientation groups mentioned that they think of climate change as a more complex problem than local air pollution, since effects are global and individuals' efforts to reduce emissions have a smaller effect on climate change than on local air pollution. The respondents had different thoughts about the small effect on the climate of each individuals' behavior. Some individualists thought of their own car driving as being insignificant and thus irrelevant in the global perspective. This lack of perceived relevance of local and individual effort for global climate change mitigation was more apparent among individualists than among non-individualists. Several of the non-individualists, and only one of the individualists, referred to the SR treatment as being a reminder of something they do care about, such as global poverty and inequality, which they wanted to act upon, regardless of the small effect from their individual behavior. For instance, one non-individualist said, "I do whatever I can in my own consumption decisions; compared with other Norwegians I can't do more (...). My consumption versus the consumption of a person in Bangladesh makes a stronger impression. Perhaps those of us who use cars very seldom could drive even less."

Another difference between the groups was the effect on rationalities from the IR treatment. It seems that the treatments reinforced respondents' initial "way of thinking" about the issues presented in the texts. Several non-individualists, but none of the individualists, specified that the IR treatment influenced their attitudes because it reminded them of health effects on other citizens. The IR treatment may thus have evoked both social and individual rationalities.

Last, we asked respondents about their thoughts on the state's role regarding environmental problems. We found no difference between the value orientation groups regarding their position on general governmental restrictions on car use, exemplified by, for instance, road pricing. Most

individualists deviated from their general position on state involvement and regulation regarding environmental issues, in that they would accept some state regulation such as road pricing, they said, for the purpose of decreasing car emissions. When asked if they changed their general political value orientation, these individualists said they would still answer in the same way as before the interview.

5 Discussion and conclusion

In this paper we ask two questions. The first concerns *whether* different institutional contexts, emphasizing an individual rationality (IR) context as opposed to a social rationality (SR) context, affect attitudes toward emission-reducing policies in groups of people with different positions on state involvement and regulation. Our second question concerns *how* the institutional contexts influence these attitudes. We conducted a quantitative survey experiment and qualitative interviews.

Regarding the first research question, our quantitative study revealed effects from the institutional contexts on attitudes, but different results in the two value orientation groups. There was an effect of the SR treatment on attitudes toward an “increase in petrol prices” among the non-individualists, and an effect of the IR treatment on attitudes toward “less space for cars” among both non-individualists and individualists. These results are supported by the results from the qualitative study. The qualitative study revealed that both emphasis on what perspective to take, but also the informationally induced institutional contexts influenced attitudes, the latter having more profound influence. Some respondents pointed to the sentences that emphasized which perspectives the respondents should take. However, the information content caused respondents to focus on certain characterizations of car emissions, such as for instance health effects, as opposed to other effects. The information in the texts seems to play an important role regarding the perspectives the respondents grounded their attitudes on, whether individual or social.

The qualitative data gave additional insight into how the differences in effect from the treatments on attitudes in the two value orientation groups may have come about. The differences between the two groups did not come from different interpretations of the texts, but from different evaluations of them. The results indicate that the non-individualists were more engaged in the effect from local air pollution on others’ health than the individualists were. The non-

individualists stressed how the IR text reminded them of this perspective. Respondents in the two value groups deviated in their views on the two coordination problems, that of climate change and that of local air pollution. The relatively small size of each individual's contribution to the problem of climate change made individualists demotivated to act and accept the policies, whereas non-individualists did not question the relevance of their own behavior and local policies for the global problem of climate change.

The qualitative study also revealed an additional effect on attitudes from the IR treatment, an effect that was not due to the institutional context emphasized in the text. It seems that the IR treatment also influenced respondents' views on policies because they had concrete experience with local air pollution (see also Scannell & Gifford, 2013). Respondents in both value orientation groups referred to local air pollution as easier to relate to and act upon than global climate change, even those who sympathize with the distant "they." This latter finding implies an important message for communicating policies; local and perceivable effects from policies may engage groups with different political values.

Another aspect which is relevant for policy communication is to acknowledge how important it is that the recipient of a message can identify with the messenger. Some respondents in both value orientation groups rejected the texts because of their perceptions that the texts were written by a political elite they felt distant from. Hence, resistance to pro-environmental messages and politics must be understood, at least partly, in the context of social identities (Weber et al, 2004; Cohen, 2003).

The effects on attitudes from the contexts in this current study are modest. However, the expected effects of an experiment like this are small considering all the information individuals are exposed to in their daily lives. Therefore, this study demonstrates some of the potential of creating institutional contexts to enhance contributions to solving social dilemmas. This mixed-methods study supports the observation that individuals may switch between social and individual rationalities depending on the institutional context. It also demonstrates the importance of understanding how institutional contexts are perceived and work. These two findings should be taken further in future studies. In particular, there is a need to undertake field studies that can provide insights into the complex dynamics between situational factors and individual

characteristics in order to understand their influence on attitudes and behavior that is relevant for mitigating climate change.

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References

- Aardal, B. (2011). *Det politiske landskap. En studie av stortingsvalget i 2009* [The political landscape. A study of the Norwegian parliamentary election, 2009]. Oslo: Cappelen Damm Akademisk.
- Biel, A. & Thøgersen, J. (2007). Activation of social norms in social dilemmas: a review of the evidence and reflections on the implications for environmental behavior. *Journal of Economic Psychology* 28(1), 93–112.
- Brannen, J. (2005). Mixing methods: The entry of qualitative and quantitative approaches into the research process. *International Journal of Social Research Methodology*, 8:3, 173–184.
- Bruvoll, A., Dalen, H. M., & Larsen, B.M. (2012). *Political motives in climate and energy policy*. Discussion paper Statistics Norway. No. 721 December 2012, Retrieved January 2016 from <https://www.ssb.no/a/publikasjoner/pdf/DP/dp721.pdf>.
- Cohen, G. L. (2003). Party over policy: The dominating impact of group influence on political beliefs. *Journal of Personality and Social Psychology*, 85, 808–22.
- Devine-Wright, P., Price, J. & Leviston, Z. (2015). My country or my planet? Exploring the influence of multiple place attachments and ideological beliefs upon climate change attitudes and opinions. *GEC* 3, 68–79.
- Dietz, T. & Stern, P.C. (2002). Exploring new tools for environmental protection. In T. Dietz and P.C. Stern (Eds), *New Tools for Environmental Protection. Education, Information and Voluntary Measures* (pp. 3–15). Washington, DC: National Academy Press.
- Drews, S. & van den Bergh, J.C.J.M. (2015). What explains public support for climate policies? A review of empirical and experimental studies. *Climate Policy*, 1469–3062.
- Eagly, A.H., & Chaiken, S. (1998). Attitude, Structure and Function. In Gilbert, D.T., Fisk, S.T. & Lindsey, G. (Eds.), *Handbook of Social Psychology* (pp. 269–322). New York: McGowan-Hill.
- Hart, P. S. & Nisbet, E. C. (2012). Boomerang effects in science communication how motivated reasoning and identity cues amplify opinion polarization about climate mitigation policies. *Communication Research*, 39, 701–723.
- Heath, O. (forthcoming). Policy alienation, Social alienation and working class abstention in Britain, 1964-2010. *British Journal of Political Science*.

- Hodgson, G.M. (1988). *Economics and Institutions: A Manifesto for a Modern Institutional Economics*. Cambridge, UK: Polity Press.
- Hodgson, G.M. (2007). The revival of Veblenian institutional economics. *Journal of Economic Issues*, 2, 325–40.
- Hogg, M.A. & G. M. Vaughan, G. M. (2011). *Social psychology*. Edinburgh, UK: Pearson Education Limited.
- Hulme, M. (2009). *Why We Disagree About Climate Change*. Cambridge, UK: Cambridge University Press.
- Hurlstone, M.J., Lewandowsky, S., Newell, B.R. & Sewell, B. (2014) The effect of framing and normative messages in building support for climate policies. *PLoS ONE* 9(12), e114335. doi:10.1371/journal.pone.0114335
- Kahan, D. M., Peters, E., Wittlin, M., Slovic, P., Larrimore Ouellette, L., Braman, D., & Mandel, G. (2012). The polarizing impact of science literacy and numeracy on perceived climate change risk. *Nature Climate Change*, 2, 732–735.
- Lord, C.G., Ross, L., & Lepper, M.R. (1979). Biased assimilation and attitude polarization: Effects of prior theories on subsequently considered evidence. *Journal of Personality and Social Psychology*, 37, 2098–109.
- March, J.G. & Olsen, J.P. (1989). *Rediscovering Institutions. The Organizational Basis of Politics*. New York: Free Press.
- Nisbet, M.C. (2009). Communicating climate change: Why frames matter for public engagement. *Environment. Science and Policy for Sustainable Development*, 51 (2), 12–23.
- Norwegian Environmental Agency (2015) Local Air pollution, retrieved from 13.08 2015: http://www.miljodirektoratet.no/no/Tema/Luft/Lokal_luftforurensning/
- Ostrom, E. (2000). Collective action and the evolution of social norms. *Journal of Economic Perspectives*, 14(3), 137–58.
- Petrovic, N., Madrigano, J., & Zaval, L. (2014). Motivating mitigation: When health matters more than climate change. *Climatic Change*, 126, 245–254.
- Pidgeon, N. (2012). Public understanding of, and attitudes to, climate change: UK and international perspectives and policy. *Climate Policy* 12, 85–106.

- Scannell, L. & R. Gifford (2013). Personally Relevant Climate Change. The Role of Place Attachment and Local Versus Global Message Framing in Engagement. *Environment and Behavior*, 45, 60–85.
- Schwartz, Shalom H. (1994), “Are there Universal Aspects in the Structure and Content of Human Values?” *Journal of Social Issues*, 50, 19–45.
- Sjöstrand, S-E. (1995). Towards a Theory of Institutional Change. In Groenewegen, J., C. Pitelis & S-E. Sjöstrand (Eds.), *On Economic Institutions. Theory and Application* (pp. 19–44). Cheltenham: Edward Elgar.
- Soma, K. & Vatn, A. (2010). Is there anything like a citizen? A descriptive analysis of instituting a citizen’s role to represent social values at the municipal level. *Environmental Policy and Governance*, 20, 30–43.
- Soma, K. & Vatn, A. (2014). Representing the common goods – stakeholders vs. citizens. *Land Use Policy*, 41, 325–333.
- Spence, A. & Pidgeon, N. (2010). Framing and communicating climate change: the effects of distance and outcome manipulations. *GEC* 20, 656–667.
- Stern, P. C., Dietz, T., & Kalof, L. (1993). Value orientations, gender, and environmental concern. *Environment and Behavior*, 25, 322–348.
- Unsworth, K.L. & Fielding, K.S. (2014). It’s political: How salience of one’s political identity changes climate change beliefs and policy support. *GEC*, 27, 131–137.
- Vatn, A. (2015). *Environmental Governance. Institutions, policies and action*. Cheltenham: Edward Elgar.
- Vatn, A. (2009). Cooperative behavior and institutions. *Journal of Socio-Economics*, 38, 188-196.
- Vågane, L. (2013). Transportytelser i Norge 1946–2012 [Transportation in Norway 1946-2012] TØI rapport 1277/2013 (retrieved from <https://www.toi.no/getfile.php?mmfileid=33392>, 23.09.2015)
- Weber, J.M., Kopelman, S., & Messick, D.M. (2004). A Conceptual Reveiw of Decision Making in Social Dilemmas: Applying a Logic of Appropriateness. *Personality and Social Psychology Review*, 8, 281–307.
- Wiest S., Raymond, L. & Clawson R.A. (2015). Framing, partisan predispositions, and public opinion on climate change. *GEC*, 31, 187–198

Appendix A: The treatments

IR treatment:

In this survey we are interested in hearing your views on different ways of reducing emissions caused by road transport. What is best for you? Some information is provided below. Later you will be asked some questions related to this information. Read it carefully, but do not spend more than around 2 minutes.

- Emissions from road traffic in Norway increased by 30 percent between 1990 and 2013. These emissions cause harmful air pollution in towns and cities.
- Norway has set national limits for local air pollution, but these are exceeded in most towns and cities. Oslo has exceeded these limits significantly for the past 10 years. This is particularly a problem during winter time.
- Pollution from road traffic is the dominant source of local air pollution. By reducing emissions from road transport in the cities, few people will develop diseases caused by local air pollution.
- Exposure to air pollution from road traffic increases the risk of various respiratory conditions, cardiovascular diseases, and leukemia.
- Air pollution from road traffic affects not only people with lung diseases, cardiovascular diseases and asthma; healthy people may also be affected by poor air quality.

You breathe in around 10,000 liters of air every day, so the quality of that air is therefore vital to your health. People living in Oslo may derive significant health benefits from reducing emissions from road transport.

If we reduce emissions locally, the risk of health problems will decrease and you will be able to breathe in the air where you live without having to worry about whether it may be harmful. If you switch to using a bicycle, both you and your heart will be healthier. There will be fewer cars on the road, fewer traffic jams, and less noise pollution.

SR treatment:

In this survey we are interested in hearing your views about different ways of reducing emissions caused by road transport. What do you think would be best for society as a whole? Some information is provided below. Later you will be asked some questions related to this information. Read it carefully, but do not spend more than around 2 minutes.

- The level of emissions of greenhouse gases in Norway and worldwide is increasing. It will continue to rise unless new measures are implemented.
- In Norway, the level of Norwegian greenhouse gas emissions is around 53 million tons annually. Emissions from transport account for 13.8 million tons, and emissions from passenger cars is the primary source. Since 1960, the level of car use has increased more than twelve fold.

- If we reduce emissions now, we could avoid several challenges in the future. such as lower food production levels, poorer water supplies, more frequent extreme weather events, and changes in ecosystems.
- Emission levels in Norway and other developed countries are far higher per person than in poor countries. In Norway, each person accounts for 10 tons of greenhouse gas emissions per inhabitant. In Bangladesh, each person accounts for 0.4 tons.
- Both the World Bank and the UN stress that developing countries are more vulnerable to climate change than developed countries. These countries are located in regions that are most vulnerable to negative impacts of climate change. They also have fewer resources to deal with the impacts of climate change.

A key point made in the report prepared by the UN's Intergovernmental Panel on Climate Change is that those of us living today will determine how severe the climate changes will be for future generations and other regions of the world, and that there are close links between economic development, energy consumption, lifestyle, and greenhouse gas emissions. We cannot expect poorer countries with lower emissions per person to reduce emissions more than us.

Appendix B: Measures in the quantitative analysis

Control for having read the text treatment

How strongly do you agree or disagree with each of these statements? [Strongly agree, partly agree, neither agree nor disagree, partly disagree, strongly disagree, don't know].

The information on the preceding page dealt with local air pollution in Oslo.

The information on the preceding page dealt with climate change.

Individual value orientation index

How strongly do you agree or disagree with each of these statements? [Strongly agree, partly agree, neither agree nor disagree, partly disagree, strongly disagree, don't know].

Many tasks would be handled better and less expensively if they were transferred from the public entities to private companies.

A high tax level is necessary for maintaining key public-sector services.

We ought to allow commercially run private schools.

If society is unable to control private business and industry, the leading banks and industrial actors will gain too much influence.

There is too much state intervention and regulation in today's society.

Full employment could be achieved more easily if the state had more influence over banks and businesses.

Beliefs emissions from cars

How strongly do you agree or disagree with each of these statements? [Strongly agree, partly agree, neither agree nor disagree, partly disagree, strongly disagree, don't know].

Car transport leads to local air pollution.

Emissions from car transport do not contribute to man-made climate changes.

Appendix C: The interview guide

Introduction

- Present the project
- In this interview, ask if they remember anything from the quantitative study.
- Underline that no all answers are correct answers, we are interested in the variety of opinions

Part 1) Background of respondent

- 1) Job/background/status/family
- 2) How concerned are you about environmental problems generally? (types of environmental problems, what is being done, thought, etc.)
- 3) How often do you/your household use a car? (How many cars in the household, how much they are used and for what)

Part 2) Emissions from car transport

(Begin openly. What types of problem do they think this is? Keep in mind social/individual problem, for people with poor health, does it have anything to do with the climate or local particulate pollution?)

- 1) What is your view on emissions from road traffic?
 - Is this a problem? What type?
 - How? Or why not?
- 2) If a problem, what can be done? What ought to be done?
- 3) Who is responsible for reducing emissions? (Keep in mind state, municipality, business and industry, private individuals)
- 4) What do you think about making fuel more expensive in order to get people to drive less?
(Positive, partly positive, negative or partly negative? No opinion?)
 - Follow-up questions here, about other policy instruments that entail individual loss, such as road pricing, congestion charge
- 5) What do you think about building more bicycle paths and public transport even if it leaves less space for cars (driving and parking) in order to get people to drive less?

(Positive, partly positive, negative or partly negative? No opinion?)

Part 3) Responses to treatments

(Show one of the texts. Begin openly, keep in mind social/individual rationales)

- 1) What do you think about this text?
 - Is it interesting? Does it contain something new?
 - Does it make sense? How/how not? Are there sentences/aspects you would highlight?
- 2) Does the text make you think anything specific/different about emissions from transport?
(Something that is now more or less important?)
- 3) Does it make you think anything specific/different about solutions?
- 4) Does it make you think anything specific/different about who is responsible for reducing emissions? (Keep in mind state, municipality, business and industry, private individuals)
- 5) What do you think now about making fuel more expensive in order to get people to drive less?
(Positive, partly positive, negative or partly negative? No opinion?)
(Follow-up questions here too, about other policy instruments that entail individual loss, such as road pricing, congestion charge)
 - If a change, can you point at what it was in the text that influenced you?
 - If no change, what would have to be included in the text to make you change your mind?
- 6) What do you think now about building more bicycle paths and public transport even if it leave less space for cars (driving and parking) in order to get people to drive less?
(Positive, partly positive, negative or partly negative? No opinion?)
 - If a change, can you point at what it was in the text that influenced you?
 - If no change, what would have to be included in the text to make you change your mind?

(Show the second text. Begin openly, keep in mind social/individual rationales)

- 1) What do you think about this text?
 - Is it interesting? Does it contain something new?
 - Does it make sense? How/how not? Are there sentences/aspects you would highlight?
- 2) Does the text make you think anything specific/different about emissions from transport?
(Something that is now more or less important?)
- 3) Does it make you think anything specific/different about solutions?
- 4) Does it make you think anything specific/different about who is responsible for reducing emissions? (Keep in mind state, municipality, business and industry, private individuals)

- 5) What do you think now about making fuel more expensive in order to get people to drive less?
(Positive, partly positive, negative or partly negative? No opinion?)
(Follow-up questions here too, about other policy instruments that entail individual loss, such as road pricing, congestion charge)
 - If a change, can you point at what it was in the text that influenced you?
 - If no change, what would have to be included in the text to make you change your mind?
- 6) What do you think now about building more bicycle paths and public transport even if it leave less space for cars (driving and parking) in order to get people to drive less?
 - If a change, can you point at what it was in the text that influenced you?
 - If no change, what would have to be included in the text to make you change your mind?

Part 4) Comparison treatments

- 1) What differences would you highlight if you compared the two texts?
- 2) What affect do they have on you: What motivates most towards accepting policies for reducing emissions from transport? What in the text is most significant, and why?
- 3) What would it take to make you willing to accept policies that would lead to your reducing consumption in general? Do the two texts differ in this respect?

Part 5) State involvement

- 1) Where would you place yourself in terms of your views on state involvement in general? (Draw a line with neutral mid-point)
- 2) Do we have your consent to access and compare the response you gave on your position on state involvement in the survey conducted last autumn?
- 3) What is your view on state involvement in different policy areas? For example, health, education, environment, etc.

Finalizing:

- Do you have any comments or questions the study or the interview?