Climate change attitudes within the field of power in Norway: a Bourdieusian perspective

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Abstract

This thesis draws mainly on the theoretical constructs of *capital* and *field of power*, developed by Bourdieu, to explore climate change attitudes of holders of different types of capital who are considered positioned within the field of power in Norway. Two hypotheses are formulated and tested: (i) there is an association between the type of capital (economic or cultural) possessed within the field of power and climate change attitudes (acceptance or denial) and (ii) the association between the type of capital (economic or cultural) possessed within the field of power in Norway and climate change attitudes (acceptance or denial) is mediated by environmental values.

The methodology employed is a secondary analysis of existing data. An analysis of an existing national survey dataset, provided by a collaborative research team from the Norwegian Institute for Nature Research (NINA) and the Centre for Development and the Environment (SUM-UiO) (Kaltenborn, B.P.; Krange, O.; Skogen, K.; Syse, K.L.), was conducted for the purposes of this master thesis.

The statistical analysis in the thesis involves data cleaning, missing value analysis, imputation of the missing data with the use of the R-package missForest, descriptive statistics, (nonlinear) categorical principal component analyses (CATPCA), chi-square tests of independence, linear and logistic regression, and logistic-regression based mediation analyses through the SPSS PROCESS tool.

This study aimed at contributing to the body of social research on climate change denial in Norway. Bourdieu's sociology provides valuable insights and understanding into the matter: through its *relational* philosophy, Bourdieu's sociology shifts one's vision of the social world towards structures of *relations*, and through the concept of the *field of power*, it offers a valuable interpretation of the reality of power relations, while mechanisms, through which our efforts for addressing climate change evolve, are revealed.

Acknowledgements

When I decided to work on this project, I did not know what a “variable” meant, neither knew I how and when this *journey* would end. I had never been taught statistics before. Motivated by the perspective of dwelling on the issue of climate change denial, I defied the difficulties and dived into an *ocean* of weird statistical terms and techniques, having a confidence that hard, persistent work would lead me to a meaningful outcome.

This journey would had never commenced if my supervisor, Karen, had not trusted, from the very beginning, me with fulfilling this project. I am very grateful to you, Karen, for the trust, support, and understanding, all this time. Thank you, moreover, for the insightful lectures at SUM, and the guidance through the *Ways of knowing*.

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1 Introduction

1.1 Climate change and its denial

In the era of Anthropocene nature and humans face an environmental crisis, with climate change being probably the major expression of this crisis since it raises challenges with regard to the survival of all forms of life on Earth. Climate change (global warming[1]) disrupts the biophysical conditions for life-systems on which humans depend and poses inevitable threats to our survival and our societies. Temperature rise, loss of sea ice, sharply changing weather conditions, droughts and heat waves, extinction of species, threats to the availability of potable water, food insecurity, and an unbalanced distribution of these effects in more vulnerable countries of the developing world, are only a few of the effects of climate change that one could, simply, mention and refer to.

The natural sciences community, since the formulation of the Intergovernmental Panel on Climate Change (IPCC) in 1988, has advanced the knowledge about the sources and impacts of climate change. Research has shown that the major factors affecting the global climate dynamics are the increases in the concentrations of greenhouse gas emissions in the atmosphere and the changes in the process of sunlight reflection back into space. It has also become well-established that human activities are the primary drivers of these factors of climate change (IPCC, 2014). The energy production from fossil fuels is considered the main driving force for the climate change, due to the accumulation of anthropogenic CO_2 in the atmosphere. Both past and future emissions will continue to contribute to global warming for more than a millennium (IPCC, 2007, pp. 17, 514; 2014, p. 4; WBGU, 2011, p. 3) (see also Brulle & Dunlap, 2015, p. 1; Rosa, Rudel, York, Jorgenson, & Dietz, 2015, p. 32).

However, the scientific community has not entirely succeeded in communicating the anthropogenic character of climate change to the public sphere. Despite the scientific consensus on the reality of the anthropogenic climate change, in the sphere of the social reality, the phenomenon of *climate change denial* persists and hinders the

[1] The terms *climate change* and *global warming* are used interchangeably in policy and public debates nowadays (see Dunlap & McCright, 2015, p. 322).

efforts of ameliorating climate change in our era (see e.g. Capstick, Whitmarsh, Poortinga, Pidgeon, & Upham, 2015; McCright, Dunlap, & Marquart-Pyatt, 2016; Scruggs & Benegal, 2012; Whitmarsh, 2011).

The term *climate change denial* is used to denote the phenomenon of denying the reality of the anthropogenic climate change. According to Dunlap & McCright (2015, p. 322) *climate change denial* and *climate change skepticism* are two phrases which are often used to reflect two endpoints of one continuum: at one edge of it lies an outright climate change *denial* of the reality of climate change and its anthropogenic character, along with refusal of any scientific evidence, whereas at the other edge lies climate change *skepticism* regarding different aspects: the importance and severity of climate change, the degree of its anthropogenic character, its negative impacts, and the necessity of, or the possibility of, ameliorating climate change. Climate change *denial* is prevalent on actors of the denial countermovement (see Dunlap & McCright, 2015, pp. 300-332), whereas climate change *skepticism* is mostly seen among the general public. In this thesis, I use *climate change denial* as a hypernym for both cases, since I consider any skepticism not consistent with the scientific consensus on all the aforementioned aspects of climate change.

1.2 On the role of social sciences in climate change research

It is acknowledged that the role of social sciences in global climate change research had been for long marginal, creating a gap in our understanding of the social factors that contribute to climate change, and only during the past decade studies of the social sciences field on climate change factors and on the human dimensions of it showed an important increase and spread across the literature. A natural sciences-based approach to climate change, developed historically since the establishment in 1983 of the Earth System Sciences Committee, has been the main reason for this. However, there is now a growing comprehension of the connectedness of climate change to social structures and processes, and of the need to integrate studies of environmental sociology to this body of climate change literature (see Brulle & Dunlap, 2015).

As it is noticed, the dominant international discourse in the field of social sciences (based, e.g., on the IPCC documents) appears climate change as being *manageable* within the current economic growth and advocates a *reformist* and *gradualist*

approach, i.e., a *change* within the current economic and institutional system (decarbonization as a top-down, technocratic process, agreements on lower emissions, etc.) (see e.g. Genovese & Tvinnereim, 2018). Another discourse, the *business-as-usual* approach, is against decarbonization and any mitigation regulations, whereas a third *radical transformative* approach calls for drastic, radical transformation of the economy, societal structures and institutions (Fox, 2014, pp. 107, 114, 120-121) (see Figure 1.1). For a thorough description of the different discourses and interpretations of climate change I refer the reader to Fox (2014, pp. 103-124).

Figure 1.1: Threefold typology of climate change construction in the field of social sciences
Note: left column: *Business-as-usual*; middle column: *Reformism*; right column: *Radical transformative*. Reproduced from Fox (2014, p. 115).

Field of Social Science			
	Mitigation is incompatible with growth	Mitigation is compatible with growth	Mitigation is incompatible with growth
	Requires limited/no state response – free market will resolve problem	Manageable within current system	Requiring radical structural transformation
	Discounts future	Optimal discount rate *excludes cumulative emissions*	Low discount rate *includes cumulative emissions*
	Individualises behaviour	Individualises behaviour	Social behaviour
	Fixed human nature	Fixed human nature	Co-evolving humans
	No decarbonisation needed – free market and self-interest will solve crises	Change requires appeals to values, perceptions and human nature through persuasion and incentives	Change is aided by structural change, collective empowerment and moral engagement
	Change is sacrifice and an attack on personal rights	Change is sacrifice	Change is for the 'common good' and 'human flourishing'
	Class structure is earned and justified	Class invisibility	Class is a social justice issue and linked to carbon emissions

A reference point to climate change research from the field of social studies is a collection of essays titled "*Climate Change and Society. Sociological Perspectives*" (2015), produced by the American Sociological Association's Task Force on Sociology and Global Climate Change. This work provides an overview of the political, economic, social and cultural aspects of climate change, attempting a shift from the dominant, natural sciences-based, discourse on climate change to the aforementioned dimensions. One of its recommendations for future research

directions and agendas refers to climate change denial and skepticism, and, in particular, to the *ideological* and *socio-economic* context in which denial and skepticism are most likely to flourish (see Dunlap & Brulle, 2015, p. 424).

Kaltenborn, Krange, and Tangeland (2017, p. 2) mention, also, that the need for improved knowledge about the social dimensions of climate change constitutes "an imperative part of futures-oriented expertise" (p. 1) and infer from previous studies that "a focus on social and cultural processes, which influence preferred futures, is an area that deserves greater prominence in climate change response research".

The work of Wilhite (2016), by explaining the relationship between the politics of economic expansion and the formation of high-energy habits at the level of family and household, exemplifies how sociological studies can respond to the aforementioned needed research.

1.3 Aim, methodology and structure of the thesis

There is, indeed, a body of social research concerned with factors related to climate change denial. Studies have shown that such factors are, for instance, education (Austgulen & Stø, 2013; Olofsson & Öhman, 2006), worldviews (Gifford, 2011; Kahan, Jenkins-Smith, & Braman, 2011), environmental values (Corbett & Durfee, 2004; Whitmarsh, 2011), a conservative political ideology and party affiliation (McCright et al., 2016; Olofsson & Öhman, 2006; Zia & Todd, 2010), lack of trust and confidence in scientists, environmental actors and institutions (Buys, Aird, van Megen, Miller, & Sommerfeld, 2014; Dunlap & McCright, 2015, p. 313; Kaltenborn et al., 2017; Krosnick & MacInnis, 2012), political alienation (i.e. estrangement from the political system) (see Ehrhardt-Martinez, Rudel, Norgaard, & Broadbent, 2015, p. 224), gender (Davidson & Haan, 2012), age (see e.g. Whitmarsh, 2011), etc. To my knowledge, there are no studies employing specifically a Bourdieusian approach, based on the theoretical concepts of *capital* and *field of power*, for exploring social dimensions of climate change denial at a national scale. Fox' s study (2014) happened to be the only such exception I found during the literature review for my thesis.

Regarding more general Bourdieusian approaches, Wilhite (2016), for instance, inspired by Bourdieu, has bridged political economy to high-energy *habits* at the level of family and household, providing this way ground for further research on

climate change attitudes. The study of Kaltenborn et al. (2017), inspired by Bourdieu's concepts of *cultural capital* and *habitus*, has examined whether a person's cultural resources available during childhood influence adult views of climate change attribution.

Regarding, in particular, Norway, there is not much research on the issue of climate change denial, let alone studies employing a Bourdieusian theoretical framework. This can be to an extent explained by a general criticism that Bourdieu's sociology may not fit well outside the French society (see e.g. Blekesaune & Rønningen, 2010, p. 186). On the other hand, the analysis of the Norwegian *field of power* by Hjellbrekke & Korsnes (2009) showed that Bourdieu's work not only can be valid outside the French society, but can further provide valuable insights into other societies than the French one (see Hjellbrekke & Korsnes, 2009, p. 45).

This thesis aims to contribute to the body of social research on climate change denial in Norway by drawing on the theoretical constructs of *capital* and *field of power* developed by Bourdieu. My objective is to explore climate change denial with reference to the *environmental values* of holders of different forms of *capital* positioned within the *field of power* in Norway. This is an unexplored area of research. Hopefully, this thesis will draw some links joining climate change denial to this area of research with the aim of shedding light to under-explored factors of climate change denial which can be of major importance for further research in the future.

The methodology employed for this purpose is a secondary analysis of existing national survey data which were collected in Norway between 11th November 2016 and 20th January 2017. The national survey data were made available to me by The Norwegian Institute for Nature Research (NINA) for the purposes of writing my thesis as part of my master's studies at SUM-UiO. Appropriate statistical techniques were employed to examine the two hypotheses of the thesis.

In what follows, Chapter 2 provides the theoretical framework of this thesis: Bourdieu's theory of *social fields* and the relevant constructs of *capital* and *field of power*. A literature review on climate change follows this, and towards the end of the chapter, the two hypotheses of this thesis are formulated. Chapter 3 details the research method applied for the purposes of this thesis. Chapter 4 is about data cleaning and imputation for handling the missing values in the analysis data. Chapter

5 deals with descriptive statistics to offer insights on characteristics of the sample. Chapter 6 proceeds to the main data analysis by employing statistically nonlinear categorical principal analysis (CATPCA) and testing the first hypothesis of the thesis by means of a chi-square test. Chapter 7 examines the second hypothesis by employing nonlinear categorical principal analysis and logistic-regression based mediation analyses. The results in each phase of the main analysis are presented separately. Finally, in Chapter 8, I provide a summary of the analysis and its main conclusions, discuss the results of the hypotheses testing and the limitations of the study, and provide some suggestions for further, future, research. I close with my overall conclusion from the study.

All the statistical analyses in this thesis were performed on Windows 2010 (64-bit) by using IBM SPSS statistics software (version 25), after adding the Integration Plug-in for R package for using specific R programming features within SPSS and installing the PROCESS tool (Hayes, 2018) in SPSS for conducting the mediation analyses.

2 Theoretical Framework and Literature Review

This chapter provides the theoretical framework of this thesis: Bourdieu's theory of *social fields* and the relevant constructs of *capital* and *field of power*. A literature review on climate change follows it, and towards the end of the chapter the two hypotheses of this study are formulated.

2.1 Some basic Bourdieusian concepts: An outline

2.1.1 Introduction to Bourdieu's theory of fields

One of Bourdieu's efforts was to create a *relational* philosophy of science based on *objective* relations, and a *dispositional* philosophy of action based on relations between agents and structures (see Practical Reason, 1994, cited in Savage & Silva, 2013, pp. 112-113). In sociology he introduced the field theories which were already in use in physics, mathematics and psychology. His theory of social fields shares with the prior field theories a common epistemology, characterized by a shift from *substantialist* to *relational* mode of thought. Bourdieu viewed social reality as fundamentally relational: it is the relationships among its subjects, and not the subjects themselves, that truly give access to the analysis of social reality. For Bourdieu, society constitutes a social space which, under the process of modernization, acquired "social fields", i.e., distinct and autonomous sub-spaces of specific human activity, with their own structure and internal interests (e.g., politics, academia, law, religion, arts, mass media, etc.) (see Hilgers & Mangez, 2015, pp. 2-5, 12; Schmitz, Witte, & Gengnagel, 2017, p. 51). The concept of social field reflects a system of relations. It is a concept devised to develop a relationally based method of analysis and can reveal the invariants which shape and structure the different fields (Hilgers & Mangez, 2015, p. 5; see also Savage & Silva, 2013, p. 113). I consider the following passage from Bourdieu (Bourdieu, 1982, p. 41; 1990c, p. 192, cited in Hilgers & Mangez, 2015, p. 1) to epitomize the philosophical foundations of his theory of social fields:

> Thinking in terms of fields requires a conversion of one's entire usual vision of the social world, a vision interested only in those things which are visible ... In fact, just as the Newtonian theory of gravitation could be developed only by breaking away from Cartesian realism, which refused to recognize any mode of physical action other than impact, direct contact, in the same way, the notion of the field presupposes that one break away from the realist representation

> which leads one to reduce the effect of the milieu to the effect of the direct action that takes place in any interaction. It is the structure of the relations constitutive of the space of the field which determines the forms that can be assumed by the visible relations of interaction and the very content of the experience that agents may have of them.

2.1.2 The concept of field

Although the *field* concept lies at the center of his sociology, Bourdieu never provided a definition of it. Instead, Bourdieu discussed the concept only in passing or used it interchangeably with similar terms (e.g. structures, mechanisms, system, social space, "game"). However, the concept of field underpinned Bourdieu's overall work (see Savage & Silva, 2013, pp. 115-116). Moreover, the literature has up to date discussed far more other Bourdieusian concepts, like *habitus* or *capital*, than this fundamental concept (see Hilgers & Mangez, 2015, p. 1).

In general, the concept of field is used to reflect an objective structure of interdependent positions, which exists independently of their individual actors and is shaped by the distribution of different resources, i.e., types of *capital*. One of the inherit properties of the field is its internal struggles. Within the field, there is an ongoing struggle "to determine the conditions and criteria of legitimate membership and legitimate hierarchy" (Bourdieu, 1988, p.11, cited in Verweij, 2008, p. 5). The resources structuring a specific field are fought over by its agents (individual and collective actors) to ensure the types of capital of most value within the field, the distribution that will define their relative positions within it, based on the volume and the composition of their capital, and the legitimate type of authority within the field (see Bourdieu & Wacquant, 1992, pp. 104, 105; see also Lave, 2012, p. 5; Schmitz et al., 2017, pp. 51-52). The field competition determines also how the various rewards (e.g. authority, status, income) are distributed among its actors acting in roles within a field (Blunden, 2004 , Field and Habitus section, para. 2).

The positions in a field are organized around two opposing poles of an axis within the field: the *autonomous* pole, which is controlled by the types of capital specific to the field, and the *heteronomous* pole, which is shaped principally by external forces (Lave, 2012, pp. 2, 6; Savage & Silva, 2013, p. 117) (see Figure 2.1). Accordingly, the hierarchization within the field follows two opposing principles: an autonomous (internal) principle, according to which hierarchy is structured by the values specific to the field, and an heteronomous (external) principle of hierarchization, based on

which the hierarchy that prevails witin the field of power (a concept I return to later) structures the hierarchization within the field (Mounier 2001, cited in Hilgers & Mangez, 2015, p. 8). These relationally structured positions shape agents' actions and perceptions in the field. "They thereby tend to perceive the social world according to the same principle of division … . This is another remarkable example of the logic behind the fact that fundamental structures of the social order are converted into mental structures …" (Bourdieu, 1996b, p. 163; see also Savage & Silva, 2013, p. 117).

Thompson (2012, pp. 67-68) points out that what led Bourdieu to the introduction of the *field* concept is the shared *values* which underlie apparently opposed views. For Bourdieu, the actors in a field share common fundamental interests and a common recognition of the value of the "game": a "fight" entails an agreement between the competitors upon what is worthy fighting for, the objects of dispute, and a common belief in the value of it (Bourdieu, 1993, cited in Savage & Silva, 2013, p. 124).

2.1.3 Characteristics of social fields

Social fields have certain characteristics, such as their *illusio, nomos, doxa, habitus* and *capital*, which demarcate the borders of each field in a historical process of differentiation within society. This historical process grants *autonomy* to specific domains of human activity (Schmitz et al., 2017, p. 52).

Within this historical process of genesis, differentiation and *autonomy* of a field, the relationships among the actors are transformed. Holders of specific forms of capital (elites) emerge with the authority to legitimatize practices and production within a field and to rationalize implicit schemes of actions to systems of explicit norms. A field' s autonomy is marked by its ability to refract external influences and to translate them into its inherent logic and shared principles upon which the actors perceive the reality. This is what Bourdieu (1996a, p. 220) called the "translation" or "refraction" effect (see also Hilgers & Mangez, 2015, p. 7).

This means that autonomization is marked by the construction of the field's *illusio*, the common unquestionable beliefs, rules and convictions about the value of the "game" (*nomos*) and the significance of the "stakes" involved in the field. The entirety of pre-reflexive beliefs and presuppositions constitute the *doxa* of the field, the mechanism through which the established order and logic in a field generates a "sense of reality" to its agents' perception, a correspondence between the field

structure and the agents' mental structures (see Hilgers & Mangez, 2015, p. 7; Schmitz et al., 2017, p. 52).

The concept of *habitus* denotes the individual's incorporated and internalized schemes of perception and action, which are acquired in the process of socialization and education via social experiences. These dispositions, which the actors bring to a field, guide them to positions that suit them within the field. However, the logic of the field shapes, subsequently, in specific ways, the conscious and subconscious practices of the actors, and becomes embedded in their dispositions. Thus, within the field the habitus acquired in former stages is restructured (Bourdieu, 1977, cited in Hanna, 2016, p. 45). Bourdieu's point was that a field's structure is more determining for the positions and the structure of the field than individual agency (except for extraordinary circumstances) (see Lave, 2012, pp. 2, 3). Habitus is embodied and durable, based on the doxic beliefs of a field, and, thus, has an inherent, spontaneous tendency to reproduce itself, that is, a certain degree of inertia. However, this does not mean that habitus is inflexible. On the contrary, it is subject to change and modification through personal experiences. It constitutes an "open system of dispositions" (Bourdieu & Wacquant, 1992, p. 133).

The relative positions occupied by the participants in a field are determined by the volume and structure of their *capital* (see Hilgers & Mangez, 2015, p. 10). There are three categories of capital according to Bourdieu (1986):

i. *Economic* capital, that is, financial capital and economic resources, such as money, property, intellectual property, shares and assets. Economic capital "is immediately and directly convertible into money and may be institutionalized in the form of property rights" (p. 243).

ii. *Cultural* capital, that is, a person's education, knowledge and intellectual skills, which provide advantage in achieving a higher social-status in society. Cultural capital "is convertible, in certain conditions, into economic capital and may be institutionalized in the form of educational qualifications" (p. 243). Cultural capital can be: (i) embodied, i.e., "in the form of long-lasting dispositions of the mind and body" (ii) objectified, i.e., "in the form of cultural goods (pictures, books, dictionaries, instruments, machines, etc.), which are the trace or realization of theories or critiques of these theories, problematics, etc." and (iii) institutionalized, i.e., "the objectification of cultural capital in the form of academic qualifications" which confers "institutional recognition on the cultural capital" (pp. 243, 247-248).

iii. *Social* capital, that reflects the aggregate of actual and potential resources linked to the possession of a durable network of institutionalized relationships of mutual acquaintance and recognition (membership in a group). Social capital "is convertible, in certain conditions, into economic capital and may be institutionalized in the form of a title of nobility" (p. 16; see also Denord, Hjellbrekke, Korsnes, Lebaron, & Le Roux, 2011, p. 90).

2.1.4 The field of power

Having described specific characteristics of a social field and its autonomy, a question rises naturally: "from what may a field be autonomous?" (Schmitz et al., 2017, p. 54). This question brings us to Bourdieu's concept of the *field of power* (see Bourdieu, 1996b). For Bourdieu, the autonomy of a field is accessed by objectively relating it to the field of power (Schmitz et al., 2017, p. 54). Bourdieu (1996a, p. 215; see also Bourdieu, 2014, p. 311; Bourdieu & Wacquant, 1992, pp. 229-230) refers to the field of power as "the space of relations of force between agents or between institutions having in common the possession of the capital necessary to occupy the dominant positions in different fields (notably economic or cultural)". This key concept is not meant to express a specific domain of human activity, a field whose content can, in a sense, be grasped intuitively, as in other fields (Hilgers & Mangez, 2015, p. 8). In his book *The state nobility: elite schools in the field of power* (1996b), Bourdieu explains:

> The field of power is a field of forces structurally determined by the state of the relations of power among forms of power, or different forms of capital. It is also, and inseparably, a field of power struggles among the holders of different forms of power, a gaming space in which those agents and institutions possessing enough specific capital (economic or cultural capital in particular) to be able to occupy the dominant positions within their respective fields confront each other using strategies aimed at preserving or transforming these relations of power. …
>
> … These different forms of capital are themselves stakes in the struggles whose objective is no longer the accumulation of or even the monopoly on a particular form of capital (or power), economic, religious, artistic, etc., as it is in the struggles that play out within each field, but rather the determination of the relative value and magnitude of the different forms of power that can be wielded in the different fields or, if you will, power over the different forms of power or the capital granting power over capital. (pp. 264-265)

Bourdieu's concept aimed to explain effects within a field that cannot be attributed barely to mechanisms internal to the field, but can be rather understood by taking into account a field's societal embeddedness (Schmitz et al., 2017, p. 54). For Bourdieu, forms of capital are convertible to other forms according to their relative strength and "exchange rate" within the field of power (Bourdieu, 1996b, p. 265). The field of power is the overarching space with struggles over which resources will be recognized as legitimate and where the exchanges values of different field-specific capitals are fought over (Schmitz et al., 2017, p. 54).

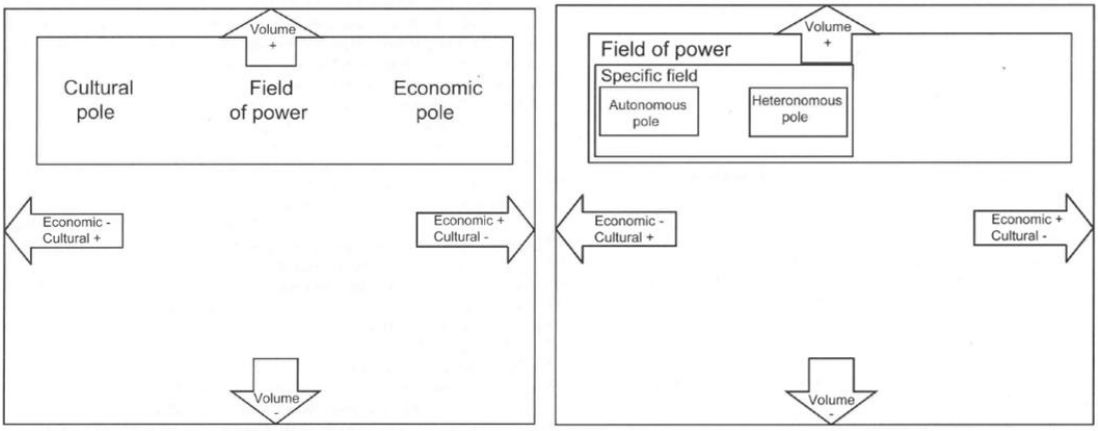
Schmitz et al. (2017, p. 55) interprets the field of power as non-identical to the concept of a "ruling class". The field of power does not constitute a superordinate space of conflicts between field elites in which agents without access to elite positions are excluded. For Bourdieu, power is a reciprocal relation of force, for which the relation between the "powerful" and the "dominated" must be considered. A consistent Bourdieusian approach for the reproduction of the balance of capital should apply a relational approach by encompassing the entirety of the power relations involved, including the social activity of those of the dominated classes (see pp. 56, 63-64). Denord et al. (2011, p. 87), in a somehow similar manner, observe that an analysis of the field of power deviates from analyses on whether "a unified ruling class exists"; it rather allows an analysis of the powerful agents as "hierarchised and competing within a structured space".

According to Bourdieu, the field of power contains two competing poles: (i) the *dominant economic pole*, i.e., the dominant class with economic capital (situated at the top right-hand side of Bourdieu's schematization - see Figure 2.1), and (ii) the *dominated cultural pole*, i.e., the dominated fraction of the dominant class which possesses cultural capital (situated at the top left-hand side of Bourdieu's schematization - see Figure 2.1).

The autonomy of each field is seen in relevance to the field of power. According to the internal hierarchization of each field, its heteronomous principle of hierarchization corresponds to the hierarchy prevailing in the field of power, while its autonomous principle of hierarchization corresponds to the hierarchy in accordance with values specific to the field (Mounier, 2001, cited in Hilgers & Mangez, 2015, p. 8). Every field, thus, is affected by the field of power by having in its own structure two opposing poles. The degree of a field' autonomy will determine the degree of its sensitivity to the external principle of hierarchization stemming from the field of

power. The less autonomous a field, the more sensitive it is to the external principle of hierarchy, and vice versa (Hilgers & Mangez, 2015, p. 10). Changes within the field of power have direct and indirect effects on the internal dynamics of a field and can transform its role and the power of the actors in a field. However, the field of power exerts its influence not only within a field, but also at the level of the interrelations between fields (Bourdieu and de Saint-Martin, 1978; Bourdieu, 1989, cited in Denord et al., 2011, p. 87). For instance, in the neoliberal societies, the growing relative value of the economic capital prevailing in the field of power strengthens the relative power of the economic field over other fields, e.g., over the educational or the literary field. The autonomy of each of the other fields is shaped by the strengthened relative value of economic capital (see e.g. 'bestsellers') and the weakened value of cultural capital (see Hilgers & Mangez, 2015, p. 10).

Figure 2.1: The field of power (left side), and the field of power in relation to other fields (right side)
Adapted from Bourdieu (1983, 1992 cited in Hilgers & Mangez, 2015, pp. 8, 9). Reproduced from Hilgers & Mangez (2015, pp. 8, 9).



2.1.5 The state as part of the field of power

While in the field of power different forms of capital, mainly economic, cultural and political capital, compete each other over legitimate capital, according to Bourdieu, this competition is regulated in the field of power by the state: a set of agencies and organizations, a sum of bureaucratic fields, which constitutes part of the field of power, and is defined by the "possession of the monopoly of legitimate physical and symbolic violence" (Bourdieu, 2014, pp. 3-4). The state, according to Bourdieu, holds a kind of "meta-field" power. "One of the issues at stake in struggles within the field of power is power over the state as meta-power able to act on the different

fields" (Bourdieu, 2014, p. 311; see also Bourdieu & Wacquant, 1992, p. 114). The state, holding the monopoly of legitimate physical and symbolic violence, ensures the mutual recognition of the types of capital as legitimate, by regulating the relative value of each of them, their "exchange rate", which is a stake in the struggle within the field of power (see Riley, 2015, p. 263).

As Riley (2015) explains, the state constitutes a "functional requirement" of the field of power for regulating the relations among these types of capital through a process by which holders of different forms of capitals come to recognize other forms of capital as legitimate. The state "secures this mutual recognition of the forms of capital by establishing the relative value that each form has" (p. 263).

This "meta-field" power of the state is defined by its *statist* capital which "allows the state to wield a power over the different fields and over the various forms of capital" (Bourdieu & Wacquant, 1992, p. 114). In the field of power, holders of capital struggle for power over the statist capital, for the latter legitimizes the different forms of capital and their reproduction (see also Albright & Hartman, 2018b, pp. 9-10).

Swartz (2013, pp. 135-136) mentions that the state and the field of power overlap conceptually. The state has developed and emerged in parallel with the field of power, within which there is a struggle over statist capital, actually a struggle for control of the state. For Bourdieu (Bourdieu & Wacquant, 1992, pp. 99-100), the struggles within the field of power aim to seize power over the state. The state is seen as an arena of struggle for control over the field of power by gaining statist capital. As Swartz (2013, pp. 136-137) adds to his interpretation of Bourdieu, the state is influenced by dominant groups, especially those with strong economic capital, who shape the activities of the state. However, the state can also function as a neutral "referee" that regulates the power relations between the competing actors, according to the rules of the field of power. These rules are in part the historical outcome of struggles for welfare provisions by the state, in favor of the ideal of justice and dominated groups. Moreover, the state, as belonging in the field of power with the monopoly of legitimate symbolic violence, has the power to "produce and impose (especially through the school system) categories of thought that we spontaneously apply to all things of the social world" (Bourdieu, Farage, & Wacquant, 1994, p. 1). The state imposes unquestionable assumptions, categories of perception, and fundamental classification principles of the world ("state forms of classification") (Bourdieu et al., 1994, p. 13). This way, as Swartz (2013, p. 145) comments, the state

creates “a political doxa, a practical, taken-for-granted understanding of the social order, accepting it as the natural order of things. It creates symbolic violence”. However, as Swartz continues, Bourdieu has also argued (see Bourdieu, 1989, p. 22) that the state power over symbolic classifications in not ever complete, but contested.

2.1.6 Homologous positions

Bourdieu (Bourdieu 1971, 1991, cited in Hilgers & Mangez, 2015, p. 13) hypothesizes that fields are related through an invisible homology of their structures: there are homologous positions in different fields and the overall social space, and agents are linked through these homologous positions, so that they are likely related and closer to actors that possess homologous positions in other fields (e.g., dominant positions). The homologies of dominant positions link dominant economically and politically actors in different fields and subfields, who share a common interest in the maintenance of their relative positions and the established order, and have a similar habitus which facilitates agreements between them. This interest can be expressed even through developing a discourse for “change”, a discourse that is mainly used as one means for the consolidation of the established order (see Bourdieu and Boltanski, 1976, cited in Hilgers & Mangez, 2015, p. 13). Hilgers & Mangez (2015, pp. 13-14) note that such a change is “heteronomous” and functions as a means for weakening the autonomy of fields. They argue that at the present time the situation of the economic and financial crisis is “reinforcing even more the relative power of the dominant economic actors, allies in the field of power, and tends to subordinate cultural capital (and therefore the activity of the specific fields) to 'external' criteria” (pp. 13-14).

2.2 Environmental values and environmental capital

2.2.1 Environmental values

Previous studies have shown that environmental values (beliefs) are associated with climate change attitudes. People with lower environmental values appear to be more skeptical to climate change, whereas pro-environmental ideology and perceptions appear to be positively related to environmental attitudes and climate change acceptance (see e.g. Beedell & Rehman, 2000; Bord, Fisher, & O' Connor, 1998; Corbett & Durfee, 2004; Whitmarsh, 2011). Thus, it is reasonable to assume that

people with stronger environmental values are more likely to report climate change acceptance than climate change denial.

2.2.2 Environmental capital

Karol & Gale (2004) have drawn on Bourdieu to expand the notion of capital to *environmental capital* [2]. According to the scholars, environmental capital is a type of "hybrid" capital which reflects both cultural and economic capital, and potentially a form of social capital. However, their intention is to point to its cultural attributes. Environmental capital is conceptualized as particular ways of understanding the interdependence of life-systems on Earth and relating to the environment. It involves a comprehension of the interconnectedness of the economic, political, social, cultural and technological systems, and their outcomes on the environment (pp. 1, 5-6). An enhanced form of environmental capital includes a variety of action skills (such as, analysis skills, communication skills, cooperation skills, decision making skills, etc.). However "everybody possesses environmental capital in one form or another" (pp. 6-7). It exists in various forms, such as material forms (e.g., solar panelling, recycled materials), educational qualifications, employment positions with a focus a sustainable environment, etc. It is also recognized in one's habits, conversations, hobbies, recreation, etc. *Environmental values* are, in addition, factors of environmental capital (p. 7). Environmental capital has the potential to shape a *habitus of sustainability* (pp. 8-9).

Environmental capital is intertwined with cultural capital. The amount of cultural capital influences one's expenditure of economic capital. In a similar way, environmental capital is of decisive importance for the use of economic capital. It entails "an awareness of non-commodified conceptions of wealth, and equates success with the ability to live sustainably, leave a small ecological footprint, and so consider the livelihood of unborn generations" (p. 7). As cultural capital, environmental capital yields also "profits of distinction for its owner" (Bourdieu, 1986, p. 245). However, Karol & Gale (2004, pp. 7-8) point to a significant difference from cultural capital: while the possession of large cultural capital "derives a scarcity value from its position in the distribution of cultural capital" (Bourdieu, 1986, p. 245), in the case of environmental capital "all agents and the

[2] This is a term distinctive from the capital recognized in resilient communities, where "environmental capital" has the meaning of ecological resilience.

environment will benefit from the environmental knowledge, attitudes and actions exhibited by a single agent in possession of environmental capital".

According to Sastry (2015, p. 146) the environment could be considered as a field in which "the *value* [emphasis added] of the various notions of the environment, as a form of cultural capital, is disputed and negotiated". Sastry (2015) explored environmental capital as a form of cultural capital in contemporary India. The researcher went on a series of case studies, and concluded that "these case studies suggest that the environment is both embodied, in different forms of social practice, in addition to being consciously negotiated, drawing on their subjective experiences of the environment"(Sastry, 2015, p. 3).

2.3 Into the Norwegian society

2.3.1 Studies on climate change denial in Norway[3]

Norgaard's (2011) ethnographic account in a rural community in Norway revealed a widespread lack of response to climate change as a form of a *socially organized denial*. Norgaard examined evidence of the population living a "double reality", where widespread awareness of climate change was disconnected from social processes. The researcher observed that the people in the community were avoiding experiencing emotional and psychological involvement and identity conflict between the national narrative of Norway, as a country where people live traditionally close to nature, and the country's oil development and contribution to climate change. Norgaard interpreted this form of denial as constructed by cultural *toolkits* and social *strategies of action* which people use to distance themselves from responsibility and disturbing emotions. Norgaard's study showed that social rules have a normative dimension and that society teaches people what to ignore as natural and logical, relevant or irrelevant to everyday life. By moving "from the microlevel of emotions to the mesolevel of culture to the macrolevel of political economy and back again" (p. 12), Norgaard concluded that climate change raised disturbing emotions that went against the norms of the particular social, economic and political context of the rural community.

Kaltenborn et al. (2017) surveyed a representative sample in Norway and investigated how cultural resources (cultural capital) and trust in environmental

[3] Selective reference of studies of most interest with a conceptual and thematic order.

governance institutions are related to attitudes toward climate change. The researchers found that high levels of trust are related to a tendency to accept climate change, whereas low levels of trust are connected with stronger beliefs on climate change as a natural phenomenon. High levels of cultural capital were found both among climate change deniers and believers, indicating that "groups with different political, professional and intellectual orientations, as well as life histories, may not trust climate change science" (p. 1).

Austgulen and Stø (2013) found that climate change denial is not widespread in the country. However, there was found more skepticism about the impact and severity of climate change. FrP-voters were significantly more skeptical than others, whereas people with higher education and knowledge scored lower on climate change scepticism. In addition, individualistic values and environmentally friendly practices were statistically significant variables in the analysis. Females were found to have a negative effect on skepticism, whereas age was found to have a positive effect on skepticism.

Tvinnereim and Ivarsflaten (2016) found, based on a nationally representative sample, that the cost distribution of climate change mitigation policies influences the public support of these policies, and that employers in the fossil-fuel sector are less likely to support climate change policies which are particularly costly to their industry. They also found that the level of support depends on the potential of the policy measures to generate new economic activities and employment opportunities.

Duarte & Yagodin (2012) studied the coverage of the climate change controversy in Norway after the "Climategate" incident in 2009. The "Climategate" incident refers to the stealing of thousand of documents and emails from hacked servers of the Climatic Research Unit (CRU) at the University of East Anglia in England, which were made public on the web. The incident was followed by a wave of voices denying climate change in mainstream media. The researchers studied how mass media in Norway (VG, Aftenposten, Bergens Tidende) tackled this increased controversy and found that skeptics were not excluded from the media discourse on climate change. There was an increase in skeptical voices in the climate coverage in the Norwegian press, based mainly on letters to the editors by skeptics.

For a more general approach to climate change perceptions in Norway I refer the reader to Arnold et al. (2016, pp. 43-52).

2.3.2 Environmental values in Norway

Karlstrøm & Ryghaug (2014) have noted that since environmental issues came in the mainstream political scene in Norway at the end of the 1980s, environmental values have become a factor influencing Norwegian voters on which party to vote for, although not such a decisive one. However, due to the latest increased attention to climate issues in the media, the political parties emphasize more climate issues in their programs (p. 11). In their study, Karlstrøm & Ryghaug found that preferences for parties with a focus on environmental values were related to attitudes towards renewable energy technologies (energy installations) (p. 21).

Norgaard (2012, p. 90) has noted that in Norway, the cultural values of environmentalism, equality and simplicity contradict the political economic reality. This refers especially to climate change, since Norway is a country that has benefited much of the oil production. "High levels of wealth, education, idealism and environmental values together with a petroleum based economy - makes [*sic*] the contradiction between climate knowledge and social inaction particularly visible in Norway" (p. 90).

According to the study of Olofsson and Öhman (2006) on environmental concern in USA, Canada, Norway and Sweden, it was found that, in Norway, those with collective and postmaterialistic values were more environmentally concerned compared to those with individualistic and materialistic values. In addition, political affiliation was found to be an important indicator, with right-wing voters being the least environmentally concerned.

Finally, Kaltenborn et al. (2017) have mentioned, with regard to climate change research, that in individual-oriented perspectives of psychology attitudes are connected to fundamental life beliefs and values, whereas in sociological and cultural perspectives, attitudes, worldviews and opinions are viewed as social phenomena which are closely connected to social status and cultural participation. "Social and cultural status is associated with different value sets, interests and power relations, and social status is to a large extent transmitted between generations through cultural participation" (p. 2).

2.3.3 The field of power in Norway

The field of power in Norway has been studied by Hjellbrekke & Korsnes (2009). The researchers analyzed the dominant capital structures and oppositions in the field of power in Norway by using multiple correspondence analysis. The results showed a three-dimensional field of power, in which (among other): (i) axis 1 (dimension 1), describing the most dominant opposition, was primarily an *economic capital* axis, where *high* volumes of economic capital were contrasted to *low* volumes of economic capital, (ii) axis 2 (dimension 2), describing the second most dominant opposition, showed an opposition between *cultural* capital and *political* capital, and (iii) axis 3 (dimension 3), describing the third most dominant opposition, showed inherited social capital and low educational capital in opposition to high volumes of both educational and inherited economic capital. Moreover, *dominant positions in public companies* (CEOs and chairmen) were located closer to *political* positions. There was also a distinct opposition between *political* positions and *academic* positions. The researchers noticed that the late tendencies for position-takings as CEOs in private, or semi-private, companies were dependent mainly on the conversion of *political* capital.

Denord et al. (2011) have studied specifically the social capital in the field of power in Norway. They found, among others, that *political parties* and *business leaders* are the most connected to other sectors. They also found, with regards to political and organisational leaders, that social capital may compensate for the relative lack of economic and educational capital (see p. 105).

2.4 Hypotheses formulation

By drawing on the above Bourdieusian concepts and the literature review, I assumed that, within the field of power in Norway, there is a struggle between the dominant economic pole (dominant class with high economic capital) and the dominated cultural pole (dominated fraction of the dominant class possessing high cultural capital) over the legitimate type of authority within the field of power, or, in other words, over statist capital. Homologous positions link those agents with a common interest in the maintenance of their *relative* positions and the established order. In addition, climate change has entered the field of power as a discourse requiring *changes* in the policy formulation and the oil-based Norwegian economy. These

required *changes* for addressing climate change threat the *relative* positions organized structurally around the dominant economic pole and the dominated cultural pole, i.e., the *relative value* of economic and cultural capital- their "exchange rate"- within the field of power in Norway. The more drastic the required changes for addressing climate change are, the more threatened is viewed this "exchange rate" within the field of power. *Climate change denial* constitutes, from this point of view, a *denial of changes in the legitimate type of authority* within the field of power.

Hypothesis 1: There is an association between the type of capital (economic or cultural) possessed in the field of power in Norway and climate change attitudes (acceptance or denial).

Moreover, I assumed that the dominant logic and doxic beliefs within the field of power shape in specific ways practices and dispositions of agents positioned within it. The dominant logic and doxic beliefs restructure their *habitus* acquired in former stages. Homologies of positions link dominant *economically* and *politically* actors (see the study of Hjellbrekke & Korsnes, 2009, mentioned above) who have a similar *habitus* that facilitates agreements between them. Based on the discussion so far, I considered *environmental values* as being part of one's *environmental capital*, the latter being (intertwined with *cultural capital* and) of decisive importance for the use of economic capital. Recalling Karol & Gale (2004, p. 7), environmental capital entails "an awareness of non-commodified conceptions of wealth, and equates success with the ability to live sustainably, leave a small ecological footprint, and so consider the livelihood of unborn generations". Environmental capital and values, thus, have the potential to *shape a habitus of sustainability* (Karol & Gale, 2004, pp. 8-9). Hence, by building further on Hypothesis 1, I hypothesized that *environmental values* can explain to an extent the association between the type of capital (economic or cultural) possessed in the field of power in Norway and climate change attitudes (acceptance or denial).

Hypothesis 2: The association between the type of capital (economic or cultural) possessed in the field of power in Norway and climate change attitudes (acceptance or denial) is mediated by environmental values.

3 Methodology: Secondary Analysis of Existing Data

This chapter describes the method I used for answering the two hypotheses described above. First, I discuss the method of *secondary analysis of existing data*. Then, I describe the survey design, the participants, and the methods used for collecting the analysis data. I proceed to an evaluation of the existing data for secondary analysis. Next, I comment briefly on the philosophy of the chosed methodology. Finally, the ethical considerations for this study are shortly discussed.

3.1 On secondary analysis of existing data as a method

The method employed in this thesis is a *secondary analysis of existing data* (a term preferred instead of the term secondary data analysis for reasons explained by Cheng and Phillips (2014, pp. 371-372)). The term implies, both, that (a) I did not participated in the research team which conceived and developed the original research project and collected the data for it, nor had I any familiarity with the survey design and data collection processes, and (b) that my analysis does not aim to answer the original research questions and hypotheses proposed in the study which led to the data collection, or, alternatively, that the research questions of my thesis may overlap with the original research questions and hypotheses (Boslaugh, 2007, pp. 1, 2; Cheng & Phillips, 2014, pp. 371-372).

A secondary analysis of existing data can be either research question-driven or data-driven. The former implies that a researcher has already a hypothesis in mind and searches for appropriate datasets to answer their questions. The latter means that a researcher glances through the variables in a dataset to decide what kind of questions can be addressed by the existing data (Cheng & Phillips, 2014, p. 373). Achieving the data to fit with the research purposes and questions of a new study constitutes the inherent, major challenge in secondary analysis of existing data (Boslaugh, 2007, p. 4; Goes & Simon, 2016; "How to do your dissertation secondary research," 2017).

Secondary analysis of existing data economizes a study in terms of the resources devoted to collect data and the time spent in collecting, cleaning and storing the collected data in an electric format (Boslaugh, 2007, p. 3). A major advantage of this method is that, by providing a possibility to other researchers to make use of

available data, it enhances the overall research efficiency and productivity of the research team which conducted the original study, and, at the same time, avoids an "unnecessary wastage of economic and intellectual resources" that can be employed to contribute to a research effort (Cheng & Phillips, 2014, pp. 372, 374). Additionally, secondary analysis of existing data benefits from the expertise and the professionalism of the research team that conducted the original research project (Boslaugh, 2007, p. 4). For instance, in large-scale and nationally representative surveys offered for secondary analysis statisticians with long expertise are usually employed for generating ready-to-use survey weights and design variables (such weights and variables an analyst could not have generated on her own). This is a great boon, let alone for a student who has likely limited access to research funds and cannot afford conducting a large-scale survey for collecting data from a nationally representative sample (Boslaugh, 2007, pp. 3-4; Cheng & Phillips, 2014, p. 374).

Secondary analysis of existing data carries, nevertheless, potential drawbacks. As Boslaugh (2007, p. 5) puts it, "every data collection effort has its 'dirty little secrets' that may not invalidate the data but should be taken into account by the analyst". For a secondary analysis of existing data to be performed, the quality of the original dataset must be first evaluated by the researcher so as to be aware of any potential limitations of her study. However, it may be the case that the researcher will be probably "unaware of study-specific nuances or glitches in the data collection process that may be important to the interpretation of specific variables in the dataset" (Cheng & Phillips, 2014, p. 374).

3.1.1 Materials: an existing national survey dataset (survey design, participants, methods)

An existing national survey dataset (221 variables, 3032 respondents) was provided to me by a collaborative research team from the Norwegian Institute for Nature Research (NINA) and the Centre for Development and the Environment (SUM-UiO) (Kaltenborn, B.P.; Krange, O.; Skogen, K.; Syse, K.L.), for analyzing it for the purposes of this thesis. The survey had been commissioned to the market research agency Kantar TNS by NINA. The dataset was accompanied by a printed form of the survey questionnaire (CAWI), which was written according to TNS quality procedures, and its documentation report "Norwegians opinions on nature, hunting and wildlife" [transl.] (March 2017, Kantar TNS) (see Appendices A and B,

respectively). The national dataset and its accompanying documents were written in Norwegian.

According to the documentation report, Kantar TNS conducted on behalf of NINA three questionnaire surveys on attitudes towards nature, hunting, and the wildlife. The three surveys mapped views of different target populations. The target populations were country's inhabitants, residents of selected municipalities, and hunters. Attitudes on illegal actions related to hunting, attitudes towards different Norwegian organizations related to nature management, and attitudes on predators and their management were surveyed.

For the first target population (country's inhabitants) the sampling frame aimed at a nationally representative sample drawn from the (pre-recruited) survey panel GallupPanelet. GallupPanelet consists of approximately 40.000 people (over 15 years) who participate regularly in surveys. The participants take points for each survey they participate in, which they can subsequently redeem (for example, earn some gift items, gift cards, etc.). GallupPanelet is run by Norsk Gallup (http://www.galluppanelet.no), a subsidiary of Kantar TNS. The surveys were conducted as internet-based web surveys via electronic questionnaires (web forms). Regarding GallupPanelet, invitations were sent by e-mails with a link to the questionnaire to 7704 persons, with a target of receiving 3000 responses. The e-mails included information about the content of the survey and its length, and a link to Kantar TNS' guidelines on safeguarding privacy issues for those interested in confidentiality of the data.

The national survey questionnaire was structured into several sections: hunting, predators management, the environment in general, perceptions on illegal hunting, the police, politics and power, and respondents' background. The survey included 19 single or multiple-select closed questions and 11 matrix type questions. Individual socio-demographics in the survey dataset included age, gender, level of education, level of personal and household income, household size, employment status, county of residence, geographic location, etc. The estimated survey length was 15 minutes (equal to 15 points earned).

The data were collected between 11th November 2016 and 20th January 2017, and a reminder was sent on 9th December 2016. The responders reached a size of N=3032, giving a response rate of 39.35%. The national survey was weighted by age, gender

and geographic area in accordance with official statistics. The documentation report informs that dropout was approximately equally distributed by gender and region, but there were higher dropouts for the two youngest age groups. The response rate was 28% for the group aged under 30 years old, and 52% for the group aged over 60 years old.

3.1.2 Evaluation of the national survey dataset

Finding a way to adapt to the survey data while crafting my research questions for this thesis proved to be an interactive process which was accomplished prior to any statistical analysis of the original dataset (see Boslaugh, 2007, pp. 6-8). Initially, this meant following the inverse of the principal that the appropriate method follows, and does not precede, the research question. However, once I had only glimpsed the variables included in the original dataset, I went on to conduct a literature review on climate change denial generally and to formulate my research questions. Then, I resorted again to the national survey dataset to ensure that it contained information of interest for my research goals. At this stage, I had to refine my research questions until a more concrete decision was made. As far as my research interests were concerned, the dataset mapped attitudes on climate change denial, environmental values, attitudes related to politics and power, and trust on different actors and organizations related to environmental management in Norway. More specifically, the accompanying questionnaire included a single-select question on climate change denial-skepticism; a matrix for 10 items designed to ascertain respondents' level of trust in actors and institutions on a 5-point Likert scale (equal numbers of positive and negative items with a don't know category added as a 6th point); a matrix for 7 items designed to ascertain respondents' level of agreement with statements relevant to nature and the climate on a 5-point Likert scale (equal numbers of positive and negative items with a don't know category added as a 6th point); and a matrix for 11 items designed to ascertain respondents' level of agreement with statements relevant to policy and power in Norway on a 5-point Likert scale (equal numbers of positive and negative items with a don't know category added as a 6th point). Data regarding socio-demographic characteristics were available in the dataset. Several socio-demographic variables could be considered as indicative of respondents' economic and cultural capital. The survey questions had a general wording, not restricted to

hunting issues. From the above, I concluded that the dataset included sufficient information for my research purposes.

With regard to the sample of the total population, the participants ranged in ages from 18 to 80 years. The documentation report informed that the survey was weighted by age, gender and geographic area in accordance with official statistics (see Statistics Norway, https://www.ssb.no). Hence, a reported weighting system served the representativeness of the sample in the national survey for this part of the Norwegian population by balancing the sample and correcting for non-response bias. It has also been reported that GallupPanelet offers a suitable sampling frame for nationally representative gross and net samples (Krange, Tangeland, & Skogen, 2011 p. 14).

Moreover, Kantar TNS is considered Norway's largest market research and market information agency (see "Kantar TNS,"). A quick online search shows many published survey reports of the agency.

An extensive documentation for the national survey would, therefore, be expected to accompany the dataset. However, the national dataset made available to me was only accompanied by its documentation report and the survey questions. Other survey instruments or documentation (e.g., development of the questionnaire and its measures, information on the applied survey weights, the web form of the questionnaire etc.) were not accessible to me. Hence, I could not identify whether any recognized instruments had been used in the national survey or account for complex sample issues if needed. Such problems are actually expected and reported as some of the potential drawbacks of conducting a secondary analysis of existing data, as mentioned above (Boslaugh, 2007, p. 5; Cheng & Phillips, 2014, pp. 373-374; "How to do your dissertation secondary research," 2017).

Furthermore, it could be assumed - based on the documentation report, which mentioned that invitations were sent to 7704 persons with an aim of receiving 3000 responses - that the survey was terminated (20 January 2017) when the predefined target of 3000 responses (actual net sample 3032 respondents) had been reached (see e.g. Krange et al., 2011 p. 15). This means that the moderate response rate of 39.35% for the gross sample could actually have been higher if not such a procedure was established for collecting the data. Having said this, a meta-analysis conducted by Manfreda, Bosnjak, Berzelak, Haas, and Vehovar (2008) showed that response rate

in web-based surveys is on average approximately 11% lower compared to other survey modes (see also Fan and Yan (2010, p. 132)). Regardless, nonresponse rate is only indicative of the data quality and lower response rates do not necessarily lead to higher non-response error (Manfreda et al., 2008).

Regarding the mode of questionnaire administration, a web-based survey is usually associated with more willingness to report on sensitive information (e.g., on income-economic capital) compared to face-to-face or telephone interviews, but is also associated with more cognitive burden, response-choice order effects and recall bias (Bowling, 2005, p. 284). The presentation of a web questionnaire and its display design have also been reported to affect a response rate (Fan & Yan, 2010, pp. 133-134).

Finally, the data were collected a few months before this thesis was commenced and, hence, no concerns regarding an outdated status of them arose.

Altogether the above considerations embraced my evaluation of the national survey dataset as having sufficient quality and being appropriate for addressing my research questions and proceeding with the analysis. Once general guidelines for conducting secondary analysis of existing data analysis were consulted (Boo & Froelicher, 2013; Boslaugh, 2007; Cheng & Phillips, 2014; "How to do your dissertation secondary research," 2017; Koziol & Arthur, 2011), a data cleaning process followed, as reported in the following chapter.

3.1.3 The philosophy of the chosen methodology

Regarding the philosophy of the chosen methodology for answering my research questions, I do not contend that this is the only way one could investigate the research questions and reach to some conclusions about the climate change denial issue in the field of power in Norway. As Albright and Hartman (2018a, p. 19) comment, regarding Bourdieu's field theory, "field theory is not a method so much as it is an orientation in which a variety of methods can be employed". I would embrace, actually, methodological pluralism to enhance my research if time and resources permitted it. I refer the interested in methodological pluralism reader to Moses and Knutsen (2007, pp. 288-291).

3.1.4 Ethical considerations

The original national survey dataset was appropriately coded to hide any identifying information and I had no access to the codes, the data being actually anonymous to me. Permission for their use was granted before the commencement of this thesis and the research material was kept securely. I followed the *Guidelines for Research Ethics in the Social Sciences, Humanities, Law and Theology* (2016), the guidelines for ethical reporting of research results, and respect for the values and views contained in the data guided the whole process of this analysis (see also Tripathy, 2013). Finally, I followed the APA Style (*Publication manual of the American Psychological Association* (6th ed.), 2010) as a citation practice.

4 Preparation for Data Analysis: Data Cleaning and Addressing Item Nonresponse

This chapter describes how the analysis data were prepared for testing my two hypotheses. First, I report the steps of the data cleaning process which I followed. Next, I detail a missing value analysis to explain the nature of missingness in the analysis dataset. Following it, I proceed to the justification and description of the method I used for handling the missing values in the analysis dataset.

4.1 Reporting on data cleaning

This section outlines the basic steps I followed for data cleaning[4]. Reporting and documenting on data cleaning is related to ensuring transparency in the data management (see e.g.Van den Broeck, Cunningham, Eeckels, & Herbst, 2005, pp. 966, 969-970).

Cleaning and preparing the original national survey dataset for my secondary analysis required enough effort and a substantial amount of time. To begin with, I created, from the national survey dataset (hereafter: original), a new dataset with the variables of interest (hereafter: secondary dataset) (a list with the names of the variables and their labels can be found in Table C1, Appendix C), with a direction to include only the information that was of interest for my analysis (van Buuren, 2012, p. 21). The secondary dataset was kept to the original Norwegian language. The data cleaning process was performed through the following steps (see Cheng & Phillips, 2014; "Data Cleaning," 2016; Ruel, Wagner, & Gillespie, 2015, pp. 208-237):

a. I checked for duplicate entries, spelling mistakes, non-valid labels and impossible or unexpected values for each of the variables:

• the variable labelled *Født I Norge* had label *Ja* for value "1", label *ubesvart* for value "2", and 477 system missing values. Value "2" was labelled to *Nei.*

• 94 entries for the variable labelled *Parti ved sist Stortingsvalg* had a value of "15", which was an implausible value (since the values were up to "14"). These entries were set to user missing values (see Ruel et al., 2015, p. 225).

[4] The process of data cleaning described in this chapter refers to all the variables that were included initially in the secondary dataset, and not just to the final analysis variables. This provided a better estimation of the overall quality of the data. In addition, as it will be shown later in the thesis, it served the imputation of the missing values in the secondary dataset.

b. I checked for logical inconsistencies among the responses of the same respondent (e.g., by comparing age and education). No such inconsistencies were diagnosed. However, the following issues should be mentioned:

• some respondents answered the *Klimabenektelse (Klimaskepsis)* question with the option that climate change is a reality and it is mainly caused by human activity, whereas at the next *Global oppvarming er en myte* question they reported that they totally agree (or rather agree) with the statement that global warming is a myth. However, the two terms *climate change* and *global warming* are used interchangeably by nonexperts to connote the same phenomenon. I regarded these inconsistencies to reflect the (mis)understanding of the two terms for those respondents, and, hence, I left them unchanged.

• 1437 respondents (unweighted cases) answered the *Har en ledende stilling* question with the option of *Nei*, whereas, regarding the *lederansvar* variable in the original dataset - which included a multiple response set with the options: *Personalansvar, Innkjøpsansvar IT/IKT, Innkjøpsansvar, Økonomiansvar, Salgs-eller markedsansvar*, or *Ingen av disse* - 172 of those respondents ticked off one, or more, of the above first 5 options (1071 respondents ticked off *Ingen av disse* and 194 respondents did not tick of any of the options). The question *Har en ledende stilling* seemed quite straightforward. Since I had no access to the original electronic questionnaire (web form), I could not cross-check the precise wording of the *lederansvar* variable, i.e., if the question included the word *lederansvar,* or just *ansvar* (e.g., *Har du ansvar innenfor noen av følgende områder*?) which could be confusing for some respondents. Thus, I could not actually confirm if the 172 cases were inconsistent or not, neither could I deduce convincing evidence for any correct answer from other responses in the dataset. Having as starting point not to delete any information, I decided to leave the above 172 cases unchanged.

c. Based on the information of the *lederansvar* variable in the original dataset (multiple response set), I implemented logical imputations to assign the corresponding values to a new dichotomous variable (*Lederansvar innenfor ... områder: Ingen av disse*) in the secondary dataset, which indicated if a respondent has ticked off the option *Ingen av disse* or any of the other options. The new variable had values “0” for *Nei* (i.e., the *Ingen av disse* option was not ticked off, but there were ticked off one, or more, of the other options) and “1” for Ja (i.e., the *Ingen av*

disse option was ticked off). The system missing values of the multiple response set (i.e., not ticked off any of the options) were preserved in the new variable. The new variable was included in the model for imputing the missing values in the secondary dataset, but it was excluded from the subsequent data analysis.

d. I checked for missing values due to skip patterns (valid skips). No such skip patterns were identified in the secondary dataset.

e. In the original dataset, system missing values for some variables had been assigned "*na"* labels and were set to user missing values. In the secondary dataset, variables for which the *jeg-vet-ikke, husker-ikke*, or *ønsker-ikke-å-svare* type of responses were interpreted as having no informational value were also set to user missing values. This involved most of the variables with these types of responses. However, for two selected items these type of responses were interpreted as meaningful and, thus, they were kept as a distinct category (see de Leeuw, Hox, & Huisman, 2003, pp. 156, 162): for the *Klimabenektelse (Klimaskepsis)* and *Global oppvarming er en myte* variables these type of responses were not set to user missing values for preserving the range of the climate change denial-skepticism continuum. This would allow me to provide separate descriptive statistics for these types of responses.

Upon the completion of the above steps of data cleaning, the new secondary dataset consisted of 49- ordinal, nominal and some of them dichotomous- variables (plus the *vekt* variable which was applying the weights in the sample) and 3032 respondents (*N*=3032) (Table C1, Appendix C).

However, the data cleaning process had not been entirely completed yet; there were missing values in the national survey dataset (item nonresponse) which should be analysed separately. The missing values analysis is explained thoroughly in the remaining of this chapter. According to Papageorgiou, Grant, Takkenberg, and Mokhles (2018, p. 156), a thorough description of how missing values were handled in an analysis serves the transparency and reproducibility of an analysis.

4.2 Case screening: Inspecting cases with high proportion of missing values

To begin with, I inspected if there were cases with high percentage of missing values over the 49 variables in the secondary dataset. For this purpose, I computed a new variable indicating the missing variables per (unweighted) case. This showed that

there were 632 complete cases in the dataset. By sorting the cases with the highest proportions of missing values, it appeared that there were 33 cases with nearly over 50% missing values (≥25 variables) which joined a pattern of non-differentiation (straight-lining) in ratings in the matrix questions of the survey. This pattern was weakening below this cut-off point. Thus, 33 unengaged responses of this non-differentiation pattern with ≥50% missing variables were removed from the dataset (*N*=2999 for unweighted cases, *N*=2990 for weighted cases) (see de Leeuw et al., 2003, p. 166).

4.3 Missing value analysis: from proportions and patterns of incomplete data to hypothesized reasons of missingness

4.3.1 Missing values and their nature: MCAR, MAR, MNAR

Missing data in a survey can have the form of (a) unit nonresponse, when an entire unit of analysis is missing, or (b) item nonresponse, when data on particular items are missing. Item nonresponse can originate in the data collection phase or in the data processing and analysis phase, e.g., problems in the format and layout of a questionnaire, errors in data entries, etc. Different mechanisms of systematic (non-random) missingness may be also at work in cases where a respondent does not provide information (see de Leeuw et al., 2003, pp. 155-156, 158, 163; Garson, 2015, p. 9). It is generally accepted that high cognitive burden and time burden on a respondent - enhanced in, e.g., large surveys with many questions which need a long time to be answered, or blocks of questions that force the respondent to stay for a long time on a certain page - increase the risk of respondents' fatigue and, thus, missingness in the dataset (see e.g. Boo & Froelicher, 2013, p. 134; Bowling, 2005; Couper, Tourangeau, Conrad, & Zhang, 2013; Morrison, Dillman, & Christian, 2010, p. 71; Rolstad, Adler, & Ryden, 2011; Schonlau, Fricker, & Elliott, 2002, p. 43).

Missing data can be regarded as a form of measurement error and can threat the quality and validity of statistical inferences for they can introduce bias into an analysis (Garson, 2015, p. 6). There is not an established threshold in the literature for the acceptable proportions of missing data in a dataset - e.g., Schafer (1999, p. 7) asserts that 5% is a small rate of missing information; Bennett (2001, p. 464) asserts that more that 10% of missing data will lead to biased inferences; Widaman (2006, p. 61) distinguishes: 1–2% is low, 10–15% or higher is moderate, 25% or higher is

relatively high; Graham & Schafer (1999) and McArdle (1994) (cited in Widaman, 2006, p. 61) claim that even more than 50% missingness on any individual variable can be handled well by optimal methods (i.e., imputation or FIML). However, the nature and patterns of missing data are more important than the proportion of missing data on itself (see e.g. Dong & Peng, 2013).

Addressing item nonresponse in a survey means deciding upon ignoring or dropping cases with missing values (most statistical packages by default drop cases listwise) or replacing them with plausible values by using different statistical techniques (imputation). Before deciding on how to deal with missing values, it is important to investigate the missing data patterns by using all the available information in a dataset, investigate if there are systematic reasons for missingness in the survey, and identify the nature (mechanism) of the missing values. Additional information from sources like logic, theory, or prior data, or even reasonable guesses, can help to establish the nature of missingness (de Leeuw et al., 2003, pp. 167, 170).

According to the established classification of missing values mechanisms (Rubin, 1976), missing values can be:

(a) missing completely at random (MCAR), when the probability of missingness is related neither to the values of other observed variables nor to the variable with the missing values itself (see e.g. Boo & Froelicher, 2013, p. 134), e.g., responses skipped because of carelessness or fatigue. When values are MCAR, the distribution of the missing values is random and unpredictable, and there are no systematic differences between nonrespondents and respondents in a dataset. When data are MCAR, the analysis is unbiased (Garson, 2015, p. 11; Graham, 2009, p. 553).

(b) missing at random (MAR/ignorable nonresponse), when the probability of missingness is related to the values of other observed variables, e.g., the respondent is reluctant to answer questions related to income; women are less inclined to report their weight. When values are MAR, the distribution of the missing values is predictable from other variables in the dataset (see e.g. de Leeuw et al., 2003, pp. 166-170).

(c) missing not at random (MNAR/non-ignorable nonresponse), when the probability of missingness is related to the variable with the missing values itself, e.g., obese women are likely to refuse to report their weight (Boo & Froelicher, 2013, p. 134); in a sensitive survey question, a respondent is reluctant to report on drinking a lot of

alcohol because s/he perceives the real answer to be socially undesirable (de Leeuw et al., 2003, p. 155). Diagnosing the MNAR mechanism requires substantive scientific knowledge of a field and the literature. MNAR mechanism is the most problematic case for data analysis, because there is the threat of biased parameter estimates. A specific model for missingness must be included in the analysis, but there is not a well-established remedy for handling missing data in this case (de Leeuw et al., 2003, p. 166; Garson, 2015, p. 16; Graham, 2009, p. 553; Rubin, 1976).

Collins, Schafer, and Kam (2001, p. 347) mention that "in real-world empirical situations it is difficult or impossible to discern the form of the missing data mechanism". Graham (2009, p. 567) writes that the three mechanisms of missingness should not be perceived as mutually exclusive, and that "the best way to think of all missing data is as a continuum between MAR and MNAR". In the same direction, according to Garson (2015, p. 15), MAR values are a spectrum, depending on how much of the missingness can other observed variables explain: "the point on this spectrum where prediction ceases to be useful is the point separating MAR from MNAR".

4.3.2 Missing value analysis

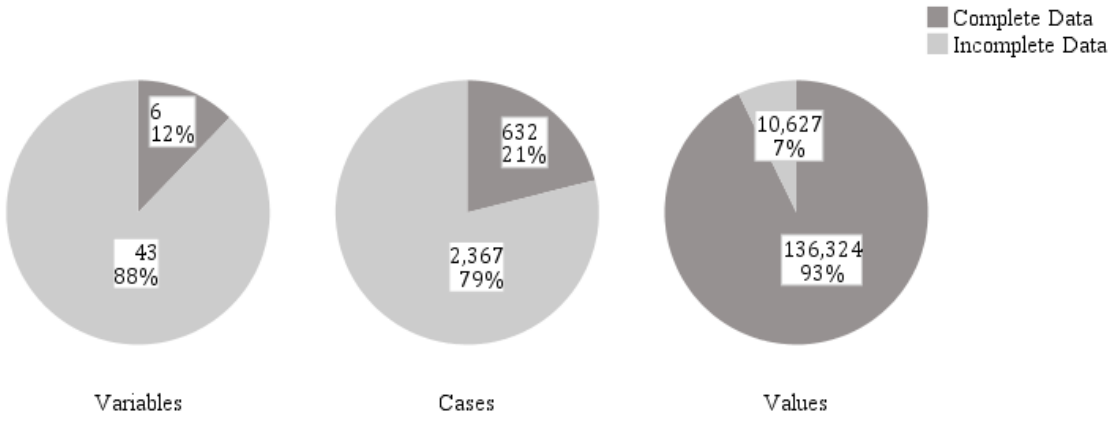
Percentages and patterns of missing values

A missing value analysis on the 2999 (unweighted[5]) cases was performed using the Missing Values module in SPSS. Univariate statistics showed there was a substantial amount of missing values with nearly all the variables being incomplete. The extent of missing data (number and percentage of missing values) per variable is shown in Table C2 in Appendix C. In total, 21 out of 49 variables had more than 5% missing values, and 9 variables more than 10% missing values. The variables *Jobber i offentlig/privat sektor*, *Bransje*, *Har en ledende stilling* and *Statens naturoppsyn (SNO)*, had the most values missing, with 35.3%, 33.5%, 36.7% and 23.1% missing

[5] It worth mentioning that when the analysis was run on weighted cases, SPSS showed inconsistencies: the percentages of missing values per variable when *frequencies* was run were different from the percentages of missing values per variable when the *Analyze patterns* procedure was run, although both procedures were applied on weighted cases. I assumed that this had to do with the way the *Analyze patterns* procedure in SPSS handles noninteger weights, i.e., cases with negative or zero replication weight value are ignored, whereas noninteger weights are truncated (https://www.ibm.com/support/knowledgecenter/en/SSLVMB_25.0.0/statistics_mainhelp_ddita/spss/mva/idh_miss.html).

values, respectively. The variable *Alder* and the variables for *Bakgrunn* contained no missing data, while the *Hovedkilde til livsopphold, Høyeste fullførte skolegang, Fylke* and *Kjønn* variables had only 1 missing datum. The pie charts in Figure 4.1 (generated by the Analyze patterns procedure in SPSS) show the number and percentage (88%) of variables with missing data, the number and the percentage (79%) of cases with missing data, and the full number and percentage of missing data (7%) in the secondary dataset.

Figure 4.1: Overall summary of missing values in the secondary dataset



It is worth noting the percentages of pairwise mismatched cases, i.e., for each pair of variables, the percentage of cases in which one variable had a missing value and the other variable had a nonmissing value (based on the Percent Mismatch of Indicator Variables table from the SPSS output): the entry for *Har en ledende stilling* paired with *Jobber i offentlig/privat sektor* was 1.73%, the entry for *Har en ledende stilling* paired with *Bransje* was 6.84%, and the entry for *Jobber i offentlig/privat sektor* paired with *Bransje* was 5.77%, whereas the percentages for these variables paired with the rest of variables in the dataset were more than 30%. The entries for *Statens naturoppsyn (SNO)* paired with the rest of the variables were approximately from 19% to 33%. Crosstabulations of the three categorical variables versus each other (*Jobber i offentlig/privat sector, Bransje* and *Har en ledende stilling*) revealed also high percentages of missing values for them.

Table 4.1 shows the "Tabulated Patterns" display in SPSS for missing patterns[6] (I omitted the empty columns for the rest of the variables). It shows the number of

[6] Note: "When the same variables are missing for several cases, cases are said to have the same *pattern*" (Hill, 1997, p. 11).

complete cases (632), how the sample size of complete cases increases by omitting variables, and whether the data in cases tend to be missing for multiple variables. It reveals four patterns of jointly missing data. One of these patterns includes three variables: *Jobber i offentlig/privat sector*, *Bransje* and *Har en ledende stilling*. The variables of this pattern are missing together more often than the other pairs, i.e., in 220 cases (7.3% of cases). Notice that these variables record information which is interchangeable: if one does not know whether a respondent works in the private or public sector, one likely also does not know their occupational branch or whether they hold a leading position.

Table 4.1: Missing Value Analysis: Tabulated Patterns

	Missing Patterns[a]									
Number of Cases	Født i Norge	Lederansvar innenfor ... områder: ...	Husstandens samlede brutto årsinntekt (før ...	Parti ved sist Stortingsvalg	Hvis jeg ville, kunne jeg raskt få et ...	Statens naturoppsyn (SNO)	Bransje	Jobber i offentlig/privat sektor	Har en ledende stilling	Complete if ...[b]
632										632
59					X					691
69						X				701
91				X						723
38			X							670
52		X								684
79	X									711
220							X	X	X	889
40		X					X	X	X	1000
30				X			X	X	X	1015
33	X						X	X	X	1001

Patterns with less than 1% cases (30 or fewer) are not displayed.

a. Variables are sorted on missing patterns.

b. Number of complete cases if variables missing in that pattern (marked with X) are not used.

Crosstabulations of variables with high proportions of missingness (>10%) against other variables in the secondary dataset

Next, I performed crosstabulations of variables in the dataset against indicator variables for the three predominant pattern variables[7] *Jobber i offentlig/privat sector*, *Bransje* and *Har en ledende stilling*. The crosstabulations showed differences in missing values among categories of each of the variables for education, level of personal and household income, gender and age (see element D.1 in Appendix D). The discrepancies were not minimal and seemed unlikely to be due to chance. Crosstabulations of variables in the dataset against an indicator variable for the

[7] See guidelines on https://www.ibm.com/support/knowledgecenter/en/SSLVMB_24.0.0/spss/tutorials/mva_describe_evaldescriptives.html.

Statens naturoppsyn (SNO) variable showed similar results (see element D.2 in Appendix D). Crosstabulations of variables in the dataset against indicator variables for the rest of the variables with more than 10% missingness (i.e., *Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon*, *Parti ved sist Stortingsvalg, Husstandens samlede brutto årsinntekt (før skatt og fradrag),* and *Født i Norge*-except for the variable *Lederansvar innenfor ... områder: Ingen av disse*) were also conducted and showed similar results (see element D.3 in Appendix D).

Based on the findings until this point, factors such as age, education, level of personal and household income, and gender, seemed to be related to missingness. The data did not seem to be MCAR. This was in accordance with other studies showing that age and education are respondents' characteristics that consistently associate with missing data: elderly people or less educated people are more likely to have higher percentages of missing data (see citations in de Leeuw et al., 2003, p. 163). In these cases, missingness is at best MAR and at worst NMAR (de Leeuw et al., 2003, pp. 163, 170).

Analysis of patterns: "islands" of missing and non-missing cells (non-monotonicity)

I then run the *Analyze patterns* procedure in SPSS for those variables that were included in the "Tabulated Patterns" display for missing patterns to check whether there existed a monotone pattern of missingness. Despite a tendency for monotonicity, displayed at the right bottom of Figure 4.2, the missing and non-missing cells were not all touching, but there were "islands" of missing and non-missing cells, which allowed me to conclude that there was not monotonicity; the patterns in the data matrix were arbitrary, at least to an extent (see e.g. "SPSS Short Course, Module 6, Multiple Imputation,"). The first pattern with no missing values was predominant among the patterns (see Figure 4.3), with over 40% of the distribution, the 122nd pattern accounted for near 15%, whereas the rest of the distribution was scattered among the rest of the patterns.

The results of the analysis so far indicated that the missing data in the secondary dataset were not completely randomly distributed across the sample. Missingness in some variables in the secondary dataset appeared to be related to specific categories

of other variables. A kind of a system underlying the missingness pattern was likely to be present and introduce bias to the subsequent data analysis.

Figure 4.2: Missing value patterns

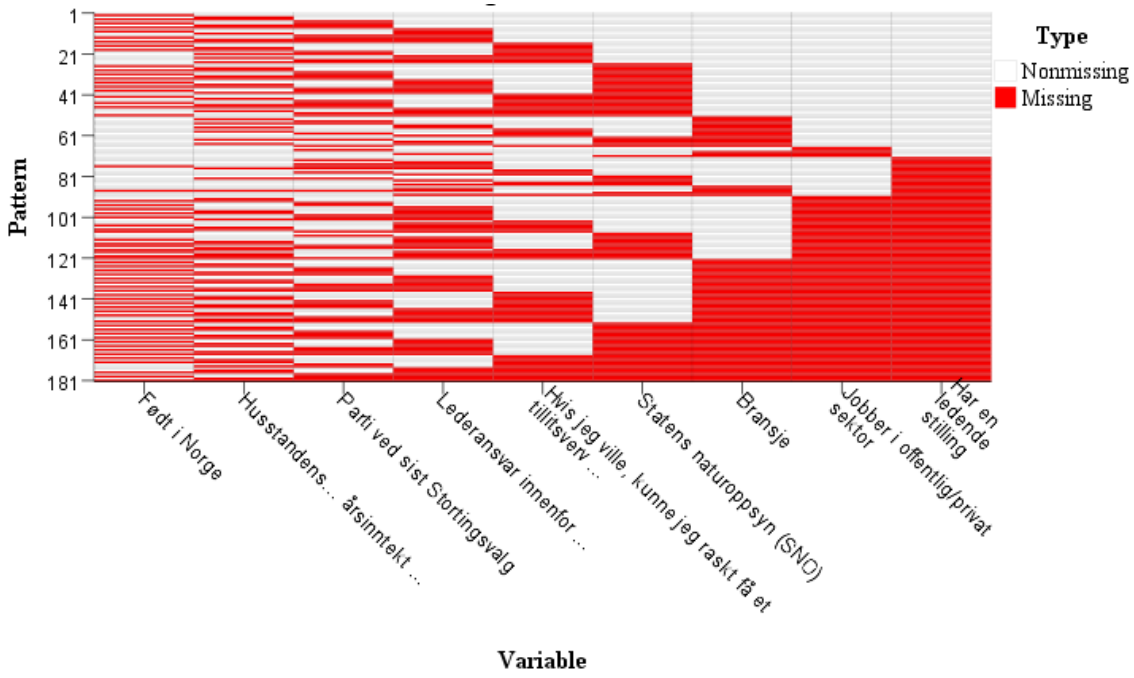
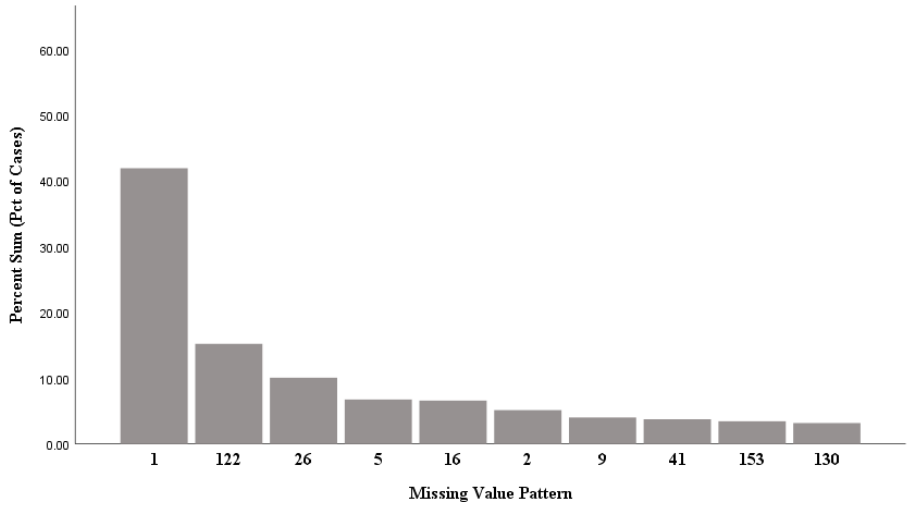


Figure 4.3: Missing value pattern frequencies (the 10 most frequently occurring patterns are shown in the chart)



Testing the MCAR, MAR and NMAR assumptions?

One of the ways to distinguish between MCAR against not MCAR data is to perform Little's (1988) MCAR test. This is a chi-square statistic for testing whether significant differences exist between (the means of) different missing value patterns (Li, 2013, p. 795). It compares patterns of missing data with the pattern expected in

case of randomness. Little's test can be performed in SPSS through the MVA module (it is printed as a footnote via the EM estimation) (Hill, 1997, pp. 43, 48). The null hypothesis is that data are MCAR, and the *p*-value is significant at the .05 level (Garson, 2015, pp. 12-14). It is noted that Little's MCAR test is not definitive (like all test of assumptions) and should be only used as another piece of information (Grace-Martin, n.d.).

While some techniques for testing the assumption of MCAR have been developed, the assumptions of MAR or MNAR cannot be directly tested. In the real world not many cases with truly missing at random data exist, and in practice more often than not the conditions for assuming MAR are somewhat relaxed (Morris, 2011 p. 241). MAR or MCAR data are often assumed in the lack of any contrary indications, whereas the probability of NMAR data becomes more of a "conceptual consideration" (Schlomer, Bauman, & Card, 2010, p. 3). The assumption of NMAR data is approached by the use of substantive knowledge in the field, logical explanations, by asking respondents for the reasons of nonresponse, etc. (Józwiak, 2018). Schafer and Graham (2002, p. 152) also point that there is no way to test whether the MAR assumption holds "except by obtaining follow-up data from non-respondents" or "by imposing an unverifiable model" (see also Garson, 2015, p. 15; Gemici, Bednarz, & Lim, 2011, p. 39; Rhoads, 2012, p. 16).

Some exploratory techniques are however applied to test if data are consistent to what is implied by randomness (MAR) (Garson, 2015, p. 18). Missing data can be systematically missing but still be MAR, "if we can model the nonresponse by using observed variables" (Arntsen, 2010, p. 10). The MAR assumption is usually approached through significance tests of missingness, which examine if missingness is significantly associated with other variables in a dataset and can be predicted to an extent by them (Garson, 2015, p. 18). For categorical variables, this is accomplished by cross-tabulating the categorical variables with missingness dummy variables and testing for significance with a chi-square test. If the test returns a significant finding (i.e., p-value < .05), missingness in a variable is significantly associated with the variables in the model and is predictable by them. It is then accepted that data are MAR and not MCAR (Schlomer et al., 2010, p. 3) (see also Garson, 2015, pp. 18-20; Heymans, 2011; Pigott, 2001, pp. 360-361).

To begin with, the only way I could come up with to run a Little's (1988) MCAR test was by treating the *Alder* variable (ordinal) as a continuous one. The three predominant pattern variables (*Jobber i offentlig/privat sector, Bransje* and *Har en ledende stilling*) were set to the categorical variables box in SPSS. The test was run on unweighted cases. Little's MCAR test was shown to be significant at the .063 level, indicating MCAR data (*p*-value > .05) [however, in the original dataset there was the *NorDemo_alder* continuous variable for age, and I cross-checked with it by running a Little's test on unweighted cases for the same variables. The result then shown to be significant, indicating not MCAR data (*p*-value < .05)].

Next, I created indicator variables for missingness (coded with 1 for *missing*, 0 for *known*) for the variables in the secondary dataset with more than 10% missingness and run crosstabulations and chi-square tests between each indicator variable and other variables of interest to examine if missingness was related to them. A *p*-value lower than .05 was considered statistically significant. The results can be found in Table E1 in Appendix E (followed with a detailed report). For all the eight variables containing more than 10% missing values, the chi-square tests returned significant findings (*p*-value < .05), revealing an association with the other variables of interest in the dataset. For instance, *Kjønn* was found associated with all variables; *Alder* with all but one variable; *Hovedkilde til livsopphold* with all but two variables and with moderate to high degrees of association with the three predominant pattern variables, etc. The findings indicated MAR data. It was unlikely that missingness had been caused by the variables with the missing values themselves (MNAR). To my knowledge and understanding, I could not see how these questions could cause missing values on their own. Besides, no well-established methods exist for handling MNAR data neither there was a way of measuring some of the missing data or verifying their nature by collecting follow-up data from some non-respondents (Grace-Martin, n.d.; Schafer & Graham, 2002, p. 152).

Some special reservations, however, should be made for the variables *Personlig* and *Husstandens årsinntekt* and *Parti ved sist Stortingsvalg*, which had 2.3%, 14.8% and 17.3% missing data, respectively. Questions for income and voting preferences are often perceived as sensitive, concerned with privacy, questions, and respondents may be reluctant or refuse to answer them (see Tourangeau & Yan, 2007, p. 860). Underreporting on sensitive survey questions is a common and old problem in survey

research and several methods (indirect questioning techniques) have been developed with the aim of reducing this kind of nonresponse bias. It is beyond the scope of this analysis to elaborate on such methods, but the interested reader is referred to references such as Tourangeau and Yan (2007), Coutts and Jann (2011), and Chaudhuri and Christofides (2013). Here, is more of interest to mention that the respondents with high income level are more likely to refuse to report their income level, indicating MNAR data when other variables in a dataset cannot predict which respondents have high income (see de Leeuw et al., 2003, p. 160; Donders, van der Heijden, Stijnen, & Moons, 2006, p. 1088; King, Honaker, Joseph, & Scheve, 1998, pp. 3-4; Morris, 2011 p. 240). In the secondary dataset, the variable *Husstandens årsinntekt* had more missing values than the variable *Personlig årsinntekt*, indicating probably some respondents' reluctance to report on their family members' income. Hence, the variable *Personlig årsinntekt* could be of assistance, along with other variables in the dataset such as *Hovedkilde til livsopphold, Bransje, Ledendestilling, Utdanning, Alder, Kjønn, Eier/leier bolig*, for predicting missing values for *Husstandens årsinntekt* (and vice versa for predicting the missing values for *Personlig årsinntekt*) (see e.g. Rehm et al., 2008, p. 867; "Washington State Population Survey Imputation ", n.d., Household income section).

Even if there are some departures from the MAR assumption towards MNAR, it still remains an issue if these departures are strong enough to seriously threat the validity of a MAR-based method for handling the missing data in the secondary dataset. There are indeed studies showing that even an erroneous assumption of MAR may have minor impacts on estimates and standard errors (see e.g. Schafer & Graham, 2002, p. 152). It is also advised that if the MCAR hypothesis is tested and rejected and no other information is available, then MAR becomes "the assumption of choice" (because multiple imputation yields correct parameter estimates and standard errors under MAR data) (Gemici et al., 2011, p. 39; see also Morris, 2011 p. 241).

Some hypothesized causes of missingness

In this section, I hypothesize some causes of missingness in the secondary dataset. To begin with, I considered the variable *Har du noen synspunkter eller kommentarer til undersøkelsen* of the original dataset. This variable was not included in the secondary dataset, but I regarded it as a useful, additional source for evaluating the nature of missingness in the secondary dataset. From the nearly 500 non-missing

responses in this variable, 11 responses characterized the questionnaire as being long; there were also a few comments describing the questions' wording and format as difficult to comprehend, or non-simplified. These few observations are reported as supplementary considerations for the sources of missingness in the dataset.

- **irrelevance:** The variables *Jobber i offentlig/privat sector, Bransje* and *Har en ledende stilling* were distinguished for their high proportions of missingness (35.3%, 33.5% and 36.7%, respectively). It would be possible one to speculate that these questions were irrelevant to many respondents of particular categories - e.g., for respondents of the *Alderspensjonist, Elev/student, Annen type trygd, For tiden arbeidsledig/arbeidstrygd, Hjemmeværende* categories of the *Hovedkilde til livsopphold* variable, or for the *Under 30* and *60+* categories of the *Alder* variable[8]. Still, these questions were not irrelevant to these categories as such; there were respondents of these categories who did report on those questions (e.g. some respondents of the *Elev/student* category reported on *Bransje*, some respondents of the *Alderspensjonist* category reported on *Har en ledende stilling*, some respondents of the *Under 30* category reported on *Jobber i offentlig/privat sektor*, etc.). However, neither filter questions with an explicit skip logic were identified nor values for non-applicable type of answers were defined in the original dataset for these variables (see Cheng & Phillips, 2014, p. 373). If that was the case, missing values due to legitimate skips (missing by design) would not introduce bias to the results, because missingness is operating at random when a particular condition is irrelevant to a respondent and no specific remedies are needed for the analysis (ignorable missingness) (see de Leeuw et al., 2003, pp. 156-157; Perlinger, 2015). For the secondary dataset, since none mechanism of skip pattern could be confirmed, missing data were handled as in fact missing (i.e. relevance is unknown) (see Cheng & Phillips, 2014, p. 373; Schafer & Graham, 2002, p. 155).

- **high respondent's burden:** When a respondent cannot comprehend a question or the response categories, it is likely that they will skip the question or respond with a *don't-know* type of answer. In such cases, the MAR assumption is the safest option

[8] This hypothesized reason of missingness was enhanced by the adjusted standardized residuals in the crosstabulations. To illustrate, respondents of the *Alderspensjonist* category had 424 missing responses out of the totally 1059 missing responses (40%) in the *Jobber i offentlig/privat sektor* variable, and adjusted standardized residuals with a value of 21.9; respondents of the *Elev/student* category had 218 missing responses out of the totally 1059 missing responses (20.6%) in the *Jobber i offentlig/privat sektor* variable, and adjusted standardized residuals with a value of 17.0.

for the nature of missingness (de Leeuw et al., 2003, p. 159). Moreover, the respondents may be called to retrieve information from memory and make judgements to answer a question in a survey. If a respondent is then unable to respond, the data are again MAR (see de Leeuw et al., 2003, pp. 158, 159-160).

Hence, it was possible that difficulties to comprehend a question or the responses, or difficulties to "compute" a judgement, could explain missingness for some respondents of particular categories in the secondary dataset. To illustrate, regarding the *Statens naturoppsyn (SNO)* variable (23.1% missing values), the youngest persons (and students), in contrast to the elderly (and retired) persons, were more likely to have missing values. This question (included in a matrix for 10 items measuring the level of trust in actors and institutions), appealed to respondents' memory for recalling relevant information, experiences and opinions; subsequently, the respondents were asked to "compute" a judgement (level of trust). It was likely that this process was a more difficult cognitive a task for the youngest respondents. Older respondents have more experience and knowledge to form opinion and judgement on such matters, even on the spot, compared to the youngest respondents. Therefore, it could be hypothesized that a failure of the cognitive task for the youngest respondents led to missingness. Note that this missingness was not related to the *Statens naturoppsyn (SNO)* variable itself, but to the *Alder* variable (MAR data) (see de Leeuw et al., 2003, pp. 155, 158-160).

- **sensitivity of issues/issues concerning with privacy:** Considerations regarding missingness in the variables *Husstandens årsinntekt* and *Parti ved sist Stortingsvalg* in the secondary dataset have been discussed in the previous section.

- **current circumstances in public spaces:** Finally, the circumstances prevailing at the time the questionnaire (and the reminder) was sent out to the respondents may be related to missingness (see the documentation report, Appendix B). At that time (November 2016-January 2017), demonstrations were taking place outside the Norwegian parliament and the Ministry of Environment, and a public debate in the Norwegian press and media was ongoing, regarding hunting licenses for 32 wolves. These licenses, which had been earlier approved by regional committees in Norway, were suspended by the Norwegian ministries of Environment and Justice, based on the Bern Convention on the Conservation of European Wildlife and Natural Habitats, and the Norwegian Act relating to the management of biological, geological and

landscape diversity (Nature Diversity Act), because their terms had not been met i.e., there was no sufficiently documented danger that wolves would cause serious damage to livestock, and, additionally, there were other satisfactory solutions to avoid serious damage[9]. It could be, thus, hypothesized that missingness was shaped to an extent by a kind of public uncertainty or reluctance, prevailing at that time, to report on such issues.

To conclude, based on the missing value analysis, the MAR assumption seems to hold in the secondary dataset.

4.3.3 Treatment of missingness: the choice of method

Listwise or pairwise deletion?

When dealing with missing values in a dataset, the mechanism and the extent of missingness should be taken into account (de Leeuw et al., 2003, p. 168). Listwise deletion (complete case analysis) does not take into account the nature of missingness and is recommended only for small proportions of MCAR data (approximately, 5%). Otherwise, listwise deletion generates biased estimates and leads to reduced sample size and lower power (see e.g. Garson, 2015, p. 11; Meeyai, 2016, p. 130; Papageorgiou et al., 2018). In the secondary dataset there were 7% MAR data, so listwise deletion should be avoided. In addition, a complete case analysis would reduce dramatically the sample size down to 632 complete cases, discarding almost 79% of the sample. The sample size would increase only to 889 complete cases if the three predominant pattern variables were deleted.

Pairwise deletion (available case analysis) can also introduce bias into an analysis and, by using different cases from one analysis to another, it leads to different samples each time; thus, it makes a comparison of analyses infeasible (Dong & Peng, 2013; Graham, 2009, p. 554; Langkamp, Lehman, & Lemeshow, 2010; Schafer & Graham, 2002, p. 155). Limiting this way my options for analysis in the secondary dataset was not preferable. Wilkinson and Task Force on Statistical Inference (1999, p. 598) have warned that listwise and pairwise deletion "are among the worst methods available for practical applications".

[9] See https://www.regjeringen.no/no/aktuelt/ikke-hjemmel-for-lisensfelling-av-ulv/id2524951/.

Imputation

Single imputation?

Thus, the choice of imputing the MAR values in the secondary dataset was considered. Single imputation methods for qualitative data have been developed-based, e.g., on stochastic regression, the Expectation Maximization (EM) and the Full Information Maximum Likelihood (FIML) algorithms, the Discriminant Function Method (DFM), etc. (see e.g. Uenal, Mayer, & Du Prel, 2014, pp. 14-17). However, according to Gemici et al. (2011, p. 20) "single imputation methods have been developed for continuous multivariate-normal data and are inefficient when used to address binary and categorical missing values", and, moreover, they "require a high level of technical expertise and are difficult to implement in practice". In addition, these methods are still experimental in some software applications (Wilson & Lueck, 2014, p. 1).

Multiple imputation

Multiple imputation assumes MAR data and, by using all available information in a dataset, it can correct for estimation bias (Allison, 2000, pp. 301-302; 2005; Arntsen, 2010, p. 38; Heymans, 2011). It is, at least, as good as listwise deletion even when the MAR assumption does not hold (Garson, 2015, p. 11). Multiple imputation is especially important when missing rates are above 10% (in some cases even above 5%), because in such cases the difference between multiple imputation and simpler techniques become substantial, and can remain unbiased up to approximately 50% missingness (Papageorgiou et al., 2018, p. 156; Wulff & Ejlskov, 2017, p. 43). However, it is not a perfect remedy to missing data. Every estimate of missing data is imperfect. But it is widely recommended nowadays as the preferred approach, since, so far, outperforms other standard techniques (Gemici et al., 2011, p. 41; Wulff & Ejlskov, 2017, p. 42).

There is a plethora of studies examining the application of different multiple imputation models when it comes to, normally distributed, continuous data. However, when the missing data are categorical, the performance of different methods for applying multiple imputation is more unclear (Akande, Li, & Reiter, 2017; Finch, 2010, p. 363; Rey del Castillo, 2012, p. 4). Methods of multiple

imputation for categorical data are, e.g., the multiple imputation by chained equations (MICE) (see e.g. White, Royston, & Wood, 2011), logistic regression [: for monotonous missing value patterns, see Uenal et al. (2014, p. 17); Wilson and Lueck (2014, p. 4)] (see also Ratitch, Lipkovich, & O'Kelly, 2013, p. 2; Rey del Castillo, 2012, p. 2; Wilson & Lueck, 2014, p. 2), the hot-deck method, and random forests approaches (based on machine learning procedure) (see Munguía & Armando, 2014, pp. 108-109; see also Rey del Castillo, 2012, pp. 7-8).

When there are high rates of missing values and associations between variables, it is recommended the model for data generation to be very general and to include "those variables that are important for predicting either missingness or the variables of interest" (de Leeuw et al., 2003, p. 169). Also Collins et al. (2001) advocate an "inclusive", instead of a "restrictive", variable inclusion strategy in the analysis model (p. 332), i.e., a strategy in which variables correlated with the variables of interest (auxiliary variables) are included in the model. This strategy benefits in two ways: lost statistical power because of missing data is partially restored, while estimation biases due to MNAR data are reduced (see also Graham, 2009, p. 560). The auxiliary variables should be helpful for predicting missing values (Little 1995, p. 1119), but need not be related to missingness on themselves (Graham, 2009, p. 570).

When several variables have missing values, it is advised the use of an imputation procedure that imputes all the missing data together instead of one variable at a time ("Using imputation for missing values," n.d.).

Imputation is both applicable in survey responses and demographic responses (see e.g. "Washington State Population Survey Imputation ", n.d.). It is also suitable for missing values of variables measuring attitudes, as in such cases "there clearly is an underlying value to be measured" (Arntsen, 2010, p. 45).

In case of multiple-item scales, where there is a relationship between the items used to measure the same construct or dimension, imputation should preserve this relationship in the imputed dataset (Carpita & Manisera, 2008, p. 144). Item-level imputation (imputing the items before computing scale scores), instead of scale-level imputation (computing scale scores before imputation), maximizes the information used for the imputation. Since "within-scale item correlations tend to be much stronger than between-scale correlations, scale-level imputation excludes the

strongest predictors of the incomplete scale scores" (Mazza, Enders, & Ruehlman, 2015, p. 4) (see also Eekhout et al., 2014; Schlomer et al., 2010, p. 9; Wulff & Ejlskov, 2017, p. 46).

Important interactions and non-linear terms should be included to the imputation model to prevent biased results (see Allison, n.d., p. 84; Graham, 2009, p. 562; Wulff & Ejlskov, 2017, p. 46). Von Hippel (2009) has proposed the *transform-then-impute* method (i.e., calculate first the interactions or squares in the unknown data and impute afterwards the transformations as "just another variable" (JAV)). However, Seaman, Bartlett, and White (2012) showed that this approach is unbiased only if the analysis model is linear regression and the data are MCAR. Furthermore, it has been shown that when complex interactions and non-linear relations are suspected to be present, a non-parametric missing value imputation based on random forests (missForest) often outperforms other established imputation methods (e.g., Multiple Imputation by Chained Equations-MICE).

Imputation with missForest

Based on the analysis up to this point, I opted to proceed to the treatment of missing values by applying random forest imputation with the use of the R-package missForest[10]. missForest is a nonparametric imputation method for any kind of data, continuous and/or categorical. It does not rely on distributional assumptions and can accommodate high dimensionality, complex interactions and nonlinear relations (Stekhoven, 2011, 2016). missForest has been shown to outperform or perform equally well with other methods for MCAR or MAR data (see e.g. Allingham, 2018, p. 49; Di Guida et al., 2016; Liao et al., 2014; Muharemi, Logofătu, & Leon, 2018; Penone et al., 2014; Shah, Bartlett, Carpenter, Nicholas, & Hemingway, 2014; Stekhoven & Bühlmann, 2012; Tang, 2017, p. 4; Tang & Ishwaran, 2017; Waljee et al., 2013; Zhbannikov, Arbeev, & Yashin, 2017, pp. 2, 6).

The missForest algorithm is implemented in the R software environment and is based on random forests. Random forest (Breiman, 2001) is one of the most effective machine learning models widely used for classification, regression and prediction (see e.g. He, Levine, Fan, Beemer, & Stronach, 2018). Random forests are described as having high accuracy and efficiency for large datasets, even with high proportions

[10] missForest is downloadable, for free, from the CRAN repository: https://cran.r-project.org/.

of missing data. Overfitting is avoided as the number of their trees (ntree) increases (Breiman & Cutler, 2005; Cutler, 2009; Horning, n.d.; Tang, 2017, p. 3).

missForest runs iteratively: each variable is regressed against all other variables in turn, and the missing values are predicted using the random forests, which are fitted on the known values of each variable (Tang, 2017, p. 4). The algorithm repeats the process until a specified maximum for iterations is reached, "continuously updating the imputed matrix variable-wise, and is assessing its performance between iterations" (Stekhoven, 2011, p. 2). The method provides an out-of-bag (OOB) imputation error estimate, which is interpreted as a representation of the true imputation error and can be used to assess the quality of the imputation (see e.g. Stekhoven & Bühlmann, 2012, pp. 113, 117).

missForest is criticized for not adequately accounting for variability in the imputed values (Sage, 2018, p. 44). Also, random forests are said to be too optimistic, and that their estimates for variable importance are not reliable, because they are biased towards the categorical variables having more levels (categories) (Bhalla, n.d.; "Dealing with missing values – part 1. Applied Multivariate Statistics – Spring 2012," 2012).

After the installation of the R Integration Package for IBM SPSS Statistics, missForest was implemented in the secondary dataset for all the variables with missing values taken together. For an inclusive strategy, the imputation model included all the variables contained in the dataset. This way non-randomness was accounted for. Besides, the variable *Alder* and the variables for *Bakgrunn* had no missing values, while the *Hovedkilde til livsopphold, Høyeste fullførte skolegang, Fylke* and *Kjønn* variables had each only one missing datum. Hence, these socio-demographic variables were not actually imputed; they acted as supportive variables for the imputation. In addition, the secondary dataset contained survey weights, and these were also included in the imputation model (see e.g. Kim, Brick, Fuller, & Kalton, 2006; Schenker et al., 2006).

Prior to the final implementation of missForest, efforts were made to fine-tune the two most important parameters of the random forest algorithm: the number of trees used in the forest (ntree), and the number of random variables used in each tree (mtry). I began by setting the mtry to the default value (square root of total number of predictors) and building random forests with different ntree values (ranging from

100, 200 … to 1000 and then to 2000), to find the optimal ntree which yielded the minimal OOB error rate. Then, a similar process was followed for finding the optimal for mtry (ranging from the default to 4 to 14 and then to 28) in which the OOB error rate became minimum (Bhalla, n.d.; Breiman & Cutler, 2005; Cutler, 2009). Each of these steps required a substantial amount of computation time (days), and there were even cases in which the program seemed not to respond. It was, thus, decided that optimization could only be achieved up to a level. missForest was finally run with the following parameter settings: maximum number of iterations=10, ntree=2000, mtry=20, and seed (for the random number generator)=81. The computation time was long, approximately 50 hours. missForest yielded a low OOB imputation error estimate, as this was indicated by the value of PFC (proportion of falsely classified entries) which was 0.363221. Note that a good performance of missForest yields a value close to 0, whereas a bad performance a value close to 1 (see Stekhoven, 2011, p. 4). Since the value of PFC was closer to 0, missForest had performed quite well (see e.g. Kundu, Goswami, & Pyne, 2018; Kuppusamy & Paramasivam, 2016).

At the end, I conducted a post-imputation data inspection to ensure that the imputation did not yield any implausible values.

5 Descriptive Statistics

In this chapter, I begin by describing some demographic and socio-economic characteristics of the sample, based on both the non-imputed and the imputed datasets (which I call before-imputation and after-imputation sample, respectively). This univariate analysis takes place along with a comparison to official statistics from the national statistical institute of Norway, Statistics Norway. Next, I describe the variables referring to climate change attitudes (*Klimabenektelse/Klimaskepsis*, and *Global oppvarming er en myte*). At the end of the chapter, descriptive statistics for other variables of interest (entered into multivariate models for controlling and confounding effects later in the analysis) are provided. The frequencies analysis was run on weighted cases (*N*=2990).

5.1 Demographic and socio-economic characteristics of the sample

5.1.1 Gender (Kjønn), Age (Alder), and Born in Norway (Født i Norge)

The before-imputation sample consisted of 1510 male (50.5%) and 1479 (49.5%) female respondents (recall that *Kjønn* was adjusted through sample weights in the original dataset). There was only one (system) missing datum for *Kjønn*, so the after-imputation sample consisted of 1511 male (50.5%) and 1479 (49.5%) female respondents. This distribution corresponded to the gender distribution of 50.38% males and 49.61% females in the Norwegian population in the year 2018, according to official statistics from Statistics Norway.

The age range of the respondents was fairly equally distributed in the before-imputation sample (recall that *Alder* was adjusted through sample weights in the original dataset). Since there were no (system) missing data for *Alder*, the distribution of this variable appeared the same in the after-imputation sample (Table 5.1). However, when the distribution in the sample was compared to official statistics for the over 20-year-old part of the Norwegian population, some discrepancies appeared. The category of *Under 30* in the sample (that is, from 18 to 29 years old) accounted for 23.9% of the sample, while the ages 20 to 29 were fairly lower in official statistics, accounting for 17.69% in this part of the Norwegian population. This means that this group was likely somehow overrepresented in the sample. The rest categories of age in the sample were fairly close to official statistics.

Regarding the *Født i Norge* variable, 2869 (96%) respondents had been born in Norway in the after-imputation sample. The vast majority of the respondents (80.6%) reported that they had been born in Norway also in the before-imputation sample.

Table 5.1: Frequencies of the *Alder* variable (*N*=2990)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 30	715	23.9	23.9	23.9
	30-44	748	25.0	25.0	48.9
	45-59	741	24.8	24.8	73.7
	60+	786	26.3	26.3	100.0
	Total	2990	100.0	100.0	

5.1.2 County (Fylke) and Region (Geografi)

With regard to counties of residence, the variable *Fylke* had only one (system) missing datum in the before-imputation sample. Thus, the distribution of this variable appeared the same in the after-imputation sample (Figure 5.1). Similar remarks apply to the variable *Geografi* for region (Figure 5.2), since the variable had only five (system) missing data (0.2%) (recall that *Geografi* was adjusted through sample weights in the original dataset). The most frequent counties of residence were Oslo and Akershus, whereas the category *Sør-* and *Vestland* appeared the most for regions.

Figure 5.1: Distribution of the *Fylke* variable

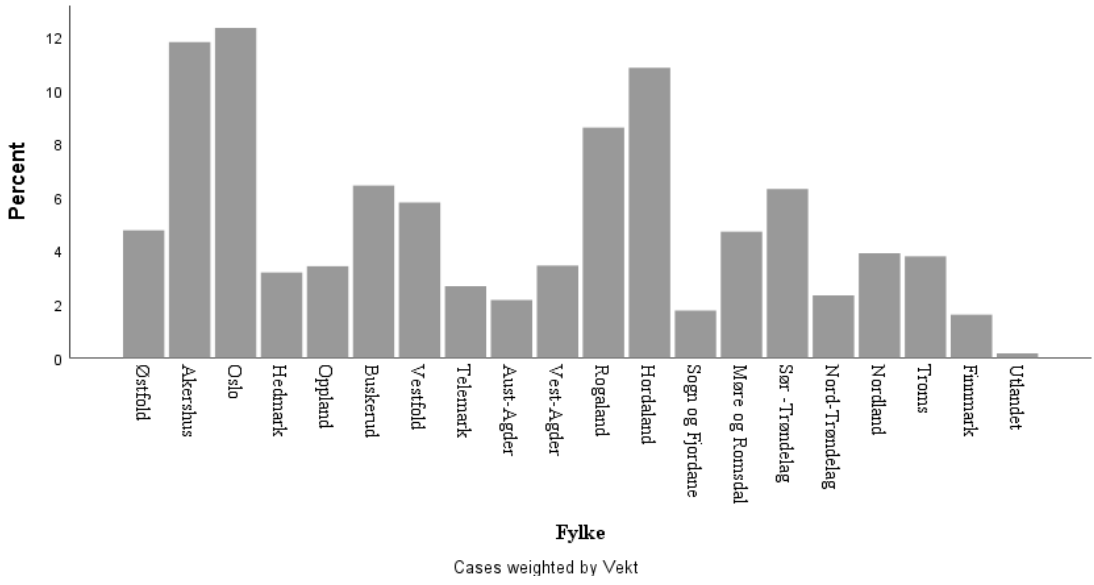
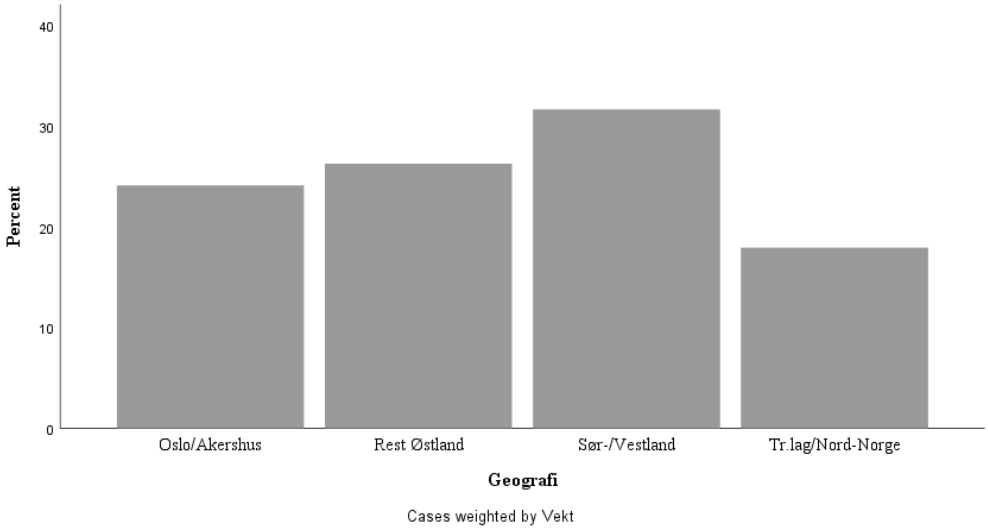


Figure 5.2: Distribution of the *Geografi* variable



5.1.3 Educational attainment (Utdanning, Høyeste fullførte skolegang)

Table 5.2 shows the distribution of the variable for education in frequencies and percentages for the after-imputation sample. The variable had only one (system) missing datum in the before-imputation sample. Thus, the distribution of the variable appeared the same after the imputation. The variable for education had five categories: elementary-primary and lower secondary school education; upper secondary school education; vocational education/upper secondary vocational education; university/college education with up to 4 years duration; and university/college education with more than 4 years duration. The first category was represented by 8.6% of the respondents in the sample. The second and third categories comprised 64.3% of the respondents in the sample, followed by the fourth and fifth categories with totally 27.1% of the respondents in the sample. There were some differences compared to the official statistics for the population over 16 years old in the year 2017[11], according to which the first category accounted for a fairly higher 26.2%, the second category for 37.4%, and the fourth and fifth categories for totally 33.4%. With regard to the underrepresentation of the first category of primary education, it has been noticed that this category is underrepresented in most of the surveys (Krange et al., 2011 p. 16).

[11] See, Statistics Norway, https://www.ssb.no/en/utdanning/statistikker/utniv.

Table 5.2: Frequencies of the *Utdanning* variable (*N*=2990)

	Frequency	Percent	Valid Percent	Cumulative Percent
Grunnskoleutdanning (10-årig grunnskole, 7-årig folkeskole eller lignende)	258	8.6	8.6	8.6
Videregående utdanning (Allmennfag, yrkesskole eller annet)	1178	39.4	39.4	48.0
Fagutdanning/yrkesutdanning/fagbrev/videregående yrkesfaglig utdanning	743	24.9	24.9	72.9
Universitets-/høgskoleutdanning med inntil 4 års varighet	480	16.1	16.1	89.0
Universitets-/høgskoleutdanning med mer enn 4 års varighet	330	11.0	11.0	100.0
Total	2990	100.0	100.0	

5.1.4 Variables referring to respondents' background (Bakgrunn)

The last two questions included in the survey questionnaire referred to respondents' background. First, the respondents were asked to report the number of books found at their home (*Antall bøker hjemme*) (with a helpful clarification that 50 books cover, approximately, one meter of a bookshelf). Next, they were asked whether there was piano *(Piano)*, chess (*Sjakkspill*), or books in languages other than Norwegian at the home they had grown up *(Bøker på andre språk enn norsk)*. This was a multiple response question, coded with dichotomous (*Ja, Nei*) variables in the original dataset. These variables had no missing values in the before-imputation sample. Thus, their distribution appeared the same in the after-imputation sample. Tables 5.3 and 5.4 display the frequencies of these variables for respondents' background.

The majority of the respondents (35%) reported to have 100-500 books at their home. Those with no books at their home made up 0.7% of the respondents, and those with more than 1000 books at their home made up a considerable 7.6% of the respondents. In total, 60.2% of the respondents could be categorized as having more than 100 books at their home.

Regarding the three home objects (piano, chess, and books in languages other than Norwegian), the 2990 respondents ticked off 5005 boxes in total. This is an average of 1.674 boxes per respondent. The highest score was for chess (61% of the respondents), followed by the option for books in languages other than Norwegian (54% of the respondents). Thus, having all the three objects at the home where one grew up did not appear to be a frequent circumstance with regard to the sample.

Table 5.3: Frequencies of the *Antall bøker hjemme* variable (*N*=2990)

		Frequency	Percent	Valid Percent	Cumulative Percent
Antall bøker hjemme	Ingen	21	.7	.7	.7
	Mindre enn 20	219	7.3	7.3	8.0
	20 - 50	418	14.0	14.0	22.0
	50 - 100	533	17.8	17.8	39.8
	100 - 500	1051	35.2	35.2	75.0
	500 - 1000	521	17.4	17.4	92.4
	Mer enn 1000	226	7.6	7.6	100.0
	Total	2990	100.0	100.0	

Table 5.4: Frequencies of the *Piano, Sjakkspill,* and *Bøker på andre språk enn norsk* variables (multiple response set) (*N*=2990)

		Responses		
		N	Percent	Percent of Cases
Vokst opp i et hjem med ...	Piano	935	18.7	31.4
	Sjakkspill	1816	36.3	60.9
	Bøker på andre språk enn norsk	1621	32.4	54.4
	Ingen av disse	633	12.7	21.2
Total		5005	100.0	167.9

5.1.5 Personal annual income (Personlig årsinntekt) and household annual income (Husstandens årsinntekt)

Tables 5.5 and 5.6 show the distributions of the *Personlig årsinntekt* and *Husstandens årsinntekt* variables for both the before- and after-imputation samples. The variable for personal income had a relative low percentage of (user and system) missing values (2.2%, weighted cases) before the imputation, whereas the variable for household income had a fairly high percentage of (user and system) missing values (15.4%, weighted cases).

Regarding the *Personlig årsinntekt* variable, the first category of income *Under 200.000 kroner* seemed to be overrepresented in both the before- and after-imputation samples. More than one third of the respondents reported annual gross income less than 300.000 NOK, and over half of the respondents reported annual income less than 400.000 NOK. According to official statistics, the average monthly earnings of employees were 43.300 NOK and 44.310 NOK for the years 2016 and 2017, respectively. Assuming wages paid for 12 months, the annual income for employees amounted to 519.600 NOK and 531.720 NOK, respectively. Regarding the self-employed population, the average gross income was 640.200 NOK for the year 2016, according to official statistics. Hence, some discrepancies were found between the samples and the official statistics. These discrepancies were likely

related to the age structure of the sample, as discussed above (i.e., that the *Under 30* age category seemed overrepresented in the sample).

With regard to the *Husstandens årsinntekt* variable, the average gross annual household income for the year 2016, according to official statistics, was 792.400 NOK. Students were not included in this official calculation. For this reason, I expected that some discrepancies were to be found between the official statistics and the sample, considering the age profile of the latter. Although hard to compare the official statistics to the numbers shown in Table 5.6, the first four categories of income in Table 5.6 amount to more than 60% of the respondents for both the before- and after-imputation samples. Hence, a tendency towards lower levels of income was observed. This could be again related to the age profile of the sample. Moreover, in both the before- and after-imputation samples, the category of 400.000-599.999 NOK appeared to be the most frequent one: 19.8% of the respondents in the before-imputation sample, and 20.4% of the respondents in the after-imputation sample. Note, however, that the first category of income in the after-imputation sample seemed to be more overrepresented compared to the sample before the imputation.

Table 5.5: Frequencies of the *Personlig brutto årsinntekt (før skatt og fradrag)* variable (*N*=2990)

		after imputation		before imputation	
Personlig brutto årsinntekt		Frequency	Percent	Frequency	Percent
Under 200.000 kroner		696	23.3	678	22.7
200.000 - 299.999 kroner		399	13.3	379	12.7
300.000 - 399.000 kroner		532	17.8	518	17.3
400.000 - 499.999 kroner		586	19.6	574	19.2
500.000 - 599.999 kroner		332	11.1	330	11.0
600.000 - 699.999 kroner		195	6.5	194	6.5
700-000 - 799.999 kroner		113	3.8	112	3.8
800.000 - 999.999 kroner		79	2.6	79	2.6
1.000.000 kroner eller mer		58	2.0	57	1.9
Total		2990	100.0	2923	97.8
Missing	Ønsker ikke å svare			66	2.2
	System			1	.0
	Total			67	2.2
Total				2990	100.0

Table 5.6: Frequencies of the *Husstandens samlede brutto årsinntekt (før skatt og fradrag)* variable (*N*=2990)

		after imputation		before imputation		
Husstandens samlede brutto årsinntekt		Frequency	Percent	Frequency	Percent	Valid Percent
Under 200.000 kroner		424	14.2	222	7.4	8.8
200.000 - 399.999 kroner		367	12.3	326	10.9	12.9
400.000 - 599.999 kroner		591	19.8	516	17.3	20.4
600.000 - 799.999 kroner		530	17.7	483	16.1	19.1
800.000 - 999.999 kroner		468	15.6	420	14.0	16.6
1.000.000 - 1.199.000 kroner		311	10.4	278	9.3	11.0
1.200.000 - 1.399.000 kroner		153	5.1	150	5.0	5.9
1.400.000 kroner eller mer		145	4.9	135	4.5	5.3
Total		2990	100.0	2529	84.6	100.0
Missing	Ønsker ikke å svare			246	8.2	
	System			214	7.2	
	Total			460	15.4	
Total				2990	100.0	

5.1.6 Home ownership (Eier/leier bolig)

The Norwegian welfare state has followed during the last decades (after the Second World War) a housing policy with the aim of ensuring home ownership to the citizens (see e.g. Sandlie & Gulbrandsen, 2017). In addition, job security, and a relatively low unemployment rate in the country (4.1% of the labour force in January 2017 for persons aged 15-74 years, according to official statistics), facilitates home ownership. It was expected, therefore, that a large proportion of the sample had reported owning their dwelling.

The *Eier/leier bolig* variable had a relative low percentage of (system) missing values (5.8%, weighted cases). Table 5.7. shows the distribution of the variable in both the before- and after-imputation samples. As expected, almost 80% of the respondents were classified into the category of home ownership.

Table 5.7: Frequencies of the *Eier/leier bolig* variable (*N*=2990)

		after imputation		before imputation		
		Frequency	Percent	Frequency	Percent	Valid Percent
Eier		2370	79.3	2217	74.2	78.7
Leier		620	20.7	599	20.0	21.3
Total		2990	100.0	2816	94.2	100.0
Missing	System			174	5.8	
Total				2990	100.0	

A re-evaluation of the sample's representativeness: summary

With regard to the sample's representativeness of the population (weighted data), there were found some deviations from official statistics regarding *Alder* (an overrepresentation of the ages from 18 to 29 years), *Utdanning* (underrepresentation of the group of primary education), and *Personlig* and *Husstandens årsinntekt* (a tendency to lower levels of income). Some deviations could be incidental or due to differentiations in the categorizations and the concepts used in official statistics. Hence, more specific evaluations seem hard to formulate. My overall estimation is that the representativeness of the total population was fairly approached, albeit not to a such a high degree.

5.2 Descriptive statistics for climate change attitudes

The survey questionnaire contained the *Klimabenektelse (Klimaskepsis)* question in which the respondents were asked to report with which of four statements about climate change they agree most. The question contained the following response options (categories): 1. Climate change is a reality, and is mainly caused by the human activity (*Klimaendringer er en realitet, og de er hovedsakelig forårsaket av menneskelig aktivitet*); 2. Climate change is a reality, but is mainly caused by natural fluctuations (*Klimaendringer er en realitet, men er hovedsakelig forårsaket av naturlige svingninger*); 3. Climate change is not a reality (*Klimaendringer er ikke en realitet*); 4. Don't know/have no opinion (*Vet ikke/har ingen mening*).

Following that, the questionnaire included a matrix designed to ascertain respondents' level of agreement with statements referring to nature and the climate. The first of these statements was Global warming is a myth (*Global oppvarming er en myte*). The two terms *climate change* and *global warming* are similar and are often used interchangeably in policy and public debates (see Dunlap & McCright, 2015, p. 322; Helliesen, 2015, p. 11). Despite the fact that the two terms are used interchangeably by nonexperts to connote the same phenomenon, in several cases there were found inconsistencies among the responses given by the same respondent, as discussed earlier in chapter 4.1.

Table 5.8 shows the distribution of the *Klimabenektelse (Klimaskepsis)* variable. The variable had 0.2% missing values; thus, its distribution was the same in both the before- and after-imputation samples. Those who believed that climate change is a

reality and is mainly caused of the human activity made up almost 58% of the sample. A total of 42% of the respondents stood apart from such a view, expressing essentially climate change denial (or skepticism): 34.5% denied the anthropogenic character of climate change, 5.6% reported that they did not know or had no opinion, and 1.9% denied that climate change is a reality in general (Figure 5.3).

Regarding the *Global oppvarming er en myte* variable, it had only two missing data (0.1%); thus, its distribution was the same in both the before- and after-imputation samples. Table 5.9 shows this distribution: a total of 65.5% of the respondents reported to disagree with the statement, with the rest 34.5% of the respondents showing, in essence, climate change denial (or skepticism).

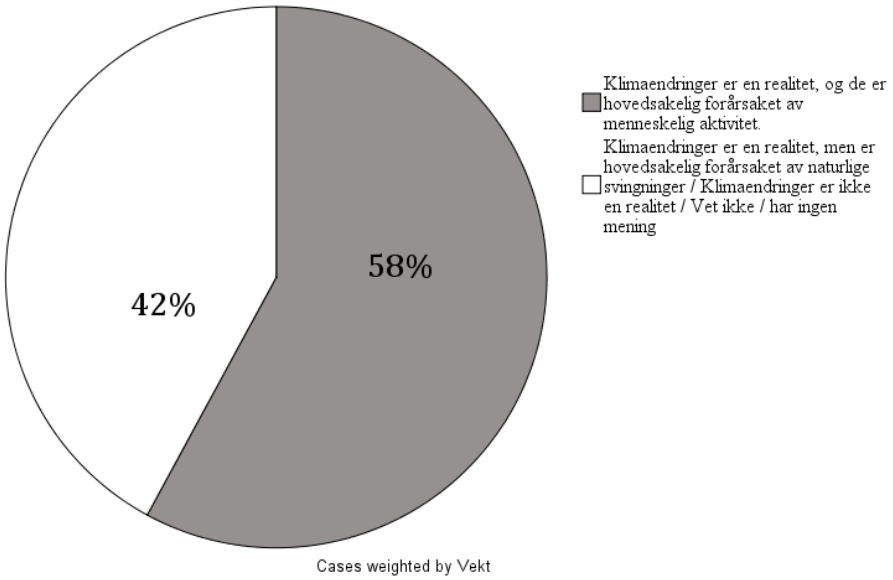
Table 5.8*:* Frequencies of the *Klimabenektelse (Klimaskepsis)* variable (*N*=2990)

		after imputation		before imputation	
Hvilket av følgende utsagn er du mest enig i ?		Frequency	Percent	Frequency	Percent
Klimaendringer er en realitet, og de er hovedsakelig forårsaket av menneskelig aktivitet.		1731	57.9	1729	57.8
Klimaendringer er en realitet, men er hovedsakelig forårsaket av naturlige svingninger.		1033	34.5	1028	34.4
Klimaendringer er ikke en realitet.		57	1.9	57	1.9
Vet ikke/har ingen mening.		168	5.6	168	5.6
Total		2990	100.0	2982	99.8
Missing	na			7	.2
Total				2990	100.0

Table 5.9: Frequencies of the *Global oppvarming er en myte* variable (*N*=2990)

		after imputation		before imputation	
Global oppvarming er en myte		Frequency	Percent	Frequency	Percent
Helt uenig		1271	42.5	1271	42.5
Ganske uenig		689	23.0	688	23.0
Verken enig eller uenig		565	18.9	564	18.9
Ganske enig		264	8.8	264	8.8
Helt enig		119	4.0	119	4.0
Vet ikke		81	2.7	81	2.7
Total		2990	100.0	2988	99.9
Missing	na			2	.1
Total				2990	100.0

Figure 5.3: Pie chart of climate change attitudes: acceptance (58%), denial (42%)



5.3 Descriptive statistics for other variables of interest in the analysis

5.3.1 Voting preference (Parti ved sist Stortingsvalg)

The variable *Parti ved sist Stortingsvalg* asked the respondents to report on their voting preferences at the last parliamentary elections in Norway (2013). The variable had a fairly high percentage of missing values (17.3%, unweighted cases). However, its distribution appeared similar in both the before- and after-imputation samples. Table 5.10 shows this distribution (recall that 94 entries with the implausible value 15 were set to user missing values).

5.3.2 Variables for trust in actors and institutions with regard to climate and environmental issues (Tillit til aktører og institusjoner når det gjelder klima- og miljøspørsmål)

The survey questionnaire included a matrix for 10 items designed to ascertain respondents' level of trust in environmental actors and institutions on a 5-point Likert scale (the response options were: *1-Svært liten tillit*; *2*; *3*; *4*; *5-Svært stor tillit*; *Vet ikke*). Each item implied equal numbers of positive and negative response options, with a don't-know response added as a 6th option. This latter response was set to user missing values before the imputation, as described earlier in the analysis. The variable *Statens naturoppsyn (SNO)* had the highest percentage (23.1%, unweighted cases) of missing values in this matrix. Table 5.11 shows basic

descriptive statistics (valid and missing cases, median, mode) for the variables of this matrix before and after the imputation.

5.3.3 Variables for agreement with statements referring to nature and the climate (Enighet om påstander om klima- og miljøspørsmål)

The survey questionnaire included a matrix for 7 items designed to ascertain respondents' level of agreement with statements referring to nature and the climate on a 5-point Likert scale (the response options were: *Helt uenig*; *Ganske uenig*; *Verken enig eller uenig*; *Ganske enig*; *Helt enig*; *Vet ikke*). Each item included equal numbers of positive and negative response options, with a don't-know response added as a 6th option. This latter response was set to user missing values before the imputation, as described earlier in the analysis (except for the *Global oppvarming er en myte* variable). The variable *At naturen har en såkalt egenverdi er en naiv og feilaktig idé* had the highest percentage (8.8%, unweighted cases) of missing values in this matrix. Table 5.12 shows basic descriptive statistics (valid and missing cases, median, mode) for the variables of this matrix before and after the imputation.

5.3.4 Variables for agreement with statements referring to politics and power (Enighet om utsagn om politikk og makt)

The survey questionnaire included a matrix for 11 items designed to ascertain respondents' level of agreement with statements referring to politics and power on a 5-point Likert scale (the response options were: *1- Helt uenig*; *2*; *3*; *4*; *5- Helt enig*; *Vet ikke*). Each item implied equal numbers of positive and negative response options, with a don't-know response added as a 6th option. This latter response was set to user missing values before the imputation, as described earlier in the analysis. The variable *Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon* had the highest percentage (18.8%, unweighted cases) of missing values in this matrix. Table 5.13 shows basic descriptive statistics (valid and missing cases, median, mode) for the variables of this matrix before and after the imputation.

Table 5.10: Frequencies of the *Parti ved sist Stortingsvalg* variable (*N*=2990)

		after imputation		before imputation		
Parti ved sist Stortingsvalg		Frequency	Percent	Frequency	Percent	Valid Percent
Valid	Arbeiderpartiet	911	30.5	693	23.2	28.3
	Fremskrittspartiet	394	13.2	328	11.0	13.4
	Høyre	777	26.0	592	19.8	24.2
	Kristelig Folkeparti	98	3.3	98	3.3	4.0
	Kystpartiet	2	.1	2	.1	.1
	Rødt	56	1.9	52	1.7	2.1
	Senterpartiet	130	4.4	129	4.3	5.3
	Sosialistisk Venstreparti	160	5.3	135	4.5	5.5
	Venstre	130	4.3	122	4.1	5.0
	Andre partier og lister	29	1.0	29	1.0	1.2
	Stemte ikke	176	5.9	169	5.6	6.9
	Hadde ikke stemmerett	126	4.2	103	3.4	4.2
	Total	2990	100.0	2451	82.0	100.0
Missing	Husker ikke/vet ikke			114	3.8	
	Vil ikke oppgi parti			279	9.3	
	15			94	3.1	
	System			51	1.7	
	Total			538	18.0	
Total				2990	100.0	

Table 5.11: Descriptive statistics for the *Tillit til aktører og institusjoner (når det gjelder klima- og miljøspørsmål)* variables (*N*=2990)

	after imputation				before imputation			
	N				N			
Tillit til …	Valid	Missing	Median	Mode	Valid	Missing	Median	Mode
Statens naturoppsyn (SNO)	2990	0	4	4	2217	773	4	4
Vanlige folk som bruker sunn fornuft	2990	0	3	4	2836	153	3	4
Klimaforskere	2990	0	4	4	2839	151	4	4
Stortingspolitikere	2990	0	2	2	2865	125	2	2
Biologer	2990	0	4	4	2817	173	4	4
Lokalpolitikere	2990	0	2	2	2853	137	2	2
Miljødirektoratet	2990	0	3	3	2805	185	3	3
Klima- og miljødepartementet	2990	0	3	3	2807	183	3	3
Naturvernforbundet	2990	0	4	4	2851	139	4	4
Politienhetene som etterforsker miljøkriminalitet	2990	0	3	3	2687	302	3	3

Table 5.12: Descriptive statistics for the *Enighet om påstander om klima- og miljøspørsmål* variables (*N*=2990)

	after imputation				before imputation			
	N				N			
Enighet om …	Valid	Missing	Median	Mode	Valid	Missing	Median	Mode
Global oppvarming er en myte	2990	0	2	1	2988	2	2	1
Balansen i naturen er skjør og kan lett forstyrres av menneskelige aktiviteter	2990	0	4	4	2940	49	4	4
Klimaendringene er vår tids største miljøproblem	2990	0	4	4	2898	92	4	5
Jeg syns det er riktig at norsk naturvernlovgivning har naturens egenverdi som utgangspunkt	2990	0	4	4	2730	259	4	4
Økonomisk vekst er den største trusselen mot et bærekraftig miljø	2990	0	3	3	2715	275	3	3
At naturen har en såkalt egenverdi er en naiv og feilaktig idé	2990	0	2	1	2715	275	2	1
Klimaforskningen overdriver klimaproblemene	2990	0	3	3	2819	171	3	3

Table 5.13: Descriptive statistics for the *Enighet om utsagn om politikk og makt* variables (*N*=2990)

	after imputation				before imputation			
	N				N			
Enighet om …	Valid	Missing	Median	Mode	Valid	Missing	Median	Mode
Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om	2990	0	4	4	2903	87	4	4
Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon	2990	0	3	1	2417	572	3	3
Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen	2990	0	3	3	2888	102	3	3
Jeg har sjelden problemer med å følge med på hva eksperter sier på TV	2990	0	4	4	2854	136	4	4
Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk	2990	0	4	4	2842	147	4	4
I Norge kan alle som vil få politisk innflytelse	2990	0	3	3	2751	238	3	3
Politikerne er mest opptatt av å sikre seg selv og sine egne posisjoner	2990	0	4	5	2862	128	4	5
Politikere har egentlig liten innflytelse, det er pengene som rår	2990	0	3	3	2786	204	3	3
Eksperter uten praktisk erfaring bestemmer for mye her i landet	2990	0	4	5	2701	288	4	5
Vanlige folk er ærligere enn politikere	2990	0	4	5	2743	247	4	5
Sunt folkevett er bedre enn formell utdannelse	2990	0	3	3	2847	142	3	3

6 Hypothesis 1

There is an association between the type of capital (economic or cultural) possessed within the field of power and climate change attitudes (acceptance or denial).

This chapter examines whether Hypothesis 1 can be confirmed, or not. Since the imputation process had performed satisfactorily (recall there was a low OOB imputation error estimate), hypotheses testing proceeded only with the imputed secondary dataset. A preliminary analysis by employing nonlinear categorical principal analysis (CATPCA) is described first in this chapter. Following it, Hypothesis 1 is tested by means of a chi-square test. The presentation of the results is integrated in each section.

6.1 Preliminary analysis: *high* economic capital and *high* cultural capital

6.1.1 Economic and cultural capital as dimensional concepts

Economic and cultural capital, as conceptualized by Bourdieu (1986), were described earlier in the thesis (chapter 2.1.3). I hereby refer to their meaning with regard to their constituent underlying dimensions.

Economic capital is the command of economic resources (e.g., money, property, assets). As the construct has a single underlying dimension (unidimensional), it can be measured through multiple *reflective* indicators (see Pelz, n.d.). One such reflective indicator of economic capital frequently employed in studies is the annual household income (see e.g. Steinführer & Kuhlicke, 2007, p. 38; Wang & Wang, 2017, p. 164).

Cultural capital (i.e., education, knowledge and intellectual skills) can be embodied, objectified and institutionalized. This implies that there are three underlying dimensions of cultural capital. As multidimensional concept, cultural capital can be measured through *formative* indicators, whereby each underlying dimension can be measured separately (see Pelz, n.d.). The scores on the different dimensions can be combined to form an overall score for cultural capital. Each underlying dimension can be measured through one or more *reflective* indicators. Indicators of cultural capital frequently employed in studies are, for example, the educational level, reading habits and behavior, and home educational resources (cultural resource

items) (see e.g. Andersen & Jaeger, 2015, p. 182; Kaltenborn et al., 2017, p. 3; Skogen & Strandbu, 2000, p. 194; Skogen & Thrane, 2007, p. 24; Steinführer & Kuhlicke, 2007, p. 36).

6.1.2 Operationalizing economic and cultural capital

To operationalize the concept of economic capital, I identified three items in the secondary dataset as potential indicators of economic capital: the variable for personal annual income (*Personlig årsinntekt*), the variable for household annual income (*Husstandens årsinntekt*), and the variable for household ownership (*Eier/leier bolig*). To operationalize the construct of cultural capital, I identified five items in the secondary dataset as potential indicators of cultural capital: (i) for objectified cultural capital, the variables for number of books at home (*Antall bøker hjemme*), piano (*Piano*), chess (*Sjakkspill*), and books in languages other than Norwegian (*Bøker på andre språk enn norsk*), and (ii) for institutionalized cultural capital, the variable for education (*Utdanning,Høyeste fullførte skolegang*). I considered these items (and their measurement scales) to reflect the conceptualization of economic and cultural capital in manner consistent to the one being of interest to my analysis, and to fit well to the study population (adults respondents positioned within the field of power in Norway) (see Rudestam & Newton, 2007, pp. 95-96) (see, also, the Norwegian studies cited at the end of the previous section). However, I would not maintain that the above indicators fully capture the essence of the complex Bourdieusian concepts of economic and cultural capital. These indicators just refer to some aspects of the concepts. Skogen and Thrane (2007, p. 24) have noted, for instance, that the number of books in one's home is rather a measure that "gauges respondents' broad intellectual orientation". One could more precisely refer to these indicators as being *resources* of economic or cultural capital (see Kaltenborn et al., 2017, p. 3).

6.1.3 Introductory notes on the measurements' characteristics: validity and reliability

Validity and reliability are considered measurement characteristics of an instrument. Reliability is the ability of producing consistent results on similar questions, whereas validity examines whether a measure actually measures what is intended to measure. Reporting on validity and reliability of a measure as evident in the sample of a study

is an important step when instruments used in previous studies are employed in a new study (Rudestam & Newton, 2007, p. 96).

Assessing the construct validity and reliability of the above items serving as indicators of economic and cultural capital was an important step in my analysis. This was of major importance for its methodology was based on analysis of secondary data. Thus, a good fit between the research questions and the dataset had to be verified (Boo & Froelicher, 2013, p. 133).

To validate the assumption that the selected items for economic and cultural capital were actually representing the underlying constructs of economic and cultural capital, I performed (nonlinear) categorical principal component analyses (CATPCA) in SPSS (see e.g. Kamphuis, Jansen, Mackenbach, & van Lenthe, 2015; Saukani & Ismail, 2018). Generally speaking, categorical principal component analysis can be conducted separately for each expected underlying construct, and a unidimensional solution can be specified a priori (see e.g. Krug et al., 2008, p. 912; Lopes & Calapez, 2012, pp. 93-94). A sample of about 300 respondents is considered a good sample size for principal component analysis (Field, 2018, pp. 797, 830). Principal component analysis serves, additionally, the purpose of reducing the variables of a dataset to their principal components, facilitating this way the application of multivariate techniques, e.g., a logistic-regression based mediation analysis (see e.g. Everson, Lee, & Friedman, 2014; Ferrari & Manzi, 2010; Friedrichs & Blasius, 2006, p. 10; Manfredi, Manisera, & Dabrassi, 2009; Mendes & Ganga, 2013). The so-called *object scores* obtained for each dimension after employing CATPCA can be used, subsequently, as measure of the new variable (see e.g. Lopes & Calapez, 2012, p. 94). CATPCA reduces this way the possibility of making a Type I error when examining the effects of many explanatory variables (Navas González, Jordana Vidal, Pizarro Inostroza, Arando Arbulu, & Delgado Bermejo, 2018, pp. 2, 8).

In the next sections, I describe analytically the steps taken for conducting CATPCA for economic capital. Then, I conceptualize and compute a new variable called High Economic capital. Accordingly, I conduct CATPCA for cultural capital, and, afterwards, I conceptualize and compute a new variable called High Cultural capital. Then, I provide the reliability assessment (determined by estimating Cronbach's alpha) of the items selected as indicators for economic and cultural capital.

Coding transformations

Prior to the CATPCA and the reliability analysis, some coding transformations of the variables took place to facilitate the interpretation of the results: the dichotomous variable for home ownership (*Eier/leier bolig*), coded with 1 for *Eier* and 2 for *Leier*, was reverse coded with 1 for *Leier* and 2 for *Eier*. Also, the dichotomous variables for piano (*Piano*), chess (*Sjakkspill*), and books in languages other than Norwegian (*Bøker på andre språk enn norsk*), coded with 0 for *Nei* and 1 for *Ja*, were recoded with 1 for *Nei* and 2 for *Ja* (so that they would not had a value of 0).

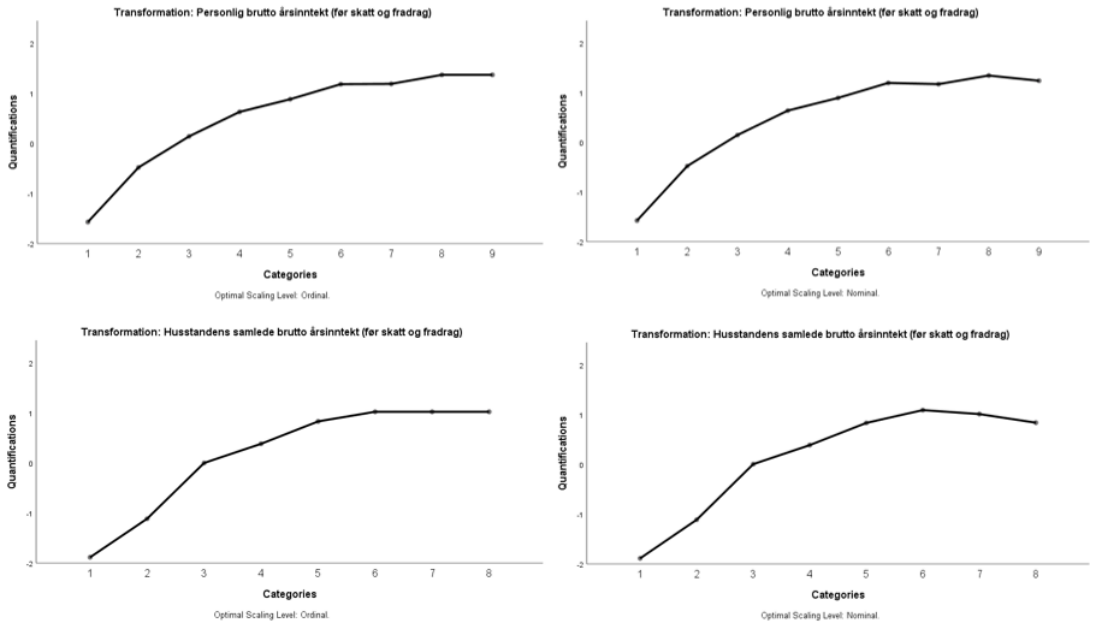
6.1.4 Categorical principal component analysis for economic capital

By employing (nonlinear) categorical principal component analysis, I examined whether it was sensible to assume a unidimensional solution for the chosen indicators of economic capital, i.e., whether they could be identified as representing one component which reflected the concept of economic capital. To run CATPCA, I quantified the variables according to the *vector* model. The vector model is a modification of the *centroid* model, which depicts the category points of a variable within the component space. The vector model is constructed by restricting, through perpendicular projection, the category points onto a straight line within the component space (Linting, Meulman, Groenen, & van der Kooij, 2007, pp. 342-344; Linting & van der Kooij, 2012, pp. 13-14).

For the variables for personal and household income, I specified different analysis levels, as recommended in the literature (Linting & van der Kooij, 2012, pp. 14-16). At each level, I inspected the *object plots* and the component scores to check whether the solution was dominated by outliers which could affect the fit of the variables. No outliers were detected at any scaling level. Figure 6.1 shows the transformation plots for personal and household income at ordinal and nominal scaling levels. When an ordinal analysis level was applied for the personal income variable, the transformation plot showed a plateau for some categories with low frequencies. However, when running CATPCA with the least restrictions, i.e., at the nominal level, the categories in the plateau exhibited quite similar nominal quantifications. Thus, I kept the variable for personal income at an ordinal analysis level to ensure more stable results (see Linting & van der Kooij, 2012, p. 21). With regard to the variable for household income, when analysed at the ordinal level, the transformation

plot showed a plateau for the quantifications of some categories with lower frequencies. However, when the household income variable was analysed at the nominal scaling level, the transformation plot revealed a stronger effect of potential nonlinear, nonmonotonic relationships with other variables. Accordingly, I decided to keep the variable for household income at a nominal scaling level. The (reverse coded) variable *Eier/leier bolig* was analysed at the ordinal scaling level.

Figure 6.1: Transformation plots for the variables for personal income (upper row) and household income (lower row) at two scaling levels: ordinal scaling level (left side), and nominal scaling level (right side)



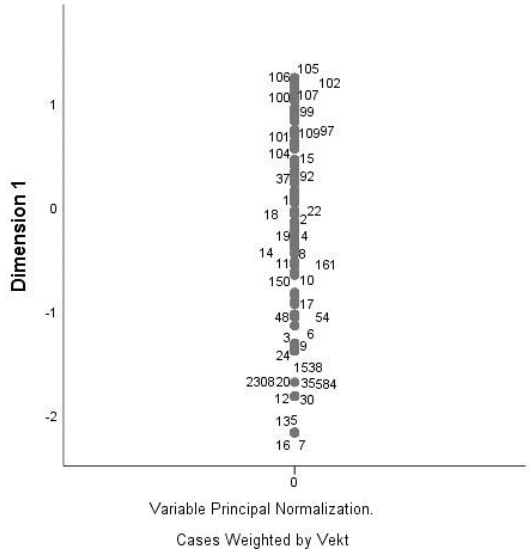
In nonlinear PCA, because of the optimal scaling which it applies, the eigenvalues of the first *p* principal components (where *p* is the number of components as specified by the user) are maximized. In other words, the nonlinear PCA solutions are "not nested" for different numbers of components, and the scree plots differ for different specified dimensions. Hence, for choosing the number of components, one should compare the scree plots from different specified dimensions. In addition, clearness and interpretability are important criteria when choosing the number of components (Linting et al., 2007, pp. 344-345, 347; Linting & van der Kooij, 2012, pp. 18-19, 20).

Accordingly, I examined the scree plots for the one-, two- and three-dimensional solutions for the quantified variables, and, consistently, all the scree plots showed an elbow after the first component (Figure F1, Appendix F). This is a consequence of the process of optimal scaling in nonlinear PCA, which aims at maximizing the

eigenvalues of the first *p* components. Hence, an elbow can be shown after the first *p* components in nonlinear PCA. For this reason, when the elbow is consistently at *p* or *p*+1 components, the solution of *p* components can be chosen (Linting et al., 2007, p. 345; Linting & van der Kooij, 2012, p. 20). Based on the scree plots, therefore, the one-dimensional solution was confirmed. In addition, based on the eigenvalue (greater than 1) criterium (see Linting et al., 2007, p. 345), the two-dimensional solution revealed an eigenvalue of less than 1 (i.e., 0.76) for the second component.

Then, I examined whether there were any potential outliers which could affect the variable fit to the solution, based on the objects plot (Figure 6.2) and the objects scores (standard scores) from CATPCA. No values were found to exceed the range of ± 3.5 (Linting & van der Kooij, 2012, p. 19).

Figure 6.2: Object plot depicting the component scores from the one-dimensional solution for economic capital (object points are labelled by case numbers)



For variable selection, I looked at the communalities of the quantified variables (table Variance Accounted For (VAF) from the SPSS CATPCA output). The variable for household income had VAF 0.80 (i.e., 80% of its variance was explained by the principal component), the variable for personal income had VAF 0.77, and the variable *Eier/leier bolig* had VAF almost 0.40. Based on the rule of thumb for VAF in a variable per component - 10%: poor, 20%: fair, 30%: good, 40%: very good, 50%: excellent (see Linting & van der Kooij, 2012, p. 19) - all variables fitted from very good to excellent in this solution, and were, thus, kept in the CATPCA.

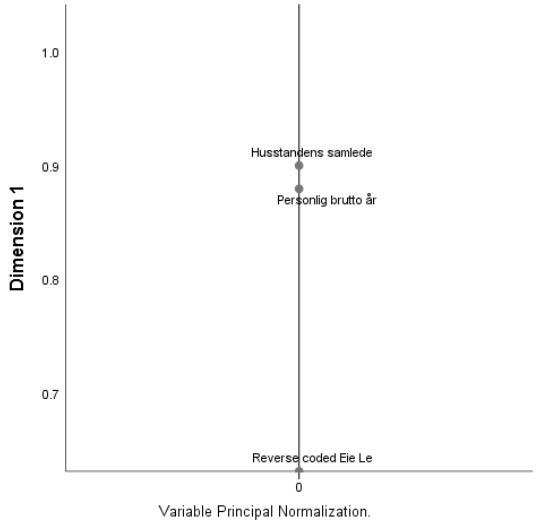
The one-dimensional solution yielded a total eigenvalue (VAF) of 1.98, which reflected 66% of the variance in the transformed variables. Thus, the solution indicated a very good fit.

The component loadings of each of the analysis variables are presented in Table 6.1. Component loadings indicate Pearson correlations between the component and the quantified variables and range between -1 and 1 (Linting et al., 2007, p. 350). As a rule of thumb in factor analysis, a variable is associated with a factor if its loading exceeds 0.3 (see e.g. Everson et al., 2014, p. e259; Field, 2018, pp. 794-795). The variables for household and personal income are the variables loading highly (close to 0.9) on the principal component of economic capital. The variable *Eier/leier bolig* exhibits also a high loading (i.e., 0.63) on the component. Figure 6.3 is a loading plot with the *loading vectors* for each variable showing the loadings on the component (the three loading vectors overlap in this case). The grey points on the loading vectors are the so-called *loading points* with coordinates the loadings on the principal component. A loading vector starts at the origin (the mean of the quantified variable) and ends at the loading point, and represents a variable's VAF (Linting & van der Kooij, 2012, pp. 13-14).

Table 6.1: Component loadings of the indicator variables for economic capital
Component Loadings

	Dimension
	1
Husstandens samlede brutto årsinntekt (før skatt og fradrag)	.899
Personlig brutto årsinntekt (før skatt og fradrag)	.879
Eier/leier bolig	.631

Figure 6.3: Loading plot with the *loading vectors* and the loading points (grey points) for the three indicator variables for economic capital (the loading vectors overlap in this case)



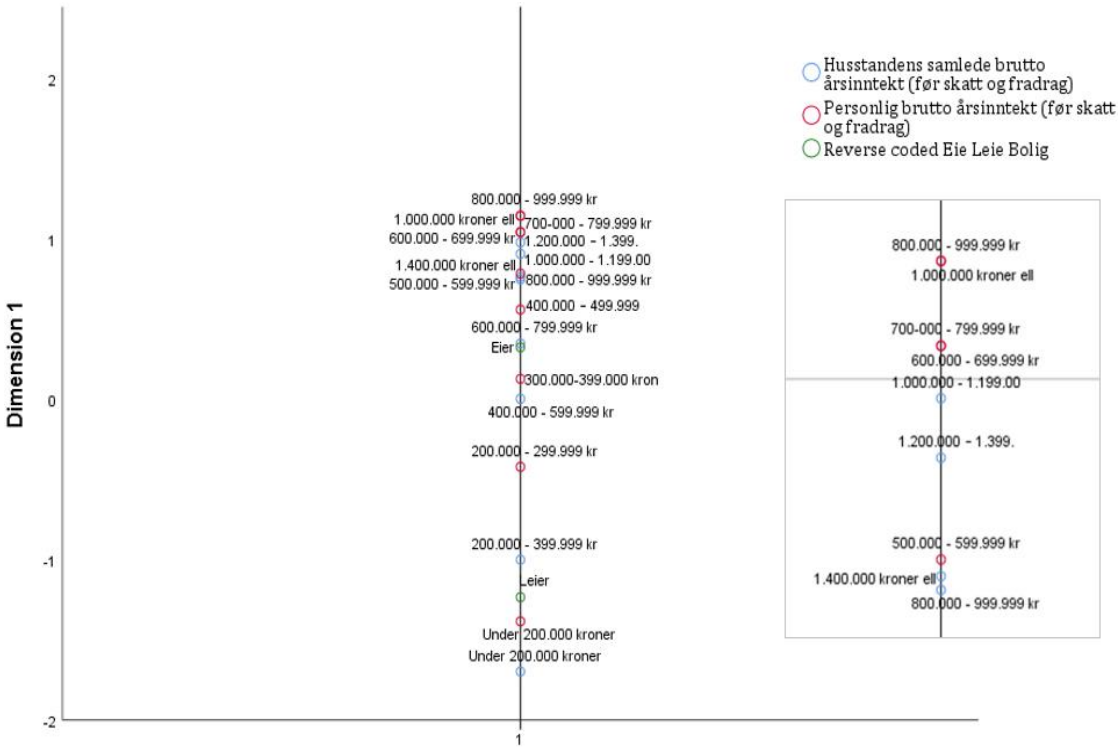
6.1.5 Delimitation of *high* economic capital (HEC)

In order to proceed to the delimitation of *high* economic capital, different considerations were taken into account. Firstly, there was some uncertainty caused by the fact that there is not an established lowest threshold for *high* economic capital in the literature. The official statistics for the average personal and household income in Norway for the year 2017 could only be of some assistance. Secondly, aiming at examining climate change attitudes of holders of high economic and high cultural capital within the field of power, I had to ensure, at the highest possible degree, that the delimitation of high economic capital falls into that spectrum. Importantly, the *relational* structure of the field of power, according to Bourdieu, should be preserved and reflected in the solution.

Figure 6.4 shows the joint category plot from the CATPCA output and offers some insight into the matter (separate category plots from the CATPCA output are provided in Figure F2, Appendix F). As mentioned above, the vector model is produced by restricting the centroids (category points) onto a straight line within the component space. CATPCA produces such category plots which show the location of the category points of a quantified variable upon the *variable vector*. A *variable vector* runs through the origin and the loading point of the *loading vector*[12] (see Figure 6.3). In a category plot, the distance from the category point to the origin reflects a category quantification. When the category point lies in the direction from the origin towards the loading point, the quantification has positive value. In the opposite case, the quantification has negative value (Linting & van der Kooij, 2012, p. 14). Note that, at a nominal analysis level, the order of the categories of a variable may not be preserved after the quantification (see Linting & van der Kooij, 2012, pp. 14-15). For this reason, in the category plots the category quantifications for household income (analysed at nominal level) are ordered differently compared to the original variable.

[12] Note that the CATPCA output shows the *variable vectors* and the *loading vectors* in different plots.

Figure 6.4: Joint plot with category points of the three quantified variables for economic capital (the smaller frame within the figure is the upper part of the graph enlarged)



As shown in Figure 6.4, on the upper part of the variable vector lie quantified categories which represent the highest categories of the original variables for household and personal income. At the upmost part, closest lie the categories *1.000.000-1.199.000 kr* for household income and *600.000-699.000 kr* for personal income, which are the "lowest" categories of the original variables located within the upmost part of the component space. Regarding the *Eier/leier bolig* variable, closest to them lies, as expected, the *Eier* category.

To proceed to the delimitation of high economic capital, while accounting for the aforementioned uncertainty, I decided to adopt a strict approach. Therefore, I excluded the categories of *600.000-699.000 kr* for personal income and *1.000.000-1.199.000 kr* for household income and proceeded with the rest of the categories. Hence, along with the *Eier* category for home ownership, the categories of *700.000-799.000 kr* for personal income, and *1.200.000-1.399.000 kr* for household income were considered to represent the lowest possible income levels for a respondent to be positioned within the field of power. Then, I computed in SPSS a new dichotomous variable called High Economic Capital (HEC), based on whether the above three criteria, i.e., minimum personal income *700.000-799.000 kr*, minimum household

income *1.200.000-1.399.000 kr*, and *Eier* for home ownership, were met *simultaneously* in a case, or not. The new variable was coded with a value of 1 for *Yes* and 0 for *No* (the SPSS syntax can be found in element F1, Appendix F). The frequencies of the new variable showed 130 cases in the first category, and 2860 cases in the second category (*N*=2990), i.e., totally 130 cases fulfilled the three cumulative conditions for high economic capital. Under my conceptualization, these cases were, thus, positioned within the dominant part of the field of power in Norway.

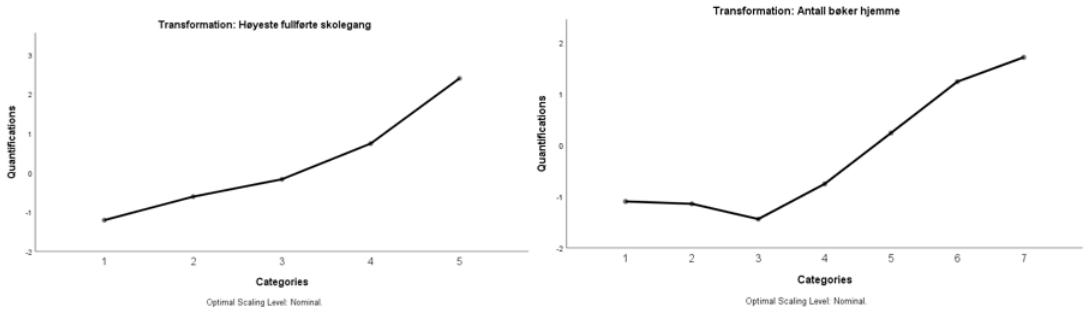
6.1.6 Categorical principal component analysis for cultural capital

By employing (nonlinear) categorical principal component analysis, I examined whether it was sensible to assume a two-dimensional solution for the chosen indicators of *objectified* and *institutionalized* cultural capital, i.e., whether these indicators could be identified as representing these two dimensions of cultural capital. To run CATPCA, I quantified the variables according to the vector model and specified different dimensions to check if the two-dimensional assumption held.

The generated scree plots for one-, two- and three-dimensional solutions were identical and, consistently, showed an elbow on the second and third components (Figure F3, Appendix F). The one-dimensional solution yielded a total VAF of 32.95% at both nominal and ordinal analysis levels. Transformation plots for *Utdanning* (*Høyeste fullførte skolegang*) and *Antall bøker hjemme* showed plateaus for some categories (with no low frequencies), whereas the *Antall bøker hjemme* variable showed a VAF of 0.20, which was deemed low. When this variable was dropped from both scaling levels, total VAF became 38.96%. No outliers were detected at any analysis level.

A two-dimensional solution at a nominal analysis level for the five variables yielded a total VAF of 53.46%. The transformation plot for *Utdanning* (*Høyeste fullførte skolegang*) showed consistently increasing quantifications for each category, but the transformation plot for *Antall bøker hjemme* showed decreasing quantifications for some categories, suggesting nonlinear, nonmonotonic relationships with the other variables (Figure 6.5). No outliers were detected. All the variables had a VAF greater than 0.3.

Figure 6.5: Transformation plots for the variables *Utdanning* (left) and *Antall bøker hjemme* (right) at the nominal scaling level



However, the component loadings did not provide a simple structure, with the variables *Utdanning* and *Antall bøker hjemme* cross-loading relatively highly on both components[13] (Table F.1, Appendix F). In addition, the solution did not seem straightforward in terms of the interpretability of the *Antall bøker hjemme* variable as objectified cultural capital (see Linting et al., 2007, pp. 347-349). The results were identical when CATPCA was run at an ordinal analysis level for all the variables, except for the *Antall bøker hjemme* variable which was kept at nominal scaling level (because of its nonlinear, nonmonotonic, relationships with the other variables).

The *Antall bøker hjemme* variable was assumed to reflect objectified cultural capital. However, the *Piano, Sjakkspill,* and *Bøker på andre spark enn norsk* variables were also assumed to reflect the same dimension. For this reason, and in order to achieve a simple structure and interpretability of the results, I excluded the *Antall bøker hjemme* variable from the analysis. The analysis was then repeated from the beginning with the rest four variables. The generated scree plots in one-, two-, and three-dimensional solutions with the four variables were identical and, consistently, showed an elbow on the second and third components (Figure 6.6). The one-dimensional solution, at the nominal analysis level for all variables, yielded a total VAF of 38.96%. The transformation plot for the variable *Utdanning* showed a plateau between some categories, and the same variable had the lowest VAF value, i.e., 0.22. No outliers were detected. The results were identical when the analysis was run at an ordinal scaling level for all variables except for the *Utdanning* variable. Based on these results, I decided to proceed to the two-dimensional solution.

[13] Note that any rotation method in SPSS CATPCA failed to converge.

Figure 6.6: Scree plot from the one-, two- and three-dimensional solutions with four variables for cultural capital (the scree plots were identical, so only one is presented here for conciseness)

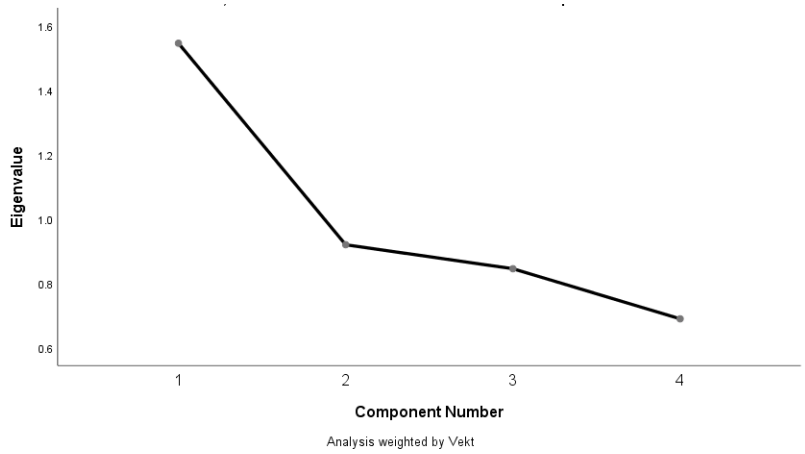
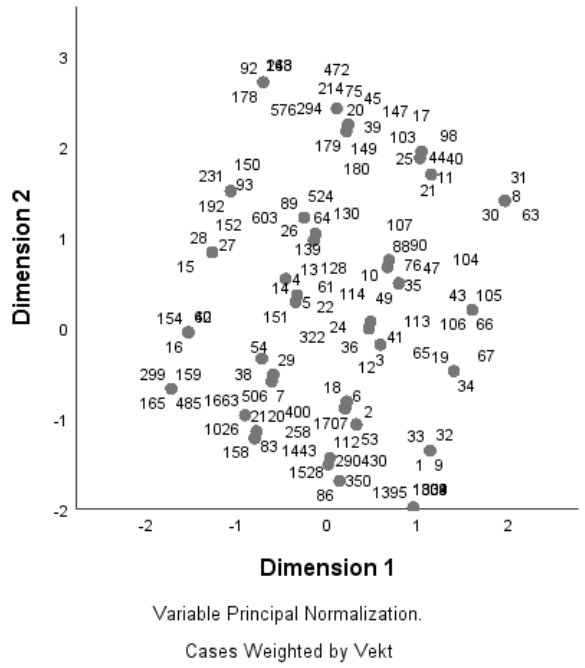


Table 6.2: Variance Accounted For (VAF) for the four quantified variables for cultural capital

	Dimension		
	1	2	Total
Sjakkspill	.502	.045	.548
Bøker på andre språk enn norsk	.502	.063	.566
Piano	.340	.015	.355
Høyeste fullførte skolegang	.202	.795	.997
Active Total	1.546	.919	2.465
% of Variance	38.657	22.968	61.625

Figure 6.7: Object scores plot (object points are labelled by case numbers)



The four variables were analysed at an ordinal scaling level in the two-dimensional solution (the transformation plots can be found in Figure F.4, Appendix F). The total

VAF across the two principal components was 61.62% (component 1: VAF 38.65%; component 2: VAF 22.97%). Hence, the two principal components explained a considerable 62% of variance in the variables for cultural capital. The VAF for each variable was above 0.35 (Table 6.2). The solution was examined for outliers and no outliers were detected (Figure 6.7).

Figure 6.8 displays the joint category plot with the category points of the four quantified variables for cultural capital (separate plots are provided in Figure F.5, Appendix F). Table 6.3 shows that all variables have component loadings above 0.3 (unrotated solution). The *Utdanning* variable cross-loads on both components, because the unrotated solution did not provide a simple structure to a complete degree. The unrotated component loading plot displayed in Figure 6.9 shows the loading vectors of the transformed variables. The loading vectors run from the origin to the loading points (signified by the grey points in the plot). Their length reflects the variable VAF, and the angle between the vectors indicates the correlation between the variables. The variables *Utdanning* (*Høyeste fullførte skolegang*) and (recoded) *Bøker på andre språk enn norsk* make an angle almost 90◦, which signifies that the variables are unrelated. In contrast, the small angle between (recoded) *Bøker på andre språk enn norsk, Sjakkspill* and *Piano* indicates that the variables are strongly and positively related (see Linting et al., 2007, pp. 343, 350; Linting & van der Kooij, 2012, p. 23). The solution presented here is unrotated[14]. Rotation is just a method for simplifying the structure by maximizing the loadings on only one of the two components (see Field, 2018, pp. 792-794, 830; Linting et al., 2007, pp. 345, 349). Since three of the four variables loaded already highly on only one component, there was no actual need for rotation to be called for. Interpretation was feasible without rotating the variables.

Based on the interpretation of Table 6.3 and Figure 6.9, component 1 contains mainly variables which reflect *objectified* cultural capital, whereas component 2 is all about *institutionalized* cultural capital. The two-dimensional, unrotated CATPCA solution with the four quantified variables provided a sensible and interpretable, in theoretical terms, picture of the dimensions of cultural capital in the secondary dataset.

[14] Because for unknown reason rotation in CATPCA could not converge, whereas when I tried to save the quantified variables and submit them to linear PCA in SPSS rotation converged.

Table 6.3: Component loadings in the two-dimensional solution for cultural capital

	Dimension	
	1	2
Sjakkspill	**.709**	-.212
Bøker på andre språk enn norsk	**.709**	-.251
Piano	**.583**	-.123
Høyeste fullførte skolegang	**.449**	**.892**

Note: Loadings higher than .30 are presented in bold.

Figure 6.8: Joint plot with category points of the four quantified variables for cultural capital

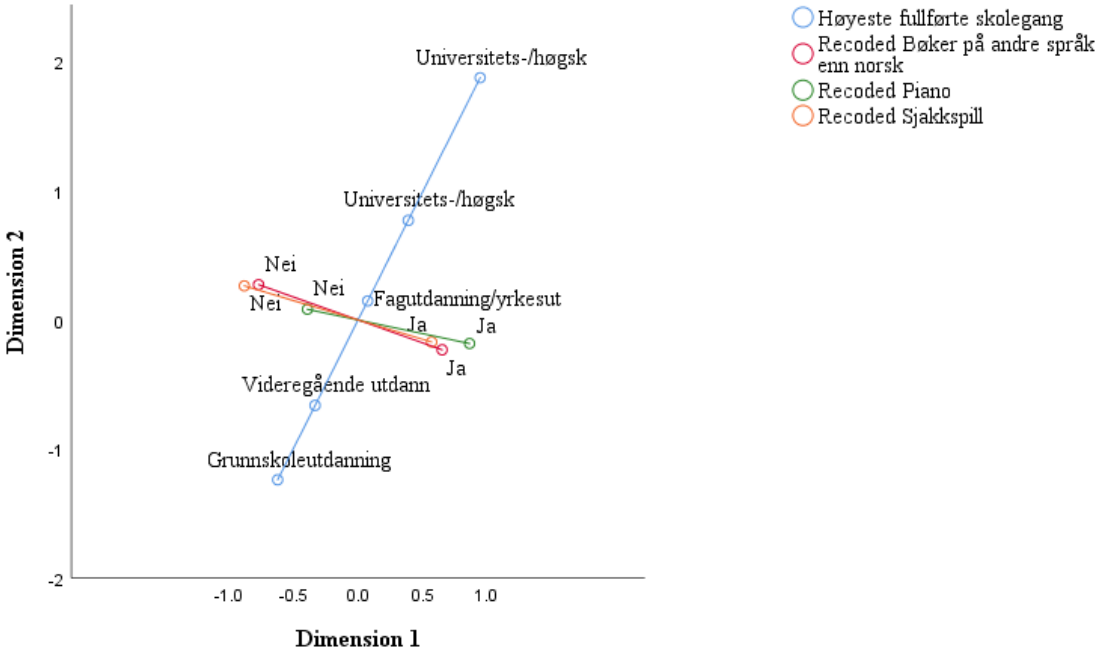
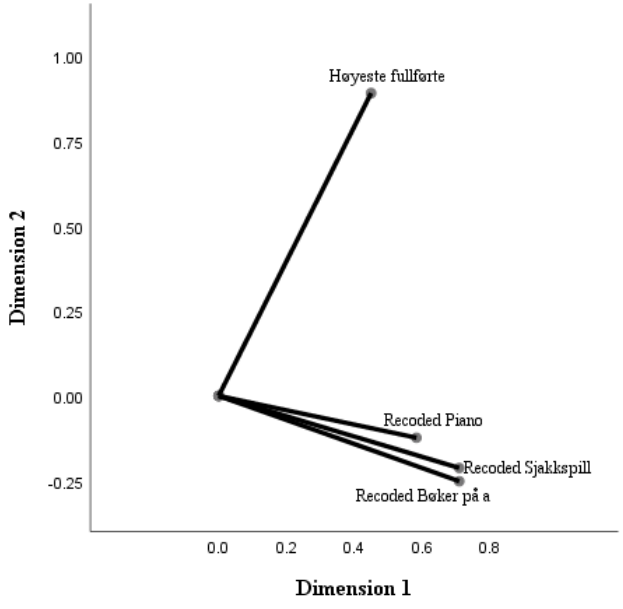


Figure 6.9: Unrotated component loadings plot for cultural capital. Component (dimension) 1: *objectified* cultural capital. Component (dimension) 2: *institutionalized* cultural capital



6.1.7 Delimitation of *high* cultural capital (HCC)

With regard to the delimitation of *high* cultural capital, there was again some uncertainty caused by the fact that there is not an established minimum threshold of *high* cultural capital in the literature. However, a university degree could be considered a minimum for high *institutionalized* cultural capital. Moreover, aiming at examining climate change attitudes of holders of high economic and high cultural capital within the field of power, I had to ensure, at the highest possible degree, that the delimitation of high cultural capital falls into that spectrum. Importantly, the *relational* structure of the field of power, according to Bourdieu, should be preserved and reflected in the solution.

To proceed to the delimitation of high cultural capital, while accounting for the aforementioned uncertainty, I decided to adopt a strict approach. Therefore, I conceptualized high cultural capital as referring to cases which *simultaneously* had: (i) the highest possible *institutionalized* cultural capital, that is, cases with more than 4 years duration of higher education, and (ii) the highest possible *objectified* cultural capital, that is, respondents who grew up in a home where all the three cultural objects (piano, chess, and books in other languages than Norwegian) could be found. Then, I computed in SPSS a new dichotomous variable for high cultural capital, based on whether the above two cumulative criteria were met in a case, or not. The new variable was coded with a value of 1 for *Yes* and 0 for *No* (the SPSS syntax can be found in element F.2, Appendix F). The frequencies of the new variable showed 101 cases in the first category, and 2889 cases in the second category (N=2990). Thus, there were totally 101 cases which fulfilled the two cumulative conditions for high cultural capital.

Note that, at this point, the new variable could contain cases which were also classified as cases with high economic capital and were positioned within the dominant part of the field of power. Therefore, this variable was labelled grossHCC. At a later stage of the analysis, I compute a new variable (netHCC) for excluding cases with high economic capital from being additionally classified as cases with high cultural capital - prioritizing, this way, their economic capital over their cultural capital. The rest cases included in the latter variable (netHCC), thus, under my conceptualization, were cases positioned within the dominated part of the field of power in Norway.

6.1.8 Cronbach's α for economic capital and cultural capital: some considerations

The one-dimensional CATPCA solution for economic capital yielded a high internal consistency coefficient, Cronbach's α=0.742. This value is above the threshold of 0.7, which is commonly used to indicate internal consistency (Everson et al., 2014, p. e259; Field, 2018, p. 823). The internal consistency coefficient based on the original variables was lower (but still acceptable), Cronbach's α=0.671. This discrepancy could be attributed to the fact that CATPCA maximizes Cronbach's α, because it "maximizes the largest eigenvalue of the correlation matrix over transformations of the variables" (Meulman, van der Kooij, & Heiser, 2004, p. 55). If the original variable *Eier/leier bolig* was deleted, Cronbach's α for the rest nonquantified variables would increase to 0.821. However, based on the output from the reliability analysis in SPSS, the correlation between this variable and the total score was above 0.3 (0.346) (see Field, 2018, p. 826; Hof, 2012, p. 10), whereas the *Eier/leier bolig* variable (with a loading of 0.631) was also justified in theoretical terms.

It should be noted that the value of Cronbach's α depends on the number of the items. A large number of variables increases Cronbach's α (Field, 2018, pp. 823, 828; Hof, 2012, p. 9; Vameghi, Sajedi, Shahshahani, & Biglarian, 2015, p. 64). In addition, the accuracy of the coefficient decreases with smaller number of response options (Gadermann, Guhn, & Zumbo, 2012, p. 3). It is likely, thus, that Cronbach's α for the original variables was not very high as a consequence of the small number of variables and the small number of response options with regard to the dichotomous *Eier/leier bolig* variable.

Regarding cultural capital, the two-dimensional CATPCA solution yielded a high internal consistency coefficient for the whole scale, Cronbach's α=0.792. However, the coefficient for the first component (*objectified* cultural capital) was fairly low, Cronbach's α=0.472. The coefficient for objectified cultural capital based on the original variables was also low, Cronbach's α=0.474. Table 6.4 is (part of) the output from the reliability analysis in SPSS for the first component. The Corrected Item-Total Correlation column shows correlations between each item and the total score. The correlation for the *Piano* variable is less than 0.3 (see Field, 2018, p. 826). However, based on the column Cronbach's Alpha if Item Deleted, none of the items if deleted would increase Cronbach's α. The considerations made above for the small

number of variables and the small number of response options apply, also, here. Moreover, according to Schwartz (n.d.), even coefficients with a value of 0.4 could be reasonable in cases of few items which are not very similar to one another. Finally, the three items for objectified cultural capital (and their loadings) were justified in theoretical terms.

Table 6.4: Item-Total Statistics from reliability analysis for objectified cultural capital (quantified variables)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Piano	.0000	2.621	.234	.055	.473
Sjakkspill	.0000	2.386	.321	.113	.323
Bøker på andre språk enn norsk	.0000	2.372	.326	.115	.313

6.2 Testing Hypothesis 1: Chi-square test of independence

To examine if the type of capital possessed in the field of power is related to climate change denial, a chi-square test of independence was appropriate. The chi-square test works as a linear model and evaluates whether two categorical variables are associated (Field, 2018, p. 844). A chi-square test relies on two assumptions: (i) independent observations, i.e., each respondent should contribute only to one of the cells of the contingency table, and (ii) expected frequencies, i.e., the expected values should not be below 5 in the case of a 2x2 contingency table, or, in the case of larger tables, all the expected counts should be greater than 1 and no more than 20% of the expected frequencies should be less than 5 (Field, 2018, p. 849).

For this analysis, the null hypothesis for the chi-square test is that the type of capital (economic or cultural) possessed in the field of power and climate change attitudes (acceptance or denial) are not associated (i.e., they are perfectly independent). Hypothesis 1 states that the type of capital (economic or cultural) in the field of power and climate change attitudes (acceptance or denial) are associated.

6.2.1 Initial transformations

The variable *Type of Capital in the field of power*

Among the 130 cases which fulfilled the three cumulative conditions for high economic capital (chapter 6.1.5), there were twelve cases which fulfilled also the two

cumulative conditions for high cultural capital (chapter 6.1.7). Since these cases were positioned within the dominant part in the field of power, I prioritized the possession of high economic capital for them[15]. To ensure that these cases with high economic capital were not additionally classified as cases with high cultural capital, I computed the new dichotomous netHCC variable for high cultural capital (the SPSS syntax can be found in element F.3, Appendix F). The new variable classified 89 cases with high cultural capital (and no high economic capital), and 2901 cases without these conditions (*N*=2990). Thus, up to this point, the analysis had classified 130 cases with high economic capital and 89 cases with high cultural capital into mutually exclusive categories. Then, the variable *Type of Capital in the field of power* was created, with value 1 for cases with high economic capital, and value 2 for cases with high cultural capital (the SPSS syntax can be found in element F.4, Appendix F). Cases not classified into any of these two categories were coded with 0 (Other) and were excluded from the analysis. Thus, the *Type of Capital in the field of power* variable contained 130 cases with high economic capital (59.4%) positioned within the dominant part of the field of power, and 89 cases with high cultural capital (40.6%) positioned within the dominated part of the field of power (*n*=219[16]).

The variable *Climate change attitude*

With regard to climate change attitudes, the survey questionnaire contained the *Klimabenektelse (Klimaskepsis)* question with four response options (chapter 5.2). This question, with the same response options, has been, also, employed in other studies for measuring public opinions on climate change (see e.g. Kaltenborn et al., 2017, p. 3; Leviston, Walker, & Morwinski, 2013). Regarding the *Global oppvarming er en myte* question, it has already been mentioned that, in several cases, there were found inconsistencies among the responses given by the same respondent to the *Klimabenektelse (Klimaskepsis)* and *Global oppvarming er en myte* questions. For my analysis, I opted to proceed with the *Klimabenektelse (Klimaskepsis)* variable and to exclude the *Global oppvarming er en myte* variable for two main reasons. First, the *Klimabenektelse (Klimaskepsis)* variable was a single-select question and more straightforward than the *Global oppvarming er en myte* variable which was

[15] Note that the majority of these cases (12 of 14, unweighted cases) had reported climate change acceptance.
[16] This corresponds to 7.3% of the whole sample in the secondary dataset (weighted cases).

included in a matrix for 7 items measured on a 5-point Likert scale (higher cognitive burden). Second, the *Klimabenektelse (Klimaskepsis)* question had been used in previous studies (cited above) for measuring climate change attitudes, whereas, to my knowledge, no study had employed the *Global oppvarming er en myte* variable as a single item for measuring climate change attitudes without employing additionally several other indicators (see e.g. Feldman, Maibach, Roser-Renouf, & Leiserowitz, 2012, pp. 14-15; McCright & Dunlap, 2011b, p. 164). Thus, the *Global oppvarming er en myte* variable was excluded from the further analysis. Next, the three categories of the *Klimabenektelse (Klimaskepsis)* variable which reflected climate change denial were reduced to one category in the computation of the variable *Climate change attitude*, with value 1 for climate change denial (categories 2, 3 and 4 of the former variable) and value 0 for climate change acceptance (category 1 of the former variable) (the SPSS syntax can be found in element F.5, Appendix F). The rationale for combining the three categories of the *Klimabenektelse (Klimaskepsis)* variable into one single category was based on the theoretical conceptualization of climate change denial followed in this thesis (chapter 1.1).

6.2.2 Results of the chi-square independence test

Table 6.5 displays the contingency table of *Type of Capital in the field of power* by *Climate change attitude*. The expected frequencies are all above 5. As shown in the table, the frequency distributions of *Type of Capital in the field of power* are not the same for all levels of *Climate change attitude*.

Of those respondents who reported climate change denial (76 cases, 34.7% of the total), 77.6% (59 cases) possess high economic capital, whereas 22.4% (17 cases) possess high cultural capital. Of those respondents who reported climate change acceptance (143 cases, 65.3% of the total), 49.7% (71 cases) possess high economic capital, and 50.3% (72 cases) possess high cultural capital (Figure 6.10). For high economic capital, the proportion of 77.6% for climate change denial is significantly more than the proportion of 49.7% for climate change acceptance, whereas for high cultural capital, the proportion of 50.3% for climate change acceptance is significantly more than the proportion of 22.4% for climate change denial (see the *different* subscripts in the columns for high economic capital and high cultural capital showing the results of the z-tests in SPSS; see Field (2018, pp. 854-855)).

Of those respondents with high economic capital, 54.6% reported climate change acceptance, and 45.4% reported climate change denial. Of those respondents with high cultural capital, 80.9% reported climate change acceptance, and 19.1% reported climate change denial. In addition, the standardized residuals are significant at an alpha level of .05 in the case of climate change denial regarding both types of capital (their values lie outside a range of ± 1.96; see Field (2018, p. 857)).

Overall, significantly more respondents than expected of those with high economic capital reported climate change denial, and significantly less respondents than expected of those with high cultural capital reported climate change denial.

Figure 6.10: Bar chart of *Type of Capital in the field of power* by *Climate change attitude* (in counts)

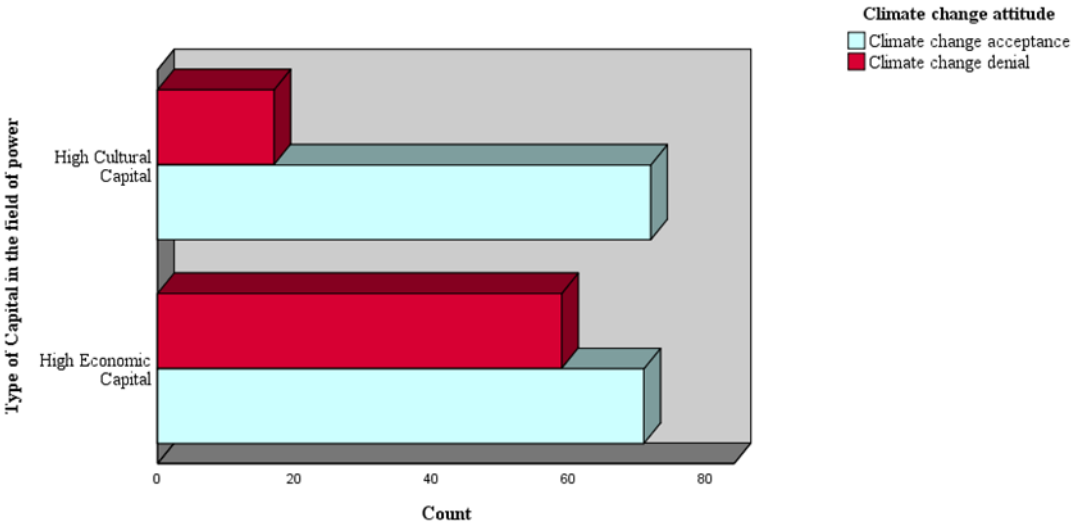


Table 6.5: ***Type of Capital in the field of power - Climate change attitude*** **(*n*=219)**

			Climate change attitude		
			Climate change acceptance	Climate change denial	Total
Type of Capital in the field of power	High Economic Capital	Count	71_a	59_b	130
		Expected Count	84.9	45.1	130.0
		% within Type of Capital in the field of power	54.6	45.4	100.0
		% within Climate change attitude	49.7	77.6	59.4
		% of Total	32.4	26.9	59.4
		Standardized Residual	-1.5	2.1	
	High Cultural Capital	Count	72_a	17_b	89
		Expected Count	58.1	30.9	89.0
		% within Type of Capital in the field of power	80.9	19.1	100.0
		% within Climate change attitude	50.3	22.4	40.6
		% of Total	32.9	7.8	40.6
		Standardized Residual	1.8	-2.5	
Total		Count	143	76	219
		Expected Count	143.0	76.0	219.0
		% within Type of Capital in the field of power	65.3	34.7	100.0
		% within Climate change attitude	100.0	100.0	100.0
		% of Total	65.3	34.7	100.0

Each subscript letter denotes a subset of *Climate change attitude* categories whose column proportions do not differ significantly from each other at the .05 level.

Table 6.6 shows the results of the chi-square test. The value of the chi-square is 16.106, and is highly significant, $p < .001$.

Table 6.6: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	16.106[a]	1	.000		
Continuity Correction[b]	14.967	1	.000		
Likelihood Ratio	16.851	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	16.033	1	.000		
N of Valid Cases	219				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 30.89.

b. Computed only for a 2x2 table

It follows that the *Type of Capital in the field of power* is significantly associated with *Climate change attitude*. For the category of cases with high economic capital, a significantly greater proportion reported climate change denial. On the contrary, for the category of cases with high cultural capital, a significantly greater proportion

reported climate change acceptance. Based on the sample, the type of capital in the field of power significantly influences climate change denial.

Effect size

Table 6.7 with the measures of association provides an estimation of the effect size (Field, 2018, p. 856). The phi coefficient shows a weak negative value of -0.271, which is highly significant ($p < .001$), that is, a value, at least at this level, is unlikely if the null hypothesis of no association was true. A more useful measure of effect size is the odds ratio (OR) (Field, 2018, p. 861). The odds that climate change denial is reported when high economic capital is possessed is 59/71=0.831. The odds that climate change denial is reported when high cultural capital is possessed is 17/72=0.236. The odds ratio is OR=0.831/0.236=3.52. This indicates that when high economic capital is possessed the odds of reporting climate change denial are 3.52 times higher than when high cultural capital is possessed.

Table 6.7: Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	-.271	.000
	Cramer's V	.271	.000
	Contingency Coefficient	.262	.000
N of Valid Cases		219	

Conclusion 1:

The null hypothesis of independence between the type of capital (economic or cultural) in the field of power and climate change attitudes (acceptance or denial) is rejected. A significant association between *Type of Capital in the field of power* and *Climate change attitude* was observed, χ^2 (1) =16.106, $p< .001$. The odds ratio shows that the odds of climate change denial are 3.52 times higher when high economic capital is possessed than when high cultural capital is possessed within the field of power.

7 Hypothesis 2

The association between the type of capital (economic or cultural) possessed in the field of power in Norway and climate change attitudes (acceptance or denial) is mediated by environmental values.

Hypothesis 2 builds on Hypothesis 1 which was confirmed by the analysis in the previous chapter. To examine Hypothesis 2, I conducted two logistic-regression based mediation analyses: (i) with a simple mediation model and (ii) with a parallel multiple mediation model. Prior to the mediation analyses, I performed a (nonlinear) categorical principal component analysis (CATPCA) which served two purposes. First, to examine the appropriateness of the survey items which measured environmental values for testing Hypothesis 2. Second, to reduce the number of the selected variables to their principal components (for the use as covariates of a logistic model a reduced set of principal components of the original predictors see e.g. Aguilera, Escabias, and Valderrama (2006)).

In this chapter, I describe first the steps I followed for conducting CATPCA. Then, I proceed to two mediation analyses for testing my Hypothesis 2, one with a simple mediation model and one with a parallel multiple mediation model. The presentation of the results is integrated in each section.

7.1 Preliminary analysis

7.1.1 Reverse coding variables contained in the matrices of the questionnaire

Reverse coded items are frequently used in questionnaires to reduce response bias, since they draw the respondents' attention to the survey questions. In a group of questions which measure a construct through Likert- items, those items that have a reversed meaning from the rest of the questions and the original direction of the construct must be reverse coded before calculating their total scores. Reverse coding such items is also necessary for assessing the reliability of a group of questions in a questionnaire (Cronbach's alpha). Reverse coding these items facilitates also the interpretation of factor analysis by eliminating negative loadings (Field, 2018, pp. 821-824; Hof, 2012, p. 9; Pelz, n.d.).

The survey questionnaire contained several items which were identified as reverse phrased compared to the rest items included in the same group of questions (matrix):

the item *Vanlige folk som bruker sunn fornuft* in the matrix for 10 items designed to ascertain respondents' level of trust in actors and institutions; the items *At naturen har en såkalt egenverdi er en naiv og feilaktig idé*, and *Klimaforskningen overdriver klimaproblemene* in the matrix for 7 items designed to ascertain respondents' level of agreement with statements referring to nature and the climate[17]; and the items *Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon*, *Jeg har sjelden problemer med å følge med på hva eksperter sier på TV*, and *I Norge kan alle som vil få politisk innflytelse* in the matrix for 11 items designed to ascertain respondents' level of agreement with statements referring to politics and power in Norway. Because the intended analysis would involve variables contained in the matrices of the questionnaire, the values of the above reverse phrased items (and their labels) were reverse coded, so that all the items in each matrix would point to the same direction and their interpretation would ensure the conceptual consistency in each group of questions (an example of the SPSS syntax for reverse coding, and a list of the reverse coded variables can be found in element G.1 and Table G.1, Appendix G, respectively).

7.1.2 Categorical principal components analysis

The categorical principal components analysis for testing Hypothesis 2 involved all the three matrices in the secondary dataset. The matrix with the items designed to ascertain respondents' level of agreement with statements referring to nature and the climate was of primary interest as measuring environmental values. The matrices with the items designed to ascertain respondents' level of trust in actors and institutions and respondents' level of agreement with statements relevant to politics and power were of interest for these variables would be used as covariates in the mediation analysis. For the use of such items in previous studies, I refer the reader, e.g., to Kaltenborn et al. (2017, pp. 3, 4), Whitmarsh (2011), and Corbett and Durfee (2004).

To run CATPCA, I quantified the (27) variables according to the vector model. When an ordinal analysis level was applied to all variables, the transformation plots showed plateaus for some variables. A nominal scaling level was then applied to examine the shape of the lines (Linting & van der Kooij, 2012, p. 21). At the nominal

[17] The reverse coded item *Global oppvarming er en myte* was excluded from the analysis.

level, the categories in the plateaus for most of the variables obtained similar quantifications. These variables were, thus, kept at an ordinal analysis level. However, for eight variables the quantifications were not similar. Thus, a nominal analysis level for these variables was more appropriate in order to account for nonlinear relationships (their transformation plots at nominal and ordinal scaling levels can be found in Figure G.1, Appendix G).

The scree plots according to the eigenvalue (greater than 1) criterium (generated in SPSS by running PCA on the quantified variables, based on two-, three- and four-dimensional solutions), were not identical. The three- dimensional solution produced a scree plot almost identical to the two-dimensional solution, showing an elbow after the third component (Figure G.2, Appendix G), but the four-dimensional solution generated a scree plot showing an elbow rather on the fifth component (Figure G.3, Appendix G). Based on what has been mentioned earlier in the analysis, the solution of three components could be chosen.

The object plots and the component scores showed no outliers roughly exceeding the range of ±3.5. For variable selection, I looked at the communalities of the quantified variables. The variables *Hvis jeg ville, kunne jeg rarskt få et tillitsverv i et politisk parti eller i en organisasjon* and *Jeg har sjelden problemer med å følge med på hva eksperter sier på TV* had VAF 0.195 and 0.100 respectively, indicating poor fit (see Linting & van der Kooij, 2012, p. 19). These variables were excluded from the analysis and a new CATPCA was run with the rest (25) variables. The new CATPCA solution was examined again for outliers (one case was detected with a score of -4.012 for the third dimension, but it was kept in the analysis as not being completely isolated from the other cases). The variable *I Norge kan alle som vil få politisk innflytelse* showed then a low VAF of 0.183 and had to be dropped from the analysis. The next CATPCA solution (24 variables) was examined again for outliers (the same case was again detected with a score of -4.230 for the third dimension, but it was kept in the analysis for the same above reason). All variables had VAF above 0.3, indicating a good fit in the solution (Table G.2, Appendix G). The three-dimensional solution yielded a total eigenvalue (VAF) of 12.794, which reflected 53.31% of the variance in the transformed variables. Thus, the solution indicated a good fit. To rotate the solution, the (24) quantified variables were saved in the secondary dataset

and a linear PCA was run on them with direct oblimin rotation.[18] At this phase, the variables *Vanlige folk som bruker sunn fornuft*, *Klimaforskere*, *Biologer* and *Naturvernforbundet* showed considerable cross-loadings on more than one components (Table G.3, Appendix G). This could indicate that the components were correlated. In any case, in terms of interpretability, the variables were not appropriate for distinguishing the components (see Field, 2018, p. 815). To achieve a simple structure in the CATPCA solution, I run again the analysis with the rest (20) variables, after excluding the above variables with cross-loadings. No outliers were detected in the new solution (Figure 7.1). All variables had VAF above 0.3, indicating a good fit (Table 7.1). The three-dimensional solution yielded a total eigenvalue (VAF) of 11.025, which explained 55.12% of the variance in the transformed variables (first component: 31.43%; second component: 13.75%; third component: 9.94%). Thus, this CATPCA solution indicated a good fit and was the final one.

To rotate the solution, the 20 quantified variables were saved in the secondary dataset (with the names and labels shown in Table 7.3) and a linear PCA was run on them with oblique (promax) rotation (for allowing correlation between the components, see Field (2018, p. 794)). The Pattern Matrix in Table 7.2 informs about the unique contribution of each variable to the components (Field, 2018, p. 816). As it seen in Table 7.2, a simple structure was finally achieved, with each of the variables loading highly on only one component[19].

[18] Rotation in CATPCA could not converge again for unknown reason.

[19] According to the PCA output in SPSS, the Kaiser-Meyer-Olkin statistic for sampling adequacy was 0.895, the diagonal elements of the anti-image matrix were all above .5, and Barlett's test of sphericity was significant ($p < .001$), all verifying adequate sample size. There were also 3 components extracted based on Kaiser's eigenvalue (greater than 1) criterium. With regard to the fit of the model, the footnote of the reproduced correlation matrix showed 53 (27%) residuals, i.e., less than 50% which could be of worry (see Field, 2018, pp. 798-799, 806-813, 819).

Figure 7.1: Scatter plots from the three-dimensional solution

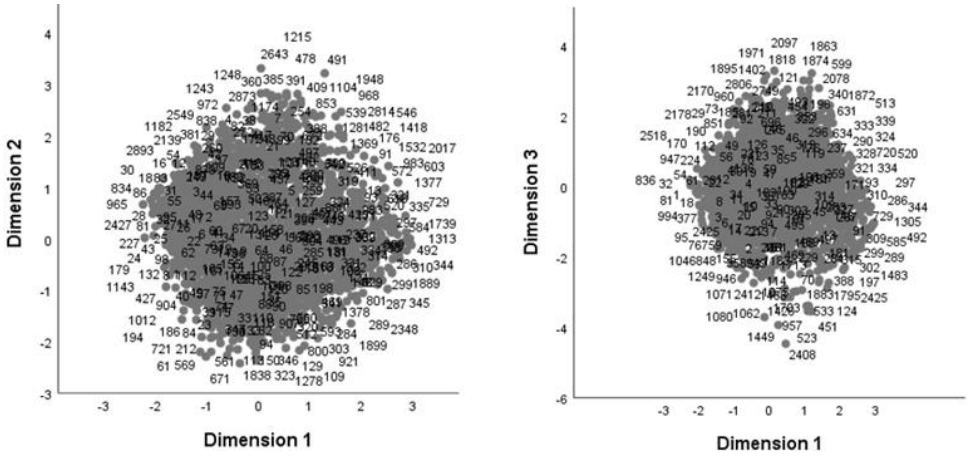


Table 7.1: Variance Accounted For in the three-dimensional solution with 20 variables (*N*=2990)

	Dimension			
	1	2	3	Total
Klima- og miljødepartementet	.511	.000	.229	.740
Miljødirektoratet	.508	.002	.230	.740
Politikerne er mest opptatt av å sikre seg selv og sine egne posisjoner	.454	.119	.018	.591
Eksperter uten praktisk erfaring bestemmer for mye her i landet	.442	.080	.064	.585
Vanlige folk er ærligere enn politikere	.433	.072	.076	.581
Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk	.425	.122	.057	.604
Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen	.382	.065	.076	.523
Sunt folkevett er bedre enn formell utdannelse	.382	.010	.124	.516
Klimaforskningen overdriver klimaproblemene (reverse coded)	.356	.212	.066	.634
Stortingspolitikere	.354	.070	.175	.598
Klimaendringene er vår tids største miljøproblem	.314	.286	.020	.620
Statens naturoppsyn (SNO)	.285	.014	.199	.498
Politienhetene som etterforsker miljøkriminalitet	.264	.008	.220	.492
Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om	.240	.110	.057	.407
Politikere har egentlig liten innflytelse, det er pengene som rår	.192	.096	.071	.359
Jeg syns det er riktig at norsk naturvernlovgivning har naturens egenverdi som utgangspunkt	.206	.377	.006	.588
Balansen i naturen er skjør og kan lett forstyrres av menneskelige aktiviteter	.207	.364	.013	.583
Økonomisk vekst er den største trusselen mot et bærekraftig miljø	.030	.344	.000	.374
At naturen har en såkalt egenverdi er en naiv og feilaktig ide (reverse coded)	.141	.341	.039	.520
Lokalpolitikere	.159	.060	.250	.469
Active Total	6.286	2.751	1.988	11.025
% of Variance	31.428	13.756	9.941	55.124

Based on the Pattern Matrix (Table 7.2), the variables that load highly on the first component seem to share a common theme, which could be interpreted as *Political alienation*; the variables that load highly on the second component seem to share a common theme, which could be interpreted as *Environmental values*; and the variables that load highly on the third component seem to share a common theme, which could be interpreted as *Trust in environmental actors and institutions*. The analysis, thus, revealed three components measured through those variables clustering together on each component. Figure 7.2 visualizes this in a three-dimensional rotated space.

Table 7.2: Pattern Matrix [a] in the three-dimensional solution with 20 variables (in bold loadings > 0.30) (*N*=2990)

	Component		
	1	2	3
Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk	**.771**	.055	-.041
Vanlige folk er ærligere enn politikere	**.753**	-.035	.001
Eksperter uten praktisk erfaring bestemmer for mye her i landet	**.747**	-.017	-.028
Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen	**.722**	-.036	.019
Politikerne er mest opptatt av å sikre seg selv og sine egne posisjoner	**.700**	.076	-.162
Sunt folkevett er bedre enn formell utdannelse	**.685**	-.205	.110
Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om	**.667**	.091	.027
Politikere har egentlig liten innflytelse, det er pengene som rår	**.645**	.079	.079
Balansen i naturen er skjør og kan lett forstyrres av menneskelige aktiviteter	.024	**.761**	.030
Jeg syns det er riktig at norsk naturvernlovgivning har naturens egenverdi som utgangspunkt	.060	**.760**	.068
At naturen har en såkalt egenverdi er en naiv og feilaktig ide (reverse coded)	-.007	**.742**	-.092
Klimaendringene er vår tids største miljøproblem	-.099	**.737**	.050
Klimaforskningen overdriver klimaproblemene (reverse coded)	-.255	**.711**	-.054
Økonomisk vekst er den største trusselen mot et bærekraftig miljø	.252	**.624**	.019
Klima- og miljødepartementet	-.041	.094	**.808**
Miljødirektoratet	-.015	.130	**.806**
Lokalpolitikere	.001	-.258	**.715**
Stortingspolitikere	-.185	-.189	**.712**
Politienhetene som etterforsker miljøkriminalitet	.119	.113	**.708**
Statens naturoppsyn (SNO)	.107	.152	**.691**

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Figure 7.2: Component plot in a three-dimensional rotated space

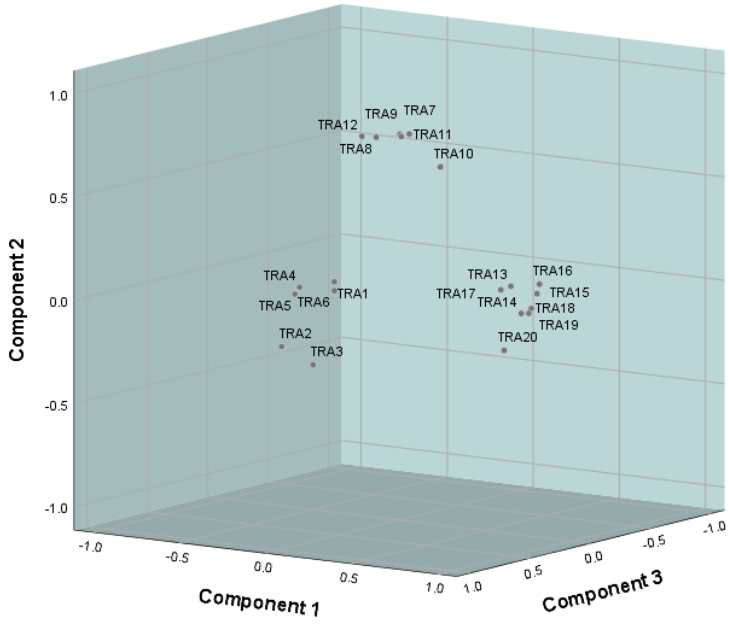


Table 7.3: Names and labels of the 20 transformed variables in the three-dimensional CATPCA solution

Name	Label
TRA1	Statens naturoppsyn (SNO)
TRA2	Stortingspolitikere
TRA3	Lokalpolitikere
TRA4	Miljødirektoratet
TRA5	Klima- og miljødepartementet
TRA6	Politienhetene som etterforsker miljøkriminalitet
TRA7	Balansen i naturen er skjør og kan lett forstyrres av menneskelige aktiviteter
TRA8	Klimaendringene er vår tids største miljøproblem
TRA9	Jeg syns det er riktig at norsk naturvernlovgivning har naturens egenverdi som utgangspunkt
TRA10	Økonomisk vekst er den største trusselen mot et bærekraftig miljø
TRA11	At naturen har en såkalt egenverdi er en naiv og feilaktig ide (reverse coded)
TRA12	Klimaforskningen overdriver klimaproblemene (reverse coded)
TRA13	Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om
TRA14	Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen
TRA15	Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk
TRA16	Politikerne er mest opptatt av å sikre seg selv og sine egne posisjoner
TRA17	Politikere har egentlig liten innflytelse, det er pengene som rår
TRA18	Eksperter uten praktisk erfaring bestemmer for mye her i landet
TRA19	Vanlige folk er ærligere enn politikere
TRA20	Sunt folkevett er bedre enn formell utdannelse

With regard to the relationship between the three components, Table 7.4 contains the Structure Matrix (which shows shared variance) and Table 7.5 shows the Component

Correlation Matrix (see Field, 2018, p. 816). *Political alienation* and *Trust in environmental actors and institutions* are the most correlated components. *Environmental values* show a weaker relationship to the other two components, whereas *Trust in environmental actors and institutions* shows the strongest relationship to the other two components. Thus, the components are not independent (justifying the choice of promax rotation, see Field (2018, p. 817)). The findings are in accordance with common-sense expectations: the particular environmental actors and institutions are from the political realm, whereas trust in environmental actors and institutions carries both environmental and political references.

Table 7.4: Structure Matrix of the quantified variables (values < .30 are omitted) (*N*=2990)

	Component		
	1	2	3
Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk	.775		-.375
Eksperter uten praktisk erfaring bestemmer for mye her i landet	.764		-.372
Vanlige folk er ærligere enn politikere	.762		-.351
Politikerne er mest opptatt av å sikre seg selv og sine egne posisjoner	.754		-.458
Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen	.723		-.319
Sunt folkevett er bedre enn formell utdannelse	.689	-.353	
Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om	.631		
Politikere har egentlig liten innflytelse, det er pengene som rår	.589		
Klimaendringene er vår tids største miljøproblem	-.315	.778	.312
Jeg syns det er riktig at norsk naturvernlovgivning har naturens egenverdi som utgangspunkt		.764	
Balansen i naturen er skjør og kan lett forstyrres av menneskelige aktiviteter		.763	
Klimaforskningen overdriver klimaproblemene (reverse coded)	-.417	.762	
At naturen har en såkalt egenverdi er en naiv og feilaktig ide (reverse coded)		.716	
Økonomisk vekst er den største trusselen mot et bærekraftig miljø		.564	
Klima- og miljødepartementet	-.432	.343	.854
Miljødirektoratet	-.414	.371	.851
Stortingspolitikere	-.458		.740
Politienhetene som etterforsker miljøkriminalitet			.688
Statens naturoppsyn (SNO)		.327	.687
Lokalpolitikere			.639

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.

Table 7.5: Component Correlation Matrix

Component	1	2	3
1	1.000	-.262	-.453
2	-.262	1.000	.295
3	-.453	.295	1.000

Extraction Method: Principal Component Analysis.
Rotation Method: Promax with Kaiser Normalization.

7.1.3 Cronbach's *α* for the three principal components

Reliability analysis was performed separately for each component (see Field, 2018, p. 823). All three components had high internal consistency coefficient: for *Political alienation*, Cronbach's α=0.85; for *Environmental values*, Cronbach's α=0.80; for *Trust in environmental actors and institutions*, Cronbach's α=0.83. Table 7.6 shows the Item-Total Statistics for each component. The values in the columns Corrected Item-Total Correlation are all above 0.3. The values in the columns Cronbach's Alpha if Item Deleted show that reliability for each component would not increase if any item was deleted.

Summary of the categorical principal component analysis

A categorical principal component analysis was performed with 27 variables analysed at ordinal and nominal scaling level. A three-dimensional solution was supported by the scree plots from the two-, three-and four-dimensional solutions. For variable selection, a minimum VAF value of 0.3 was considered, and three variables were excluded from the analysis for this reason. The quantified variables were submitted to standard PCA for a rotated solution (direct oblimin). To achieve a simple structure, four more variables were excluded from the analysis. The final analysis was run with 20 variables. The 20 quantified variables were submitted to standard PCA for a rotated solution (oblique promax), reaching a simple structure. Three components explained in combination 55.12% of the variance in the variables. The three components were identified as representing the constructs of *Political alienation* (Cronbach's α=0.85), *Environmental values* (Cronbach's α=0.80), and *Trust in environmental actors and institutions* (Cronbach's α=0.83). The component scores were saved in the secondary dataset to be used for further analysis (see Field, 2018, pp. 786-787, 804, 818).

Table 7.6: Reliability analysis for the 3 components: Item-Total Statistics

Political alienation (Cronbach's α = 0.85)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item -Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk	24.63	31.651	.660	.464	.820
Vanlige folk er ærligere enn politikere	24.84	30.016	.657	.473	.819
Eksperter uten praktisk erfaring bestemmer for mye her i landet	24.62	30.968	.652	.440	.820
Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen	25.17	30.330	.586	.362	.828
Politikerne er mest opptatt av å sikre seg selv og sine egne posisjoner	24.63	31.265	.643	.452	.821
Sunt folkevett er bedre enn formell utdannelse	25.17	30.439	.574	.376	.830
Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om	24.62	32.999	.473	.241	.841
Politikere har egentlig liten innflytelse, det er pengene som rår	25.13	33.975	.433	.194	.845

Environmental values (Cronbach's α = 0.80)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Balansen i naturen er skjør og kan lett forstyrres av menneskelige aktiviteter	18.53	14.653	.641	.446	.753
Jeg syns det er riktig at norsk naturvernlovgivning har naturens egenverdi som utgangspunkt	18.41	15.924	.583	.376	.770
At naturen har en såkalt egenverdi er en naiv og feilaktig ide (reverse coded)	18.44	16.238	.443	.290	.795
Klimaendringene er vår tids største miljøproblem	18.76	13.443	.673	.556	.742
Klimaforskningen overdriver klimaproblemene (reverse coded)	19.17	13.021	.645	.499	.750
Økonomisk vekst er den største trusselen mot et bærekraftig miljø	19.11	16.030	.398	.177	.806

Trust in environmental actors and institutions (Cronbach's α = 0.83)

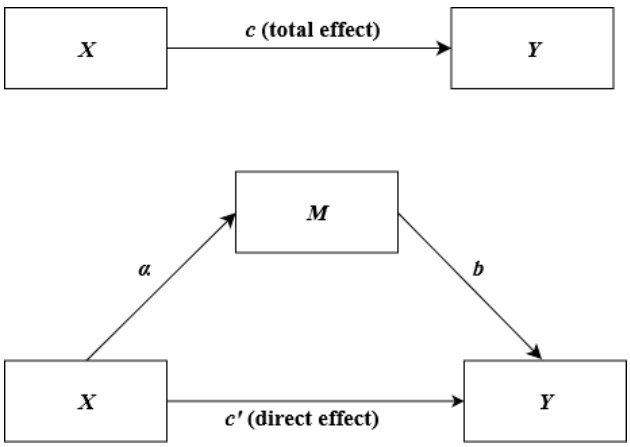
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Klima- og miljødepartementet	14.55	12.484	.753	.726	.774
Miljødirektoratet	14.41	12.608	.759	.734	.773
Lokalpolitikere	15.24	14.740	.447	.331	.838
Stortingspolitikere	15.41	14.048	.604	.456	.807
Politienhetene som etterforsker miljøkriminalitet	14.33	14.046	.548	.317	.818
Statens naturoppsyn (SNO)	13.99	14.424	.539	.366	.819

7.2 Testing Hypothesis 2: Mediation analysis with a simple mediation model

7.2.1 On the mediation analysis approach

Mediation analysis is a statistical method used to examine how a predictor variable X transmits its effect on an outcome variable Y (Hayes, 2018, p. 78). Figure 7.3 is a conceptual diagram of a simple mediation model. This causal system contains two outcome variables, M and Y, and two predictor variables, X and M. The variable X causally influences the variables Y and M, and the variable M exerts influence on the variable Y. Thus, variable X influences variable Y through two pathways: (i) the pathway directly from X to Y, depicted on the diagram as pathway *c'*, which is the direct effect of X on Y, and (ii) the pathway depicted on the diagram as the product *αb* of the two pathways *α* and *b*, which is the indirect effect of X on Y through M (mediator variable). Pathway *α* is the pathway from the predictor variable X to the outcome variable M (the total effect of X on M). Pathway *b* is the pathway from M as predictor variable to Y as the outcome variable (the total effect of M on Y while controlling for X) (Hayes, 2018, pp. 79, 82). By combining the direct and indirect effects of X on Y, we get the total effect *c* of X on Y, i.e., the effect we would have if we only regressed Y on X, without considering M (Hayes, 2018, p. 112). Since there are two outcome variables in this causal system, it is represented algebraically by two equations, one for each outcome (Hayes, 2018, p. 82) (see also Demming, Jahn, & Boztug, 2017, pp. 77-78, 81).

Figure 7.3: A conceptual diagram of a simple mediation model



According to the traditional approach to mediation analysis, called the *causal steps method* or *Baron and Kenny method*, an association between X and Y is a necessary

precondition for mediation (Hayes, 2018, pp. 113-121). Moreover, the causal steps method focuses on a sequence of tests of significance for each path as necessary conditions for mediation. It requires first an association of X and Y (pathway *c'*); it then estimates the effect of X on M for statistical significance (pathway α); if this criterion is met, it proceeds to examine the effect of M on Y while controlling for X. If significant results are found within this sequence, the direct effect of X on Y is compared to the total effect of X on Y. If the direct effect is closer to 0 than the total effect, and is not statistically significant, then it is said that M mediates completely the effect of X on Y. If the direct effect is statistically significant, then it is said that M partially mediates this relationship between X and Y.

This approach is criticized as misguided and in the modern literature of mediation analysis is no longer recommended. Most scholars today accept that evidence of an association between X and Y is not a necessary condition for causality (Backe, Patil, Nes, & Clench-Aas, 2018, p. 156; Demming et al., 2017, pp. 77, 81-83; Field, 2018, pp. 500-508; Hayes, 2018, pp. 80, 113-121, 146; Hayes & Rockwood, 2017, p. 43; Meyers, 2016, p. 68; Valeri & VanderWeele, 2013, p. 138). Statistical significance of both pathways α and *b* is not a requirement, since the indirect effect of X on Y is not an estimation of α and *b*, but an estimation of the product αb of α and *b* (Hayes, 2018, p. 116). It is possible that X influences Y through M even without evidence that the total effect is different from zero (e.g. in case of suppression, or when there are subpopulations in which X exerts opposite influences on Y, etc.). According to the modern thinking of mediation analysis, it is "the test of the indirect effect that matters, not the test on the individual paths in the model" (Hayes, 2018, p. 119). As Hayes (2018), advocating a regression based bootstrapping approach to mediation analysis, puts it,

> Modern mediation analysis emphasizes an explicit estimation of the indirect effect, inferential tests of the indirect effect that don't make unnecessary assumptions, and an acknowledgment that evidence of a statistically significant association between X and Y is not necessary to talk about and model intervening variable processes (in which case the concepts of complete and partial mediation simply don't make sense). (p. 146)

Moreover, as mediation analysis is a causal model, it is important to account for potential alternative possibilities (epiphenomenal association) and confounding or spurious association with other variables. This is approached by adding these

variables into the mediation model (Hayes, 2018, pp. 121-129; Valeri & VanderWeele, 2013, p. 140; VanderWeele, 2016, pp. 19-22). Controlling for other variables which are sources of epiphenomenal association or confounding addresses the threat posed by these variables to claims of causality in a mediation analysis. This statistical manipulation, however, cannot imply that other such variables do not exist neither allows an interpretation of a mediation found in an analysis as an unambiguous causality, because one can never really explain entirely an association, regardless how many intervening variables linking X and Y a mediation model includes (Hayes, 2018, pp. 18, 129). Again, according to Hayes (2018):

> Unfortunately, one can never know whether an association observed between an antecedent [predictor variable] or consequent [outcome variable] is causal or can be attributed to some other variable or variables that haven't been statistically controlled for in the model. But knowing that a relationship of interest persists when holding other things constant at least eliminates some alternative explanations. Ultimately, the best one can do absent data that afford more unequivocal causal interpretation is attempt to control for covariates that critics might argue are responsible for the association you are claiming is causal, in the hope that those critics will be satisfied if the association of interest stands up to the statistical control process. (p. 52)

Mediation assumes that M is "causally located between X and Y" in a causal chain of events. This implies a temporal precedence of the cause with regard to the effect. Given limitations of the data, there will be cases in which the direction of a causal flow is based only on solid theoretical or logical grounds (Hayes, 2018, pp. 81, 129-132; Kane & Ashbaugh, 2017, p. 159).

Logistic-regression based mediation analysis with a dichotomous outcome variable

Some further considerations regarding logistic-regression based mediation analysis with a dichotomous outcome variable merit attention. In the mediation analysis literature, two different methods have been applied for calculating the indirect effect. The first method is the *product-of-coefficients* approach, which calculates the indirect effect as the product αb of the pathways α and b. Another approach is the *difference-between-coefficients* approach, which calculates the indirect effect as the difference between the c and c' pathways (Rijnhart, Twisk, Eekhout, & Heymans, 2019, p. 1; Valeri & VanderWeele, 2013, p. 141; VanderWeele, 2016, pp. 18-19). While these two methods yield the same results when mediator and outcome variables are

continuous, in the case of a dichotomous outcome variable and logistic regression, simulation studies have shown that these two methods yield different estimates of the indirect effect (Rijnhart et al., 2019, p. 2; Valeri & VanderWeele, 2013, p. 142; VanderWeele, 2016, p. 19). To overcome this problem, some scholars have proposed standardization of the logistic regression coefficients (y-standardization, full-standardization or standardized logistic solution). Another logistic-regression based approach has been proposed by VanderWeele and Vansteelandt (2010) under the assumptions of: (i) no unobserved confounders (ii) no interaction between the effects of the predictor and the mediator variables on the outcome (or including the interaction in the model if there exists one) and (iii) a "rare" event, i.e., a low outcome prevalence, for which the cut-off point of 10% is usually used (see also Rijnhart et al., 2019, p. 4; Valeri & VanderWeele, 2013, pp. 139-140). However, in the literature remains unclear yet which method should be applied and under which conditions (Rijnhart et al., 2019, p. 2). In their study Rijnhart et al. (2019) showed that standardization does not necessary increase the performance of the estimates. In addition, according to Valeri and VanderWeele (2013, pp. 140, 142) (see also VanderWeele, 2016, pp. 22-23), in mediation analysis with a dichotomous outcome, when the outcome event is not "rare" (i.e., above 10%), the odds ratio used in logistic regression does not approximate the risk ratio and logistic regression biases the estimates of the effects. In cases where the outcome is common (not rare), the scholars advocate the use of a generalized linear regression model with a binomial distribution and a log link, instead of logistic regression, for conducting mediation analysis (pp. 140-142). However, the scholars note that the product approach can still be used in a logistic regression with "common" outcome to test for mediation, i.e., to test whether the product of the coefficients is different from zero, but these estimates should not be interpretable as measures of the indirect effect (pp. 142-143). In other words, if the product is nonzero, it implies the presence of an indirect effect. Thus, the product method can still provide a valid test for the presence of an indirect effect (provided that the rest of the assumptions mentioned above hold). In the simulation study of Rijnhart et al. (2019, p. 9) it was shown that the bias of the estimates of the indirect effect across different prevalence rates of 0.10, 0.30, and 0.50 were low-although the researchers noted that the odds ratios won't approximate the risk ratios for high rates from 10% to 50%. Moreover, Samoilenko, Blais, and Lefebvre (2018, p. 204) have found that it is possible the odds ratio not to be interpretable as relative

risk even when the outcome is rare (below 10%). In another article by VanderWeele (2010), the following are stated:

> In this appendix, we give bias formulas for the controlled direct effect and natural direct and indirect effect risk ratios for settings in which there is an unmeasured confounder *U* of the mediator-outcome relationship under certain simplifying assumptions. ... *If the outcome is rare in all strata of exposure A, mediator M, covariates C, and unmeasured confounder U* [emphasis added], then these bias formulas for the risk ratio can also be used for the odds-ratio scale. (p. 550)

The above all studies are demanding of algebraic competence, and it is beyond my personal competence to investigate and elaborate more on them. Regarding the assumption of a *rare* outcome in mediation analysis, however, after a literature review, I concluded that although the assumption is mainly used in mediation analyses in clinical-epidemiological studies, it remains actually an unclear assumption in this very same field (see such a recognition in Samoilenko et al. (2018, p. 203)) - let alone that, to my knowledge, there is a lack of social sciences literature taking into account this assumption as a prerequisite for logistic-regression based mediation analysis. Lately, VanderWeele, Valeri, and Ananth (2018) stated that they themselves and many other scholars have not been "as careful in the precise statement of this assumption as might be hoped", and added that "greater care should certainly be taken in the articulation of this assumption, and we will endeavor to do so in the future".

Based on all the above, I considered as most appropriate to discuss this issue and to proceed with a logistic-regression based mediation model for the effect of *Type of Capital in the field of power* on *Climate change attitude*.

7.2.2 Mediation analysis through the PROCESS tool. The mediation model

For examining the hypothesis that *Type of Capital in the field of power* transmits its effect on *Climate change attitude* through *Environmental values*, I conducted a mediation analysis after installing in SPSS the PROCESS tool (Hayes, 2018)[20] (see also Hayes, Montoya, & Rockwood, 2017), a freely available[21] and widely used computational tool for modelling path analysis-based mediation and moderation

[20] The tool was developed by Andrew F. Hayes and its use is documented in the book *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach* (Hayes, 2018). The guidelines of this book were followed throughout the mediation analyses in this thesis.
[21] http://processmacro.org/download.html.

analyses or moderated mediation (see e.g. Demming et al., 2017; Field, 2018, pp. 166, 502; Goodboy, Martin, & Bolkan, 2017; Kane & Ashbaugh, 2017; Kreijns, Vermeulen, Buuren, & Van Acker, 2017; Newsom, 2016). For mediation models, PROCESS requires at least two regression equations and estimates each equation separately. It handles dichotomous outcome variables with maximum likelihood logistic regression (for the direct, indirect and the path from the mediator to the outcome variable), while using ordinary least squares (OLS) regression for estimating the parameters of the model for the mediator variable. PROCESS provides a set of conceptual and statistical diagrams based on a model number, and the user can choose one of the preprogrammed models which corresponds to the model of their interest (Hayes, 2012, pp. 11, 22; Hayes et al., 2017, p. 77).

For examples in the literature in which PROCESS has been used for logistic-regression based mediation analysis, I refer the reader, for instance, to Meyers (2016, p. 129); Backe et al. (2018, p. 156); Berntson (2015, pp. 33, 35, 39-40); Dance, DeBerard, and Gundy Cuneo (2016, p. 68); Jones et al. (2015, p. 571); Tsfati and Nir (2017, p. 315); Vindholmen, Høigaard, Espnes, and Seiler (2014, pp. 81-82, 85).

Hayes (2012, p. 22) provides two cautionary notes for the users of PROCESS. First, Imai, Keele, and Tingley (2010, p. 331) have shown through simulations that estimating the indirect effect as the product of OLS and logistic regression coefficients can produce biased results in some situations. Second, logistic regression in case of dichotomous outcome variable leads to the indirect and total effects of X on Y being scaled differently, that is, the total effect will not equal the sum of direct and indirect effect of X on Y. This point is related to the application of the *different* method, which applies the difference between the total and direct effect as a substitute for estimating the indirect effect. It is also related to the use of this difference as a measure of effect size. The quantification of effect size in mediation analysis, according to Hayes (2018, p. 133), “is an evolving area of thought and research”. I considered this to be the reason for most of the studies using logistic-regression based mediation analysis being silent on effect size. In addition, the prerequisites for applying most of the common measures of effect size, as they are discussed thoroughly by Hayes (2018, pp. 133-140), were not met for this analysis (see also Meyers, 2016, pp. 73, 74).

Another important aspect to be mentioned is that PROCESS cannot accommodate sampling weights into the estimation process (Hayes, 2012, p. 23). However, weights can introduce instability to the data and it is generally recommended not to use weights for regression models to avoid biased estimates and standard errors. This is a kind of trade-off between more stability and more accurate representativeness (see Gideon, 2012, p. 65; Johnson, 2008). Hence, the mediation analyses were conducted on unweighted cases (n=237) (see e.g. Backe et al., 2018, p. 156; Berntson, 2015, pp. 22-23).

I specified the mediation model in PROCESS as model number 4 (simple mediation). For statistical inference for the indirect effect I used bootstrapping (a 95% percentile bootstrap confidence interval using 10,000 bootstrap samples, with seed 23543). Bootstrap CI was preferred as making no assumptions about the sampling distribution of the indirect effect, having more power and yielding more accurate results than other methods (e.g. the Sobel test, normal theory approach) when testing for indirect effects. If a CI includes zero, it does not provide evidence of a mediated effect of X on Y. If CI does not include zero, one can claim with 95% confidence that there is a statistically significant indirect effect. The indirect effect is positive or negative, dependent on whether the limits of CI are entirely above or below 0, respectively. In addition, the positive or negative signs of the α and b pathways are important when examining an indirect effect. For example, a theory of a positive indirect effect of X on Y, because X is positively related to M and M is positively related to Y, cannot be confirmed when both the signs of the α and b pathways are shown to be negative (Demming et al., 2017, p. 83; Hayes, 2012, p. 6; 2018, pp. 97-107; Hayes & Rockwood, 2017, pp. 43-44; Kane & Ashbaugh, 2017, p. 153; Meyers, 2016, pp. 72, 130; Shannon et al., 2018, p. 6).

Considering covariates

Several covariates, contained in the secondary dataset, had to be considered in the mediation analysis to account for alternative explanations (see e.g. Hayes & Rockwood, 2017, p. 42). With regard to climate change attitudes, for example, a study of Davidson and Haan (2012) on climate change attitudes in Canada (Alberta), showed that women exhibited greater awareness of perceived impacts about climate change than men. These gender differences (were not attributable to gendered social

roles but) were related to political attitudes, with women being less inclined to ascribe to a conservative political ideology (vote for a conservative government) compared to men, and with political ideology showing the strongest predictive value in this study. Political ideology, party affiliation, and gender have been found related to views on climate change in several other studies (see e.g. McCright & Dunlap, 2011a; McCright et al., 2016; Olofsson & Öhman, 2006; Zia & Todd, 2010). Other potential factors exerting influence on climate change attitudes are political alienation (estrangement from the political system) (see Ehrhardt-Martinez et al., 2015, p. 224), and lack of trust and confidence in scientists, environmental actors and institutions (Buys et al., 2014; Dunlap & McCright, 2015, p. 313; Kaltenborn et al., 2017; Krosnick & MacInnis, 2012).

Therefore, I considered that the following covariates should be included in the mediation model: *Political alienation*, *Trust in environmental actors and institutions*, *Parti ved sist Stortingsvalg*, and *Kjønn* (for the use as covariates of a logistic model a reduced set of principal components of the original predictors see Aguilera et al. (2006)). The variable *Parti ved sist Stortingsvalg* was multi-categorical, and, based on the above, it was conservative voting (conservative political orientation) that was of main interest for the analysis. Thus, I computed the new *Conservative Voting* variable, with categories 0 for *No* and 1 for *Yes*, based on whether a respondent had reported voting one of the two conservative parties included in the survey: *Fremskrittspartiet* (Progress Party, right-wing) or *Høyre* (Conservative Party, centre-right) (see "List of political parties in Norway,")[22] (the SPSS syntax can be found in element G.2, Appendix G). In addition, to proceed to logistic-regression based mediation, the variable *Type of Capital in the field of power* was recoded with value 0 for high cultural capital and value 1 for high economic capital[23], whereas the variable *Kjønn* was recoded with value 0 for *Kvinne* and value 1 for *Mann*. Recall that *Climate change attitude* was coded with 0 for climate change acceptance, and 1 for climate change denial.

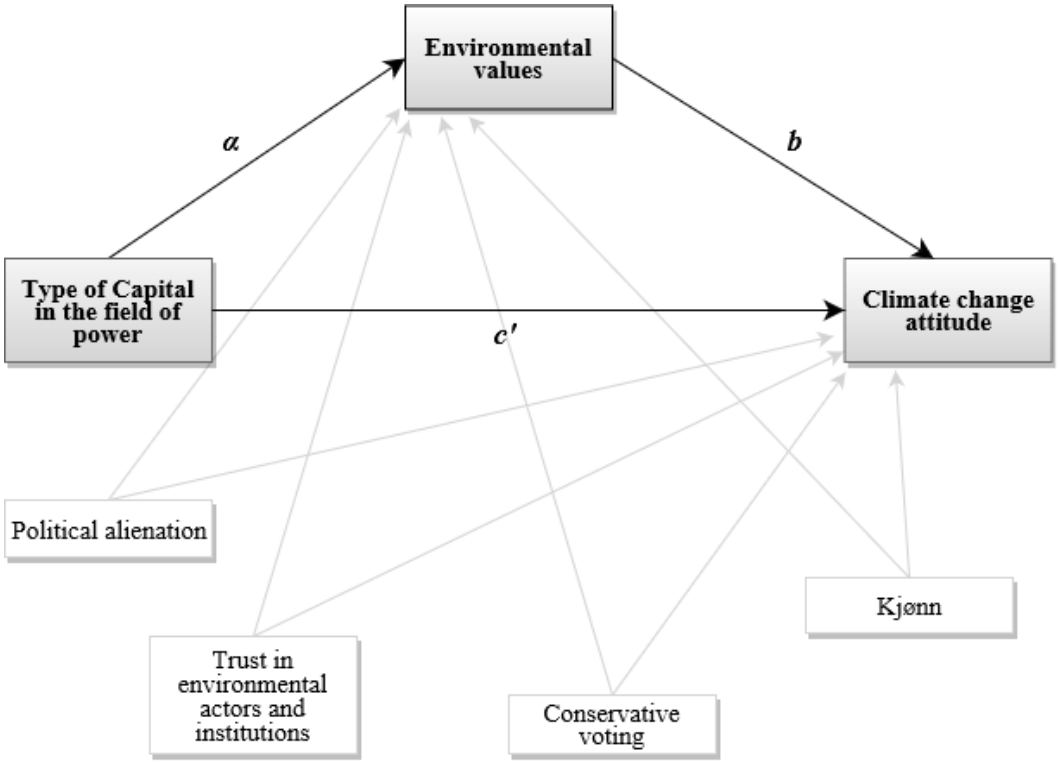
[22] The Wikipedia page mentions also the non-parliamentary party *Kystpartiet* as representing national conservatism. This political party was included in the survey, but was not of interest for this analysis, since none of the respondents with high economic capital or high cultural capital had chosen this response option.

[23] The category Other was again excluded from the analysis.

In PROCESS, by default, covariates are included as additional predictor variables in the model for the mediator and the models for the outcome variable. This way PROCESS controls completely for them (Hayes, 2018, pp. 127, 560).

Figure 7.4 is a conceptual diagram (based on Hayes, 2018, p. 123) of the simple mediation model while controlling for the covariates *Political alienation*, *Trust in environmental actors and institutions*, *Conservative voting* and *Kjønn*. Based on Hypothesis 2, *Type of Capital in the field of power* is proposed to be negatively related to *Environmental values* (pathway *α*), and *Environmental values* is proposed to be negatively related to *Climate change attitude* (pathway *b*). These two pathways will be used to estimate the proposed *positive* indirect effect of *Type of Capital in the field of power* on *Climate change attitude*. The direct effect of *Type of Capital in the field of power* on *Climate change attitude*, while keeping *Environmental values* constant, is shown on the conceptual diagram as pathway *c'*.

Figure 7.4: Conceptual diagram (based on Hayes, 2018, p. 123) of the simple mediation model for the mediating effect of *Environmental values* on the relationship between *Type of Capital in the field of power* and *Climate change attitude*, while controlling for four covariates: *Political alienation, Trust in environmental actors and institutions, Conservative voting,* and *Kjønn.*



7.2.3 Preliminary analyses for linear and logistic regression

Linear regression (assumptions, casewise diagnostics, multicollinearity)

The assumptions of OLS regression were examined prior to the mediation analysis. These assumptions are: (i) linearity between the predictor variables and the outcome variable (ii) normality, i.e., normal distribution of the errors (iii) homoscedasticity (iv) independence of errors (see Hayes, 2018, pp. 68-73; Kane & Ashbaugh, 2017, pp. 151-152). Diagnostic statistics for outliers or influential cases (bias), and multicollinearity were also assessed (see Field, 2018, pp. 381-388, 397-425, 508; Hayes, 2018, pp. 68-73). For these purposes, the variables *Type of Capital in the field of power*, *Political alienation*, *Trust in environmental actors and institutions*, *Conservative voting*, and *Kjønn* were entered (forced entry) into a linear regression model in SPSS with *Environmental values* as the outcome variable.

- **Multicollinearity** (see Field, 2018, pp. 401-402, 409, 417): The correlation matrix, containing the Pearson correlation coefficient between every pair of variables, showed no substantial correlations (r >0.9) between the predictor variables (Table 7.7). The highest correlation was between *Political alienation* and *Trust in environmental actors and institutions*, r =- .506, p< .001. The *Conservative Voting* variable correlated best with the outcome variable *Environmental values*, r = -.370, p< .001. Moreover, the VIF values were all below 10, the average VIF was slightly greater than 1, and the tolerance statistics were all above 0.2 (Table 7.8; see also Table 7.9). Thus, no multicollinearity was found between the predictors.

- **Bias** (see Field, 2018, pp. 257, 383-385, 420-425):

(i) casewise diagnostics. I looked for standardized residuals outside the range of ±1.96. There were five residuals outside this range (2.11%, n=237), one of them lied outside ±2.58, but none of them lied outside ±3.29 (Table G.4, Appendix G). None residual had Cook's distance greater than 1. The average leverage was (k+1)/n=6/237=0.025, and seven cases were outside twice this value (0.051); one of these cases was outside three times this value (0.076) (Table G.5, Appendix G). These cases had also Mahalanobis distances that exceeded a cut-off point of 11.07 (p=.05), and the same above case with the highest leverage exceeded a cut-off point of 15.09 (p=.01) (case number 1, Table G.5, Appendix G). The boundaries based on the covariance ratio were 1+(3(k+1)/n)=1.07 and 1-(3(k+1)/n)=0.92. Two of the above cases which exceeded the thresholds for leverage and Mahalanobis distances

were outside the boundary of 1.07 for the covariance ratio (cases number 1 and 5, Table G.5, Appendix G). The DFBeta statistics where within ± 1. Considering the very low Cook's distances for these cases, there were no grounds for serious concerns. To conlude, the model appeared unbiased by outliers or influential cases.

(ii) assumptions. Linearity, homoscedasticity and independence of the residuals were assessed based on the plot of standardized predicted values against standardized residuals which is shown in Figure 7.5. Besides, given that the data collection method did not entail, for instance, cluster sampling or dyadic data (see Hayes (2018, p. 72); Kane and Ashbaugh (2017, p. 152)), the independence assumption was met. As it is shown in Figure 7.5, the points are evenly and randomly scattered throughout the graph, indicating no violation of the assumptions. Partial plots of the residuals of the outcome variable and each of the predictor variables were also inspected for outliers and confirmed the above (Figure G.4, Appendix G). Normality (and independence) of the residuals was examined based on the histogram and normal probability plot shown in Figure 7.6. The distribution appears normal and bell-shaped, indicating normal distribution in the model, whereas in the P-P plot the dots lie fairly close along the diagonal line.

Table 7.7: Correlations in linear regression with *Environmental values* as the outcome variable

		Environmental values	Type of Capital in the field of power	Political alienation	Trust in environmental actors and institutions	Conservative Voting	Kjønn
Pearson Correlation	Environmental values	1.000	-.331	-.231	.325	-.370	-.216
	Type of Capital in the field of power	-.331	1.000	.163	-.146	.353	.345
	Political alienation	-.231	.163	1.000	-.506	.230	.251
	Trust in environmental actors and institutions	.325	-.146	-.506	1.000	-.304	-.286
	Conservative Voting	-.370	.353	.230	-.304	1.000	.208
	Kjønn	-.216	.345	.251	-.286	.208	1.000
Sig. (1-tailed)	Environmental values	.	.000	.000	.000	.000	.001
	Type of Capital in the field of power	.000	.	.008	.015	.000	.000
	Political alienation	.000	.008	.	.000	.000	.000
	Trust in environmental actors and institutions	.000	.015	.000	.	.000	.000
	Conservative Voting	.000	.000	.000	.000	.	.001
	Kjønn	.001	.000	.000	.000	.001	.

Table 7.8: Collinearity Statistics in linear regression with *Environmental values* as the outcome variable

	Tolerance	VIF
Type of Capital in the field of power	.796	1.256
Political alienation	.725	1.379
Trust in environmental actors and institutions	.686	1.457
Conservative Voting	.807	1.240
Kjønn	.815	1.227

Table 7.9: Collinearity Diagnostics in linear regression with *Environmental values* as the outcome variable

			Variance Proportions					
Dimension	Eigenvalue	Condition Index	(Constant)	Type of Capital in the field of power	Political alienation	Trust in environmental actors and institutions	Conservative Voting	Kjønn
1	3.333	1.000	.02	.02	.01	.00	.03	.02
2	1.468	1.507	.00	.00	.14	.22	.03	.01
3	.423	2.809	.00	.04	.70	.62	.01	.01
4	.392	2.914	.02	.00	.00	.08	.79	.18
5	.241	3.717	.05	.92	.03	.04	.09	.22
6	.142	4.838	.92	.01	.12	.04	.06	.57

Figure 7.5: Plot of standardized predicted values against standardized residuals from the linear regression with *Environmental values* as the outcome variable

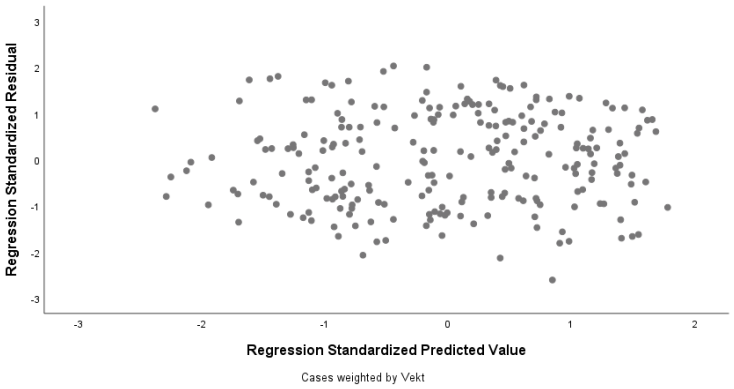
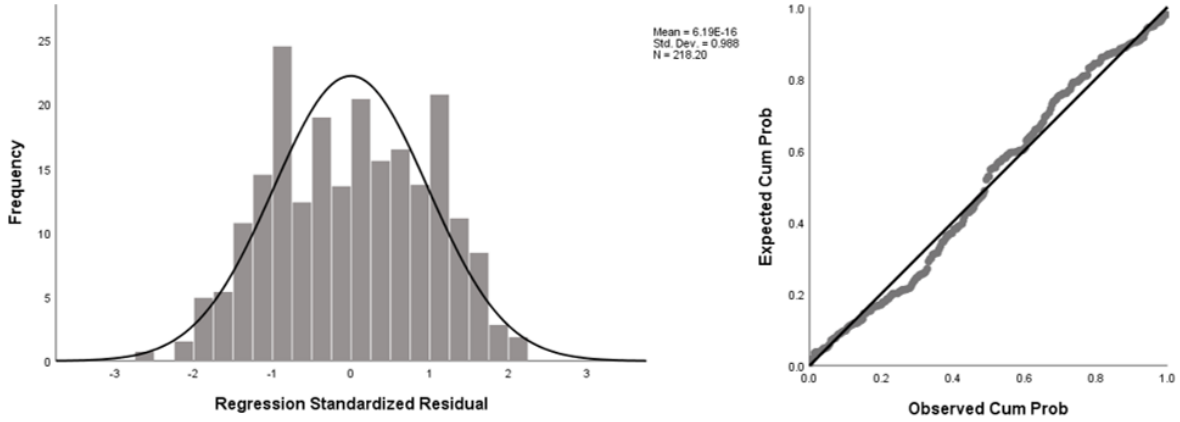


Figure 7.6: Histogram and normal probability plot from the linear regression with *Environmental values* as the outcome variable



Logistic regression (assumptions, casewise diagnostics, multicollinearity, observed and expected cell frequencies)

The assumptions of logistic regression and casewise diagnostics were also examined prior to the mediation analysis.

• **Linearity** (see Field, 2018, pp. 886, 893, 913; Stoltzfus, 2011, p. 1101): To examine whether each of the continuous predictor variables (*Environmental values, Political alienation, Trust in environmental actors and institutions*) was linearly related to the log of the outcome variable (*Climate change attitude*), I conducted a Box-Tidwell transformation test (see examples in Del Valle, Astorkiza, & Astorkiza, 2008, p. 236; Field, 2018, p. 913; Josephat & Ame, 2018, pp. 11-12). For this purpose, I first created variables that were the natural log transformations of the predictors (the SPSS syntax can be found in element G.3, Appendix G). Because the predictors had negative scores (from CATPCA), I added the constant 4 to the values, so that the argument to ln() in SPSS was positive (see "Can you perform a log transformation in SPSS?," 2016). Next, I run a logistic regression by entering the variables in a block and adding three interaction terms between each continuous predictor and its log (the SPSS syntax can be found in element G.4, Appendix G). The interaction terms should not be found significant for the assumption of linearity of the logit to hold in the dataset (see Field, 2018, p. 913). As shown in Table 7.10, the interaction terms had significance values greater than .05, confirming the assumption of linearity in the dataset.

Table 7.10: Variables in the Equation (logistic regression) (in bold the interaction terms and their significance values)

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Political alienation	-.436	1.115	.153	1	.696	.647
	Environmental values	-1.101	1.482	.552	1	.458	.333
	Trust in environmental actors and institutions	-.703	.723	.944	1	.331	.495
	PolitAlienln by Political alienation	.697	.867	.646	1	**.421**	2.008
	Environmental values by EnvironValuesln	-.441	1.092	.163	1	**.687**	.644
	TrustActInstitln by Trust in environmental actors and institutions	.767	.533	2.076	1	**.150**	2.154
	Type of Capital in the field of power	.100	.446	.050	1	.823	1.105
	Conservative Voting	.913	.420	4.731	1	.030	2.492
	Kjønn	.673	.460	2.143	1	.143	1.960
	Constant	-1.731	.564	9.434	1	.002	.177

a. Variable(s) entered on step 1: Political alienation, Environmental values, Trust in environmental actors and institutions, PolitAlienln*Political alienation, Environmental values*EnvironValuesln, TrustActInstitln*Trust in environmental actors and institutions, Type of Capital in the field of power, Conservative Voting, Kjønn.

- **Bias (outliers and influential cases)** (see Field, 2018, pp. 382, 893, 907-910): To check for bias, I run a logistic regression (the predictors were entered in a block) and saved diagnostic statistics. There were found 16 residuals (6.75%, *n*=237) outside the range of ±1.96; six of them (2.53%) were outside ±2.58, and two of them were outside ±3.29. All these residuals had Cook's distance less than 1. Their leverage values were either close to the average leverage, (k+1)/n=7/237=0.029, or did not exceed the two times average leverage (0.059). Their DFBetas were less than 1. Thus, these outliers did not appear to have much influence on the parameters of the model. There were also 3 residuals with a leverage value exceeding the three times average leverage (0.089), but their Cook's distances and DFBetas were less than 1. Overall, based on the influence statistics, there were no grounds for concern, and the analysis proceeded without removing any data points (see Field, 2018, p. 385).
- **Multicollinearity** (see Field, 2018, pp. 402, 913; Rovai, Baker, & Ponton, 2013, p. 205): I run a linear regression with the continuous predictor variables (and *Climate change attitude* as the outcome variable) to obtain tolerance and VIF statistics to examine multicollinearity. Tables 7.11 and 7.12 are from the SPSS output. Tolerance values are all above 0.2, and VIF values are all below 10, just exceeding a value of 1. None dimension has a large condition index, the highest value being 1.757 (Table 7.12). Thus, no multicollinearity was found between the predictors in the model.

Table 7.11: Collinearity statistics for logistic regression

Model		Collinearity Statistics	
		Tolerance	VIF
1	Political alienation	.776	1.288
	Environmental values	.892	1.121
	Trust in environmental actors and institutions	.761	1.314

Table 7.12: Collinearity Diagnostics for logistic regression

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Political alienation	Environmental values	Trust in environmental actors and institutions
1	1	1.681	1.000	.00	.17	.13	.17
	2	1.000	1.297	1.00	.00	.00	.00
	3	.774	1.474	.00	.17	.86	.08
	4	.545	1.757	.00	.66	.01	.74

• **Observed and expected cell frequencies:** According to Peduzzi, Concato, Kemper, Holford, and Feinstein (1996), for unbiased regression coefficients in a logistic regression model, as a rule of thumb, there should be no fewer than 10 events for the least common outcome of the dependent variable, per independent variable (EPV). The least common outcome of a dichotomous variable determines, thus, the maximum number of predictor variables in the model (see also Stoltzfus, 2011, p. 1101; Watts, 2012, p. 142). In the secondary dataset, there were 143 cases of climate change acceptance and 76 cases of climate change denial (*n*=219, weighted cases). The least frequently occurring outcome, thus, was climate change denial (76 cases). Based on the above EPV rule, there should be up to seven predictor variables in a logistic regression model. Table 7.13 shows the observed frequencies and percentages of the least common outcome, i.e., climate change denial, for the predictor variables *Type of Capital in the field of power, Conservative Voting* and *Kjønn*. Each category of the predictor variables has more than 10 events of climate change denial.

I also examined crosstabulations of pairs of the categorical predictor variables, including the outcome variable, to check that all cells had expected frequencies more than 1, and that no more than 20% cells had expected frequencies less than 5 (the goodness-of-fit tests in logistic regression make this assumption). Incomplete information from the predictor variables are often signalled by coefficients with unreasonable standard errors (Field, 2018, p. 887). When pairs of the variables were crosstabulated, all cells had expected frequencies more than 1, and no more than 20% cells had expected frequencies less than 5. When all the variables together were crosstabulated, all cells had expected frequencies more than 1, and seven cells (19.44%) had expected frequencies less than 5 (Tables G.6 - G.9, Appendix G).

Table 7.13: Observed frequencies and percentages of the least common outcome (climate change denial) per categorical predictor variable (*n*=219)

		Type of Capital in the field of power		Conservative Voting		Kjønn	
		High Cultural Capital	High Economic Capital	No	Yes	Kvinne	Mann
Climate change acceptance	count	72	71	102	41	61	82
	%	50.3	49.7	71.3	28.7	42.7	57.3
Climate change denial	count	17	59	24	51	15	61
	%	22.4	77.6	32.0	68.0	19.7	80.3

7.2.4 Preliminary analyses of the covariates included in the mediation analysis

Since the variables *Conservative Voting* and *Kjønn* were to be included as covariates in the mediation model, I examined the association of each of them with the outcome variable *Climate change attitude* by conducting a chi-square test. The association between *Conservative Voting* and *Climate change attitude* was found significant, χ^2 (1)=31.20, p< .001. The odds of expressing climate change denial were 5.276 times higher for respondents who reported conservative voting than for those who reported nonconservative voting. The association between *Kjønn* and *Climate change attitude* was also found significant, χ^2 (1)=11.50, p=.001. The odds of expressing climate change denial were 3.032 times higher for men than for women (the contingency tables and chi-square tests for *Conservative Voting* and *Kjønn* are provided in Tables G.10 – G.13, Appendix G).

Furthermore, except for *Conservative Voting* and *Kjønn*, *Environmental values, Political alienation, and Trust in environmental actors and institutions* were also to be included in the mediation model. I run a logistic regression (the predictors were entered in a block with forced entry) to access the efficacy of a full model versus a null model without these explanatory variables (only with intercept) (see e.g. Backe et al., 2018, p. 156). The full model was significantly better than the model with the intercept, χ^2(6) =105.51, p< .001 (part of the SPSS output can be found in element G.5, Appendix G). The full model classified correctly 88.3% of those who reported climate change acceptance and 73.7% of those who reported climate change denial, with an increase of the overall success rate from 65.3% to 83.2% compared to the null model only with intercept. It explained between 38.3% and 53% of the variation in climate change denial. According to the Wald statistic, only three of the six variables were shown to make a significant contribution to the prediction of climate change denial at a conventional .05 level: *Environmental values, Political alienation,* and *Conservative Voting* (Table 7.14). As a reminder, the odds ratio (OR) represents the change in odds of being in one of the categories of the outcome when the value of the predictor increases by one unit (Tabachnick & Fidell, 2013, p. 463). If the odds ratio is greater than 1, then as the predictor increases, the odds of the outcome occurring also increase. If the odds ratio is less than 1, then as the predictor increases, the odds of the outcome occurring decrease (Field, 2018, p. 885). The odds ratio for *Environmental values*, Exp(B)=.202, indicating that as the score of

Environmental values increases, the odds of expressing climate change denial decrease. The odds ratio for *Political alienation*, Exp(B)=1.690, indicating that as the score of *Political alienation* increases, the odds of expressing climate change denial also increase. The odds ratio for *Conservative Voting*, Exp(B)=2.528, indicating that conservative voting increases the odds of expressing climate change denial. Note that the closer the odds ratio is to a value of 1, the smaller is the effect size. None of the CIs for the above odds ratios included a value of 1. According to Field (2018, p. 904), the fact that the CI does not contain a value of 1 suggests that "the direction of the relationship we have observed is true in the population".

Therefore, although the variables *Type of Capital in the field of power* (Hypothesis 1) and *Kjønn* showed evidence of association with climate change denial when this association was tested separately through the chi-square tests, they fell short of significance when the other predictors were controlled for, p=.865 and p=.175, respectively. This provided a first impression of a mediated effect of the *Type of Capital in the field of power* on *Climate change attitude*. The results confirmed, to an extent, that the proposed covariates should be included in the mediation analysis for a more thorough examination.

Table 7.14: Variables in the Equation (from logistic regression for predicting climate change denial) (in bold significance values < .05 and respective odds ratios)

							95% C.I. for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Type of Capital in the field of power (1)	.074	.434	.029	1	.865	1.077	.460	2.522
	Environmental values	-1.601	.260	37.813	1	**.000**	**.202**	.121	.336
	Political alienation	.525	.237	4.913	1	**.027**	**1.690**	1.063	2.687
	Trust in environmental actors and institutions	.172	.231	.554	1	.457	1.188	.755	1.869
	Conservative Voting (1)	.927	.407	5.196	1	**.023**	**2.528**	1.139	5.611
	Kjønn (1)	.613	.452	1.838	1	.175	1.846	.761	4.478
	Constant	-1.328	.469	8.004	1	.005	.265		

a. Variable(s) entered on step 1: Type of Capital in the field of power, Environmental values, Political alienation, Trust in environmental actors and institutions, Conservative Voting, Kjønn.

7.2.5 Results of the mediation analysis with a simple mediation model

Mediation analysis with a simple mediation model (the SPSS syntax can be found in element G.6, Appendix G) revealed a *positive* significant indirect effect of *Type of Capital in the field of power* on *Climate change attitude* through *Environmental values*, αb=.6579, BootSE=.2630, BootCI [0.2247, 1.2629]. The percentile bootstrap

CI derived from 10.000 samples indicated that the indirect effect was entirely above zero. Controlling for *Environmental values* (and the rest covariates), there was not found a statistically significant direct effect of the *Type of Capital in the field of power* on *Climate change attitude*, *c'*=.3192, *SE*=.4356, *z*=.7329, *p*=.4636, BootCI= [-0.5344, 1.1729]. The rest of the results are shown in Table 7.15. The *positive* significant indirect effect indicates that *Type of Capital in the field of power* is indirectly related to *Climate change attitude* through its relationship with *Environmental values*. Those cases with high economic capital in the field of power were on average (mean difference) .6579 units higher in likelihood of expressing climate change denial than climate change acceptance, compared to cases with high cultural capital in the field of power, as this is explained by their lower scores on *Environmental values*. In the first regression model, the *negative* significant *α* coefficient indicates that cases with high economic capital scored on average .4340 units lower on *Environmental values* than cases with high cultural capital (when controlling for the rest covariates). In the second regression model, the *negative* significant *b* coefficient indicates that of those two cases with the same *Type of Capital in the field of power* (and while controlling for the rest covariates), the one case which differed by one unit more on *Environmental values* differed by 1.5158 units less in likelihood of expressing climate change denial than climate change acceptance (see Meyers, 2016, pp. 129-134) (see also Hayes & Rockwood, 2017, p. 42).

The total effect of *Type of Capital in the field of power* on *Climate change attitude*, obtained by simply regressing *Climate change attitude* on *Type of Capital in the field of power* (while controlling for *Political alienation, Trust in environmental actors and institutions, Conservative voting,* and *Kjønn*) (see Jones et al., 2015, p. 571) was found not significant, *c*=.613, *SE*=.374, *p*=.101.

In line with Hypothesis 2, thus, cases with high economic capital in the field of power scored less on *Environmental values* than cases with high cultural capital in the field of power, and lower scores on *Environmental values* were subsequently related to increased likelihood of expressing climate change denial. I would underline that *Political alienation* and *Conservative Voting* appeared also predicting *Climate change attitude* individually. In any case, the mediation analysis with the

simple mediation model revealed that the effect of *Type of Capital in the field of power* on *Climate change attitude* is mediated by *Environmental values*.

Table 7.15: Regression models of mediation analysis with a simple mediation model for the effect of *Type of Capital in the field of power* on *Climate change attitude* through *Environmental values*, with covariates included (*n*=237)

Outcome variable: *Environmental values*

	Model summary						
	R	R-sq	MSE	F	df1	df2	p
	.4960	.2460	.7720	15.0711	5.0000	231.0000	.0000
	Model						
	coeff.	se	t	p	LLCI	ULCI	
constant	.6497	.1326	4.8995	.0000	.3885	.9110	
Type of Capital in the field of power - *α*	**-.4340**	.1335	-3.2512	**.0013**	-.6970	-.1710	
Political alienation	-.0412	.0742	-.5560	.5787	-.1874	.1049	
Trust in environmental actors and institutions	.2348	.0724	3.2455	.0013	.0923	.3774	
Conservative Voting	-.4814	.1273	-3.7808	.0002	-.7323	-.2305	
Kjønn	-.0261	.1361	-.1917	.8481	-.2943	.2421	

Outcome variable: *Climate change attitude*

	Model Summary						
	-2LL	ModelLL	df	p	McFadden	CoxSnell	Nagelkrk
	193.8175	109.2576	6.0000	.0000	.3605	.3693	.5118
	Model						
	coeff	se	Z	p	LLCI	ULCI	
constant	-1.4508	.4713	-3.0784	.0021	-2.3744	-.5271	
Type of Capital in the field of power - *c'*	**.3192**	.4356	.7329	**.4636**	-.5344	1.1729	
Environmental values - *b*	**-1.5158**	.2415	-6.2758	**.0000**	-1.9892	-1.0424	
Political alienation	.4567	.2230	2.0483	.0405	.0197	.8937	
Trust in environmental actors and institutions	.1838	.2237	.8216	.4113	-.2547	.6223	
Conservative Voting	.9363	.3832	2.4437	.0145	.1853	1.6873	
Kjønn	.3622	.4424	.8187	.4130	-.5048	1.2291	

Note: The results are expressed in a log-odds metric.

Conclusion 2:

Hypothesis 2 was confirmed by the analysis. The effect of *Type of Capital in the field of power* on *Climate change attitude* is mediated by *Environmental values.* The results of the mediation analysis with a simple mediation model showed a *positive* significant indirect effect of *Type of Capital in the field of power* on *Climate change attitude* through *Environmental values*, αb=.6579, Boot*SE*=.2630, BootCI [0.2247, 1.2629].

7.3 Testing Hypothesis 2: Mediation analysis with a parallel multiple mediation model

7.3.1 On parallel mediation analysis through PROCESS

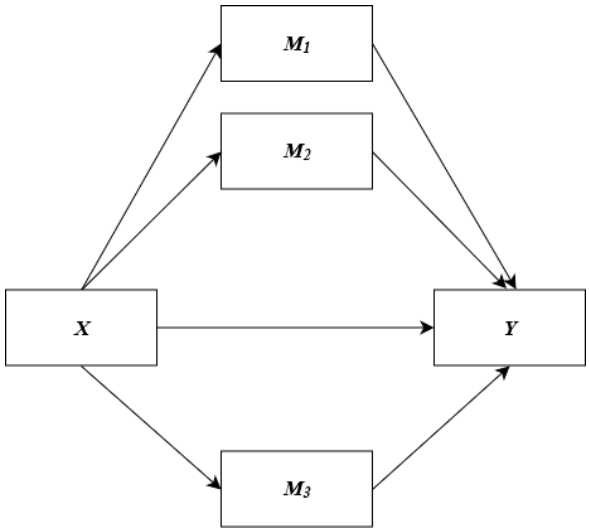
Next, I considered whether multiple mechanisms mediated the relationship between *Type of Capital in the field of power* and *Climate change attitude* which was founded to be mediated by *Environmental values* in the previous section. Such potential mediators in this analysis were considered *Political alienation* and *Trust in environmental actors and institutions*. Multiple mediators can be explored in PROCESS by including them simultaneously in a parallel multiple mediator model (model number 4). In this model, the mediators are allowed to be correlated, but they should not be *causally* interrelated (in the latter case, a serial multiple mediator model should be applied instead) (see Demming et al., 2017, pp. 78-79, 86; Goodboy et al., 2017, p. 8; Hayes, 2018, pp. 148, 149, 167; Hayes & Rockwood, 2017, p. 45; Jones et al., 2015, p. 571; Kane & Ashbaugh, 2017, pp. 156-159). The indirect effects in a parallel multiple mediator model are called *specific* indirect effects and are interpreted as in a simple mediation model except for the addition of "controlling for all other mediators in the model" (Hayes, 2018, p. 153). The *total indirect* effect is the sum of all the specific indirect effects and reflects the extent to which the mediations in a model can together explain the relationship between the predictor and the outcome variable (Hayes, 2018, p. 153).

When adding the argument *contrast=1* to the command in PROCESS for parallel mediation, PROCESS offers pairwise *comparisons* between specific indirect effects (each pairwise comparison is labelled "C1", "C2" and so on in the output). A comparison between specific indirect effects is possible, since a specific indirect effect is interpreted as "the amount by which two cases differing by one unit on X are estimated to differ on Y through the intervening variable independent of the other intervening variables" (Hayes, 2018, p. 164). As this interpretation does not involve the metric of the mediator, a specific indirect effect is scaled only in terms of the metrics of X and Y. Thus, different specific indirect effects are meaningfully compared to each other in a multiple mediator model, even if the mediators are measured on different scales, without the necessity of prior standardization or other arithmetic calculations applied to the scales (Hayes, 2018, p. 164). Bootstrap CIs are used for this purpose, whereas a confidence interval that does not include zero

indicates that the indirect effects are statistically different from each other. When the point estimates of these CIs are of the same sign, this test can be interpreted as a test of difference in strength of the indirect effects. When the signs are different, the argument *contrast=2* in the command in PROCESS provides bootstrap CIs for the difference of the indirect effects while ignoring their signs (Hayes, 2018, pp. 163-166). Such comparisons allow a researcher to assess the importance of the specific indirect effects and are especially useful for competitive theory testing and enhanced confidence in a proposed model against rival possible explanations (see Demming et al., 2017, pp. 79, 90; Hayes & Rockwood, 2017, p. 46).

There is also the possibility to request bootstrap CIs for the regression coefficients in each regression in the model, by adding the option *modelbt=1* to the PROCESS command line (Hayes, 2018, p. 573). Finally, there are options for using heteroscedasticity-consistent standard error estimators for regression coefficients (see Hayes, 2012, p. 22; Hayes, 2018, p. 576), and seeding the random number generator for bootstraping (Hayes, 2018, p. 567).

Figure 7.7: A conceptual diagram of a parallel multiple mediator model with three mediators, M1, M2 and M3 (based on Hayes, 2018, p. 150)



7.3.2 Preliminary analyses for linear regression

Before applying the parallel multiple mediator model, I verified the assumptions of linear regression for the variables *Political alienation* and *Trust in environmental*

actors and institutions. For this purpose, I run two linear regressions, one for each outcome variable.

Political alienation

• **Multicollinearity**: The correlation matrix, containing the Pearson correlation coefficient between every pair of variables, showed no substantial correlations (r > 0.9) between the predictor variables. The highest correlation was between *Environmental values* and *Conservative voting*, r=-.370, p<.001. *Trust in environmental actors and institutions* correlated best with the outcome variable *Political alienation*, r=-.506, p< .001. The VIF values were all below 10, the average VIF slightly greater than 1, and the tolerance statistics were all above 0.2. Thus, no multicollinearity was found between the predictors.

• **Bias:**

(i) casewise diagnostics. I looked for standardized residuals outside the range of ±1.96. There were 12 residuals outside this range (almost 5%, n=237), two of them lied outside ±2.58, but none of them lied outside ±3.29 (Table G.14, Appendix G). The average leverage was (k+1)/n=6/237=0.025, and none case was outside twice this value (0.05). Mahalanobis distances for these residuals were within a cut-off point of 11.07 (p=.05). Four other cases had Mahalanobis distances that exceeded a cut-off point of 11.07 (p=.05), two of them exceeded also a cut-off point of 15.09 (p=.01), but the same cases had very low Cook's distances. The boundaries based on the covariance ratio were 1+(3(k+1)/n)=1.076 and 1-(3(k+1)/n)=0.924. The DFBeta statistics where within ± 1. To conclude, the model appeared unbiased of outliers or influential cases.

(ii) assumptions. Linearity, homoscedasticity and independence of the residuals were assessed based on the plot of standardized predicted values against standardized residuals which is shown in Figure 7.8 (as mentioned above, given that the data collection method did not entail, for instance, cluster sampling or dyadic data, the independence assumption was met). As it is shown in Figure 7.8, the points are randomly scattered throughout the graph, indicating no violation of the assumptions. Partial plots of the residuals of the outcome variable and each of the predictor variables were also inspected for outliers and confirmed the above (Figure G.5, Appendix G). Normality (and independence) of the residuals were examined based on the histogram and normal probability plot shown in Figure 7.9. The distribution

appears right skewed, and this is also reflected in the P-P plot in which some points do not lie fairly close along the diagonal line. Given a sufficient sample size (central limit theorem), I considered any violation of normality as no reason for concern (see Casson & Farmer, 2014, p. 595; Hayes, 2018, pp. 68-69; Schmidt & Finan, 2018, p. 149).

Figure 7.8: Plot of standardized predicted values against standardized residuals from the linear regression with *Political alienation* as the outcome variable

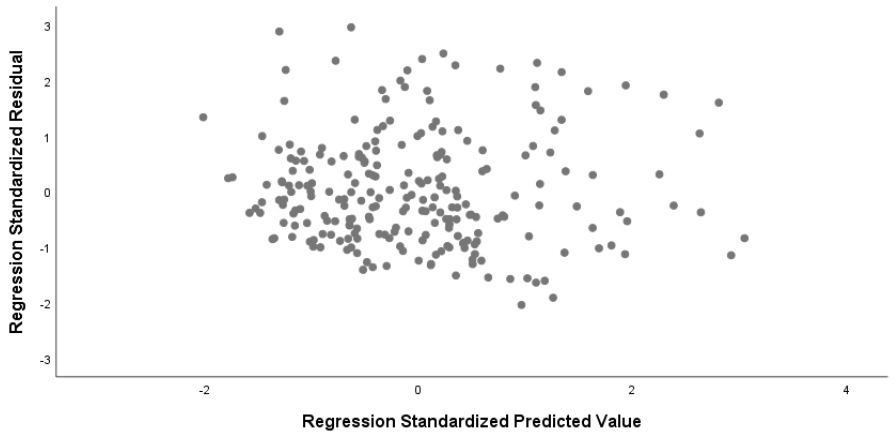
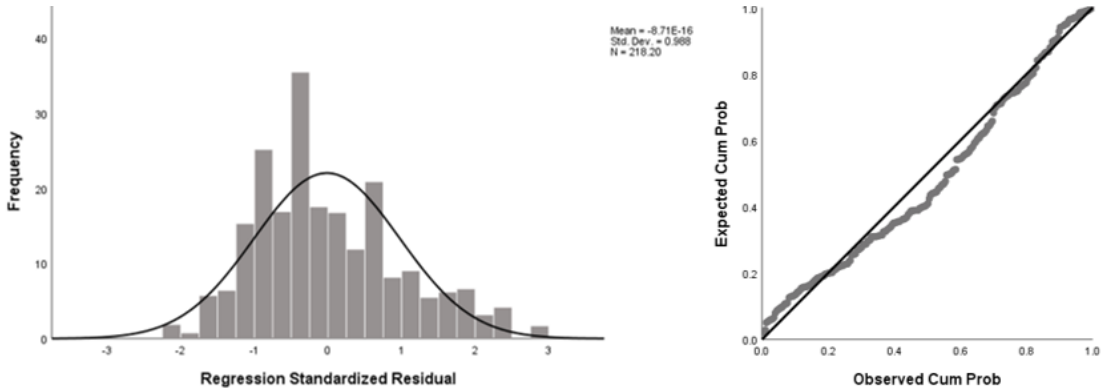


Figure 7.9: Histogram and normal probability plot from the linear regression with *Political alienation* as the outcome variable



Trust in environmental actors and institutions

- **Multicollinearity:** The correlation matrix, containing the Pearson correlation coefficient between every pair of variables, showed no substantial correlations (r > 0.9) between the predictor variables. The highest correlation was between *Environmental values* and C*onservative voting*, r= -.370, p<.001. *Political alienation* correlated best with the outcome variable *Trust in environmental actors and institutions*, r=-.506, p<.001. The VIF values were all below 10, the average VIF slightly greater than 1, and the tolerance statistics were all above 0.2. Thus, no multicollinearity was found between the predictors.

- **Bias:**

(i) casewise diagnostics. I looked for standardized residuals outside the range of ±1.96. There were 10 residuals outside this range (4.22%, *n*=237), four of them (1.69%) lied outside ±2.58, and two of them lied outside ±3.29 (Table G.15, Appendix G). The Cook's distances for the latter two residuals were very low. The average leverage was (k+1)/n=6/237=0.025, and none case was outside twice this value (0.05). Mahalanobis distances for these residuals were within a cut-off point of 11.07 (*p*=.05). Three other cases had Mahalanobis distances that exceeded a cut-off point of 11.07 (*p*=.05), but none of them exceeded a cut-off point of 15.09 (*p*=.01). The boundaries based on the covariance ratio were 1+(3(k+1)/n)=1.076 and 1-(3(k+1)/n)=0.924, and all residuals were within or very close to these limits. The DFBeta statistics where within ± 1. To conclude, the model appeared unbiased of outliers or influential cases.

(ii) assumptions. Linearity, homoscedasticity and independence of the residuals were assessed based on the plot of standardized predicted values against standardized residuals which is shown in Figure 7.10 (as mentioned above, given that the data collection method did not entail, for instance, cluster sampling or dyadic data, the independence assumption was met). As it is seen in Figure 7.10, the points show funneling, indicating violation of the homoscedasticity assumption (recall that PROCESS provides the user with an option for heteroscedasticity-consistent covariance matrix estimators; see Hayes (2018, pp. 71, 576); Hayes and Cai (2007, p. 716)). Partial plots of the residuals of the outcome variable and each of the predictor variables were also inspected. The partial plot in Figure 7.12 for *Political alienation* shows again a violation of homoscedasticity (the rest of the partial plots can be found in Figure G.6, Appendix G). Normality (and independence) of the residuals were examined based on the histogram and normal probability plot which are shown in Figure 7.11. The distribution appears to approximate better this time a normal distribution, but it is still somehow left skewed, and this is also reflected in the P-P plot in which some points do not lie fairly close along the diagonal line. Given a sufficient sample size (central limit theorem), I considered any violation of normality as no reason for concern (see Casson & Farmer, 2014, p. 595; Hayes, 2018, pp. 68-69; Schmidt & Finan, 2018, p. 149).

Figure 7.10: Plot of standardized predicted values against standardized residuals from the linear regression with *Trust in environmental actors and institutions* as the outcome variable. The plot shows heteroscedasticity

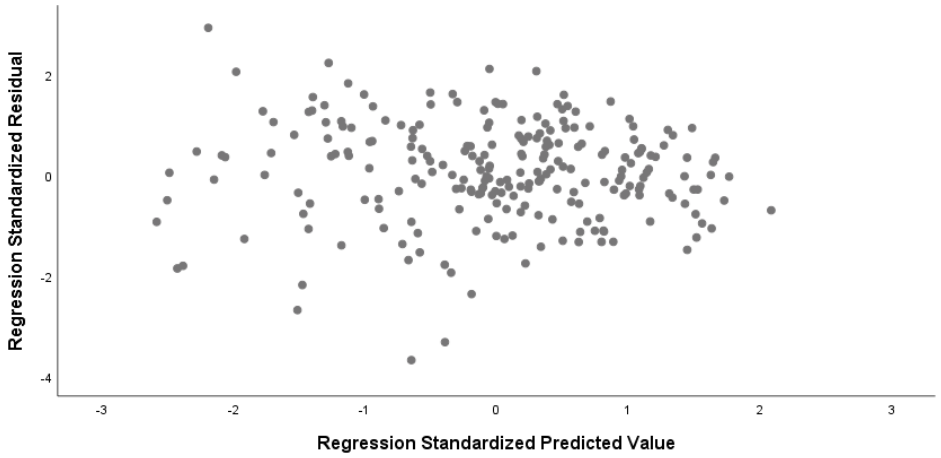


Figure 7.11: Histogram and normal probability plot from the linear regression with *Trust in environmental actors and institutions* as the outcome variable

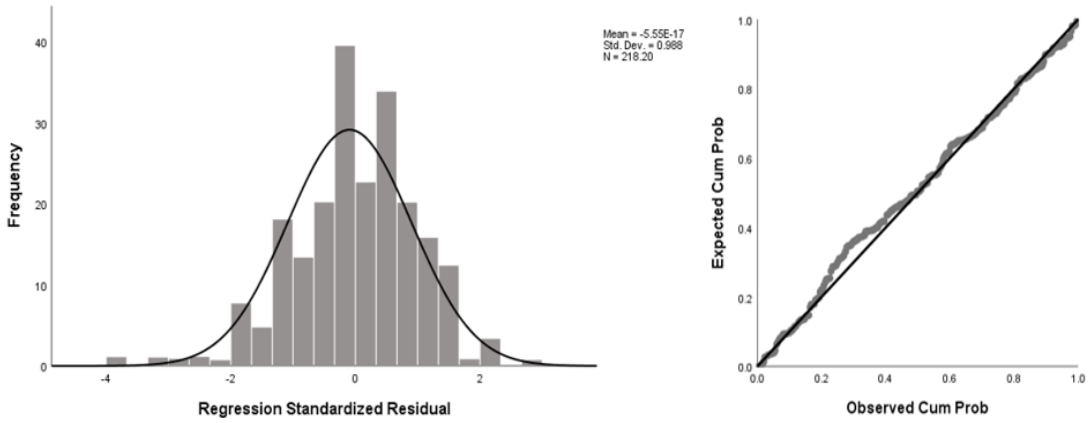
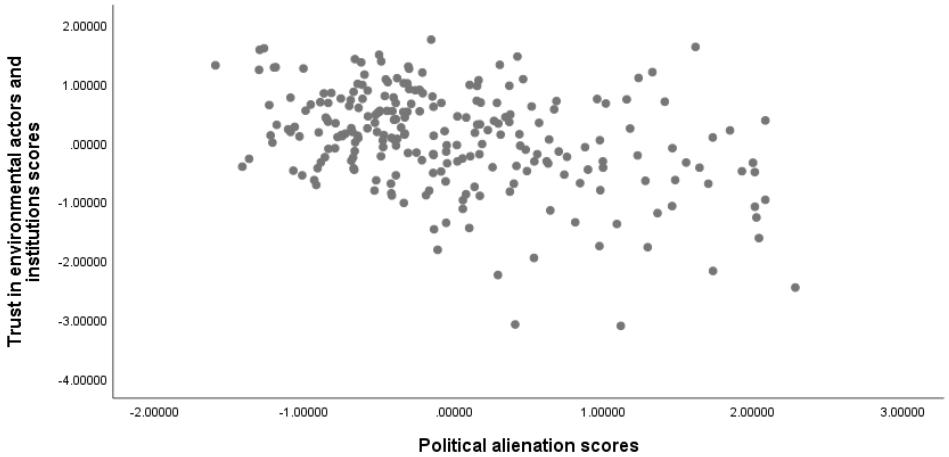


Figure 7.12: Partial plot of *Trust in environmental actors and institutions* and *Political alienation*. The plot shows heteroscedasticity



7.3.3 Specification of the parallel multiple mediation model

I run a parallel multiple mediator model in PROCESS (model number 4), in which I included, except for *Environmental values*, the variables *Political alienation* and *Trust in environmental actors and institutions* as additional mediators (see Figure 7.13). The covariates *Kjønn* and *Conservative voting* were also included. The parallel multiple mediator model assumes that none of the mediator variables *causally* influences the other, regardless of any correlation between them. In this model, pathway α is estimated for each of the mediator variables, each pathway b is estimated while controlling for *Type of Capital in the field of power* and the other mediators (and covariates), and pathway c' is estimated while keeping all the mediators (and covariates) constant (Hayes, 2018, pp. 151-152). Since heteroscedasticity was likely present in the model, I opted to use a heteroscedasticity-consistent standard error estimator for regression coefficients, the HC3 estimator (option *hc=3*), which reduces biases (see Hayes, 2012, p. 22; Hayes, 2018, p. 576). I also requested pairwise comparisons for the specific indirect effects (option *contrast=2*) and bootstrap CIs for the regression coefficients (option *modelbt=1*). Finally, I added the argument *normal=1* to the command in PROCESS for having the results of a Sobel test (although this test assumes normal distribution and, generally, is not very recommended; see Hayes (2018, pp. 95-97, 521)), and specified a seed for the random number generator (*seed=23543*) (the complete SPSS syntax for the parallel mediation can be found in element G.7, Appendix G).

7.3.4 Results of the mediation analysis with a parallel multiple mediation model

Mediation analysis with the parallel multiple mediation model revealed again that *Type of Capital in the field of power* is indirectly related to *Climate change attitude* through *Environmental values*. The estimates were very close to the ones of the simple mediation model. As it can be seen in Figure 7.13 and Table 7.16, cases with high economic capital in the field of power scored lower on *Environmental values* (α_1=-.437, p=.0023) than cases with high cultural capital in the field of power, and lower scores on *Environmental values* were subsequently related to increased likelihood of expressing climate change denial (b_1=-1.516, p<.001). A 95% percentile bootstrap CI based on 10.000 samples indicated that, when controlling for the unique variance explained by the other mediators, the indirect effect through

Environmental values was entirely above zero, $\alpha_1 b_1$=.6620, Boot*SE* =.2639, BootCI [0.2372, 1.2718] (recall that in the simple mediation model, the indirect effect through *Environmental values* was αb=.6579, Boot*SE*=.2630, BootCI [0.2247, 1.2629]). The total indirect effect was .714, Boot*SE*=.2790, BootCI [0.2600, 1.3599]. However, there was insufficient evidence of parallel mediation, since neither of the indirect effects through *Political alienation* and *Trust in environmental actors and institutions* was different from zero: for *Political alienation*, $\alpha_2 b_2$=.0504, Boot*SE*=.0727, BootCI [-0.0584, 0.2302]; for *Trust in environmental actors and institutions*, $\alpha_3 b_3$=.0014, Boot*SE*=.0427, BootCI [-0.0910, 0.0962]. The results of the Sobel test for the indirect effects were in accordance with the above findings (the complete output from the parallel mediation analysis, showing also the bootstrap CIs for the regression coefficients, can be found in element G.8, Appendix G).

Accordingly, the pairwise comparisons between the specific indirect effects showed that the indirect effect through *Environmental values* was larger than the other effects. The CIs from its pairwise comparisons did not include zero, implying that the indirect effect through *Environmental values* was statistically different from the other effects (see Demming et al., 2017, pp. 86, 92; Hayes, 2018, pp. 165-166; Kane & Ashbaugh, 2017, pp. 157-158): for comparison C1 (i.e., *Environmental values* minus *Political alienation*), effect=.6116, BootCI [0.1633, 1.1972]; for comparison C2 (i.e., *Environmental values* minus *Trust in environmental actors and institutions*), effect=.6606, BootCI [0.2081, 1.2378]; for comparison C3 (i.e., *Political alienation* minus *Trust in environmental actors and institutions*), effect=.0490, BootCI [-0.0699, 0.1999].

There was no evidence of a direct effect of *Type of Capital in the field of power* on *Climate change attitude* after mediators (and covariates) were taken into account, c'=.3192, *SE*=.4356, *z*=.7329, *p*=.4636, BootCI [-0.5344, 1.1729].

Finally, the total effect of *Type of Capital in the field of power* on *Climate change attitude*, obtained by simply regressing *Climate change attitude* on *Type of Capital in the field of power*, while controlling for *Conservative voting* and *Kjønn* (see Jones et al., 2015, p. 571), was found not significant, *c*=.599, *SE*=.365, *p*=.101.

Figure 7.13: Statistical diagram of the parallel multiple mediation model for the relationship between *Type of Capital in the field of power* and *Climate change attitude* (based on Hayes, 2018, pp. 126, 155) with the covariates *Kjønn* and *Conservative voting* included.
Notes: *p < .05; **p < .01; ***p < .001 (*n*=237, unweighted data)

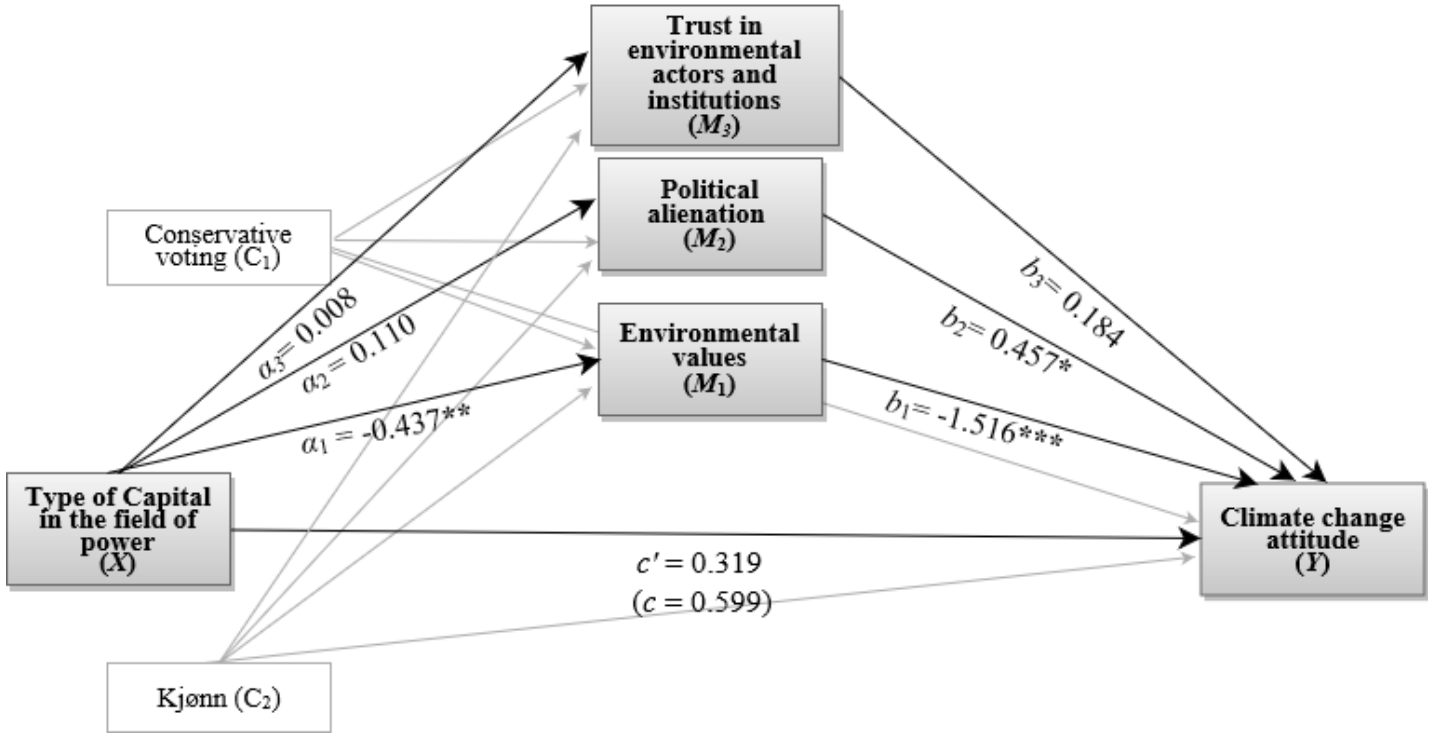


Table 7.16: Regression coefficients, standard errors and model summary information for the parallel multiple mediation model with the two covariates (depicted in Figure 7.13) (based on Hayes, 2018, pp. 127, 157) (*n*=237, unweighted data)

		Outcome variable												
		M_1 (*Environmental values*)				M_2 (*Political alienation*)				M_3 (*Trust in environmental actors and institutions*)				Y (*Climate change attitude*)		
Predictor variable		Coeff.	*SE* (HC3)	*p*		Coeff.	*SE* (HC3)	*p*		Coeff.	*SE* (HC3)	*p*		Coeff.	*SE*	*p*
X (*Type of Capital in the field of power*)	α_1	-0.437	0.142	.0023	α_2	0.110	0.122	.3682	α_3	0.008	0.134	.9535	c'	0.319	0.436	.4636
M_1 (*Environmental Values*)		-	-	-		-	-	-		-	-	-	b_1	-1.516	0.241	< .001
M_2 (*Political alienation*)		-	-	-		-	-	-		-	-	-	b_2	0.457	0.223	.0405
M_3 (*Trust in environmental actors and institutions*)		-	-	-		-	-	-		-	-	-	b_3	0.184	0.224	.4113
C_1 (*Conservative voting*)	f_{1M1}	-0.606	0.132	< .001	f_{1M2}	0.311	0.124	.0129	f_{1M3}	-0.477	0.127	.0002	g_1	0.936	0.383	.0145
C_2 (*Kjønn*)	f_{2M1}	-0.137	0.141	.3295	f_{2M2}	0.357	0.117	.0024	f_{2M3}	-0.412	0.131	.0019	g_2	0.362	0.442	.4130
Constant	i_{M1}	0.868	0.106	< .001	i_{M2}	-0.933	0.098	< .001	i_{M3}	0.768	0.084	< .001	i_Y	-1.451	0.471	.0021
		R^2=0.198 *F* (HC3) (3, 233) = 21.855, $p < .001$				R^2= 0.098 *F* (HC3) (3, 233) = 8.111, $p < .001$				R^2= 0.129 *F* (HC3) (3, 233) = 13.902, $p < .001$				Nagelkerke' s R^2=0 .512		

Conclusion 3:

Hypothesis 2 was confirmed by the analysis. The effect of *Type of Capital in the field of power* on *Climate change attitude* is mediated by *Environmental values.* The results of the mediation analysis with a parallel multiple mediation model showed a *positive* significant indirect effect of *Type of Capital in the field of power* on *Climate change attitude* through *Environmental values*, $\alpha_1 b_1$=.6620, Boot*SE*=.2639, BootCI [0.2372, 1.2718]. However, there was insufficient evidence of parallel mediation, since neither of the indirect effects through *Political alienation* and *Trust in environmental actors and institutions* was different from zero: for *Political alienation*, $\alpha_2 b_2$=.0504, Boot*SE*=.0727, BootCI [-0.0584, 0.2302]; for *Trust in environmental actors and institutions*, $\alpha_3 b_3$=.0014, Boot*SE*=.0427, BootCI [-0.0910, 0.0962].

8 Discussion

In this chapter, I provide first a summary of the analysis and its main conclusions. Next, I discuss the results of the hypotheses testing. I then proceed to limitations of the study and provide some recommendations for future research. I close with my overall conclusion from the study.

8.1 Summary of the study and main conclusions

This thesis explored climate change attitudes of holders of different types of capital who were considered positioned within the field of power in Norway. Two hypotheses were examined:

Hypothesis 1: There is an association between the type of capital (economic or cultural) possessed within the field of power and climate change attitudes (acceptance or denial).

Hypothesis 2: The association between the type of capital (economic or cultural) possessed in the field of power in Norway and climate change attitudes (acceptance or denial) is mediated by environmental values.

The methodology employed in the thesis was a secondary analysis of existing national survey data which had been collected in Norway between 11th November 2016 and 20th January 2017. The data had been collected by the market research agency Kantar TNS on behalf of The Norwegian Institute for Nature Research (NINA). A nationally representative sample had been drawn from the (pre-recruited) survey panel GallupPanelet. According to the documentation report of the survey, the survey had been weighted by age, gender and geographic area in accordance with official statistics.

The analysis was commenced with data cleaning, and a new secondary dataset was created. A missing value analysis revealed approximately 7% missing data in the secondary dataset, which were estimated as missing at random (MAR). Subsequently, a random forest imputation with the use of the R-package missForest was applied for imputing the missing values. Descriptive statistics were provided for both the non-imputed and the imputed datasets. Hypotheses testing was conducted only on the imputed dataset, since the imputation process had performed satisfyingly.

For Hypothesis 1, the concepts of economic and cultural capital were first operationalized. To validate the assumption that the selected items for economic and cultural capital were actually representing the underlying constructs of economic and cultural capital, I performed (nonlinear) categorical principal component analyses (CATPCA). I then conceptualized and computed the variables for *high* economic capital and *high* cultural capital in the field of power in Norway. I also provided the reliability assessment (Cronbach's alpha) for the items selected as indicators of economic and cultural capital. Hypothesis 1 was tested by means of a chi-square test, the results of which confirmed the first hypoothesis.

For Hypothesis 2, I conducted logistic-regression based mediation analyses in SPSS through the PROCESS tool. Prior to the mediation analyses, I performed a (nonlinear) categorical principal component analysis (CATPCA), which served two purposes. First, to examine the appropriateness of the survey items which measured environmental values for testing the second hypothesis. Second, to reduce the number of the variables in the dataset to their principal components. Based on the CATPCA, three components were identified in the secondary dataset as representing the constructs of *Political alienation, Environmental values* and *Trust in environmental actors and institutions.*

The first mediation analysis was based on a simple mediation model (model number 4 in PROCESS) with *Environmental values* as the mediator variable. The second mediation analysis was based on a parallel multiple mediation model (model number 4 in PROCESS) with the addition of *Political alienation* and *Trust in environmental actors and institutions* as multiple mediators. Both mediation models controlled for several covariates.

The following three main conclusions were drawn from the analysis:

Conclusion 1 (Hypothesis 1): The null hypothesis of independence between the type of capital (economic or cultural) in the field of power and climate change attitudes (acceptance or denial) was rejected. A significant association between *Type of Capital in the field of power* and *Climate change attitude* was observed, $\chi^2(1)=16.106$, $p<.001$. The odds ratio showed that the odds of climate change denial were 3.52 times higher when high economic capital is possessed than when high cultural capital is possessed within the field of power.

Conclusion 2 (Hypothesis 2): Hypothesis 2 was confirmed by the analysis. The effect of *Type of Capital in the field of power* on *Climate change attitude* is mediated by *Environmental values.* The results of the mediation analysis with a simple mediation model showed a *positive* significant indirect effect of *Type of Capital in the field of power* on *Climate change attitude* through *Environmental values*, αb=.6579, Boot*SE*=.2630, BootCI [0.2247, 1.2629].

Conclusion 3 (Hypothesis 2): The results of the mediation analysis with a parallel multiple mediation model showed a *positive* significant indirect effect of *Type of Capital in the field of power* on *Climate change attitude* through *Environmental values*, $\alpha_1 b_1$=.6620, Boot*SE*=.2639, BootCI [0.2372, 1.2718]. There was insufficient evidence of parallel mediation, since significant indirect effects through *Political alienation* or *Trust in environmental actors and institutions* were not found: for *Political alienation*, $\alpha_2 b_2$=.0504, Boot*SE*=.0727, BootCI [-0.0584, 0.2302]; for *Trust in environmental actors and institutions*, $\alpha_3 b_3$=.0014, Boot*SE*=.0427, BootCI [-0.0910, 0.0962].

8.2 Discussing the results of the hypotheses testing

The two hypotheses of this thesis were confirmed by the statistical analysis. First, based on the results of testing the first hypothesis, it was found that the type of capital, economic or cultural, possessed in the field of power is related to climate change denial. Under my interpretation, the Bourdieusian perspective adopted in the thesis revealed that *climate change denial* conceals *a denial of changes in the legitimate type of authority* within the field of power.

In accordance with the above, the study of Austgulen and Stø (2013) found that people with higher education in Norway (that is, institutionalized cultural capital) scored lower on climate change skepticism.

Next, based on the mediation analyses, it was found that there is an *indirect* effect of the type of capital possessed in the field of power on climate change denial through *environmental values*. Based on the parallel mediation analysis, there was no evidence of association between the type of capital possessed in the field of power and political alienation or trust in environmental actors and institutions, neither were these variables found to mediate the relationship between the type of capital and climate change denial. When the variable for environmental values was controlled

for (along with the rest covariates), there was no evidence of a direct effect of the type of capital in the field of power on climate change denial.

However, there was no evidence of an effect of the type of capital in the field of power on climate change denial even when the variable for environmental values was not controlled for, but the covariates for conservative voting and gender (total effect in the case of parallel mediation), or the latter along with the variables for political alienation and trust in environmental actors and institutions (total effect in the case of simple mediation), were instead held constant. With regard to these variables, it is worth mentioning that, based on the results of the analysis, conservative voting and political alienation appeared to predict individually climate change attitudes, whereas gender and trust in environmental actors and institutions showed no such evidence. In the analysis of Austgulen and Stø (2013), females were found to have a negative effect on climate change skepticism in Norway.

The results of the mediation analyses are consistent with the Bourdieusian approach, inspired basically by the concepts of *capital* and *field of power*, with which I attempted to frame the present analysis. The rationale for proposing environmental values as mediating the relationship between the type of capital possessed within the field of power and climate change denial was explained during the hypotheses formulation (chapter 2.4). With regard to political alienation, although difficult one to comprehend how actors within the field of power, struggling over statist capital, are characterized by political alienation, my estimation is that there is still a kind of political alienation that could be applicable within the field of power and relate to climate change denial for *both* types of capital: with regard to holders of economic capital, a kind of estrangement from the political system could refer to those policy measures for climate change which threat the continuation of a "business as usual" economic rationale; with regard to holders of cultural capital, a sense of political estrangement could result from the frequent occurrence of overlapping economic and political interests within the field of power where the economic pole is dominant. Therefore, political alienation was not expected to be a crucial determinant of the relationship between the type of capital within the field of power and climate change denial.

Recall, also, the study of Hjellbrekke and Korsnes (2009), according to which the field of power in Norway was shown as a three-dimensional space, in which (i)

dimension 1, describing the most dominant opposition, was primarily an *economic* capital dimension, where high volumes of economic capital were contrasted to low volumes of economic capital (ii) dimension 2, describing the second most dominant opposition, showed an opposition between *cultural* capital and *political* capital (iii) *dominant positions in public companies (CEOs and chairmen)* were located closer to *political* positions, and (iv) there was also found a distinct opposition between *political* positions and *academic* positions.

With regard to trust in environmental actors and institutions, the findings of this analysis differ from the findings of the study of Kaltenborn et al. (2017) in Norway, which showed that trust in environmental governance institutions is related to climate change attitudes (: high levels of trust were found associated with a tendency to perceive climate change as human caused, and low levels of trust were found to correspond with stronger beliefs that climate change are natural phenomena). In the present thesis, based on the mediation analysis, there was not found evidence of association between trust in environmental actors and institutions and climate change attitudes, neither was such trust found to mediate the relationship between the type of capital within the field of power and climate change denial. Recall that trust in environmental actors and institutions (after CATPCA) referred to *Statens naturoppsyn (SNO), Stortingspolitikere, Lokalpolitikere, Miljødirektoratet, Klima- og miljødepartementet,* and *Politienhetene som etterforsker miljøkriminalitet*, i.e. actors and institutions from within the *political space*. According to a Bourdieusian interpretation, the homologies of dominant positions link dominant *economically* and *politically* actors in different (sub)fields who share a common interest in the maintenance of their relative positions and the established order and have a similar habitus that facilitates agreements between them (see also the study of Hjellbrekke & Korsnes, 2009). On the other hand, *environmental capital* is closely related to *cultural* capital, as explained earlier in the thesis. Thus, trust in environmental actors and institutions (from within the *political space*) was not expected to be a crucial determinant of the relationship between the type of capital within the field of power and climate change denial.

8.3 Limitations of the study and recommendations for future research

This analysis is subject to the concerns that apply to every secondary analysis of existing data. As mentioned earlier in the analysis, the national survey dataset was only accompanied by its documentation report and the survey questions. Other documentation (e.g. development of the questionnaire, information about the applied survey weights, the web form of the questionnaire etc.) was not accessible to me. Hence, I could not identify whether any recognized instruments had been used in the national survey or account for complex sample issues if needed. Such problems are actually expected and reported as some of the potential drawbacks of conducting a secondary analysis of existing data (Boslaugh, 2007, p. 5; Cheng & Phillips, 2014, pp. 373-374; "How to do your dissertation secondary research," 2017).

With regard to the representativeness of the total population by the sample (weighted cases), there were found some deviations from official statistics regarding *Alder* (an overrepresentation of the ages from 18 to 29 years), *Utdanning* (underrepresentation of the group of primary education), and *Personlig* and *Husstandens årsinntekt* (a tendency to lower levels of income). Some deviations could be incidental or due to differentiations in the categorizations and the concepts used in official statistics. My overall estimation was that the representativeness of the total population had been fairly approached, albeit not to a such a high degree.

There were almost 7% missing values in the secondary dataset, which were considered as missing at random (MAR), and some hypothesized causes of missingness were discussed in chapter 4.3.2. The missing values were imputed satisfactorily, but none imputation method constitutes perfect remedy for missing data. Missing values should be addressed as far as possible during the design and collecting the data stages of a survey.

Moreover, operationalization of the concepts used in this analysis (e.g., for economic and cultural capital) was limited to a certain extent by the indicators available in the secondary dataset. It could be true that including more indicators to operationalize the concepts used could lead to more reliable results.

Furthermore, with regard to the delimitation of *high* economic and *high* cultural capital, there was some uncertainty caused by the fact that it did not exist an established minimum threshold of high economic or high cultural capital in the

literature. Moreover, since the aim of the analysis was to examine climate change attitudes of holders of high economic and high cultural capital within the field of power, a strict approach was more appropriate in order to account for this uncertainty and ensure, at the highest possible degree, that the delimitation of these concepts falls into that spectrum. Importantly, the *relational* structure of the field of power, according to Bourdieu, should be preserved and reflected in the solution. Hence, the delimitation of the above concepts reflects a conventional solution adopted for the purposes of this study and the interpretation of the field of power is grounded on the characteristics of the sample used in this analysis.

Finally, as far as the mediation analyses are concerned, an effort was made to account for covariates and alternative possible explanations based on the available data in the secondary dataset. This means that different covariates and possible explanations may exist which were not taken into account in the present analysis.

The mediation analyses assumed no interaction between the effects of type of capital in the field of power and environmental values on climate change denial. In addition, it did not examine alternative mechanisms of moderation, or combined mechanisms of mediation and moderation (conditional process analysis, see Hayes, 2018, p. 393), for the effect of the type of capital in the field of power on climate change attitudes. Moreover, beyond its main findings, the analysis revealed other factors, such as conservative voting and political alienation, which appeared to have a role to play in the formation of climate change attitudes. Therefore, further research is recommended to investigate the above issues. Qualitative approaches should be also employed to complement the quantitative methods and to offer different insights into the complex issue of climate change denial within the field of power in Norway.

8.4 Conclusion

This analysis tested two hypotheses formulated by drawing mainly on the theoretical constructs of *capital* and *field of power* developed by Bourdieu. My objective was to explore the relationship between the type of capital, economic or cultural, possessed in the field of power and climate change denial, with reference to the environmental values of holders of different types of capital positioned within the field of power. The statistical analysis showed that there is a significant association between the type of capital, economic or cultural, possessed in the field of power and climate change

denial. It also revealed that this relationship can be explained, to an extent, by environmental values. Thus, the results of the analysis confirmed the two hypotheses of the thesis. However, "human behavior is too complicated to be reduced to a mathematical model, and no model we could ever imagine, much less estimate or test, would be complete and accurate (MacCallum 2003)" (Hayes, 2018, pp. 394-395).

This thesis aimed at contributing to the body of social research on climate change denial in Norway by drawing inspiration from Bourdieu's sociology. This has been an unexplored area of research, but it is of major importance for climate change research and policy measures, for it maintains that actors within the field of power struggle over *statist* capital, legitimization and reproduction of their different forms of capital. Hopefully, the study has managed to shed some light on climate change denial in the field of power in Norway, by showing that Bourdieu's sociology provides valuable insights and understanding into the matter: through its *relational* philosophy, Bourdieu's sociology shifts one's vision of the social world towards structures of *relations,* and through the concept of the *field of power*, it offers a valuable interpretation of the reality of power relations, while mechanisms, through which our efforts for addressing climate change evolve, are revealed. Under my interpretation, the Bourdieusian perspective adopted in the thesis revealed that, with regard to the field of power, *environmental values* can explain how *climate change* denial conceals *a denial of changes in the legitimate type of authority* within the field of power.

Bibliography

Aguilera, A., Escabias, M., & Valderrama, M. (2006). Using principal components for estimating logistic regression with high-dimensional multicollinear data. *Computational Statistics & Data Analysis, 50*(2006), 1905-1924.

Akande, O., Li, F., & Reiter, J. (2017). An Empirical Comparison of Multiple Imputation Methods for Categorical Data. *The American Statistician, 71*(2), 162-170.

Albright, J., & Hartman, D. (2018a). Field as Both a Conceptual and Empirical Object of Analysis. In J. Albright, D. Hartman, & J. Widin (Eds.), *Bourdieu's Field Theory and the Social Sciences* (pp. 16-20): Palgrave Macmillan.

Albright, J., & Hartman, D. (2018b). Introduction: On Doing Field Analysis. In J. Albright, D. Hartman, & J. Widin (Eds.), *Bourdieu's Field Theory and the Social Sciences* (pp. 1-15): Palgrave Macmillan.

Allingham, J. (2018). *Unsupervised automatic dataset repair* (Dissertation), University of Cambridge United Kingdom.

Allison, P. D. (2000). Multiple Imputation for Missing Data:A Cautionary Tale. *Sociological Methods & Research, 28*(3), 301-309.

Allison, P. D. (2005). *Imputation of categorical variables with PROC MI*. Paper presented at the 30th Meeting of SAS User Group International, Philadelphia, PA. https://support.sas.com/resources/papers/proceedings/proceedings/sugi30/113-30.pdf

Allison, P. D. (n.d.). Missing Data. Retrieved from https://pdfs.semanticscholar.org/58de/eac621923189c28cae06066652c218e126e4.pdf

Andersen, G. I., & Jaeger, M. (2015). Cultural Capital in Context: Heterogeneous Returns to Cultural Capital across Schooling Environments. *Social science research, 50*(2015), 177-188.

Arnold, A., Böhm, G., Corner, A., Mays, C., Pidgeon, N., Poortinga, W., . . . Tvinnereim, E. (2016). *European Perceptions of Climate Change. Socio-political profiles to inform a cross-national survey in France, Germany, Norway and the UK*: Project: EPCC - European Perceptions of Climate Change and Energy Preferences.

Arntsen, S. F. (2010). *The Application of Multiple Imputation in Correcting for Unit Nonresponse Bias.* (Master thesis), NTNU, Trondheim.

Austgulen, M. H., & Stø, E. (2013). Norsk skepsis og usikkerhet om klimaendringer. *Tidsskrift for samfunnsforskning, 54*(02), 124-150.

Backe, I. F., Patil, G. G., Nes, R. B., & Clench-Aas, J. (2018). The relationship between physical functional limitations, and psychological distress: Considering a possible mediating role of pain, social support and sense of mastery. *SSM-population health, 4*(2018), 153-163.

Beedell, J., & Rehman, T. (2000). Using social-psychology models to understand farmers' conservation behaviour. *Journal of Rural Studies, 16*(1), 117-127. doi:https://doi.org/10.1016/S0743-0167(99)00043-1

Bennett, D. (2001). How can I deal with missing data in my study? *Australian and New Zealand Journal of Public Health, 25*(5), 464-469.

Berntson, J. (2015). *Depressive symptom severity, stressful life events, and subclinical atherosclerosis in African American adults.* (Master' s thesis), Purdue University, Indianapolis, Indiana.

Bhalla, D. (n.d.). Random Forest in R : Step by Step Tutorial Retrieved from https://www.listendata.com/2014/11/random-forest-with-r.html

Blekesaune, A., & Rønningen, K. (2010). Bears and fears: Cultural capital, geography and attitudes towards large carnivores in Norway. *Norsk Geografisk Tidsskrift, 64*(4), 185-198. doi:10.1080/00291951.2010.528225

Blunden, A. (2004). *Bourdieu on Status, Class and Culture* [PDF file]. Retrieved from http://www.ethicalpolitics.org/ablunden/pdfs/bourdieu-review.pdf

Boo, S., & Froelicher, E. (2013). Secondary analysis of national survey datasets. *Japan journal of nursing science, 10*(1), 130-135.

Bord, R. J., Fisher, A., & O' Connor, R. E. (1998). Public perceptions of global warming: United States and international perspectives. *Climate Research, 11*(1), 75-84.

Boslaugh, S. (2007). An Introduction to Secondary Data Analysis. *Secondary Data Sources for Public Health: A Practical Guide*, 1-11.

Bourdieu, P. (1986). The Forms of Capital (Richard Nice, Trans.). In J. G. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education* (pp. 241-258): Westport, CT: Greenwood.

Bourdieu, P. (1989). Social Space and Symbolic Power. *Sociological Theory, 7*(1), 14-25. doi:10.2307/202060

Bourdieu, P. (1996a). *The rules of art: genesis and structure of the literary field* (S. Emanuel, Trans.). Cambridge: Polity Press.

Bourdieu, P. (1996b). *The state nobility: elite schools in the field of power*. Cambridge: Polity Press.

Bourdieu, P. (2014). *On the State: Lectures at the College de France, 1989 - 1992* (D. Fernbach, Trans. P. Champagne, R. Lenoir, F. Poupeau, & M.-C. Riviere Eds.): Polity

Bourdieu, P., Farage, S., & Wacquant, L. J. D. (1994). Rethinking the State: Genesis and Structure of the Bureaucratic Field. *Sociological Theory, 12*(1), 1-18. doi:10.2307/202032

Bourdieu, P., & Wacquant, L. J. D. (1992). *An invitation to reflexive sociology*. Cambridge: Polity Press.

Bowling, A. (2005). Mode of Questionnaire Administration Can Have Serious Effects on Data Quality. *Journal of public health, 27*(3), 281-291.

Breiman, L. (2001). Random Forests. *Machine Learning, 45*(1), 5-32.

Breiman, L., & Cutler, A. (Producer). (2005). Random Forests for Scientific Discovery (ENAR 2005). [Power point slides] Retrieved from http://www.math.usu.edu/adele/RandomForests/index.htm

Brulle, R. J., & Dunlap, R. E. (2015). Sociology and Global Climate Change: Introduction. In R. E. Dunlap & R. J. Brulle (Eds.), *Climate Change and Society. Sociological Perspectives* (pp. 1-31). New York: Oxford University Press.

Buys, L., Aird, R., van Megen, K., Miller, E., & Sommerfeld, J. (2014). Perceptions of climate change and trust in information providers in rural Australia. *Public Understanding of Science, 23*(2), 170-188.

Can you perform a log transformation in SPSS? (2016, 7.9.2016). Retrieved from https://www-01.ibm.com/support/docview.wss?uid=swg21481524

Capstick, S., Whitmarsh, L., Poortinga, W., Pidgeon, N., & Upham, P. (2015). International trends in public perceptions of climate change over the past quarter century. *Wiley Interdisciplinary Reviews: Climate Change, 6*(1), 35-61. doi:10.1002/wcc.321

Carpita, M., & Manisera, M. (2008). On the imputation of missing data in surveys with Likert-type scales. *MTISD 2008. Methods, Models and Information Technologies for Decision Support Systems, 1*(1), 144-147.

Casson, R. J., & Farmer, L. D. (2014). Understanding and checking the assumptions of linear regression: a primer for medical researchers. *Clinical & experimental ophthalmology, 42*(6), 590-596.

Chaudhuri, A., & Christofides, T. C. (2013). *Indirect Questioning in Sample Surveys*: Springer Science & Business Media.

Cheng, H. G., & Phillips, M. R. (2014). Secondary analysis of existing data: opportunities and implementation. *Shanghai archives of psychiatry, 26*(6), 371-375.

Collins, L., Schafer, L. J., & Kam, C.-M. (2001). A Comparison of Inclusive and Restrictive Strategies in Modern Missing Data Procedures. *Psychological methods, 6*(4), 330-351.

Corbett, J. B., & Durfee, J. L. (2004). Testing Public (Un)Certainty of Science: Media Representations of Global Warming. *Science Communication, 26*(2), 129-151. doi:10.1177/1075547004270234

Couper, P. M., Tourangeau, R., Conrad, F., & Zhang, C. (2013). The Design of Grids in Web Surveys. *Social Science Computer Review, 31*(3), 322-345.

Coutts, E., & Jann, B. (2011). Sensitive Questions in Online Surveys: Experimental Results for the Randomized Response Technique (RRT) and the Unmatched Count Technique (UCT). *Sociological Methods & Research, 40*(1), 169-193.

Cutler, A. (Producer). (2009). Random Forests - A Statistical Tool for the Sciences (useR! 2009) [Power point slides] Retrieved from http://www.math.usu.edu/adele/RandomForests/index.htm

Dance, C., DeBerard, M., & Gundy Cuneo, J. (2016). Pain acceptance potentially mediates the relationship between pain catastrophizing and post-surgery outcomes among compensated lumbar fusion patients. *Journal of Pain Research, 10*, 65-72.

Data Cleaning. (2016). Retrieved from https://www.acaps.org/data-cleaning

Davidson, D., & Haan, M. (2012). Gender, Political Ideology, and Climate Change Beliefs in an Extractive Industry Community. *Population and Environment, 34*(2), 217–234.

de Leeuw, E., Hox, J., & Huisman, M. (2003). Prevention and treatment of item nonresponse. *Journal of official statistics, 19*(2), 153-176.

Dealing with missing values – part 1. Applied Multivariate Statistics – Spring 2012. (2012). [Power point slides] Retrieved from https://stat.ethz.ch/education/semesters/ss2012/ams/slides/v3.1.pdf

Del Valle, I., Astorkiza, K., & Astorkiza, I. (2008). Basque inshore skippers' long term behaviour: A logit approach. *Aquatic Living Resources, 21*(3), 227–238.

Demming, C. L., Jahn, S., & Boztug, Y. (2017). Conducting mediation analysis in marketing research. *Marketing ZFP, 39*(3), 76-98.

Denord, F., Hjellbrekke, J., Korsnes, O., Lebaron, F., & Le Roux, B. (2011). Social Capital in the Field of Power: The Case of Norway. *The Sociological Review, 59*(1), 86-108. doi:10.1111/j.1467-954X.2010.01994.x

Di Guida, R., Engel, J., Allwood, J. W., Weber, R. J. M., Jones, M. R., Sommer, U., . . . Dunn, W. B. (2016). Non-targeted UHPLC-MS metabolomic data processing methods: a comparative investigation of normalisation, missing value imputation, transformation and scaling. *Metabolomics, 12*(93). doi:10.1007/s11306-016-1030-9

Donders, R., van der Heijden, G., Stijnen, T., & Moons, K. (2006). Review: A gentle introduction to imputation of missing values. *Journal of clinical epidemiology, 59*(2006), 1087-1091.

Dong, Y., & Peng, J. (2013). Principled missing data methods for researchers. *SpringerPlus, 2*(1), 222.

Duarte, K., & Yagodin, D. (2012). Scientific Leaks. Uncertainty and skepticism in climate change journalism. In E. Eide & R. Kunilius (Eds.), *Media meets climate: the global challenge for journalism* (pp. 163-178): Göteborg: NORDICOM.

Dunlap, R. E., & Brulle, R. J. (2015). Bringing Sociology into Climate Change Research and Climate Change into Sociology. Concluding Observations. In R. E. Dunlap & R. J. Brulle (Eds.), *Climate Change and Society. Sociological Perspectives* (pp. 412-436). New York: Oxford University Press.

Dunlap, R. E., & McCright, A. M. (2015). Challenging Climate Change. The Denial Countermovement. In R. E. Dunlap & R. J. Brulle (Eds.), *Climate Change and Society. Sociological Perspectives* (pp. 300-332). New York: Oxford University Press.

Eekhout, I., de Vet, H., Twisk, J., Brand, P. L. J., de Boer, M., & Heymans, M. (2014). Missing data in a multi-item instrument were best handled by multiple imputation at the item score level. *Journal of clinical epidemiology, 67*(3), 335-342.

Ehrhardt-Martinez, K., Rudel, K. T., Norgaard, K. M., & Broadbent, J. (2015). Mitigating Climate Change. In R. E. Dunlap & R. J. Brulle (Eds.), *Climate Change and Society. Sociological Perspectives* (pp. 199-234): Oxford University Press.

Everson, J., Lee, S.-Y., & Friedman, C. (2014). Reliability and Validity of the American Hospital Association's National Longitudinal Survey of Health Information Technology Adoption. *Journal of the American Medical Informatics Association : JAMIA, 21*, e257–e263.

Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey: A systematic review. *Computers in Human Behavior, 26*(2), 132-139.

Feldman, L., Maibach, E. W., Roser-Renouf, C., & Leiserowitz, A. (2012). Climate on cable: The nature and impact of global warming coverage on Fox News, CNN, and MSNBC. *The International Journal of Press/Politics, 17*(1), 3-31.

Ferrari, P., & Manzi, G. (2010). Nonlinear Principal Component Analysis as a Tool for the Evaluation of Customer Satisfaction. *Quality Technology and Quantitative Management, 7*(2), 117-132.

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (Fifth ed.): Sage Publications.

Finch, H. (2010). Imputation Methods for Missing Categorical Questionnaire Data: A Comparison of Approaches. *Journal of Data Science, 8*(2010), 361-378.

Fox, E. (2014). *Society, Power and Climate Change: A social critique of public climate change receptivity in Ireland.* (PhD thesis), National University of Ireland, Galway.

Friedrichs, J., & Blasius, J. (2006). *Attitudes of Owners and Renters in a Deprived Neighbourhood*. Paper presented at the ENHR conference "Housing in an expanding Europe: theory, policy, participation and implementation", Ljubljana, Slovenia. https://www.enhr.net/documents/2006%20Slovenia/W12_Friedrichs_Blasius.pdf

Gadermann, A. M., Guhn, M., & Zumbo, B. D. (2012). Estimating ordinal reliability for Likert-type and ordinal item response data: a conceptual, empirical, and practical guide. *Practical Assessment, Research & Evaluation, 17*(3).

Garson, G. D. (2015). *Missing Values Analysis and Data Imputation* Retrieved from http://www.statisticalassociates.com/missingvaluesanalysis_p.pdf

Gemici, S., Bednarz, A., & Lim, P. (2011). Getting tough on missing data: a boot camp for social science researchers. Retrieved from https://www.ncver.edu.au/research-and-statistics/publications/all-publications/getting-tough-on-missing-data-a-boot-camp-for-social-science-researchers

Genovese, F., & Tvinnereim, E. (2018). Who opposes climate regulation? Business preferences for the European emission trading scheme. *The Review of International Organizations*, 1-32.

Gideon, L. (2012). *Handbook of Survey Methodology for the Social Sciences*. New York: Springer Science & Business Media.

Gifford, R. (2011). The Dragons of Inaction: Psychological Barriers That Limit Climate Change Mitigation and Adaptation. *American Psychologist, 66*(4), 290-302. doi:10.1037/a0023566

Goes, J., & Simon, M. (2016). *Using Secondary data in Doctoral Research*. Retrieved from http://dissertationrecipes.com/wp-content/uploads/2011/04/Using-Secondary-Data-in-Doctoral-Research.pdf

Goodboy, A. K., Martin, M. M., & Bolkan, S. (2017). Workplace Bullying and Work Engagement: A Self-Determination Model. *Journal of Interpersonal Violence*, 1-23. doi:10.1177/0886260517717492

Grace-Martin, K. (n.d.). How to Diagnose the Missing Data Mechanism. Retrieved from The Analysis Factor website: https://www.theanalysisfactor.com/missing-data-mechanism/

Graham, J. (2009). Missing Data Analysis: Making It Work in the Real World. *Annual review of psychology, 60*(1), 549-576.

Guidelines for Research Ethics in the Social Sciences, Humanities, Law and Theology. (2016). The Norwegian National Research Ethics Committees Retrieved from https://www.etikkom.no/en/.

Hanna, S. (2016). *Bourdieu in translation studies : the socio-cultural dynamics of Shakespeare translation in Egypt* Routledge Advances in Translation and Interpreting Studies, Vol. 14.

Hayes, A. F. (Producer). (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [White paper]. Retrieved from https://pdfs.semanticscholar.org/e9bb/7b23993113a73ee1ff6cde5ff9a4164f946e.pdf?_ga=2.88787803.1385060903.1555875389-2001148670.1542454860

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (Second ed.). New York: The Guilford Press.

Hayes, A. F., & Cai, L. (2007). Using heteroskedasticity-consistent standard error estimators in OLS regression: An introduction and software implementation. *Behavior research methods, 39*(4), 709-722.

Hayes, A. F., Montoya, A., & Rockwood, N. (2017). The analysis of mechanisms and their contingencies: PROCESS versus structural equation modeling. *Australasian Marketing Journal, 25*(2017), 76-81.

Hayes, A. F., & Rockwood, N. J. (2017). Regression-based statistical mediation and moderation analysis in clinical research: Observations, recommendations, and implementation. *Behaviour research and therapy, 98*(2017), 39-57.

He, L., Levine, R. A., Fan, J., Beemer, J., & Stronach, J. (2018). Random forest as a predictive analytics alternative to regression in institutional research. *Practical Assessment, Research and Evaluation, 23*(1), 1-16.

Helliesen, M. S. (2015). *In Science We Trust, Through Ideology We Look: Explaining Climate Change Attitudes in Norway* (Master thesis), University of Bergen.

Heymans, M. (2011, 12 May 2015). Handling missing data (Amsterdam Public Health research institute quality handbook). Retrieved from http://www.emgo.nl/kc/handling-missing-data/

Hilgers, M., & Mangez, E. (2015). Introduction to Pierre Bourdieu's social fields. In M. Hilgers & E. Mangez (Eds.), *Bourdieu's Theory of Social Fields: Concepts and applications* (pp. 1-36).

Hill, M. (1997). *SPSS Missing Value Analysis 7.5*. Chicago: SPSS Inc.

Hjellbrekke, J., & Korsnes, O. (2009). Quantifying the field of power in Norway. In K. Robson & C. Sanders (Eds.), *Quantifying Theory: Pierre Bourdieu* (pp. 31-45): Springer, Dordrecht.

Hof, M. (2012). Questionnaire Evaluation with Factor Analysis and Cronbach's Alpha. An example. Retrieved from http://www.let.rug.nl/nerbonne/teach/rema-stats-meth-seminar/student-papers/MHof-QuestionnaireEvaluation-2012-Cronbach-FactAnalysis.pdf

Horning, N. (Producer). (n.d.). Introduction to decision trees and random forests Retrieved from http://whrc.org/wp-content/uploads/2016/02/DecisionTrees_RandomForest_v2.pdf

How to do your dissertation secondary research in 4 steps. (2017). Retrieved from https://www.oxbridgeessays.com/blog/how-to-dissertation-secondary-research-4-steps/

Imai, K., Keele, L., & Tingley, D. (2010). A General Approach to Causal Mediation Analysis. *Psychological methods, 15*(4), 309-334.

IPCC. (2007). Climate Change 2007: The Physical Science Basis. Working Group I Contribution to the Fourth Assessment Report of the IPCC.

IPCC. (2014). Climate Change 2014 Synthesis Report: Summary for policymakers.

Johnson, D. R. (Producer). (2008). Using Weights in the Analysis of Survey Data. [PowerPoint slides] Retrieved from http://www.nyu.edu/classes/jackson/design.of.social.research/Readings/Johnson%20-%20Introduction%20to%20survey%20weights%20%28PRI%20version%29.pdf

Jones, C. L., Jensen, J. D., Scherr, C. L., Brown, N. R., Christy, K., & Weaver, J. (2015). The Health Belief Model as an Explanatory Framework in Communication Research: Exploring Parallel, Serial, and Moderated Mediation. *Health Communication, 30*(6), 566-576.

Josephat, P. K., & Ame, A. (2018). Effect of Testing Logistic Regression Assumptions on the Improvement of the Propensity Scores. *International Journal of Statistics and Applications, 8*(1), 9-17.

Józwiak, K. (Producer). (2018). What to do when incomplete subjects information is available? Tutorial on Dealing with Missing Data. [PowerPoint slides] Retrieved from https://www.nki.nl/media/10941182/dealing-with-missing-data-tutorial-2018.pdf

Kahan, D. M., Jenkins-Smith, H., & Braman, D. (2011). Cultural cognition of scientific consensus. *Journal of Risk Research, 14*(2), 147-174.

Kaltenborn, B. P., Krange, O., & Tangeland, T. (2017). Cultural resources and public trust shape attitudes toward climate change and preferred futures—A case study among the Norwegian public. *Futures, 89*, 1-13. doi:10.1016/j.futures.2017.04.005

Kamphuis, C., Jansen, T., Mackenbach, J., & van Lenthe, F. (2015). Bourdieu's Cultural Capital in Relation to Food Choices: A Systematic Review of Cultural Capital Indicators and an Empirical Proof of Concept. *PLoS ONE, 10*(8), e0130695. doi:10.1371/journal.pone.0130695

Kane, L., & Ashbaugh, A. R. (2017). Simple and parallel mediation: A tutorial exploring anxiety sensitivity, sensation seeking, and gender. *The Quantitative Methods for Psychology, 13*(3), 148-165.

Kantar TNS. (30. mar. 2019). Retrieved from https://no.wikipedia.org/wiki/Kantar_TNS

Karlstrøm, H., & Ryghaug, M. (2014). Public attitudes towards renewable energy technologies in Norway. The role of party preferences. *Energy Policy, 67*, 656-663. doi:https://doi.org/10.1016/j.enpol.2013.11.049

Karol, J., & Gale, T. (2004). *What is 'environmental capital'? Bourdieu's social theory and sustainability*. Paper presented at the Australian Association for Research in Education (AARE) International Conference, Melbourne.

Kim, J. K., Brick, J. M., Fuller, W. A., & Kalton, G. (2006). On the Bias of the Multiple-Imputation Variance Estimator in Survey Sampling. *Journal of the Royal Statistical Society. Series B (Statistical Methodology), 68*(3), 509-521.

King, G., Honaker, J., Joseph, A., & Scheve, K. (1998). *Listwise Deletion is Evil: What to Do About Missing Data in Political Science*. Paper presented at the Annual Meeting of the American Political Science Association.

Koziol, N., & Arthur, A. (Producer). (2011). An Introduction to Secondary Data Analysis [[PowerPoint slides]] Retrieved from http://r2ed.unl.edu/presentations/2011/RMS/120911_Koziol/120911_Koziol.pdf

Krange, O., Tangeland, T., & Skogen, K. (2011). *NINA Rapport 657. Bestandsmål for store rovdyr. Hva mener folk om bestandsmål og om hvem som skal bestemme i rovviltforvaltningen?* . Retrieved from https://www.nina.no/Publikasjoner/Publikasjon.aspx?pubid=6345

Kreijns, K., Vermeulen, M., Buuren, H., & Van Acker, F. (2017). Does Successful Use of Digital Learning Materials Predict Teachers' Intention to Use Them Again in the Future? *International Review of Research in Open and Distributed Learning, 18*(7), 158-173. doi:10.19173/irrodl.v18i7.2895

Krosnick, J. A., & MacInnis, B. (2012). *Trends in American Public Opinion on Global Warming Policies Between 2010 and 2012*. Stanford University.

Krug, I., Treasure, J., Anderluh, M., Bellodi, L., Cellini, E., Collier, D., . . . Fernández-Aranda, F. (2008). Associations of individual and family eating

patterns during childhood and early adolescence: a multicentre European study of associated eating disorder factors. *British Journal of Nutrition, 101*(6), 909-918.

Kundu, S., Goswami, T., & Pyne, B. (2018). A Comparative Study of MissForest and Rough Set Theory for Imputation of Missing Data. *International Journal of Advanced Research in Science, Engineering and Technology, 5*(7), 6350-6357.

Kuppusamy, V., & Paramasivam, I. (2016). A Study of Impact on Missing Categorical Data - A Qualitative Review. *Indian Journal of Science and Technology, 9*(32). doi:10.17485/ijst/2016/v9i32/83088

Langkamp, D. L., Lehman, A., & Lemeshow, S. (2010). Techniques for Handling Missing Data in Secondary Analyses of Large Surveys. *Academic Pediatrics, 10*(3), 205-210.

Lave, R. (2012). Bridging Political Ecology and STS: A Field Analysis of the Rosgen Wars. *Annals of the Association of American Geographers, 102*(2), 366-382. doi:10.1080/00045608.2011.641884

Leviston, Z., Walker, I., & Morwinski, S. (2013). Your opinion on climate change might not be as common as you think. *Nature Climate Change, 3*(4), 334-337.

Li, C. (2013). Little's Test of Missing Completely at Random. *The Stata Journal, 13*(4), 795-809.

Liao, S., Lin, Y., Kang, D., Chandra, D., Bon, J., Kaminski, N., . . . Tseng, G. (2014). Missing value imputation in high-dimensional phenomic data: Imputable or not, and how? *BMC Bioinformatics, 15*(346). doi:10.1186/s12859-014-0346-6

Linting, M., Meulman, J., Groenen, P., & van der Kooij, A. (2007). Nonlinear Principal Components Analysis: Introduction and Application. *Psychological methods, 12*(3), 336-358.

Linting, M., & van der Kooij, A. (2012). Nonlinear Principal Components Analysis With CATPCA: A Tutorial. *Journal of Personality Assessment, 94*(1), 12-25.

List of political parties in Norway. (14.1.2019). Retrieved from https://en.wikipedia.org/wiki/List_of_political_parties_in_Norway

Little, J. A. R. (1988). A Test of Missing Completely at Random for Multivariate Data with Missing Values. *Journal of the American Statistical Association, 83*(404), 1198-1202.

Little , J. A. R. (1995). Modeling the Drop-Out Mechanism in Repeated-Measures Studies. *Journal of the American Statistical Association, 90*(431), 1112-1121.

Lopes, H., & Calapez, T. (2012). The Relational Dimension of Identity—Theoretical and Empirical Exploration. *Review of Social Economy, 70*(1), 81-107.

Manfreda, K. L., Bosnjak, M., Berzelak, J., Haas, I., & Vehovar, V. (2008). Web Surveys versus other Survey Modes: A Meta-Analysis Comparing Response Rates. *International Journal of Market Research, 50*(1), 79-104.

Manfredi, P., Manisera, M., & Dabrassi, F. (2009). The alexithymia construct: a reading based on Categorical Principal Component Analysis. *PSYCHOFENIA - ANNO, XII*(21), 165-180.

Mazza, G., Enders, C., & Ruehlman, L. (2015). Addressing Item-Level Missing Data: A Comparison of Proration and Full Information Maximum Likelihood Estimation [Author manuscript]. *Multivariate Behavioral Research, 50*(5), 504-519.

McCright, A. M., & Dunlap, R. E. (2011a). Cool Dudes: The Denial of Climate Change Among Conservative White Males in the United States. *Global Environmental Change, 21*(4), 1163-1172.

McCright, A. M., & Dunlap, R. E. (2011b). The politicization of climate change and polarization in the American public's views of global warming, 2001–2010. *The Sociological Quarterly, 52*(2), 155-194.

McCright, A. M., Dunlap, R. E., & 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

Meeyai, S. (2016). Logistic Regression with Missing Data: A Comparison of Handling Methods, and Effects of Percent Missing Values. *Journal of Traffic and Logistics Engineering, 4*(2), 128-134.

Mendes, G., & Ganga, G. (2013). Predicting Success in Product Development: The Application of Principal Component Analysis to Categorical Data and Binomial Logistic Regression. *Journal of Technology Management & Innovation, 8*(3), 83-97.

Meulman, J., van der Kooij, A., & Heiser, W. (2004). Principal Component Analysis with Nonlinear Optimal Scaling Transformations for Ordinal and Nominal Data. In D. Kaplan (Ed.), *The Sage Handbook of Quantitative Methodology for the Social Sciences* (pp. 49-70): Sage Publications.

Meyers, T. W. (2016). *The Relationship between Socioeconomic Status (SES) and the National Council Licensure Examination for Registered Nurses: Comparing SES indicators in Mediated and Moderated Logistic Regression.* (Doctoral dissertation), Kent State University.

Morris, E. A. (2011). *Access and outcomes: Transportation, location, and subjective well-being.* (PhD dissertation), University of California, Los Angeles.

Morrison, L. R., Dillman, D., & Christian, L. (2010). Questionnaire Design Guidelines for Establishment Surveys. *Journal of official statistics, 26*(1), 43-85.

Moses, J. W., & Knutsen, T. L. (2007). *Ways of Knowing. Competing Methodologies in Social and Political Research.* . New York: Palgrave Macmillan.

Muharemi, F., Logofătu, D., & Leon, F. (2018). *Review on General Techniques and Packages for Data Imputation in R on a Real World Dataset*. Paper presented at the 10th International Conference on Computational Collective Intelligence, ICCCI 2018, Bristol, UK. https://www.researchgate.net/profile/Doina_Logofatu/publication/328403838_Review_on_General_Techniques_and_Packages_for_Data_Imputation_in_R_on_a_Real_World_Dataset/links/5bcaf88fa6fdcc03c796762d/Review-on-General-Techniques-and-Packages-for-Data-Imputation-in-R-on-a-Real-World-Dataset.pdf

Munguía, T., & Armando, J. (2014). Comparison of imputation methods for handling missing categorical data with univariate pattern. *Revista de Métodos Cuantitativos para la Economía y la Empresa, 17*(2014), 101-120.

Navas González, F. J., Jordana Vidal, J., Pizarro Inostroza, G., Arando Arbulu, A., & Delgado Bermejo, J. V. (2018). Can Donkey Behavior and Cognition Be Used to Trace Back, Explain, or Forecast Moon Cycle and Weather Events? *Animals : an open access journal from MDPI, 8*(11), 215. doi:10.3390/ani8110215

Newsom, J. T. (Producer). (2016). Mediation Analysis with Logistic Regression Retrieved from http://web.pdx.edu/~newsomj/cdaclass/ho_mediation.pdf

Norgaard, K. M. (2011). *Living in Denial. Climate Change, Emotions, and Everyday Life*: Mit Press.

Norgaard, K. M. (2012). Climate Denial and the Construction of Innocence: Reproducing Transnational Environmental Privilege in the Face of Climate Change. *Race, Gender & Class, 19*(1-2), 80-103.

Olofsson, A., & Öhman, S. (2006). General Beliefs and Environmental Concern: Transatlantic Comparisons. *Environment and Behavior, 38*(6), 768-790.

Papageorgiou, G., Grant, S., Takkenberg, J., & Mokhles, M. (2018). Statistical primer: How to deal with missing data in scientific research? *Interactive CardioVascular and Thoracic Surgery, 27*(2), 153–158.

Peduzzi, P., Concato, J., Kemper, E., Holford, T., & Feinstein, A. (1996). A Simulation Study of the Number of Events per Variable in Logistic Regression Analysis. *Journal of clinical epidemiology, 49*(12), 1373-1379.

Pelz, B. (Producer). (n.d.). Research Methods for the Social Sciences, Chapter 6 Measurement of Constructs. [Courseware] Retrieved from https://courses.lumenlearning.com/suny-hccc-research-methods/chapter/chapter-6-measurement-of-constructs/

Penone, C., Davidson, A., Shoemaker, K., Di Marco, M., Rondinini, C., Brooks, T., . . . Costa, G. (2014). Imputation of missing data in life-history trait datasets: Which approach performs the best? *Methods in Ecology and Evolution, 5*(9), 961–970. doi:10.1111/2041-210X.12232

Perlinger, T. (Producer). (2015). Quantitative Methods II, Lecture 3. [Power point slides: L03 Graphical examination + Missing data (student).pdf] Retrieved from https://studentportalen.uu.se/portal/portal/uusp/student/filearea?entityId=119958&toolAttachmentId=309391

Pigott, D. T. (2001). A Review of Methods for Missing Data. *Educational Research and Evaluation, 7*(4), 353-383.

Publication manual of the American Psychological Association (6th ed.). (2010). Washington, DC, US: American Psychological Association.

Ratitch, B., Lipkovich, I., & O'Kelly, M. (2013). Combining analysis results from multiply imputed categorical data. *PharmaSUG 2013-Paper SP03, 2013*, 1-19.

Rehm, J., Irving, H., Ye, Y., Kerr, W. C., Bond, J., & Greenfield, T. (2008). Are Lifetime Abstainers the Best Control Group in Alcohol Epidemiology? On the Stability and Validity of Reported Lifetime Abstention. *American journal of epidemiology, 168*(8), 866-871. doi:10.1093/aje/kwn093

Rey del Castillo, P. (2012). *Use of Machine Learning Methods to Impute Categorical data*. Paper presented at the UNECE Work Session on Statistical Data Editing, Oslo, Norway.

Rhoads, C. H. (2012). Problems with Tests of the Missingness Mechanism in Quantitative Policy Studies. *Statistics, Politics, and Policy, 3*(1, Article 6). doi:10.1515/2151-7509.1012

Rijnhart, J. J., Twisk, J. W., Eekhout, I., & Heymans, M. W. (2019). Comparison of logistic-regression based methods for simple mediation analysis with a dichotomous outcome variable. *BMC Medical Research Methodology, 19*(1), 19.

Riley, D. (2015). The New Durkheim: Bourdieu and the State. *Critical Historical Studies, 2*(2), 261-279. doi:10.1086/683641

Rolstad, S., Adler, J., & Ryden, A. (2011). Response Burden and Questionnaire Length: Is Shorter Better? A Review and Meta-analysis. *Value in Health, 14*(2011), 1101-1108.

Rosa, E. A., Rudel, T. K., York, R., Jorgenson, A. K., & Dietz, T. (2015). The Human (Anthropogenic) Driving Forces of Global Climate Change. In R. E. Dunlap & R. J. Brulle (Eds.), *Climate Change and Society. Sociological Perspectives* (pp. 32-60). New York: Oxford University Press.

Rovai, A. P., Baker, J. D., & Ponton, M. K. (2013). *Social Science Research Design and Statistics: A Practitioner's Guide to Research Methods and IBM SPSS*: Watertree Press LLC.

Rubin, D. B. (1976). Inference and Missing Data. *Biometrika, 63*(3), 581-592.

Rudestam, K. E., & Newton, R. R. (2007). *Surviving Your Dissertation: A Comprehensive Guide to Content and Process*: SAGE Publications.

Ruel, E., Wagner, W. E., & Gillespie, B. J. (2015). *The Practice of Survey Research*: SAGE Publications.

Sage, A. (2018). *Random forest robustness, variable importance, and tree aggregation.* (Dissertation), Iowa State University. Retrieved from https://lib.dr.iastate.edu/etd/16453

Samoilenko, M., Blais, L., & Lefebvre, G. (2018). Comparing logistic and log-binomial models for causal mediation analyses of binary mediators and rare binary outcomes: evidence to support cross-checking of mediation results in practice. *Observational Studies, 4*(2018), 193-216.

Sandlie, H., & Gulbrandsen, L. (2017). The Social Homeownership Model – the Case of Norway. *Critical Housing Analysis, 4*(1), 52-60. doi:10.13060/23362839.2017.4.1.324

Sastry, D. (2015). *Environmental capital as cultural capital: environmentalism and identity-formation in the Indian middle class.* (PhD thesis), Birkbeck, University of London.

Saukani, N., & Ismail, N. (2018). Identifying the Components of Social Capital by Categorical Principal Component Analysis (CATPCA). *Social Indicators Research, 141*(2), 631–655.

Savage, M., & Silva, E. B. (2013). Field Analysis in Cultural Sociology. *Cultural Sociology, 7*(2), 111-126. doi:10.1177/1749975512473992

Schafer, L. J. (1999). Multiple Imputation: A Primer. *Statistical methods in medical research, 8*(1), 3-15.

Schafer, L. J., & Graham, J. (2002). Missing Data: Our View of the State of the Art. *Psychological methods, 7*(2), 147-177.

Schenker, N., Raghunathan, T. E., Chiu, P.-L., Makuc, D. M., Zhang, G., & Cohen, A. J. (2006). Multiple Imputation of Missing Income Data in the National Health Interview Survey. *Journal of the American Statistical Association, 101*(475), 924-933.

Schlomer, G. L., Bauman, S., & Card, N. A. (2010). Best practices for missing data management in counseling psychology. *Journal of Counseling Psychology, 57*(1), 1-10.

Schmidt, A. F., & Finan, C. (2018). Linear regression and the normality assumption. *Journal of clinical epidemiology, 98*(2018), 146-151.

Schmitz, A., Witte, D., & Gengnagel, V. (2017). Pluralizing field analysis: Toward a relational understanding of the field of power. *Social Science Information, 56*(1), 49-73. doi:10.1177/0539018416675071

Schonlau, M., Fricker, R. D., & Elliott, M. N. (2002). *Conducting Research Surveys via E-mail and the Web*. Santa Monica, CA; Arlington, VA; Pittsburgh, PA: RAND Corporation.

Schwartz, S. (n.d.). Reliability. Retrieved from http://essedunet.nsd.uib.no/cms/topics/1/4/3.html

Scruggs, L., & Benegal, S. (2012). Declining Public Concern about Climate Change: Can We Blame the Great Recession? *Global Environmental Change, 22*(2), 505-515. doi:10.1016/j.gloenvcha.2012.01.002

Seaman, S., Bartlett, J., & White, I. (2012). Multiple imputation of missing covariates with non-linear effects and interactions: An evaluation of statistical methods. *BMC Medical Research Methodology, 12*. doi:10.1186/1471-2288-12-46

Shah, A., Bartlett, J., Carpenter, J., Nicholas, O., & Hemingway, H. (2014). Comparison of random forest and parametric imputation models for imputing missing data using MICE: A CALIBER study. *American journal of epidemiology, 179*(6), 764-774.

Shannon, S., Brennan, D., Hanna, D., Younger, Z., Hassan, J., & Breslin, G. (2018). The Effect of a School-Based Intervention on Physical Activity and Well-Being: a Non-Randomised Controlled Trial with Children of Low Socio-Economic Status. *Sports Medicine - Open, 4*, 16. doi:10.1186/s40798-018-0129-0

Skogen, K., & Strandbu, Å. (2000). Environmentalism among Norwegian Youth: Different Paths to Attitudes and Action? *Journal of Youth Studies, 3*(2), 189-209. doi:10.1080/713684371

Skogen, K., & Thrane, C. (2007). Wolves in Context: Using Survey Data to Situate Attitudes Within a Wider Cultural Framework. *Society & Natural Resources, 21*(1), 17-33.

SPSS Short Course, Module 6, Multiple Imputation. Retrieved from http://bayes.acs.unt.edu:8083/BayesContent/class/Jon/SPSS_SC/Module6/SPSS_M6_2.htm

Steinführer, A., & Kuhlicke, C. (2007). Social vulnerability and the 2002 flood. *Country Report Germany (Mulde River), Leipzig*.

Stekhoven, D. (2011). Using the missForest Package. *R Package*, 1-11.

Stekhoven, D. (2016). Package "missForest". Retrieved from https://cran.r-project.org/web/packages/missForest/missForest.pdf

Stekhoven, D., & Bühlmann, P. (2012). MissForest - Non-parametric missing value imputation for mixed-type data. *Bioinformatics (Oxford, England), 28*(1), 112-118.

Stoltzfus, J. (2011). Logistic Regression: A Brief Primer. *Academic Emergency Medicine (Official journal of the Society for Academic Emergency Medicine), 18*, 1099-1104.

Swartz, D. L. (2013). *Symbolic Power, Politics, and Intellectuals: The Political Sociology of Pierre Bourdieu*. Chicago University of Press.

Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics*: Pearson Education.

Tang, F. (2017). *Random Forest Missing Data Approaches.* (Dissertation), University of Miami Retrieved from https://scholarlyrepository.miami.edu/oa_dissertations/1852 Available from Open Access Dissertations. 1852.

Tang, F., & Ishwaran, H. (2017). Random forest missing data algorithms. *Statistical Analysis and Data Mining: The ASA Data Science Journal, 10*(6), 363–377. doi:10.1002/sam.11348

Thomson, P. (2012). Field. In M. Grenfell (Ed.), *Pierre Bourdieu: Key Concepts* (pp. 65-80): Acumen Publishing.

Tourangeau, R., & Yan, T. (2007). Sensitive questions in surveys. *Psychological Bulletin, 133*(5), 859-883.

Tripathy, J. P. (2013). Secondary Data Analysis: Ethical Issues and Challenges. *Iranian journal of public health, 42*(12), 1478-1479.

Tsfati, Y., & Nir, L. (2017). Frames and Reasoning: Two Pathways from Selective Exposure to Affective Polarization. *International Journal of Communication, 11*(2017), 301-322.

Tvinnereim, E., & Ivarsflaten, E. (2016). Fossil fuels, employment, and support for climate policies. *Energy Policy, 96*, 364-371. doi:https://doi.org/10.1016/j.enpol.2016.05.052

Uenal, H., Mayer, B., & Du Prel, J.-B. (2014). Choosing Appropriate Methods for Missing Data in Medical Research: A Decision Algorithm on Methods for Missing Data. *Journal of Applied Quantitative Methods, 9*(4), 10-21.

Using imputation for missing values. (n.d., 07/05/09). Retrieved from http://www.restore.ac.uk/PEAS/imputation.php07/05/09

Valeri, L., & VanderWeele, T. J. (2013). Mediation analysis allowing for exposure–mediator interactions and causal interpretation: Theoretical assumptions and implementation with SAS and SPSS macros. *Psychological methods, 18*(2), 137-150. doi:10.1037/a0031034

Vameghi, R., Sajedi, F., Shahshahani, S., & Biglarian, A. (2015). Validity and Reliability Determination of Parents Evaluation of Developmental Status (PEDS) in 4-60 Months old Children in Tehran. *Iranian Rehabilitation Journal, 13*(2), 62-67.

van Buuren, S. (2012). *Flexible Imputation of Missing Data*. NW: CRC Press.

Van den Broeck, J., Cunningham, S., Eeckels, R., & Herbst, K. (2005). Data Cleaning: Detecting, Diagnosing, and Editing Data Abnormalities. *PLoS Medicine, 2*(10), e267 (966-970).

VanderWeele, T. J. (2010). Bias Formulas for Sensitivity Analysis for Direct and Indirect Effects *Epidemiology, 21*(4), 540-551.

VanderWeele, T. J. (2016). Mediation analysis: a practitioner's guide. *Annual review of public health, 37*(2016), 17-32.

VanderWeele, T. J., Valeri, L., & Ananth, C. V. (2018). Mediation Formulas with Binary Mediators and Outcomes and the "Rare Outcome Assumption" [original unedited manuscript]. *American journal of epidemiology, kwy281*. doi:10.1093/aje/kwy281

VanderWeele, T. J., & Vansteelandt, S. (2010). Odds ratios for mediation analysis for a dichotomous outcome. *American journal of epidemiology, 172*(12), 1339-1348.

Verweij, M. (2008). Towards a Theory of Constrained Relativism: Comparing and Combining the Work of Pierre Bourdieu, Mary Douglas and Michael Thompson, and Alan Fiske. *Sociological Research Online, 12*(6), 1-13. doi:10.5153/sro.1595

Vindholmen, S., Høigaard, R., Espnes, G. A., & Seiler, S. (2014). Return to work after vocational rehabilitation: does mindfulness matter? *Psychology research and behavior management, 7*(2014), 77-88.

von Hippel, P. T. (2009). How to Impute Interactions, Squares, and Other Transformed Variables. *Sociological Methodology, 39*(2009), 265-291.

Waljee, A., Mukherjee, A., Singal, A., Zhang, Y., Warren, J., Balis, U., . . . Higgins, P. (2013). Comparison of imputation methods for missing laboratory data in medicine. *BMJ Open, 3*(3:e002847). doi:10.1136/bmjopen-2013-002847

Wang, H., & Wang, J. (2017). The Effect of Habitus and Capitals on Adoption Behavior of E-Commerce Information System: An Investigation of Digital Immigrants. *Open Journal of Social Sciences, 5*, 159-170.

Washington State Population Survey Imputation (n.d.). Retrieved from http://courses.washington.edu/pbaf527b/Imputation.pdf

Watts, H. (2012). *A psychological approach to predicting membership retention in the fitness industry.* (Doctoral dissertation), University of Worcester.

WBGU. (2011). *World in Transition: A Social Contract for Sustainability. Summary for policy-makers.*, Berlin: German Advisory Council on Global Change

White, I., Royston, P., & Wood, A. (2011). Multiple imputation using chained equations: Issues and guidance for practice. *Statistics in medicine, 30*(4), 377-399.

Whitmarsh, L. (2011). Scepticism and Uncertainty about Climate Change: Dimensions, Determinants and Change over Time. *Global Environmental Change, 21*(2), 690-700. doi:10.1016/j.gloenvcha.2011.01.016

Widaman, K. F. (2006). III. Missing data: what to do with or without them. *Monographs of the Society for Research in Child Development, 71*(3), 42-64.

Wilhite, H. (2016). *The Political Economy of Low Carbon Transformation : Breaking the habits of capitalism*: Routledge.

Wilkinson, L., & Task Force on Statistical Inference. (1999). Statistical methods in psychology journals: Guidelines and explanations. *American Psychologist, 54*(8), 594-604.

Wilson, M. D., & Lueck, K. (2014). Working with Missing Data: Imputation of Nonresponse Items in Categorical Survey Data with a Non-Monotone Missing Pattern. *Journal of Applied Mathematics, 2014*(Article ID 368791, 9 pages). doi:10.1155/2014/368791

Wulff, J., & Ejlskov, L. (2017). Multiple Imputation by Chained Equations in Praxis: Guidelines and Review. *Electronic Journal of Business Research Methods, 15*(1), 41-56.

Zhbannikov, I., Arbeev, K., & Yashin, A. (2017). *Stochastic Process Model and its Applications to Imputation of Censored Longitudinal Data*. Paper presented at the Population Association of America 2017 Annual Meeting (PAA 2017), Chicago.

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*(6), 743-761.

Appendices

Appendix A: The survey questionnaire (original Norwegian version) [Chapter 3.1.1]

CAWI Questionnaire

Name of survey
Nasjonalt skjema

Client name
NORSK INST FOR NATURFORSKNING

Author(s)
Krey, Carl-Henrik

This questionnaire was written according to TNS quality procedures

checked by

TNS

TNS
© TNS 11-11-2016

16101810
Version number: 1
Global Practice: Political & Social

Repeating study (if this survey has been previously conducted)	
Name of survey	Nasjonalt skjema
Language	Norwegian, Bokmål (Norway)
Survey length (minutes)	16
Version	1
Author(s)	Krey, Carl-Henrik
Contact	Roar Hind Konsulent roar.hind@tns-gallup.no +47 480 44 130
Panel	
Sample size	Gross: Net:
Sample description	
Quota	
If several countries: indicate the countries	
If several targets	
Check-in site	www.tns-nipo.com
Comments	

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Q001 - Q001: **Single coded**

Answer not required | Not back

Hvordan er stedet der du bor?

Normal

1 ☐ Mindre grend eller spredtbygd strøk
2 ☐ 200 – 2000 innbyggere
3 ☐ 2000 – 10 000 innbyggere
4 ☐ 10 000 – 40 000 innbyggere
5 ☐ 40 000 – 100 000 innbyggere
6 ☐ 100 000 – 300 000 innbyggere
7 ☐ Oslo
8 ☐ Vet ikke

Q002 - Q002: **Single coded**

Answer not required | Not back

Hvor lenge har du bodd i kommunen du bor i?

Normal

1 ☐ ☐ Har alltid bodd her
2 ☐ ☐ Født her og har kun vært borte i perioder (for eks. i forbindelse med utdannelse)
3 ☐ ☐ Innflyter, har bodd her i mer enn 10 år
4 ☐ ☐ Innflytter, har bodd her i 1-10 år
5 ☐ ☐ Innflytter, har bodd her i mindre en 1 år

Q003 - Q003: **Text**

Not back

Om jakt

Q004 - Q004: **Single coded**

Answer not required | Not back

Hva er din grunnleggende innstilling til jakt?

Normal

1 ☐ Jeg er negativ til jakt
2 ☐ Jeg har ingen klar oppfatning om jakt
3 ☐ Jeg aksepterer jakt
4 ☐ Jeg er positiv til jakt

Q005 - Q005: **Single coded**

Answer not required | Not back

Er det noen i din husstand som jakter?

Normal

1 ☐ Ja
2 ☐ Nei

Ask only if **Q005 - Q005**,1

Q006 - Q006: **Single coded**

Answer not required | Not back

Har du selv vært på i jakt i løpet av de siste fem årene?

Normal

1 ☐ Ja
2 ☐ Nei

Q007 - Q007: **Text**

Not back

Om rovdyr og rovdyrforvaltning

Q008 - Q008: **Matrix**

Answer not required | Not back | Number of rows: 4 | Number of columns: 5

Hva syns du om at disse dyrene finnes i Norge?

Normal

Rendered as Dynamic Grid

	Misliker sterkt	Misliker	Nøytral	Liker	Liker godt
Bjørn	☐	☐	☐	☐	☐
Jerv	☐	☐	☐	☐	☐
Gaupe	☐	☐	☐	☐	☐
Ulv	☐	☐	☐	☐	☐

Q009 - Q009: **Matrix**

Answer not required | Not back | Number of rows: 4 | Number of columns: 5

Kunne du godta å ha noen av de store rovdyrene i nærheten av der du bor?

Normal

Rendered as Dynamic Grid

	Nei, absolutt ikke	Nei, helst ikke	Ja, kanskje	Ja, absolutt	Vet ikke
Bjørn	☐	☐	☐	☐	☐
Jerv	☐	☐	☐	☐	☐
Gaupe	☐	☐	☐	☐	☐
Ulv	☐	☐	☐	☐	☐

Q010 - Q010: **Single coded**

Answer not required | Not back

Finnes det gaupe i traktene der du bor?

Normal

1 ☐ Ja
2 ☐ Nei
3 ☐ Vet ikke

Q011 - Q011: **Single coded**

Answer not required | Not back

Finnes det jerv i traktene der du bor?

Normal

1 ☐ Ja
2 ☐ Nei
3 ☐ Vet ikke

Q012 - Q012: **Single coded**

Answer not required | Not back

Finnes det bjørn i traktene der du bor?

Normal

1 ☐ Ja
2 ☐ Nei
3 ☐ Vet ikke

Q013 - Q013: Single coded

Answer not required | Not back

Finnes det ulv i traktene der du bor?

Normal

1 ☐ Ja
2 ☐ Nei
3 ☐ Vet ikke

Q014 - Q014: Single coded

Answer not required | Not back

Om ulv i Norge tilhører en finsk-russisk ulvestamme og ikke en norsk-svensk, mener du det da blir mer eller mindre viktig å bevare en viss ulvebestand i Norge, eller spiller det ingen rolle for bevaringen hvor ulven kommer fra?

Normal

1 ☐ Mer viktig
2 ☐ Mindre viktig
3 ☐ Spiller ingen rolle
4 ☐ Vet ikke

Q015 - Q015: Single coded

Answer not required | Not back

Om det er noe innblanding av hund i norsk ulv, mener du det da blir mer eller mindre viktig å bevare en viss ulvebestand i Norge, eller spiller det ingen rolle for bevaringen om det er innblanding av hund i norsk ulv?

Normal

1 ☐ Mer viktig
2 ☐ Mindre viktig
3 ☐ Spiller ingen rolle
4 ☐ Vet ikke

Q016 - Q016: **Matrix**

Answer not required | Not back | Number of rows: 15 | Number of columns: 5

Rovdyrkonfliktene kan håndteres på forskjellige måter. Hvor uenig eller enig er du i følgende påstander?
For å redusere problemene kan man …

Normal

Rendered as Dynamic Grid

	Helt uenig	Delvis uenig	Delvis enig	Helt enig	Vet ikke
… sette opp gjerder for å forhindre rovdyr i å angripe husdyr.	☐	☐	☐	☐	☐
… skremme bort rovdyr.	☐	☐	☐	☐	☐
… flytte rovdyr.	☐	☐	☐	☐	☐
… merke rovdyr med radiosender slik at de kan overvåkes.	☐	☐	☐	☐	☐
… ta moren og ungene ut av hiet for å avlive dem.	☐	☐	☐	☐	☐
… skyte rovdyr.	☐	☐	☐	☐	☐
… bruke gift for å drepe rovdyr.	☐	☐	☐	☐	☐
… opprette/opprettholde egne soner hvor rovdyra har lov til å være (eks. ulvesonen).	☐	☐	☐	☐	☐
… flytte sauebesetninger til beiter i områder uten rovdyr.	☐	☐	☐	☐	☐
… gi sauebønder midler til å starte annen næring	☐	☐	☐	☐	☐
… styrke politiets innsats mot faunakriminalitet	☐	☐	☐	☐	☐
… satse på rovdyrturisme	☐	☐	☐	☐	☐
… undervise om rovdyr i skolen	☐	☐	☐	☐	☐
… informere om positive sider ved å ha rovdyr i norsk natur	☐	☐	☐	☐	☐
… ta fra jegere retten til å skyte rovdyr som angriper hund	☐	☐	☐	☐	☐

Q017 - Q017: **Text**

Not back

Generelt om miljø

Q018 - Q018: **Multi coded**

Answer not required | Not back

Er det noen av disse viltartene som etter din oppfatning ikke hører hjemme i norsk natur?

Du kan sette flere kryss.

Normal

1 ☐ Mårhund
2 ☐ Gaupe
3 ☐ Dådyr
4 ☐ Kanadagås
5 ☐ Mink
6 ☐ Ulv
7 ☐ Villsvin
8 ☐ Grågås
9 ☐ Rådyr
10 ☐ Vaskebjørn

Q019 - Q019: **Matrix**

Answer not required | Not back | Number of rows: 10 | Number of columns: 6

Når det gjelder klima- og miljøspørsmål, hvor stor tillit vil du si at du har til aktørene og institusjonene på lista nedenfor?

Normal

Rendered as Dynamic Grid

	1 - Svært liten tillit	2	3	4	5 - Svært stor tillit	Vet ikke
Statens naturoppsyn (SNO)	☐	☐	☐	☐	☐	☐
Vanlige folk som bruker sunn fornuft	☐	☐	☐	☐	☐	☐
Klimaforskere	☐	☐	☐	☐	☐	☐
Stortingspolitikere	☐	☐	☐	☐	☐	☐
Biologer	☐	☐	☐	☐	☐	☐
Lokalpolitikere	☐	☐	☐	☐	☐	☐
Miljødirektoratet	☐	☐	☐	☐	☐	☐
Klima- og miljødepartementet	☐	☐	☐	☐	☐	☐
Naturvernforbundet	☐	☐	☐	☐	☐	☐
Politienhetene som etterforsker miljøkriminalitet	☐	☐	☐	☐	☐	☐

Q020 - Q020: **Single coded**

Answer not required | Not back

Hvilket av følgende utsagn er du mest enig i?

Sett ett kryss.

Normal

1 ☐ Klimaendringer er en realitet, og de er hovedsakelig forårsaket av menneskelig aktivitet.

2 ☐ Klimaendringer er en realitet, men er hovedsakelig forårsaket av naturlige svingninger.

3 ☐ Klimaendringer er ikke en realitet.

4 ☐ Vet ikke/har ingen mening.

Q021 - Q021: **Matrix**

Answer not required | Not back | Number of rows: 7 | Number of columns: 6

Nedenfor har vi listet opp en rekke påstander om klima- og miljøspørsmål. Hvor enig eller uenig er du i påstandene?

Sett ett kryss på hver linje.

Normal

Rendered as Dynamic Grid

	Helt uenig	Ganske uenig	Verken enig eller uenig	Ganske enig	Helt enig	Vet ikke
Global oppvarming er en myte.	☐	☐	☐	☐	☐	☐
Balansen i naturen er skjør og kan lett forstyrres av menneskelige aktiviteter	☐	☐	☐	☐	☐	☐
Klimaendringene er vår tids største miljøproblem	☐	☐	☐	☐	☐	☐
Jeg syns det er riktig at norsk naturvernlovgivning har naturens egenverdi som utgangspunkt	☐	☐	☐	☐	☐	☐
Økonomisk vekst er den største trusselen mot et bærekraftig miljø	☐	☐	☐	☐	☐	☐
At naturen har en såkalt egenverdi er en naiv og feilaktig idé	☐	☐	☐	☐	☐	☐
Klimaforskningen overdriver klimaproblemene	☐	☐	☐	☐	☐	☐

Q022 - Q022: **Text**

Not back

Oppfatninger om ulovlig rovdyrjakt

Q023 - Q023: **Single coded**

Answer not required | Not back

Forskere hevder at en stor andel av ulvene i Norge blir skutt ulovlig. I hvilken grad mener du at det er akseptabelt å skyte ulv ulovlig?

Angi på en skala fra 1 til 5, der 1 betyr «fullstendig uakseptabelt» og 5 betyr «fullstendig akseptabelt».

Normal

1	☐	1 - Fullstendig uakseptabelt
2	☐	2
3	☐	3
4	☐	4
5	☐	5 - Fullstendig akseptabelt
6	☐	Vet ikke

Q024 - Q024: **Single coded**

Answer not required | Not back

Jeg tror forskerne tar feil når de hevder at en stor del av ulvene i Norge blir skutt ulovlig.

Normal

1	☐	Enig
2	☐	Uenig
3	☐	Vet ikke

Q025 - Q025: **Single coded**

Answer not required | Not back

Hva tror du folk i ditt nærmiljø mener om å skyte ulv ulovlig?

Sett bare ett kryss

Normal

1	☐	Nesten alle synes det er akseptabelt å skyte ulv ulovlig
2	☐	Ganske mange synes det er akseptabelt å skyte ulv ulovlig
3	☐	De fleste har nok ingen mening om å skyte ulv ulovlig
4	☐	Ganske få synes det er akseptabelt å skyte ulv ulovlig
5	☐	Nesten ingen synes det er akseptabelt å skyte ulv ulovlig

Q026 - Q026: **Matrix**

Answer not required | Not back | Number of rows: 4 | Number of columns: 3

Hvor enig eller uenig er du i utsagnene nedenfor?

Normal

Rendered as Dynamic Grid

	Enig	Har ingen mening	Uenig
Jakt på gaupe bør ikke tillates	☐	☐	☐
Jakt på jerv bør ikke tillates	☐	☐	☐
Jakt på bjørn bør ikke tillates	☐	☐	☐
Jakt på ulv bør ikke tillates	☐	☐	☐

Q027 - Q027: **Matrix**

Answer not required | Not back | Number of rows: 4 | Number of columns: 4

Hvilke(t) av følgende tiltak syns du er akseptable (riktigst) hvis en gaupe …

Her kan du sette flere kryss.

Normal

Rendered as Dynamic Grid

	Den må få være i fred	Den kan felles etter tillatelse fra myndighetene	Den kan jaktes lovlig	Den kan felles også uten tillatelse fra myndighetene
… dreper husdyr eller tamrein	☐	☐	☐	☐
… angriper hund	☐	☐	☐	☐
… observeres nær bolighus	☐	☐	☐	☐
… lever i skogen og blir sjelden sett	☐	☐	☐	☐

Q028 - Q028: **Matrix**

Answer not required | Not back | Number of rows: 4 | Number of columns: 4

Hvilke(t) av følgende tiltak syns du er akseptable (riktigst) hvis en ulv …

Her kan du sette flere kryss.

Normal

Rendered as Dynamic Grid

	Den må få være i fred	Den kan felles etter tillatelse fra myndighetene	Den kan jaktes lovlig	Den kan felles også uten tillatelse fra myndighetene
… dreper husdyr eller tamrein	☐	☐	☐	☐
… angriper hund	☐	☐	☐	☐
… observeres nær bolighus	☐	☐	☐	☐
… lever i skogen og blir sjelden sett	☐	☐	☐	☐

Q029 - Q029: **Matrix**

Answer not required | Not back | Number of rows: 5 | Number of columns: 6

I hvor stor grad mener du at jegeres omdømme påvirkes av det som er nevnt nedenfor?

Angi på en skala fra 1 til 5, der 1 betyr «svært negativt påvirket av dette» og 5 betyr «svært positivt påvirket av dette».

Normal

Rendered as Dynamic Grid

	1 - Svært negativt påvirket av dette	2	3	4	5 - Svært positivt påvirket av dette	Vet ikke
Jegere poserer på bilder med døde dyr	☐	☐	☐	☐	☐	☐
Jegere deltar aktivt i arbeid for å verne natur	☐	☐	☐	☐	☐	☐
Jegere jakter ulv lovlig	☐	☐	☐	☐	☐	☐
Jegere deltar på trofejakt i Afrika	☐	☐	☐	☐	☐	☐
Jegere jakter ulv ulovlig	☐	☐	☐	☐	☐	☐

Q030 - Q030: **Text**

Not back

Politiet

Q031 - Q031: **Single coded**

Answer not required | Not back

I hvilken grad har du tillit til politiet?

Angi på en skala fra 1 til 5, der 1 betyr «svært liten tillit» og 5 betyr «svært stor tillit».

Normal

1 ☐ 1 - Svært liten tillit
2 ☐ 2
3 ☐ 3
4 ☐ 4
5 ☐ 5 - Svært stor tillit
6 ☐ Vet ikke

Q032 - Q032: **Matrix**

Answer not required | Not back | Number of rows: 9 | Number of columns: 6

Her følger noen utsagn om politiet. Hvor enig eller uenig er du?

Angi på en skala fra 1 til 5, der 1 betyr «helt uenig» og 5 betyr «helt enig».

Normal

Rendered as Dynamic Grid

	1 - Helt uenig	2	3	4	5 - Helt enig	Vet ikke
Tatt i betraktning alt politiet forventes å gjøre, vil jeg si at de gjør en god jobb	☐	☐	☐	☐	☐	☐
Politiet behandler rike mennesker bedre enn fattige	☐	☐	☐	☐	☐	☐
Politiet behandler alle folk likt, uavhengig av om de er fattige eller rike	☐	☐	☐	☐	☐	☐
Politiet behandler folk i Norge med respekt	☐	☐	☐	☐	☐	☐
I Norge har vi et effektivt politi	☐	☐	☐	☐	☐	☐
Politiet lykkes dårlig med å pågripe personer som begår innbrudd	☐	☐	☐	☐	☐	☐
Politiet er som resten av offentlig sektor preget av byråkratisk sommel	☐	☐	☐	☐	☐	☐
Politiet foretar mange gale prioriteringer	☐	☐	☐	☐	☐	☐
Politiet gjør en verdifull og nyttig innsats når de etterforsker ulovlig ulvejakt	☐	☐	☐	☐	☐	☐

Q033 - Q033: **Text**

Not back

Om politikk og makt

Q034 - Q034: **Matrix**

Answer not required | Not back | Number of rows: 11 | Number of columns: 6

Her kommer noen utsagn som har med politikk og makt å gjøre. Marker hvor enig eller uenig du er i det enkelte utsagnet ved å sette ett kryss for hvert utsagn.

Angi på en skala fra 1 til 5, der 1 betyr «helt uenig» og 5 betyr «helt enig».

Normal

Rendered as Dynamic Grid

	1 - Helt uenig	2	3	4	5 - Helt enig	Vet ikke
Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om	☐	☐	☐	☐	☐	☐
Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon	☐	☐	☐	☐	☐	☐
Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen	☐	☐	☐	☐	☐	☐
Jeg har sjelden problemer med å følge med på hva eksperter sier på TV	☐	☐	☐	☐	☐	☐
Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk	☐	☐	☐	☐	☐	☐
I Norge kan alle som vil få politisk innflytelse	☐	☐	☐	☐	☐	☐
Politikerne er mest opptatt av å sikre seg selv og sine egne posisjoner	☐	☐	☐	☐	☐	☐
Politikere har egentlig liten innflytelse, det er pengene som rår	☐	☐	☐	☐	☐	☐
Eksperter uten praktisk erfaring bestemmer for mye her i landet	☐	☐	☐	☐	☐	☐
Vanlige folk er ærligere enn politikere	☐	☐	☐	☐	☐	☐
Sunt folkevett er bedre enn formell utdannelse	☐	☐	☐	☐	☐	☐

Q035 - Q035: **Text**

Not back

Bakgrunn

Q036 - Q036: **Single coded**

Answer not required | Not back

Hvor mange bøker tror du det er hjemme hos deg? (50 bøker er ca. 1 meter i bokhylla.)

Normal

1	☐	Ingen
2	☐	Mindre enn 20
3	☐	20 - 50
4	☐	50 - 100
5	☐	100 - 500
6	☐	500 - 1000
7	☐	Mer enn 1000

Q037 - Q037: **Multi coded**

Answer not required | Not back

Kryss av for det som fantes hjemme hos deg da vokste opp.

Normal

1	☐	Piano
2	☐	Sjakkspill
3	☐	Bøker på andre språk enn norsk

Appendix B: The documentation report (original Norwegian version)
[Chapter 3.1.1]

KANTAR TNS

Nordmenns meninger om natur, jakt og ville dyr.

Spørreundersøkelse blant landets innbyggere, innbyggere i utvalgte kommuner og blant jegere – på oppdrag fra Norsk institutt for naturforskning.

Dokumentasjonsrapport

roar.hind@tns-gallup.no
Mars 2017

Om undersøkelsen

Formål og målgrupper

På oppdrag fra Norsk institutt for naturforskning (NINA), har Kantar TNS gjennomført tre spørreskjemaundersøkelser om holdninger til natur og jakt på ville dyr.

De tre undersøkelsene kartlegger ulike målgruppers holdninger til jaktetikk (hva som er riktig og galt i forbindelse med jakt), spesifikt, holdninger til ulovlige handlinger som kan forekomme under jakt, holdninger til ulike organisasjoner som har en rolle i norsk naturforvaltning, og hva målgruppene mener om rovdyr og forvaltningen av dem.

Den ene gruppen som er intervjuet, er jegere. Disse er trukket tilfeldig fra Jegerregisteret.

Den andre gruppen er innbyggere i utvalgte kommuner med rovdyrkonflikter. Disse ble trukket fra Kantar TNS sin befolkningsbase (kop av Bisnode).

Hva folk flest mener om ulike natur- og miljøspørsmål er viktig for naturforvaltning og politikken på miljøområdet. Hva folk som selv ikke er jegere mener om jakt og om hvordan jegere bør opptre, er også viktig. Den tredje gruppen som har blitt intervjuet, er derfor et representativt utvalg av landets innbyggere – trukket fra GallupPanelet.

Metode

Alle de tre undersøkelsene er besvart ved bruk av elektronisk spørreskjema (webskjema).

Innbyggerundersøkelsen ble gjennomført på GallupPanelet ved utsendelse av e-post med link til spørreskjema. Undersøkelsene rettet til jegere og innbyggere i de utvalgte kommunene, ble sendt ut ved postale invitasjonsbrev. For å svare, ble disse to målgruppene bedt om å gå inn på en hjemme-/webside for undersøkelsen, og åpne undersøkelsen ved inntasting av en unikt påloggingskode.

Utvalg og svarprosent

Jegerutvalget: I alt ble 2400 personer trukket representativt fra jegerregisteret til å delta i undersøkelsen med mål om å oppnå 800 svar.

852 personer (36 prosent) svarte etter to påminnelser. Det ble først sendt ut en postal påminnelse til de som ikke hadde svart innen frist (2046 stykker) og dernest en påminnelse per SMS til 1287 personer som det var mulig å nå via mobilt telefonnummer, påsatt fra Bisnodes befolknings-/telefonbase.

Lokalkommuner: Her ble det trukket 3 252 personer fra Kantar TNS sin befolkningsbase (kopi av Bisnode). Utvalgets størrelse var også her estimert med ønske om 800 svar.

Utvalget ble representativt trukket fra kommunene Trysil, Elverum, Åmot, Våler, Åsnes, Grue, Nord-Odal, Sør-Odal, Kongsvinger, Eidskog, Nes, Aurskog Høland og Rømskog.

I alt svarte 502 personer etter én postal påminnelse (til 3051 personer) og én påminnelse på SMS (til 2128 personer). De som ble purret på SMS kunne også svare på webskjemaet/ mobilen.

Lokalkommuneutvalget oppnådde en forholdsvis lav respons, kun 15 prosent. Responsraten må vurderes på bakgrunn av at det kun var mulig å svare på et webskjema. Responsraten var likevel estimert høyere i utgangspunktet.

I tillegg ble det derfor trukket et tilleggsutvalg på 330 personer fra GallupPanelet i de aktuelle kommunene. Av disse svarte 188 personer (57 prosent) etter én påminnelse.

Totalt ble det oppnådd 680 intervju som gir en samlet respons i de to utvalgene på 19 prosent.

Landsrepresentativt utvalg: 7704 mottok invitasjon til undersøkelsen trukket fra GallupPanelet med sikte på 3000 svar. Av disse svarte 3032 innen frist og etter én påminnelse.

Gjennomføring

Utsendelse og påminnelser

Den landsrepresentative undersøkelsen ble sendt ut 14.11. og purret 09.12. Undersøkelsen ble endelig avsluttet 20.01. 2017.

Undersøkelsen til jegere og innbyggere i lokalkommunene ble sendt ut 28.11. Begge utvalg ble purret postalt 15.12. SMS-påminnelser til begge utvalgene ble sendt 05.01.2017.

Ekstrautvalget i lokalkommunene (GallupPanelet) ble trukket 20.01. og purret 26.01. 2017.

Vekting

Den nasjonale innbyggerundersøkelsen er vektet på kjønn, alder og geografi i hht offisiell statistikk.

Undersøkelsene blant jegere og lokalsamfunn (de utvalgte kommunene) er vektet på kjønn og alder.

Hendelser i media

Samtidig med at undersøkelsene ble sendt ut og purret, ble det stor oppmerksomhet omkring lisensjakt på ulv etter at Miljødepartementet og lovavdelingen i Justis- og beredskapsdepartementet stoppet et vedtak om felling av 32 ulv som var godkjent av de regionale rovviltnemndene.

Både jegerutvalget og lokalkommuneundersøkelsen ble purret samme dag på SMS som det var demonstrasjoner utenfor Stortinget og Miljødepartementet.

På samme tidspunkt ble felling av ulv debattert i landets lokalpresse, i riksdekkende aviser, i nyhetene på NRK og TV2 og tatt opp i «Debatten» på NRK.

Invitasjonsbrev

Emnefeltet: Spørreundersøkelse fra Norsk Gallup - Nordmenns meninger om natur, jakt og ville dyr

Vi vil gjerne invitere deg til å delta i en undersøkelse om ***nordmenns meninger om natur, jakt og ville dyr.*** Vi stiller blant annet en del spørsmål om jaktetikk (hva som er riktig og galt i forbindelse med jakt), ulovlige handlinger som kan forekomme under jakt, hva du mener om ulike organisasjoner som har en rolle i norsk naturforvaltning, og hva du mener om rovdyr og forvaltningen av dem.

Spørreskjemaet tar inntil 15 minutter å fylle ut og du vil motta 15 poeng. Norsk Gallup gjennomfører undersøkelsen på oppdrag fra *Norsk institutt for naturforskning*.

For å svare, klikker du på linken nedenfor:

^slink^

Dersom linken ikke virker, kan du kopiere den og lime den inn i din nettleser.

Med vennlig hilsen
TNS Gallup
Roar Hind
Avdelingsleder, politikk & samfunn

Har du spørsmål om denne undersøkelsen når det gjelder innholdet eller om tekniske forhold, send en e-post til avsender: gallup-undersokelse@tns-gallup.no.

TNS Gallup er Norges største markedsanalyseselskap, og vi gjennomfører markedsundersøkelser for både offentlige og private organisasjoner og bedrifter. Vi forholder oss til de lover og regler som gjelder til enhver tid, samt bransjens etiske retningslinjer. Hvis du ønsker å lese våre retningslinjer for ivaretakelse av personvernhensyn, finner du dem på
http://www.galluppanelet.no/index.cfm?action=Main.lobbyGeneral&myContent=PRIVACYPOLICY

16101810 «gallupid»
«navn»
«adresse1»
«postnr» «poststed»

Oslo, 23.11. 2016.

Invitasjon til spørreundersøkelsen - Nordmenns meninger om natur, jakt og ville dyr

Hei!
Vi vil gjerne invitere deg til å delta i en undersøkelse om ***nordmenns meninger om natur, jakt og ville dyr.*** Vi stiller blant annet en del spørsmål om jaktetikk (hva som er riktig og galt i forbindelse med jakt), ulovlige handlinger som kan forekomme under jakt, hva du mener om ulike organisasjoner som har en rolle i norsk naturforvaltning, og hva du mener om rovdyr og forvaltningen av dem.

Spørreskjemaet tar ca. 20 minutter å fylle ut. NORSK GALLUP gjennomfører undersøkelsen på oppdrag fra *Norsk institutt for naturforskning*.

Hva folk flest mener om ulike natur- og miljøspørsmål er viktige for naturforvaltning og politikken på miljøområdet. Hva folk som selv ikke er jegere mener om jakt og om hvordan jegere bør opptre, er også viktig. Derfor er det av stor betydning at du lar din stemme bli hørt, om du selv er jeger eller ikke. Det spiller ingen rolle om du selv synes at du har kunnskap om disse temaene. Alle meninger er like viktige, og dette er ingen kunnskapstest!

Vi håper du har mulighet til å svare!

Du deltar i trekning av premier. Som takk for din innsats vil du som svarer delta i trekning av *tr universalgavekort på kr 2 000 hver og 10 universalgavekort på kr 500 hver*.

Undersøkelsen besvares på internett
For å svare går du til denne adressen: www.tns-gallup.no/natur
Din personlige påloggingskode er: «userid»

Svarfrist. Vi håper du kan svare så raskt som mulig, helst innen en uke etter at du har mottatt dette brevet.

Det er frivillig å delta, og dine svar er konfidensielle. **Hvis du har spørsmål** i forbindelse med utfylling av skjemaet, konfidensialitet eller dersom du opplever tekniske problemer, kan du sende en e-post til gallup-undersokelse@tns-gallup.no.

Med vennlig hilsen

Roar Hind
NORSK GALLUP (KANTAR TNS)
Roar Hind, Avdelingsleder, politikk & samfunn

16101810 «gallupid»
«navn»
«adresse1»
«postnr» «poststed»

Oslo, 23.11. 2016.

Invitasjon til spørreundersøkelsen - Jegeres meninger om natur, jakt og ville dyr

Hei!
Vi vil gjerne invitere deg til å delta i en undersøkelse om ***jegeres meninger om natur, jakt og ville dyr.*** Du er trukket ut fordi du står i jegerregisteret. Vi stiller blant annet en del spørsmål om jaktetikk, ulovlige handlinger som kan forekomme under jakt, hva du mener om ulike organisasjoner som har en rolle i forbindelse med jakt og naturforvaltning, og hva du mener om rovdyr og forvaltningen av dem.

Spørreskjemaet tar inntil 20 minutter å fylle ut. NORSK GALLUP gjennomfører undersøkelsen på oppdrag fra Norsk institutt for naturforskning.

Jegere har en svært viktig rolle i norsk viltforvaltning, og det er viktig å ha god oversikt over hva jegere mener om ulike natur- og miljøspørsmål, og ikke minst om jakt og viltforvaltning. Derfor er det av stor betydning at du lar din stemme bli hørt. Det spiller ingen rolle om du selv synes at du har kunnskap om alle temaene. Alle meninger er like viktige, og dette er ingen kunnskapstest!

Vi håper du har mulighet til å svare!

Du deltar i trekning av premier. Som takk for din innsats vil du som svarer delta i trekning av tr universalgavekort på kr 2 000 hver og 10 universalgavekort på kr 500 hver.

Undersøkelsen besvares på internett
For å svare går du til denne adressen: www.tns-gallup.no/jeger
Din personlige påloggingskode er:

Svarfrist. Vi håper du kan svare så raskt som mulig, helst innen en uke etter at du har mottatt dette brevet.

Hvis du har spørsmål i forbindelse med utfylling av skjemaet, eller dersom du opplever teknisk problemer, kan du sende en e-post til gallup-undersokelse@tns-gallup.no.

Med vennlig hilsen

Roar Hind
NORSK GALLUP (KANTAR TNS)
Roar Hind, Avdelingsleder, politikk & samfunn

Svarprosent og frafall i den nasjonale innbyggerundersøkelsen

Tabellene til høyre, viser at frafaller er om lag likt fordelt mellom kjønn og etter regioner.

Ser vi på alder, finner vi som forventet høyere frafall blant de to yngste aldersgruppene. Mens svarprosent blant de over 60 år er på 52 prosent, svarte kun 28 prosent i aldersgruppen under 30 år.

Nord- og Sør Trøndelag representerer ytterpunktene når det gjelder respons etter fylker, med hhv 34 og 50 prosent svar.

	Bruttoutvalg		Nettoutvalg			
Kjønn	Antall	Prosent	Antall	Prosent	Avvik	Svar-prosent
Mann	3772	49,0	1519	50,1	1,1	40
Kvinner	3835	49,8	1512	49,9	0,1	39
Total	7607	98,7	3031	100	1,3	40
System	97	1,3	1	0	-1,3	1
Total	7704	100,0	3032	100	0,0	39

	Bruttoutvalg		Nettoutvalg			
Region	Antall	Prosent	Antall	Prosent	Avvik	Svar-prosent
Oslo/Akershus	1806	23,4	748	24,7	1,3	41
Rest østland	1969	25,6	805	26,6	1,0	41
Sør og vestlandet	2400	31,2	943	31,1	-0,1	39
Trøndelag og Nordnorge	1414	18,4	531	17,5	-0,9	38
Total	7589	98,5	3027	99,8	1,3	40
System	115	1,5	5	0,2	-1,3	4
Total	7704	100,0	3032	100	0,0	39

	Bruttoutvalg		Nettoutvalg			
Alder	Antall	Prosent	Antall	Prosent	Avvik	Svar-prosent
Under 30	1640	21,3	463	15,3	-6,0	28
30-44	2204	28,6	730	24,1	-4,5	33
45-59	2068	26,8	902	29,7	2,9	44
60+	1792	23,3	937	30,9	7,6	52
Total	7704	100,0	3032	100	0,0	39

	Bruttoutvalg		Nettoutvalg			
Fylker	Antall	Prosent	Antall	Prosent	Avvik	Svar-prosent
Østfold	345	4,5	143	4,7	0,2	41
Akershus	878	11,4	392	12,9	1,5	45
Oslo	928	12,0	356	11,7	-0,3	38
Hedmark	276	3,6	105	3,5	-0,1	38
Oppland	274	3,6	106	3,5	-0,1	39
Buskerud	448	5,8	192	6,3	0,5	43
Vestfold	405	5,3	169	5,6	0,3	42
Telemark	221	2,9	90	3	0,1	41
Aust-Agder	169	2,2	64	2,1	-0,1	38
Vest-Agder	256	3,3	107	3,5	0,2	42
Rogaland	597	7,7	258	8,5	0,8	43
Hordaland	893	11,6	316	10,4	-1,2	35
Sogn og Fjordane	125	1,6	54	1,8	0,2	43
Møre og Romsdal	360	4,7	143	4,7	0,0	40
Sør-Trøndelag	513	6,7	175	5,8	-0,9	34
Nord-Trøndelag	140	1,8	70	2,3	0,5	50
Nordland	379	4,9	123	4,1	-0,8	32
Troms	286	3,7	118	3,9	0,2	41
Finnmark	96	1,2	45	1,5	0,3	47
Missing	115	1,5	5	0,2	-1,3	4
Total	7704	100,0	3031,0	100	0,0	39

Svarprosent og frafall lokalkommuner

Tabellen lengst til venstre inkluderer 188 svar fra GallupPanalet - blant 690 svar totalt. Ekskludert de 188, er svarprosent blant de 3252 trukket på befolkningsbasen på 15,4 prosent. Svarprosent blant de 330 som ble trukket fra GallupPanelet er på 57 prosent.

Bruttoutvalget er trukket representativt på kjønn og alder tvers av kommunene. Undersøkelsen er også tilsvarende vektet på kjønn og alder.

Høyest svarprosent blant de 3252 trukket fra befolkningsutvalget ble oppnådd i Nord-Odal med 22 prosent. Lavest respons hadde Grue og Aurskog-Høland med hhv 11 og 12 prosent.

Menn har en høyere svarprosent enn kvinner i befolkningsutvalget, 17 mot 14 prosent. Inkludert svar fra GallupPanelet, er prosent-fordelingen «rettet» opp med 22 mot 21 prosent for hhv menn og kvinner. Svarprosent samlet inkludert panelutvalget er 19 prosent.

	Bruttoutvalg		Nettoutvalg				Nettoutvalg inkl. GallupPanel			
Kjønn	Antall	Prosent	Antall	Prosent	Awik	Svar-prosent	Antall	Prosent	Awik	Prosent
Mann	1634	50,2	279	55,6	5,4	17	352	51,0	0,8	22
Kvinne	1618	49,8	222	44,2	-5,6	14	337	48,8	-0,9	21
			501				689		0,0	
			1	0,2	0,2		1	,1	0,1	
Total	3252	100,0	502	100	0,0	15	690	100,0	0,0	21

	Bruttoutvalg		Nettoutvalg				Nettoutvalg inkl. GallupPanel			
Kommuner	Antall	Prosent	Antall	Prosent	Awik	Svar-prosent	Antall	Prosent	Awik	Prosent
Aurskog-Høland	414	12,7	50	10	-2,7	12	67	9,7	-3,0	16
Eidskog	167	5,1	26	5,2	0,1	16	40	5,8	0,7	24
Elverum	546	16,8	107	21,3	4,5	20	138	20,0	3,2	25
Grue	132	4,1	15	3	-1,1	11	21	3,0	-1,0	16
Kongsvinger	474	14,6	60	12	-2,6	13	89	12,9	-1,7	19
Nes	539	16,6	82	16,3	-0,3	15	122	17,7	1,1	23
Nord-Odal	139	4,3	30	6	1,7	22	37	5,4	1,1	27
Rømskog	21	,6	3	0,6	0,0	14	5	,7	0,1	24
Sør-Odal	213	6,5	35	7	0,5	16	49	7,1	0,6	23
Trysil	178	5,5	29	5,8	0,3	16	38	5,5	0,0	21
Våler	106	3,3	14	2,8	-0,5	13	20	2,9	-0,4	19
Åmot	120	3,7	23	4,6	0,9	19	29	4,2	0,5	24
Åsnes	203	6,2	28	5,6	-0,6	14	35	5,1	-1,2	17
Total	3252	100,0	502	100,2	0,2	15	690	100,0	0,0	21

Svarprosent og frafall jegere

Av 2400 jegere kontaktet svarte 852 stykker (36 prosent) etter påminnelser (postalt og SMS).

Der er en noe høyere svarprosent blant storviltjegere enn blant de som jakter på småvilt, 38 mot 30 prosent.

Høyest svarprosent finner vi blant jegere I Akershus og Telemark (41 prosent). Lavest respons finner vi blant jegere i Finnmark og Oppland med hhv 28 og 29 prosent.

En mindre andel jegere som ikke kunne knyttes til gruppe eller fylke er fjernet fra universet.

Både brutto- og nettoutvalg følger i all hovedsak universet etter fylker.

Undersøkelsen er vektet på kjønn og alder.

	Universet		Bruttoutvalg			Nettoutvalg				
Gruppe	Antall	Prosent	Antall	Prosent	Avvik univers	Antall	Prosent	Avvik univers	Avvik bruttoutvalg	Svar-prosent
Småvilt	68249	34,0	821	34,1		249	29,2	-4,8	-4,9	30
Storvilt	131828	65,7	1579	65,8		603	70,8	5,1	5,0	38
Total	200737	100,0	2400	100		852	100,0	0,0	0,0	36

	Universet		Bruttoutvalg			Nettoutvalg				
Fylke	Antall	Prosent	Antall	Prosent	Avvik univers	Antall	Prosent	Avvik univers	Avvik bruttoutvalg	Svar-prosent
Østfold	9539	4,8	117	4,9	0,1	46	5,4	0,6	0,5	39
Akershus	18891	9,4	219	9,1	-0,3	90	10,6	1,2	1,5	41
Oslo	12499	6,2	147	6,1	-0,1	56	6,6	0,3	0,5	38
Hedmark	13558	6,8	172	7,2	0,4	64	7,5	0,8	0,3	37
Oppland	10529	5,2	129	5,4	0,2	37	4,3	-0,9	-1,1	29
Buskerud	10237	5,1	134	5,6	0,5	50	5,9	0,8	0,3	37
Vestfold	6858	3,4	84	3,5	0,1	28	3,3	-0,1	-0,2	33
Telemark	8684	4,3	100	4,2	-0,1	41	4,8	0,5	0,6	41
Aust Agder	5877	2,9	81	3,4	0,5	28	3,3	0,4	-0,1	35
Vest Agder	7643	3,8	90	3,8	0,0	31	3,6	-0,2	-0,2	34
Rogaland	9903	4,9	133	5,5	0,6	43	5,0	0,1	-0,5	32
Hordaland	12933	6,4	149	6,2	-0,2	52	6,1	-0,3	-0,1	35
Sogn og Fjordane	6881	3,4	90	3,8	0,4	30	3,5	0,1	-0,3	33
Møre og Romsdal	10080	5,0	118	4,9	-0,1	46	5,4	0,4	0,5	39
Sør-Trøndelag	16095	8,0	172	7,2	-0,8	63	7,4	-0,6	0,2	37
Nord-Trøndelag	11221	5,6	120	5	-0,6	40	4,7	-0,9	-0,3	33
Nordland	12711	6,3	145	6	-0,3	47	5,5	-0,8	-0,5	32
Troms	9659	4,8	123	5,1	0,3	38	4,5	-0,4	-0,6	31
Finnmark	6255	3,1	74	3,1	0,0	21	2,5	-0,7	-0,6	28
Missing	84	,0	3	0,1	0,1	1	,1	0,1	0,0	33
Total	200137	99,7	2400	100	0,3	852	100,0	0,3	0,0	36

Appendix C: Tables C1 & C2

[Chapters 4.1 - 4.3.2]

Table C.1: Variables of the national survey dataset that were included in the secondary dataset

Variable	Label
[Grad av tillit til aktører og institusjoner når det gjelder klima- og miljøspørsmål]	
Q019_1_tillit_til_aktører_og_institusjoner_klima_ og_ miljøspørsmål	Statens naturoppsyn (SNO)
Q019_2_tillit_til_aktører_og_institusjoner_klima_ og_ miljøspørsmål	Vanlige folk som bruker sunn fornuft
Q019_3_tillit_til_aktører_og_institusjoner_klima_ og_ miljøspørsmål	Klimaforskere
Q019_4_tillit_til_aktører_og_institusjoner_klima_ og_ miljøspørsmål	Stortingspolitikere
Q019_5_tillit_til_aktører_og_institusjoner_klima_ og_ miljøspørsmål	Biologer
Q019_6_tillit_til_aktører_og_institusjoner_klima_ og_ miljøspørsmål	Lokalpolitikere
Q019_7_tillit_til_aktører_og_institusjoner_klima_ og_ miljøspørsmål	Miljødirektoratet
Q019_8_tillit_til_aktører_og_institusjoner_klima_ og_ miljøspørsmål	Klima- og miljødepartementet
Q019_9_tillit_til_aktører_og_institusjoner_klima_ og_ miljøspørsmål	Naturvernforbundet
Q019_10_tillit_til_aktører_og_institusjoner_klima_ og_ miljøspørsmål	Politienhetene som etterforsker miljøkriminalitet
Q020_Klimabenektelse_Klimaskepsis	Klimabenektelse (Klimaskepsis)
[Grad av enighet om påstander om klima- og miljøspørsmål]	
Q021_1_påstander_om_klima_og_miljøspørsmål	Global oppvarming er en myte.
Q021_2_påstander_om_klima_og_miljøspørsmål	Balansen i naturen er skjør og kan lett forstyrres av menneskelige aktiviteter
Q021_3_påstander_om_klima_og_miljøspørsmål	Klimaendringene er vår tids største miljøproblem
Q021_4_påstander_om_klima_og_miljøspørsmål	Jeg syns det er riktig at norsk naturvernlovgivning har naturens egenverdi som utgangspunkt
Q021_5_påstander_om_klima_og_miljøspørsmål	Økonomisk vekst er den største trusselen mot et bærekraftig miljø
Q021_6_påstander_om_klima_og_miljøspørsmål	At naturen har en såkalt egenverdi er en naiv og feilaktig idé
Q021_7_påstander_om_klima_og_miljøspørsmål	Klimaforskningen overdriver klimaproblemene
[Grad av enighet om utsagn om politikk og makt]	
Q034_1_om_politikk_og_makt	Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om

Q034_2_om_politikk_og_makt	Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon
Q034_3_om_politikk_og_makt	Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen
Q034_4_om_politikk_og_makt	Jeg har sjelden problemer med å følge med på hva eksperter sier på TV
Q034_5_om_politikk_og_makt	Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk
Q034_6_om_politikk_og_makt	I Norge kan alle som vil få politisk innflytelse
Q034_7_om_politikk_og_makt	Politikerne er mest opptatt av å sikre seg selv og sine egne posisjoner
Q034_8_om_politikk_og_makt	Politikere har egentlig liten innflytelse, det er pengene som rår
Q034_9_om_politikk_og_makt	Eksperter uten praktisk erfaring bestemmer for mye her i landet
Q034_10_om_politikk_og_makt	Vanlige folk er ærligere enn politikere
Q034_11_om_politikk_og_makt	Sunt folkevett er bedre enn formell utdannelse
[Bakgrunn]	
Q036_bakgrunn_bøker_hjemme	Antall bøker hjemme
Q037_bakgrunn_1_Vokst_opp_i_et_hjem_med_piano	Piano
Q037_bakgrunn_2_Vokst_opp_i_et_hjem_med_sjakkspill	Sjakkspill
Q037_bakgr_3_Vokst_opp_i_et_hjem_med_bøker_på_andre_språk_enn_norsk	Bøker på andre språk enn norsk
Q037_bakgrunn_4_ingen_av_disse	Ingen av disse
Fylke	Fylke
Kjønn	Kjønn
Livsopphold	Hovedkilde til livsopphold
Personlig_årsinntekt	Personlig brutto årsinntekt (før skatt og fradrag)
Utdanning	Høyeste fullførte skolegang
Husstandens_årsinntekt	Husstandens samlede brutto årsinntekt (før skatt og fradrag)
Geografi	Geografi
Alder	Alder
Født_i_Norge	Født i Norge
Offentlig_Privat_sektor	Jobber i offentlig/privat sektor
Stortingsvalg	Parti ved sist Stortingsvalg
Bransje	Bransje
Ledendestilling	Har en ledende stilling
Eie_leie_bolig	Eier/leier bolig
Vekt	Vekt
Recoded_lederansvar	Lederansvar innenfor ... områder: Ingen av disse

Table C.2: Missing Value Analysis: Univariate Statistics (*N*=2999, unweighted cases)

	N	Missing	
		Count	Percent
Grad av tillit til aktører og institusjoner (når det gjelder klima- og miljøspørsmål)			
Statens naturoppsyn (SNO)	2305	694	23.1
Vanlige folk som bruker sunn fornuft	2864	135	4.5
Klimaforskere	2859	140	4.7
Stortingspolitikere	2887	112	3.7
Biologer	2838	161	5.4
Lokalpolitikere	2876	123	4.1
Miljødirektoratet	2829	170	5.7
Klima- og miljødepartementet	2831	168	5.6
Naturvernforbundet	2881	118	3.9
Politienhetene som etterforsker miljøkriminalitet	2719	280	9.3
Klimabenektelse (Klimaskepsis)	2992	7	.2
Grad av enighet om påstander om klima- og miljøspørsmål			
Global oppvarming er en myte.	2997	2	.1
Balansen i naturen er skjør og kan lett forstyrres av menneskelige aktiviteter	2953	46	1.5
Klimaendringene er vår tids største miljøproblem	2909	90	3.0
Jeg syns det er riktig at norsk naturvernlovgivning har naturens egenverdi som utgangspunkt	2761	238	7.9
Økonomisk vekst er den største trusselen mot et bærekraftig miljø	2749	250	8.3
At naturen har en såkalt egenverdi er en naiv og feilaktig idé	2735	264	8.8
Klimaforskningen overdriver klimaproblemene	2839	160	5.3
Grad av enighet om utsagn om politikk og makt			
Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om	2923	76	2.5
Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon	2435	564	18.8
Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen	2906	93	3.1
Jeg har sjelden problemer med å følge med på hva eksperter sier på TV	2884	115	3.8
Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk	2869	130	4.3
I Norge kan alle som vil få politisk innflytelse	2767	232	7.7
Politikerne er mest opptatt av å sikre seg selv og sine egne posisjoner	2889	110	3.7
Politikere har egentlig liten innflytelse, det er pengene som rår	2814	185	6.2
Eksperter uten praktisk erfaring bestemmer for mye her i landet	2746	253	8.4
Vanlige folk er ærligere enn politikere	2757	242	8.1
Sunt folkevett er bedre enn formell utdannelse	2873	126	4.2
Bakgrunn			
Antall bøker hjemme	2999	0	.0

Vokst opp i et hjem med ...			
Piano	2999	0	.0
Sjakkspill	2999	0	.0
Bøker på andre språk enn norsk	2999	0	.0
Ingen av disse	2999	0	.0
Fylke	2998	1	.0
Kjønn	2998	1	.0
Hovedkilde til livsopphold	2998	1	.0
Personlig brutto årsinntekt (før skatt og fradrag)	2929	70	2.3
Høyeste fullførte skolegang	2998	1	.0
Husstandens samlede brutto årsinntekt (før skatt og fradrag)	2556	443	14.8
Geografi	2994	5	.2
Alder	2999	0	.0
Født i Norge	2578	421	14.0
Jobber i offentlig/privat sektor	1939	1060	35.3
Parti ved sist Stortingsvalg	2479	520	17.3
Bransje	1994	1005	33.5
Har en ledende stilling	1899	1100	36.7
Eier/leier bolig	2827	172	5.7
Lederansvar innenfor ... områder: Ingen av disse	2456	543	18.1

Appendix D: Crosstabulations of variables with high proportions of missingness (>10%) against other variables in the secondary dataset

[Chapter 4.3.2]

D.1: Crosstabulations of the predominant pattern variables *Jobber i offentlig/privat sector, Bransje* and *Har en ledende stilling* against other variables

- *Har en ledende stilling* was missing for high percentages for all the categories of the variable *Hovedkilde til livsopphold* (e.g. 85.9% for *Elev/student*, 80.2% for *Annen type trygd*, 76.7% for *Alderspensjonist*), except for the categories *Inntektsgivende arbeid heltid* (7.3%), *Inntektsgivende arbeid deltid* (9.5%) and *Selvstendig næringsdrivende* (8.8%). Similar patterns of unevenly spread responses across their categories were found for the variables *Jobber i offentlig/privat sektor* and *Bransje*.

- The predominant pattern variables were missing for higher percentages of the *Grunnskoleutdanning* and *Videregående utdanning* categories of education, and there was a linear decrease in the percentage of missing values across the rest of the categories. It seemed, thus, that a response for occupational issues was more likely to be missing for respondents of these categories of education.

- The predominant pattern variables were missing for high percentages (over 53%) of the *Under 200.000 kroner* and *200.000 - 299.999 kroner* categories of personal income and of the *Under 200.000 kroner* and *200.000 - 399.999 kroner* categories of household income, and there was a linear decrease in the percentage of missing values across the rest of the categories. It seemed, thus, that those respondents who reported one of the above two categories of personal or household income were less likely to report on occupational issues compared to respondents from the other categories.

- The predominant pattern variables were missing more often for females than for males. Males seemed to be more apt to report on occupational issues.

- The predominant pattern variables were missing more often for the *Under 30* and *60+* categories of *Alder*, ranging from 53.5% to 57.5% compared to 14.2% to 19.6% for the rest of the *Alder* categories.

D.2: Crosstabulations of the *Statens naturoppsyn (SNO)* variable against other variables

- *Hovedkilde til livsopphold* seemed again related to missingness; for example, the category *Elev/student* had 45% missing data, whereas *Alderspensjonist* had 12.5% missing data.

- The *Under 200.000 kroner* category of personal and household income had the highest percentages of missing data (34.4% and 32.4%, respectively).

- The *Grunnskoleutdanning* category of education had the highest percentage of missing data (29.7 %)

- The variable *Statens naturoppsyn (SNO)* was missing more often for females (31.1%) than males (15.2%).

- The *Under 30 category* of *Alder* had the highest percentage (44.8%) of missing values, whereas there was a linear decrease in the percentage of missing values across the rest of the categories, with the *60+* category showing the lowest proportion (13.9%) of missing values.

D.3: Crosstabulations of the rest variables having more than 10% missing values (i.e. *Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon; Parti ved sist Stortingsvalg; Husstandens samlede brutto årsinntekt (før skatt og fradrag); Født i Norge*) against other variables

The following findings are of most interest:

- For the variable *Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon* (18.8% missing values) the highest percentages with missing values were shown:

  • for the categories *Hjemmværende/Husarbeid i hjemmet* (39.1%) and *Elev/student* (24%) of the *Hovedkilde til livsopphold* variable

  • for the *Under 200.000 kroner* categories of personal (25.2%) and household (24.3%) income

• for females (20.6%) compared to males (17.1%)

- For the variable *Parti ved sist Stortingsvalg* (17.3% missing values) the highest percentages with missing values were shown:

• for the *Under 30* category of *Alder* (21.7%)

• for the *Elev/student* category of *Hovedkilde til livsopphold* (22.9%)

• for the *Under 200.000 kroner* categories of personal (26.9%) and household (25.3%) income

• for females (19.3%) compared to males (15.5%)

- For the variable *Husstandens samlede brutto årsinntekt (før skatt og fradrag)* (14.8% missing values) the highest percentages with missing values were shown:

• for the *Under 30* (22 %) and *60+* (17%) categories of *Alder*

• for the *Annet* (31.3%) and *Elev/student* (22.1 %) categories of *Hovedkilde til livsopphold*

• for the *Grunnskoleutdanning* category of education (16.8%)

• for the *Under 200.000 kroner* category of personal income (32.2%)

• for females (17.3%) compared to males (12.3%)

- For the variable *Født i Norge* (14% missing values) the highest percentages with missing values were shown:

• for the *Under 30* category of *Alder* (18.9%), and there was a linear decrease in the percentage of missing values across the rest of the categories

Appendix E: Table E1 (and detailed report of the results)

[Chapter 4.3.2]

Table E.1: Variables' association to missingness indicator variables (missingness > 10%) *

MISSINGNESS INDICATOR VARIABLES

VARIABLES OF INTEREST	Jobber i offentlig/privat sector	Bransje	Har en ledende stilling	Statens naturoppsyn (SNO)	Hvis jeg ville, kunne jeg raskt....	Parti ved sist Stortingsvalg	Husstandens samlede brutto årsinntekt	Født i Norge
Alder	(exact sign.) p<0.001 adj.stand.resid. >1.96: all cells not MCAR	(exact sign.) p<0.001 adj.stand.resid. >1.96: all cells not MCAR	(exact sign.) p<0.001 adj.stand.resid. >1.96: all cells not MCAR	(exact sign.) p<0.001 adj.stand.resid. >1.96: all cells not MCAR	(exact sign.) p=0.062 MCAR	(exact sign.) p=0.002 not MCAR	(exact sign.) p<0.001 not MCAR	(exact sign.) p<0.001 not MCAR
Hovedkilde til livsopphold	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells Conting.coeff. 0.586, Phi and Cramer's V 0.723 not MCAR	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells Conting. coeff. 0.620, Phi and Cramer's V 0.789 not MCAR	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells except for categ. 9 Conting. coeff. 0.586, Phi and Cramer's V 0.723 not MCAR	(Monte Carlo sign.) p<0.001 not MCAR	(Monte Carlo sign.) p = 0.096 MCAR	(Monte Carlo sign.) p = 0.098 MCAR	(Monte Carlo sign.) p<0.001 not MCAR	(Monte Carlo sign.) p=0.009 not MCAR
Høyeste fullførte skolegang	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells not MCAR	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells not MCAR	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells not MCAR	(Monte Carlo sign.) p<0.001 not MCAR	(Monte Carlo sign.) p = 0.117 MCAR	(Monte Carlo sign.) p = 0.018 not MCAR	(Monte Carlo sign.) p = 0.272 MCAR	(Monte Carlo sign.) p=0.107 MCAR
Personlig brutto årsinntekt	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells not MCAR	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells Conting. coeff. 0.421, Phi and Cramer's V 0.464 not MCAR	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells Conting. coeff. 0.391, Phi and Cramer's V 0.424 not MCAR	(Monte Carlo sign.) p<0.001 not MCAR	(Monte Carlo sign.) p = 0.001 not MCAR	(Monte Carlo sign.) p<0.001 not MCAR	(Monte Carlo sign.) p<0.001 not MCAR	(Monte Carlo sign.) p=0.139 MCAR
Husstandens samlede brutto årsinntekt	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells not MCAR*	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells, except for category 4 not MCAR*	(Monte Carlo sign.) p<0.001 adj.stand.resid. >1.96: all cells not MCAR*	(Monte Carlo sign.) p<0.001 not MCAR*	(Monte Carlo sign.) p = 0.167 MCAR*	(Monte Carlo sign.) p = 0.002 not MCAR*		(Monte Carlo sign.) p=0.249 MCAR*
Kjønn	(exact sign.) p<0.001 not MCAR	(exact sign.) p<0.001 not MCAR	(exact sign.) p<0.001 not MCAR	(exact sign.) p<0.001 not MCAR	(exact sign.) p=0.017 not MCAR	(exact sign.) p=0.004 not MCAR	(exact sign.) p<0.001 not MCAR	(exact sign.) p=0.006 not MCAR
Jobber i offentlig/privat sector		(Monte Carlo sign.) p=0.540 MCAR*	(Monte Carlo sign.) p= 0.748 MCAR*	(Monte Carlo sign.) p= 0.319 MCAR*	(Monte Carlo sign.) p= 0.411 MCAR*	(Monte Carlo sign.) p= 0.583 MCAR*	(Monte Carlo sign.) p= 0.931 MCAR*	(Monte Carlo sign.) p=0.158 MCAR*
Har en ledende stilling	(exact sign.) p=0.214 MCAR*	(exact sign.) p=0.271 MCAR*		(exact sign.) p=0.006 not MCAR*	(exact sign.) p=0.492 MCAR*	(exact sign.) p=0.048 not MCAR*	(exact sign.) p=0.138 MCAR*	(exact sign.) p=0.929 MCAR*
Bransje	(Monte Carlo sign.) p= 0.321 MCAR*		(Monte Carlo sign.) p= 0.515 MCAR*	(Monte Carlo sign.) p<0.001 not MCAR*	(Monte Carlo sign.) p= 0.104 MCAR*	(Monte Carlo sign.) p= 0.273 MCAR*	(Monte Carlo sign.) p= 0.716 MCAR*	(Monte Carlo sign.) p=0.374 MCAR*
Statens naturoppsyn (SNO)	(exact sign.) p=0.016 not MCAR*	(exact sign.) p= 0.003 not MCAR*	(exact sign.) p= 0.003 not MCAR*		(exact sign.) p= 0.050 not MCAR*	(exact sign.) p= 0.651 MCAR*	(exact sign.) p= 0.004 not MCAR*	(exact sign.) p= 0.148 MCAR*
Hvis jeg ville, kunne jeg raskt få et tillitsverv...	(exact sign.) p=0.281 MCAR*	(exact sign.) p=0.546 MCAR*	(exact sign.) p=0.266 MCAR*	(exact sign.) p<0.001 not MCAR*		(exact sign.) p=0.063 MCAR*	(exact sign.) p=0.039 not MCAR*	(exact sign.) p=0.497 MCAR*
Parti ved sist Stortingsvalg	(Monte Carlo sign.) p= 0.003 not MCAR*	(Monte Carlo sign.) p=0.005 not MCAR*	(Monte Carlo sign.) p= 0.032 not MCAR*	(Monte Carlo sign.) p<0.001 not MCAR*	(Monte Carlo sign.) p= 0.002 not MCAR*		(Monte Carlo sign.) p= 0.001 not MCAR*	(Monte Carlo sign.) p=0.230 MCAR*
Født i Norge	(exact sign.) p=0.920 MCAR*	(exact sign.) p=0.920 MCAR*	(exact sign.) p=1.000 MCAR*	(exact sign.) p=0.033 not MCAR*	(exact sign.) p=0.009 not MCAR*	(exact sign.) p=0.166 MCAR*	(exact sign.) p=0.216 MCAR*	

* the results may be biased because of high percentage of missing values in the crosstabulation with the variable of interest

Detailed report of the results:

Variables' association to the missingness dummy of *Jobber i offentlig/privat sector:*

• ***Alder***: the (exact) significance of the Pearson chi-square is .000 (p< .001) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96). The association is highly significant (not MCAR data).

• ***Hovedkilde til livsopphold****:* the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 622500317) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96). The contingency coefficient is .586, the Phi and Cramer's V measures of association are .723 (not MCAR data).

• ***Høyeste fullførte skolegang:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 1619197531) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96). The contingency coefficient is .188, the Phi and Cramer's V measures of association are .192 (not MCAR data).

• ***Personlig brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 1202584817) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96) (not MCAR data).

• ***Husstandens samlede brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 1862879082) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96) (not MCAR data). However, the Case Processing Summary table shows 14.8% missing values, which indicates that the results might be biased.

• ***Kjønn:*** the (exact) significance of the Pearson chi-square is .000 (p< .001) (not MCAR data).

• ***Bransje:*** the (Monte Carlo) significance of the Pearson chi-square is .321 (p> .05) (MCAR data). However, the Case Processing Summary table shows 33.5% missing values, which indicates that the results might be biased.

• ***Har en ledende stilling****:* the (exact) significance of the Pearson chi-square is .214 (p> .05) (MCAR data). However, the Case Processing Summary table shows 36.7% missing values, which indicates that the results might be biased.

• ***Statens naturoppsyn (SNO):*** the (exact) significance of the Pearson chi-square is .016 (p< .05) (not MCAR data). However, the Case Processing Summary table shows 23.1% missing values, which indicates that the results might be biased.

• ***Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon:*** the (exact) significance of the Pearson chi-square is .281 (p> .05) (MCAR data). However, the Case Processing Summary table shows 18.8% missing values, which indicates that the results might be biased.

• ***Parti ved sist Stortingsvalg:*** the (Monte Carlo) significance of the Pearson chi-square is .003 (p< .05) (99% CI is based on 10000 sampled tables with starting seed 826015830) (not MCAR data). However, the Case Processing Summary table shows 17.3% missing values, which indicates that the results might be biased.

• ***Født i Norge:*** the (exact) significance of the Pearson chi-square is .920 (p> .05) (MCAR data). However, the Case Processing Summary table shows 14% missing values, which indicates that the results might be biased.

Variables' association to the missingness dummy of *Bransje*:

• ***Alder:*** the (exact) significance of the Pearson chi-square is .000 (p< .001) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96) (not MCAR data).

• ***Hovedkilde til livsopphold:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 2003971856) (the adjusted

standardized residuals are clearly all above the cut-off point of 1.96) The contingency coefficient is .620, the Phi and Cramer's V measures of association are .789 (not MCAR data).

• ***Høyeste fullførte skolegang:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 1572883042) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96). The contingency coefficient is .194, the Phi and Cramer's V measures of association are .198 (not MCAR data).

• ***Personlig brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 726369912) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96) The contingency coefficient is .421, the Phi and Cramer's V measures of association are .464 (not MCAR data).

• ***Husstandens samlede brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 1245737549) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96, except for the category 4=*600.000-799.999 kroner*) (not MCAR data). However, the Case Processing Summary table shows 14.8% missing values, which indicates that the results might be biased.

• ***Kjønn:*** the (exact) significance of the Pearson chi-square is .000 (p< .001) (not MCAR data).

• ***Jobber i offentlig/privat sector:*** the (Monte Carlo) significance of the Pearson chi-square is .540 (p> .05) (MCAR data). However, the Case Processing Summary table shows 35.3% missing values, which indicates that the results might be biased.

• ***Har en ledende stilling****:* the (exact) significance of the Pearson chi-square is .271 (p> .05) (MCAR data). However, the Case Processing Summary table shows 36.7% missing values, which indicates that the results might be biased.

• ***Statens naturoppsyn (SNO):*** the (exact) significance of the Pearson chi-square is .003 (p< .05) (not MCAR data). However, the Case Processing Summary table shows 23.1% missing values, which indicates that the results might be biased.

• ***Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon:*** the (exact) significance of the Pearson chi-square is .546 (p> .05) (MCAR data). However, the Case Processing Summary table shows 18.8% missing values, which indicates that the results might be biased.

• ***Parti ved sist Stortingsvalg:*** the (Monte Carlo) significance of the Pearson chi-square is .005 (p< .05) (99% CI is based on 10000 sampled tables with starting seed 51626314) (not MCAR data). However, the Case Processing Summary table shows 17.3% missing values, which indicates that the results might be biased.

• ***Født i Norge:*** the (exact) significance of the Pearson chi-square is .920 (p> .05) (MCAR data). However, the Case Processing Summary table shows 14% missing values, which indicates that the results might be biased.

Variables' association to the missingness dummy of *Har en ledende stilling*:

• ***Alder:*** the (exact) significance of the Pearson chi-square is .000 (p< .001) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96) (not MCAR data).

• ***Hovedkilde til livsopphold:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 328401650) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96, except for the category 9=*Annet*) The contingency coefficient is .586, the Phi and Cramer's V measures of association are .723 (not MCAR data).

• ***Høyeste fullførte skolegang:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 37464600) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96). The contingency coefficient is .185, the Phi and Cramer's V measures of association are .188 (not MCAR data).

• ***Personlig brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 1982003148) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96). The contingency coefficient is .391, the Phi and Cramer's V measures of association are .424 (not MCAR data).

• ***Husstandens samlede brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 1084288993) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96) (not MCAR data). However, the Case Processing Summary table shows 14.8% missing values, which indicates that the results might be biased.

• ***Kjønn:*** the (exact) significance of the Pearson chi-square is .000 (p< .001) (not MCAR data).

• ***Jobber i offentlig/privat sector:*** the (Monte Carlo) significance of the Pearson chi-square is .748 (p> .05) (MCAR data). However, the Case Processing Summary table shows 35.3% missing values, which indicates that the results might be biased.

• ***Bransje:*** the (Monte Carlo) significance of the Pearson chi-square is .515 (p> .05) (MCAR data). However, the Case Processing Summary table shows 33.5% missing values, which indicates that the results might be biased.

• ***Statens naturoppsyn (SNO):*** the (exact) significance of the Pearson chi-square is .003 (p< .05) (not MCAR data). However, the Case Processing Summary table shows 23.1% missing values, which indicates that the results might be biased.

• ***Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon:*** the (exact) significance of the Pearson chi-square is .266 (p> .05) (MCAR data). However, the Case Processing Summary table shows 18.8% missing values, which indicates that the results might be biased.

• ***Parti ved sist Stortingsvalg:*** the (Monte Carlo) significance of the Pearson chi-square is .032 (p< .05) (99% CI is based on 10000 sampled tables with starting seed 804659772) (not MCAR data). However, the Case Processing Summary table shows 17.3% missing values, which indicates that the results might be biased.

• ***Født i Norge:*** the (exact) significance of the Pearson chi-square is 1.000 (p>0.05) (MCAR data). However, the Case Processing Summary table shows 14% missing values, which indicates that the results might be biased.

Variables' association to the missingness dummy of *Statens naturoppsyn (SNO)*:

• ***Alder:*** the (exact) significance of the Pearson chi-square is .000 (p< .001) (the adjusted standardized residuals are clearly all above the cut-off point of 1.96) (not MCAR data).

• ***Hovedkilde til livsopphold:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 763478394) (not MCAR data).

• ***Høyeste fullførte skolegang:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 675470178) (not MCAR data).

• ***Personlig brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 405688583) (not MCAR data).

• ***Husstandens samlede brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 463717874) (not MCAR data). However, the Case Processing Summary table shows 14.8% missing values, which indicates that the results might be biased.

• ***Kjønn:*** the (exact) significance of the Pearson chi-square is .000 (p< .001) (not MCAR data).

• ***Jobber i offentlig/privat sector:*** the (Monte Carlo) significance of the Pearson chi-square is .319 (p> .05) (MCAR data). However, the Case Processing Summary table shows 35.3% missing values, which indicates that the results might be biased.

• ***Bransje:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 7316993) (not MCAR data). However, the Case Processing Summary table shows 33.5% missing values, which indicates that the results might be biased.

• ***Har en ledende stilling****:* the (exact) significance of the Pearson chi-square is .006 (p< .05) (not MCAR data). However, the Case Processing Summary table shows 36.7% missing values, which indicates that the results might be biased.

• ***Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon:*** the (exact) significance of the Pearson chi-square is .000 (p< .001) (not MCAR data). However, the Case Processing Summary table shows 18.8% missing values, which indicates that the results might be biased.

• ***Parti ved sist Stortingsvalg:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 1005297775) (not MCAR data). However, the Case Processing Summary table shows 17.3% missing values, which indicates that the results might be biased.

• ***Født i Norge:*** the (exact) significance of the Pearson chi-square is .033 (p< .05) (not MCAR data). However, the Case Processing Summary table shows 14% missing values, which indicates that the results might be biased.

Variables' association to the missingness dummy of *Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon*:

• ***Alder:*** the (exact) significance of the Pearson chi-square is .062 (MCAR data).

• ***Hovedkilde til livsopphold***: the (Monte Carlo) significance of the Pearson chi-square is .096 (99% CI, 0.088- 0.103) (based on 10000 sampled tables with starting seed 13881883) (MCAR data).

• ***Høyeste fullførte skolegang:*** the (Monte Carlo) significance of the Pearson chi-square is .117 (99% CI, 0.108-0.125) (based on 10000 sampled tables with starting seed 2125745741) (MCAR data).

• ***Personlig brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .001 (99% CI, 0.000-0.002) (based on 10000 sampled tables with starting seed 1082653322) (not MCAR data).

• ***Husstandens samlede brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .167 (99% CI, 0.157-0.176) (based on 10000 sampled tables with starting seed 1942064802) (MCAR data). However, the Case Processing Summary table shows 14.8% missing values, which indicates that the results might be biased.

• ***Kjønn:*** the (exact) significance of the Pearson chi-square is .017 (p< .05) (not MCAR data).

• ***Jobber i offentlig/privat sector:*** the (Monte Carlo) significance of the Pearson chi-square is .411 (p> .05) (99% CI, 0.398-0.423) (based on 10000 sampled tables with starting seed 2107161883) (MCAR data). However, the Case Processing Summary table shows 35.3% missing values, which indicates that the results might be biased.

• ***Bransje:*** the (Monte Carlo) significance of the Pearson chi-square is .104 (99% CI, 0.096-0.112) (based on 10000 sampled tables with starting seed 1555045827) (MCAR data). However, the Case Processing Summary table shows 33.5% missing values, which indicates that the results might be biased.

• ***Har en ledende stilling****:* the (exact) significance of the Pearson chi-square is .492 (p> .05) (MCAR data). However, the Case Processing Summary table shows 36.7% missing values, which indicates that the results might be biased.

• ***Statens naturoppsyn (SNO):*** the (exact) significance of the Pearson chi-square is .050 (not MCAR data). However, the Case Processing Summary table shows 23.1% missing values, which indicates that the results might be biased.

• ***Parti ved sist Stortingsvalg:*** the (Monte Carlo) significance of the Pearson chi-square is .002 (99% CI, 0.001- 0.003) (based on 10000 sampled tables with starting seed 1750542282) (not MCAR data). However, the Case Processing Summary table shows 17.3% missing values, which indicates that the results might be biased.

• ***Født i Norge:*** the (exact) significance of the Pearson chi-square is .009 (p< .05) (not MCAR data). However, the Case Processing Summary table shows 14% missing values, which indicates that the results might be biased.

Variables' association to the missingness dummy of *Parti ved sist Stortingsvalg*:

• ***Alder:*** the (exact) significance of the Pearson chi-square is .002 (not MCAR data).

• ***Hovedkilde til livsopphold:*** the (Monte Carlo) significance of the Pearson chi-square is .098 (99% CI, 0.091- 0.106) (based on 10000 sampled tables with starting seed 680051886) (MCAR data).

• ***Høyeste fullførte skolegang:*** the (Monte Carlo) significance of the Pearson chi-square is .018 (99% CI, 0.015-0.022) (based on 10000 sampled tables with starting seed 199001046) (not MCAR data).

• ***Personlig brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 1451817298) (not MCAR data).

• ***Husstandens samlede brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .002 (99% CI, 0.001-0.002) (based on 10000 sampled tables with starting seed 1221027855) (not MCAR data). However, the Case Processing Summary table shows 14.8% missing values, which indicates that the results might be biased.

• ***Kjønn:*** the (exact) significance of the Pearson chi-square is .004 (not MCAR data).

• ***Jobber i offentlig/privat sector:*** the (Monte Carlo) significance of the Pearson chi-square is .583 (99% CI, 0.570-0.596) (based on 10000 sampled tables with starting seed 717180510) (MCAR data). However, the Case Processing Summary table shows 35.3% missing values, which indicates that the results might be biased.

• ***Bransje:*** the (Monte Carlo) significance of the Pearson chi-square is .273 (99% CI, 0.262-0.284) (based on 10000 sampled tables with starting seed 2045694167) (MCAR data). However, the Case Processing Summary table shows 33.5% missing values, which indicates that the results might be biased.

• ***Har en ledende stilling****:* the (exact) significance of the Pearson chi-square is .048 (not MCAR data). However, the Case Processing Summary table shows 36.7% missing values, which indicates that the results might be biased.

• ***Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon:*** the (exact) significance of the Pearson chi-square is .063 (MCAR data). However, the Case Processing Summary table shows 18.8% missing values, which indicates that the results might be biased.

• ***Statens naturoppsyn (SNO):*** the (exact) significance of the Pearson chi-square is .651 (MCAR data). However, the Case Processing Summary table shows 23.1% missing values, which indicates that the results might be biased.

• ***Født i Norge:*** the (exact) significance of the Pearson chi-square is .166 (MCAR data). However, the Case Processing Summary table shows 14% missing values, which indicates that the results might be biased.

Variables' association to the missingness dummy of *Husstandens samlede brutto årsinntekt*:

• ***Alder:*** the (exact) significance of the Pearson chi-square is .000 (p< .001) (not MCAR data).

• ***Hovedkilde til livsopphold:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 1168265992) (not MCAR data).

• ***Høyeste fullførte skolegang:*** the (Monte Carlo) significance of the Pearson chi-square is .272 (99% CI, 0.260-0.283) (based on 10000 sampled tables with starting seed 732824725) (MCAR data).

• ***Personlig brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .000 (p< .001) (99% CI is based on 10000 sampled tables with starting seed 589781954) (not MCAR data).

• ***Kjønn:*** the (exact) significance of the Pearson chi-square is .000 (p< .001) (not MCAR data).

• ***Jobber i offentlig/privat sector:*** the (Monte Carlo) significance of the Pearson chi-square is .931 (99% CI, 0.925-0.938) (based on 10000 sampled tables with starting seed 642363950) (MCAR data). However, the Case Processing Summary table shows 35.3% missing values, which indicates that the results might be biased.

• ***Bransje:*** the (Monte Carlo) significance of the Pearson chi-square is .716 (99% CI, 0.704-0.727) (based on 10000 sampled tables with starting seed 1929034689) (MCAR data). However, the Case Processing Summary table shows 33.5% missing values, which indicates that the results might be biased.

• ***Har en ledende stilling****:* the (exact) significance of the Pearson chi-square is .138 (MCAR data). However, the Case Processing Summary table shows 36.7% missing values, which indicates that the results might be biased.

• ***Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon:*** the (exact) significance of the Pearson chi-square is .039 (not MCAR data). However, the Case Processing Summary table shows 18.8% missing values, which indicates that the results might be biased.

• ***Parti ved sist Stortingsvalg:*** the (Monte Carlo) significance of the Pearson chi-square is .001 (99% CI, 0.000- 0.001) (based on 10000 sampled tables with starting seed 1599101450) (not MCAR data). However, the Case Processing Summary table shows 17.3% missing values, which indicates that the results might be biased.

• ***Statens naturoppsyn (SNO):*** the (exact) significance of the Pearson chi-square is .004 (not MCAR data). However, the Case Processing Summary table shows 23.1% missing values, which indicates that the results might be biased.

• ***Født i Norge:*** the (exact) significance of the Pearson chi-square is .216 (MCAR data). However, the Case Processing Summary table shows 14% missing values, which indicates that the results might be biased.

Variables' association to the missingness dummy of *Født i Norge*:

• ***Alder:*** the (exact) significance of the Pearson chi-square is .000 (p< .001) (not MCAR data).

• ***Hovedkilde til livsopphold:*** the (Monte Carlo) significance of the Pearson chi-square is .009 (99% CI, 0.007-0.012) (based on 10000 sampled tables with starting seed 622500317) (not MCAR data).

• ***Høyeste fullførte skolegang:*** the (Monte Carlo) significance of the Pearson chi-square is .107 (99% CI, 0.099-0.115) (based on 10000 sampled tables with starting seed 1372427163) (MCAR data).

• ***Personlig brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .139 (99% CI, 0.130-0.148) (based on 10000 sampled tables with starting seed 140248026) (MCAR data).

• ***Husstandens samlede brutto årsinntekt:*** the (Monte Carlo) significance of the Pearson chi-square is .249 (99% CI, 0.238-0.260) (based on 10000 sampled tables with starting seed 1667063755) (MCAR data). However, the Case Processing Summary table shows 14.8% missing values, which indicates that the results might be biased.

• ***Kjønn:*** the (exact) significance of the Pearson chi-square is .006 (not MCAR data).

• ***Jobber i offentlig/privat sector:*** the (Monte Carlo) significance of the Pearson chi-square is .158 (99% CI, 0.148-0.167) (based on 10000 sampled tables with starting seed 1098401681) (MCAR data). However, the Case Processing Summary table shows 35.3% missing values, which indicates that the results might be biased.

• ***Bransje:*** the (Monte Carlo) significance of the Pearson chi-square is .374 (99% CI, 0.361-0.386) (based on 10000 sampled tables with starting seed 1336538522) (MCAR data). However, the Case Processing Summary table shows 33.5% missing values, which indicates that the results might be biased.

• ***Har en ledende stilling****:* the (exact) significance of the Pearson chi-square is .929 (MCAR data). However, the Case Processing Summary table shows 36.7% missing values, which indicates that the results might be biased.

• ***Statens naturoppsyn (SNO):*** the (exact) significance of the Pearson chi-square is .148 (MCAR data). However, the Case Processing Summary table shows 23.1% missing values, which indicates that the results might be biased.

• ***Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon:*** the (exact) significance of the Pearson chi-square is .497 (MCAR data). However, the Case Processing Summary table shows 18.8% missing values, which indicates that the results might be biased.

• ***Parti ved sist Stortingsvalg:*** the (Monte Carlo) significance of the Pearson chi-square is .230 (99% CI, 0.219- 0.240) (based on 10000 sampled tables with starting seed 1913297137) (MCAR data). However, the Case Processing Summary table shows 17.3% missing values, which indicates that the results might be biased.

Appendix F: Supplemental material for Chapter 6

[Hypothesis 1]

Figure F.1: Scree plots from the one-, two- and three-dimensional solutions for economic capital

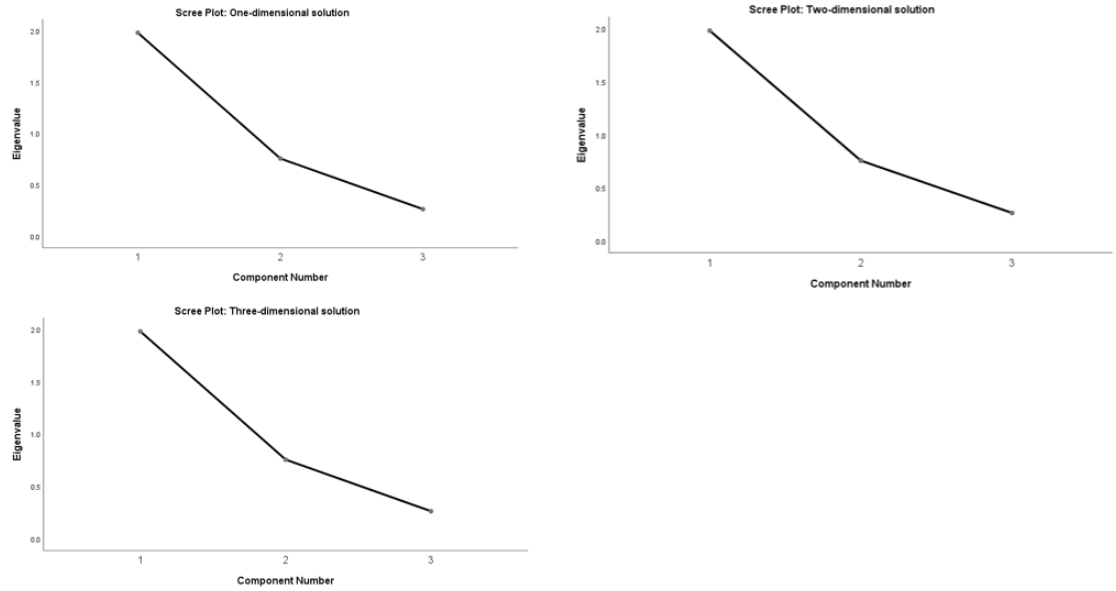
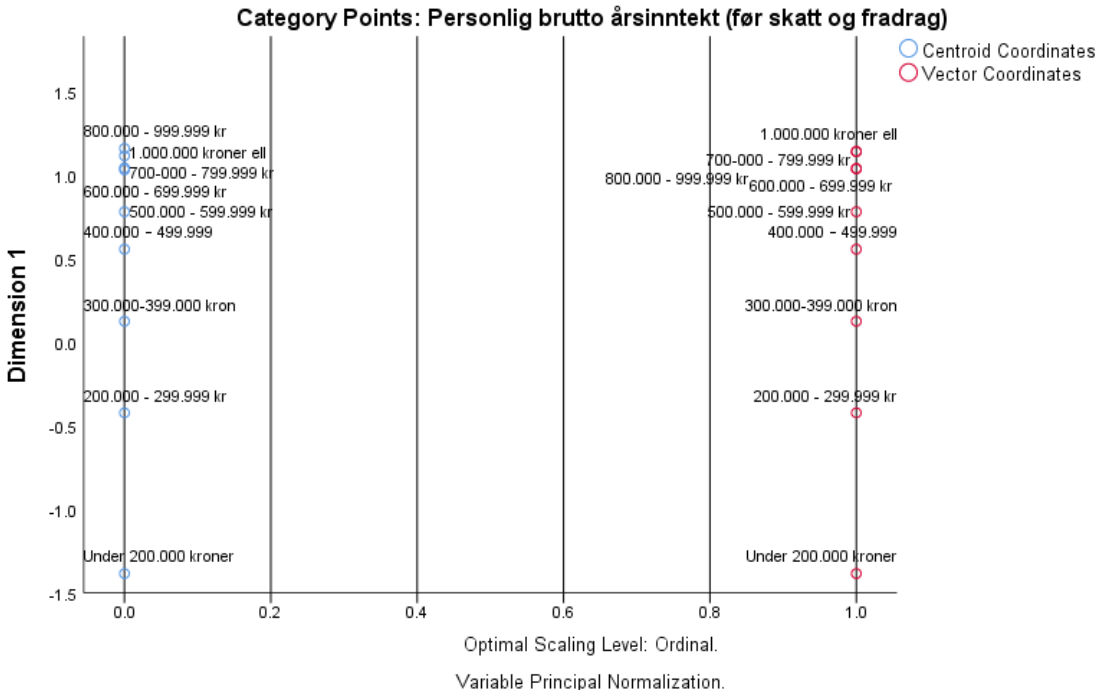
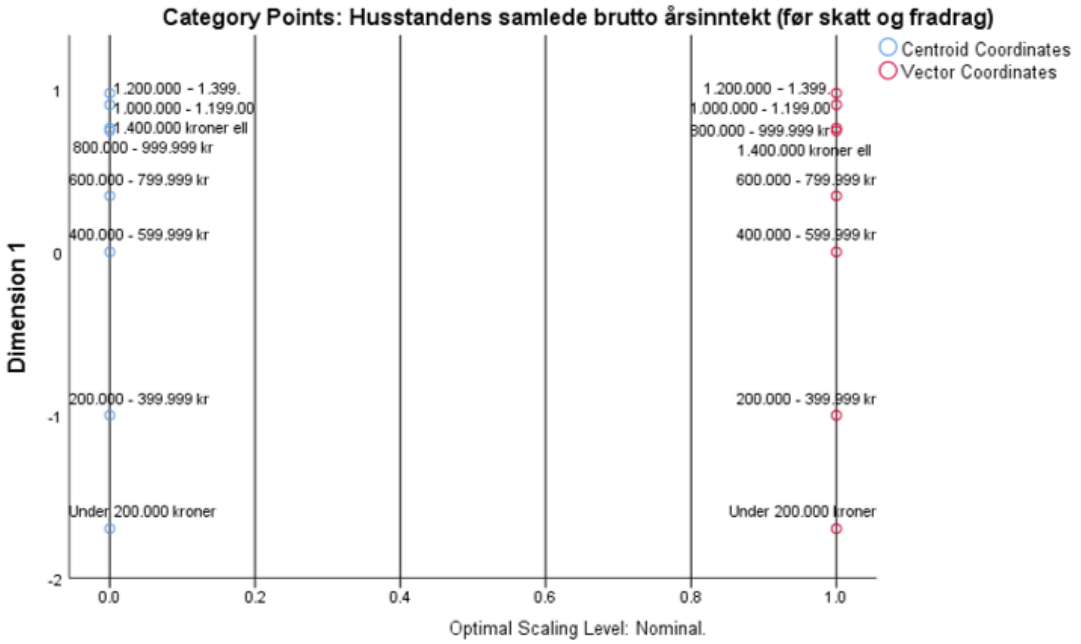
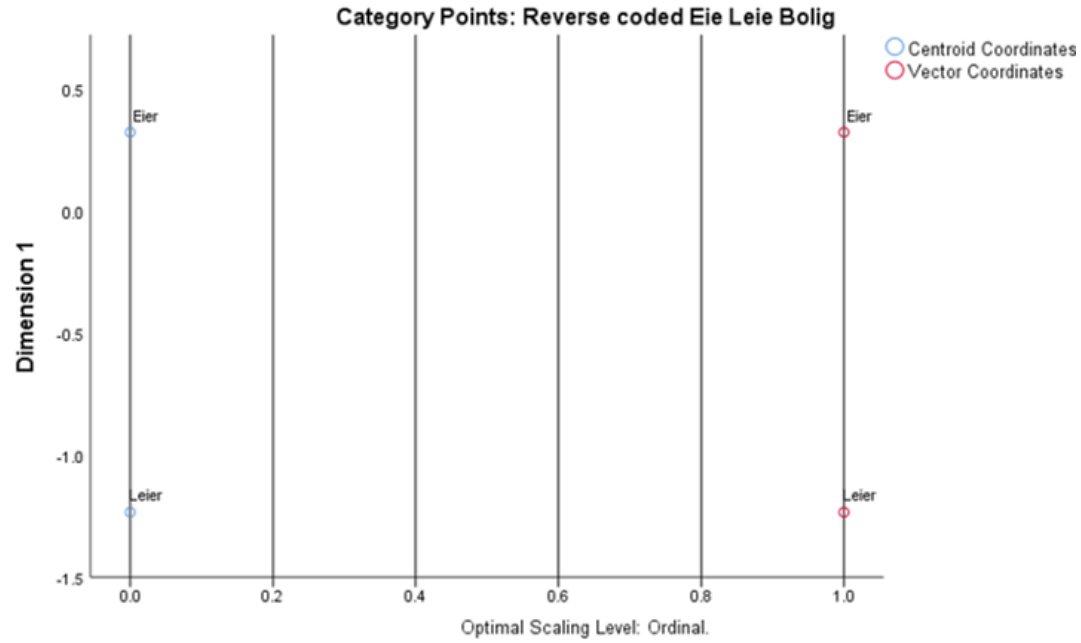


Figure F.2: Plots with category points for the three quantified variables for economic capital

[note: SPSS produces in the same plot the *centroid* coordinates, which are not of interested in this thesis and thus should be ignored by the reader]







F.1: SPSS syntax for computing the variable High Economic Capital (HEC)

```
COMPUTE HEC = 1.
IF ((Personlig_årsinntekt = 7 OR Personlig_årsinntekt= 8 OR Personlig_årsinntekt= 9) & (Husstandens_årsinntekt= 7 OR Husstandens_årsinntekt= 8) & (Reversecoded_Eie_leie_bolig= 2)) HEC =1.
IF NOT ((Personlig_årsinntekt = 7 OR Personlig_årsinntekt= 8 OR Personlig_årsinntekt= 9) & (Husstandens_årsinntekt= 7 OR Husstandens_årsinntekt= 8) & (Reversecoded_Eie_leie_bolig= 2)) HEC = 0.
EXECUTE.
```

Figure F.3: Scree plot from the one-, two- and three-dimensional solutions on the 5 quantified variables selected for cultural capital

[Note: the scree plots were identical, so only one is presented here for conciseness]

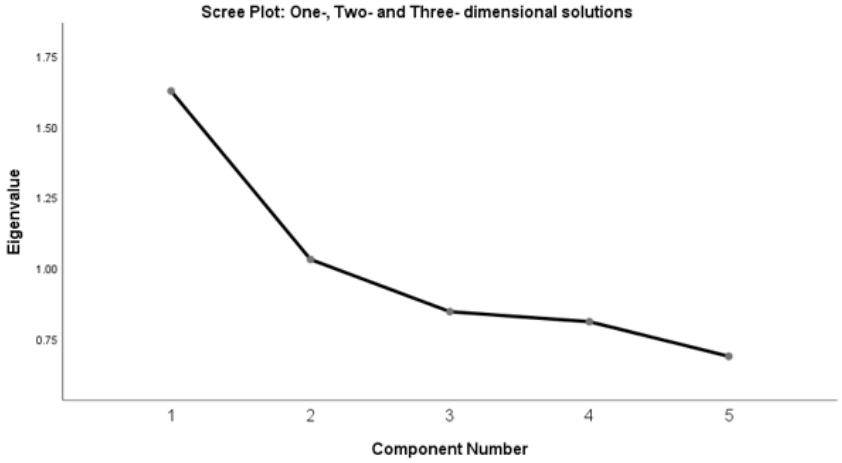


Table F.1: Component loadings in the two-dimensional solution with the five variables for cultural capital

Component Loadings

	Dimension	
	1	2
Bøker på andre språk enn norsk (recoded)	**.662**	-.351
Sjakkspill (recoded)	**.652**	-.374
Piano (recoded)	**.556**	-.179
Antall bøker hjemme	**.441**	**.676**
Høyeste fullførte skolegang	**.520**	**.533**

Figure F.4: Transformation plots of the four quantified variables for cultural capital at the ordinal scaling level: *Utdanning* (upper row, left); *Piano* (upper row, right); *Sjakkspill* (lower row, left); *Bøker på andre språk enn norsk* (lower row, right)

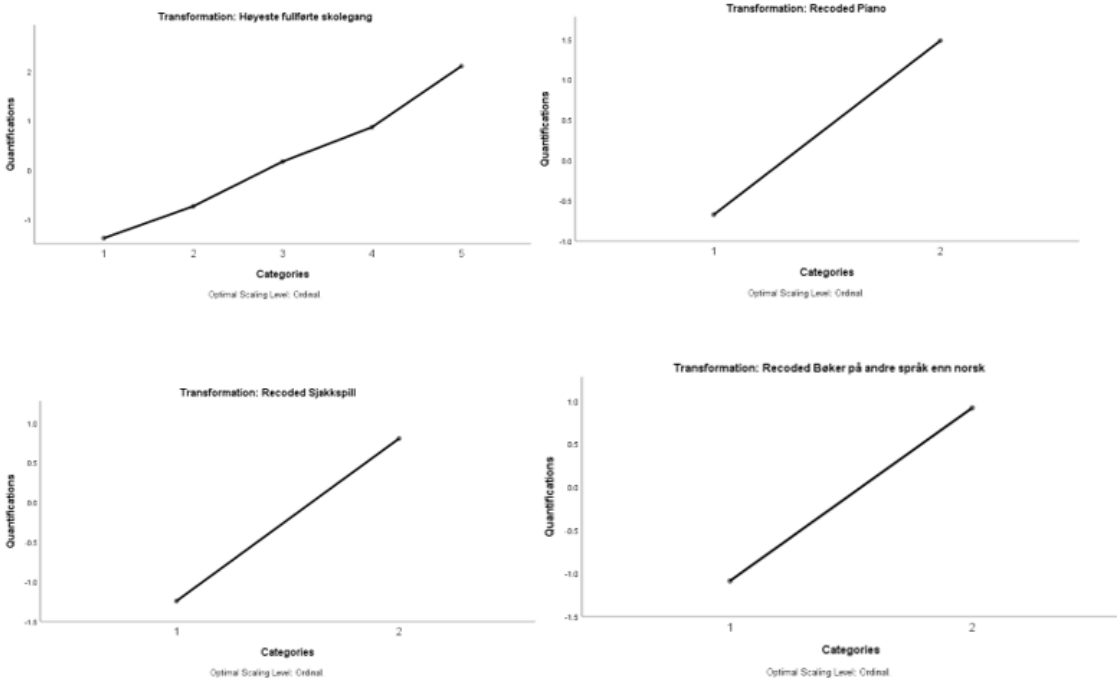
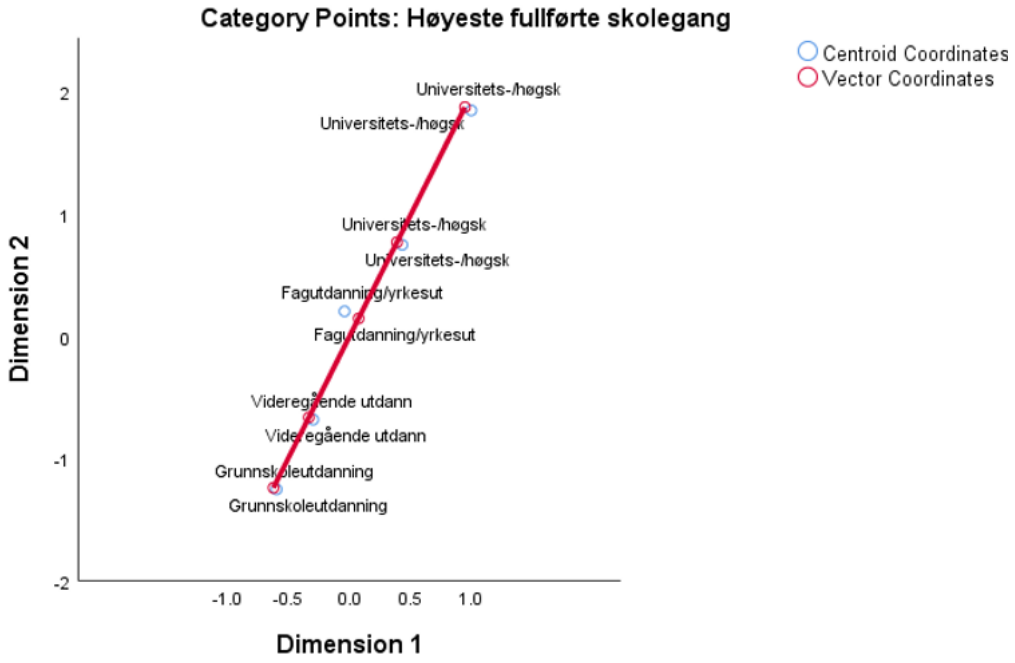
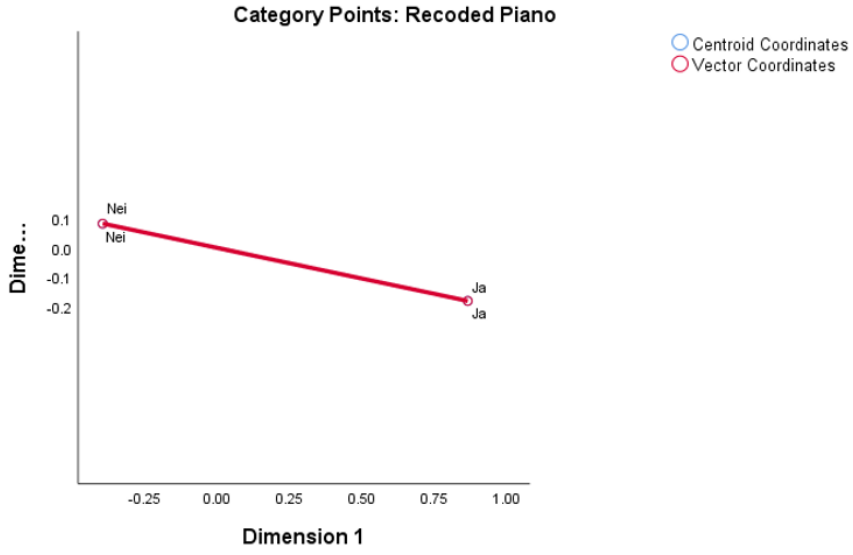
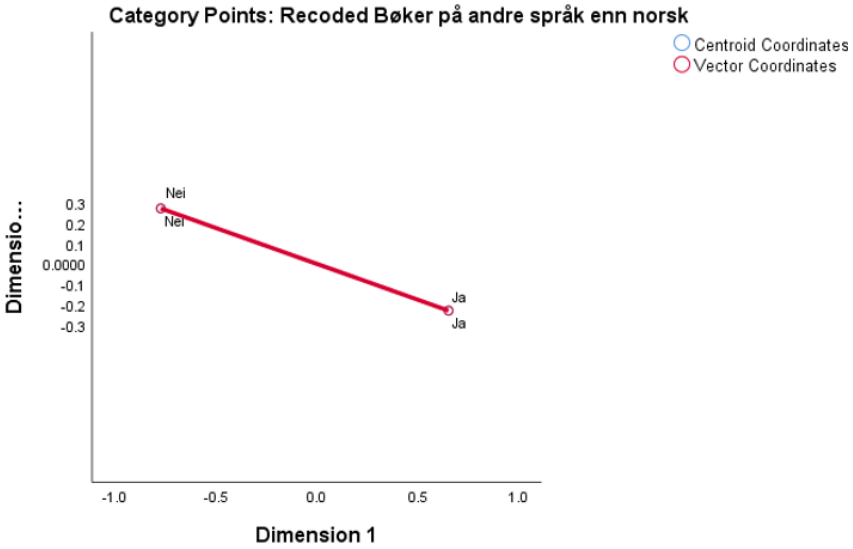
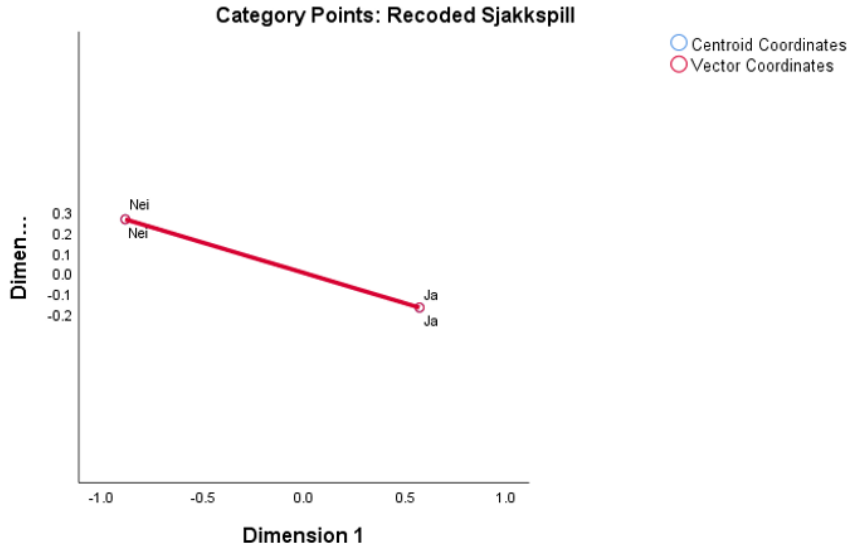


Figure F.5: Plots with category points for the four quantified variables for cultural capital









F.2: SPSS syntax for computing the variable *grossHCC*

```
COMPUTE grossHCC = 1.
IF ((Utdanning = 5) & (Recoded_piano= 2) & (Recoded_Sjakkspill= 2) &
(Recoded_Bøker_andre_språk= 2)) grossHCC = 1.
IF NOT ((Utdanning = 5) & (Recoded_piano= 2) & (Recoded_Sjakkspill= 2) &
(Recoded_Bøker_andre_språk= 2)) grossHCC = 0.
EXECUTE.
```

F.3: SPSS syntax for computing the variable *netHCC*

```
COMPUTE netHCC = 1.
IF ((grossHCC = 1) & NOT (HEC = 1)) netHCC = 1.
IF NOT ((grossHCC = 1) & NOT (HEC = 1)) netHCC = 0.
EXECUTE.
```

F.4: SPSS syntax for computing the variable *Type of Capital in the field of power*

```
COMPUTE Type_Of_Capital_field_of_power = 1.
IF ((HEC = 1) & (netHCC = 0)) Type_Of_Capital_field_of_power = 1.
IF ((netHCC = 1) & (HEC = 0)) Type_Of_Capital_field_of_power = 2.
IF NOT ((HEC = 1) & (netHCC = 0)) & NOT ((netHCC = 1) & (HEC = 0))
Type_Of_Capital_field_of_power = 0.
EXECUTE.
```

F.5: SPSS syntax for computing the variable *Climate change attitude*

```
COMPUTE Climate_change_attitude = 1.
IF (Q020_Klimabenektelse_Klimaskepsis = 1) Climate_change_attitude = 0.
IF (Q020_Klimabenektelse_Klimaskepsis = 2 OR Q020_Klimabenektelse_Klimaskepsis = 3 OR
Q020_Klimabenektelse_Klimaskepsis = 4 ) Climate_change_attitude = 1 .
EXECUTE.
```

Appendix G: Supplemental material for Chapter 7

[Hypothesis 2]

G.1: example of SPSS syntax for reverse coding

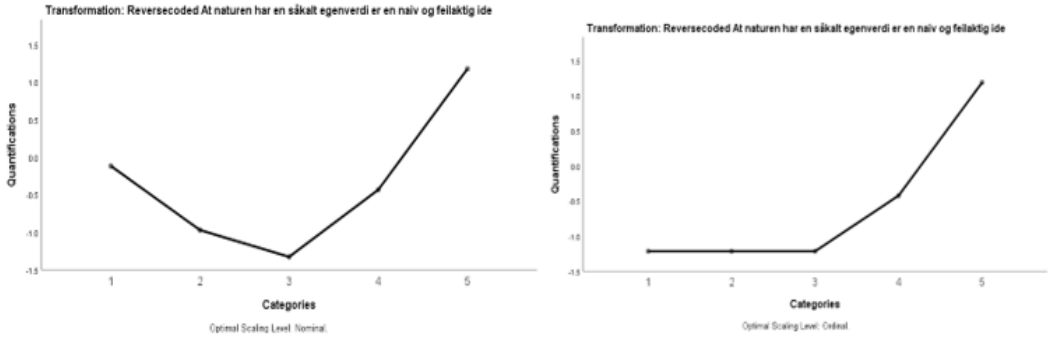
```
DATASET ACTIVATE DataSet1.
RECODE Q019_2_tillit_til_aktører_og_institusjoner_klima_og_miljøspør (1=5) (2=4) (3=3) (4=2)
(5=1)
INTO Q019_2_Reversecoded_tillit.
VARIABLE LABELS Q019_2_Reversecoded_tillit 'Q019_2_Reversecoded_tillit'.
EXECUTE.
```

Table G.1: Reverse coded variables

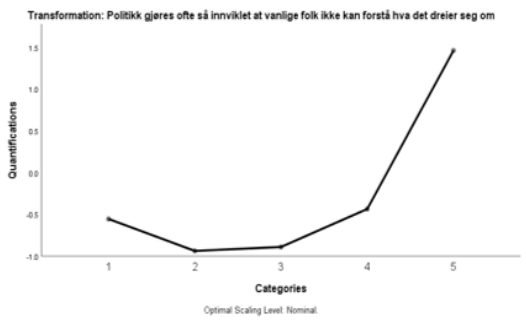
before reverse coding	after reverse coding
Variable: Q019_2_tillit_til_aktører_og_institusjoner_klima_og_miljøspørsmål **Label**: Vanlige folk som bruker sunn fornuft	**Variable**: Q019_2_Reversecoded_tillit **Label**: Reversecoded Vanlige folk som bruker sunn fornuft
Variable: Q021_6_påstander_om_klima_og_miljøspørsmål **Label**: At naturen har en såkalt egenverdi er en naiv og feilaktig idé	**Variable**: Q021_6_Reversecoded_påstander **Label**: Reversecoded At naturen har en såkalt egenverdi er en naiv og feilaktig ide
Variable: Q021_7_påstander_om_klima_og_miljøspørsmål **Label**: Klimaforskningen overdriver klimaproblemene	**Variable**: Q021_7_Reversecoded_påstander **Label**: Reversecoded Klimaforskningen overdriver klimaproblemene
Variable: Q034_2_om_politikk_og_makt **Label**: Hvis jeg ville, kunne jeg raskt få et tillitsverv i et politisk parti eller i en organisasjon	**Variable**: Q034_2_Reversecoded_om_politikk_og_makt **Label**: Reversecoded Hvis jeg ville, kunne jeg rarskt få et tillitsverv i et politisk parti eller i en organisasjon
Variable: Q034_4_om_politikk_og_makt **Label**: Jeg har sjelden problemer med å følge med på hva eksperter sier på TV	**Variable**: Q034_4_Reversecoded_om_politikk_og_makt **Label**: Reversecoded Jeg har sjelden problemer med å følge med på hva eksperter sier på TV
Variable: Q034_6_om_politikk_og_makt **Label**: I Norge kan alle som vil få politisk innflytelse	**Variable**: Q034_6_Reversecoded_om_politikk_og_makt **Label**: Reversecoded I Norge kan alle som vil få politisk innflytelse

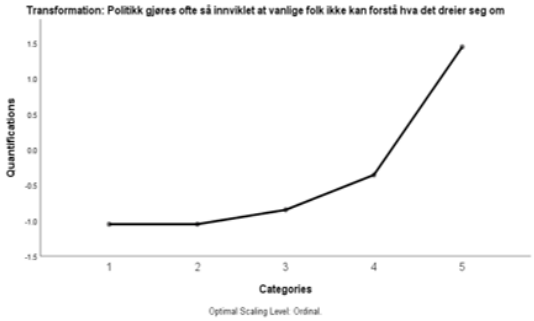
Figure G.1: Transformation plots for eight of the quantified variables in CATPCA at the nominal (left side) and ordinal (right side) scaling levels

At naturen har en såkalt egenverdi er en naiv og feilaktig ide (reverse coded)

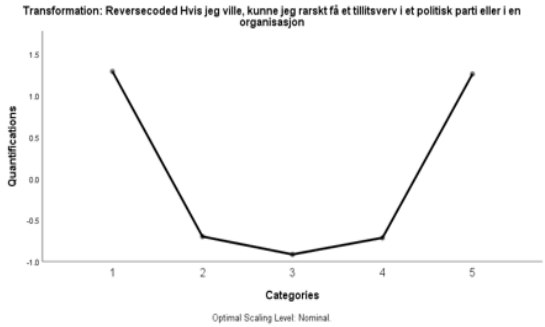


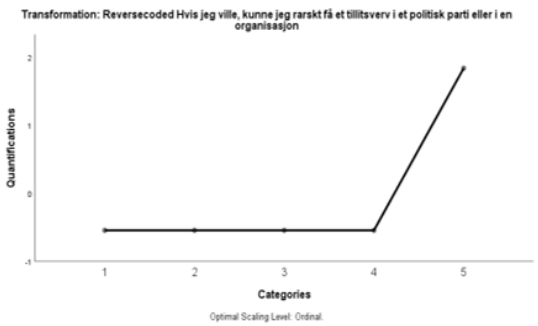
Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om



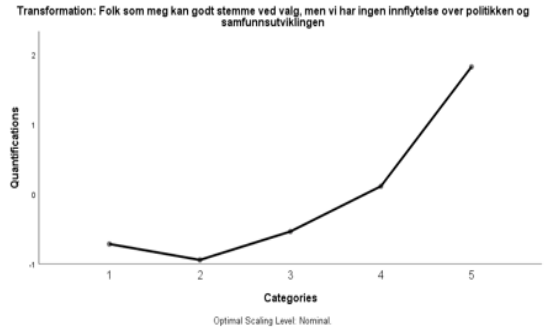


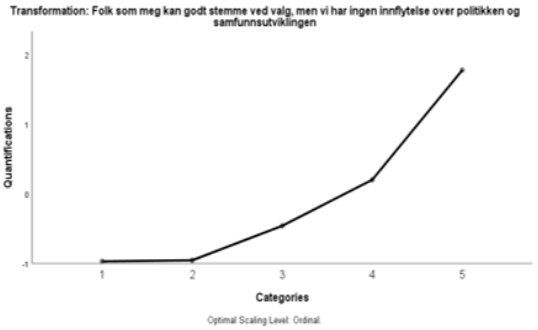
Reversecoded Hvis jeg ville, kunne jeg rarskt få et tillitsverv i et politisk parti eller i en organisasjon



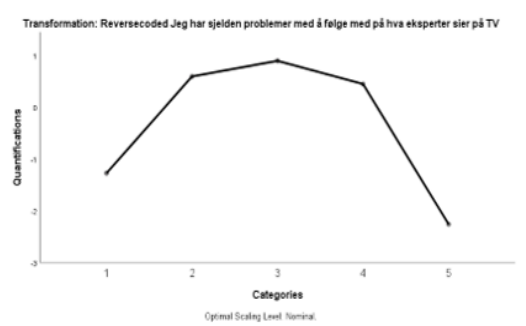


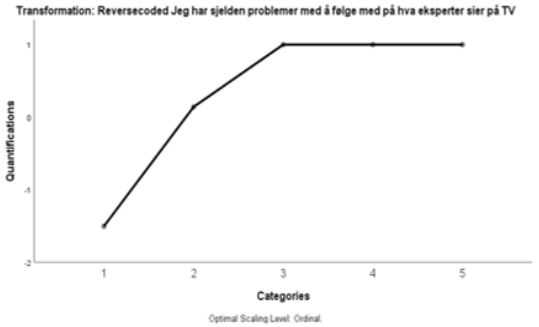
Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen



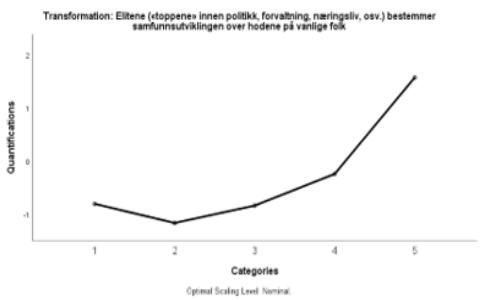


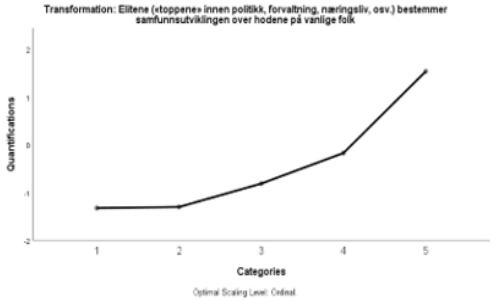
Reversecoded Jeg har sjelden problemer med å følge med på hva eksperter sier på TV



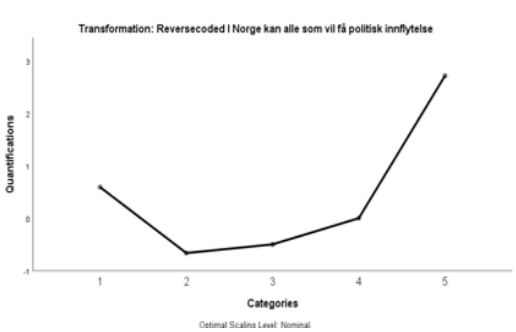


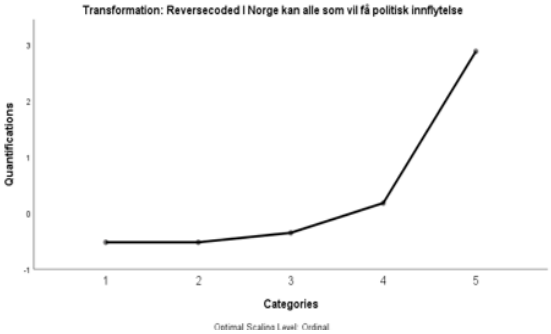
Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk



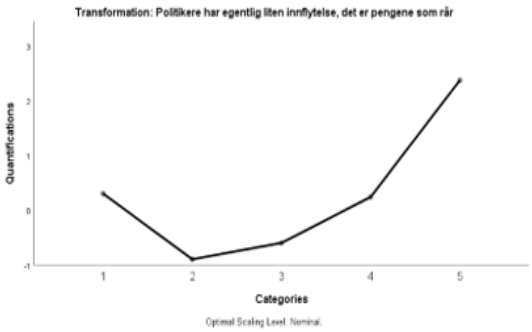


Reversecoded I Norge kan alle som vil få politisk innflytelse





Politikere har egentlig liten innflytelse, det er pengene som rår



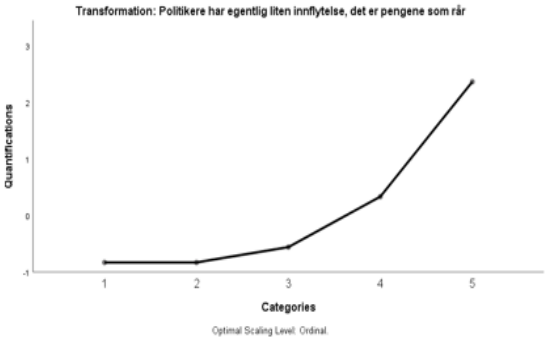


Figure G.2: Scree plot based on the two- and three- dimensional solutions in CATPCA for the variables contained in the three matrices of the secondary dataset
[note: the scree plots were almost identical in both cases, so only the one is displayed here]

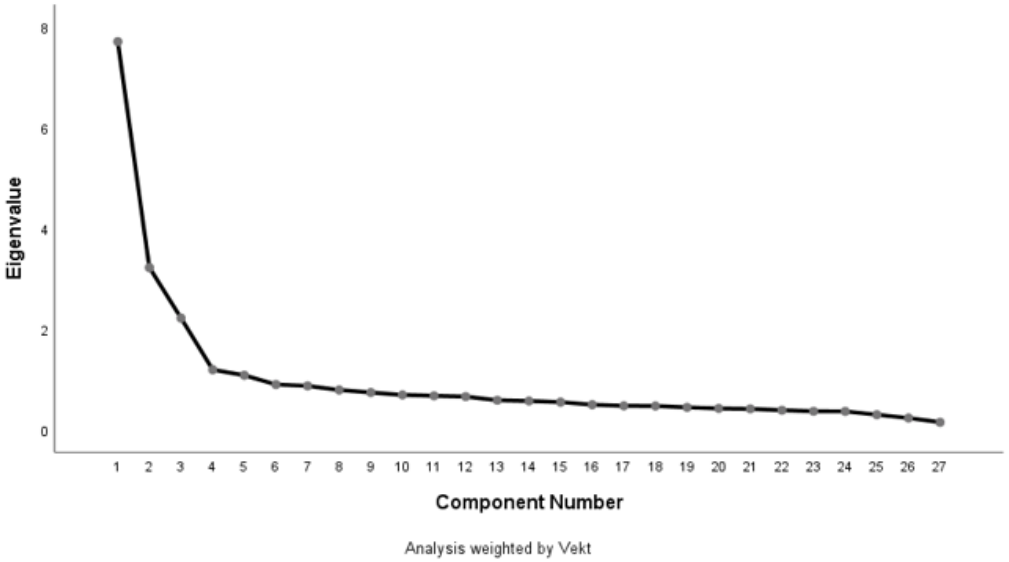


Figure G.3: Scree plot based on the four-dimensional solution in CATPCA for the variables contained in the three matrices of the secondary dataset

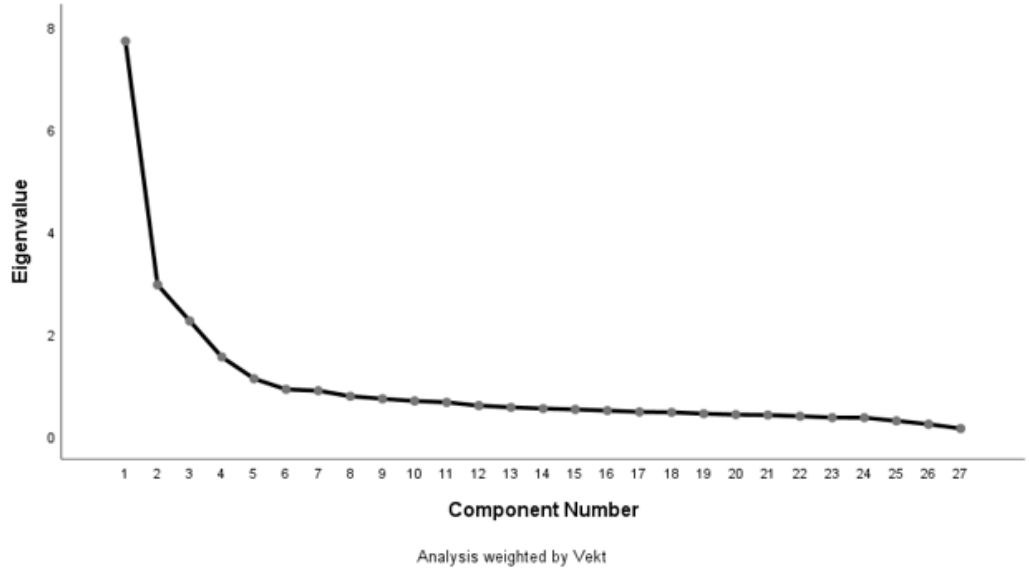


Table G.2: Variance Accounted For (VAF) from the CATPCA output for the 24 quantified variables

	Dimension			
	1	2	3	Total
Klimaforskere	.594	.054	.002	.650
Miljødirektoratet	.552	.001	.163	.716
Klima- og miljødepartementet	.548	.000	.169	.717
Naturvernforbundet	.438	.090	.039	.567
Klimaforskningen overdriver klimaproblemene (reverse coded)	.433	.107	.114	.655
Biologer	.422	.073	.026	.520
Klimaendringene er vår tids største miljøproblem	.379	.162	.053	.595
Eksperter uten praktisk erfaring bestemmer for mye her i landet	.372	.164	.049	.585
Politikerne er mest opptatt av å sikre seg selv og sine egne posisjoner	.365	.216	.007	.587
Vanlige folk er ærligere enn politikere	.358	.159	.063	.580
Sunt folkevett er bedre enn formell utdannelse	.341	.052	.140	.533
Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk	.333	.231	.039	.603
Stortingspolitikere	.317	.083	.196	.595
Statens naturoppsyn (SNO)	.315	.013	.150	.478
Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen	.310	.148	.053	.511
Politienhetene som etterforsker miljøkriminalitet	.289	.008	.176	.474
Balansen i naturen er skjør og kan lett forstyrres av menneskelige aktiviteter	.263	.234	.042	.538
Jeg syns det er riktig at norsk naturvernlovgivning har naturens egenverdi som utgangspunkt	.260	.250	.031	.541
Økonomisk vekst er den største trusselen mot et bærekraftig miljø	.053	.273	.011	.337
At naturen har en såkalt egenverdi er en naiv og feilaktig ide (reverse coded)	.176	.214	.085	.475
Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om	.183	.185	.030	.398
Politikere har egentlig liten innflytelse, det er pengene som rår	.143	.164	.042	.349
Lokalpolitikere	.128	.060	.290	.478
Vanlige folk som bruker sunn fornuft (reverse coded)	.042	.002	.269	.312
Active Total	7.611	2.945	2.238	12.794
% of Variance	31.714	12.270	9.324	53.308

Table G.3: Pattern Matrix[a] of the linear PCA on the 24 quantified variables with direct oblimin rotation

	Component		
	1	2	3
Klima- og miljødepartementet	.731		
Miljødirektoratet	.726		
Stortingspolitikere	.673		
Lokalpolitikere	.668		
Politienhetene som etterforsker miljøkriminalitet	.645		
Statens naturoppsyn (SNO)	.626		
Naturvernforbundet	.499		-.478
Vanlige folk som bruker sunn fornuft (reverse coded)	-.389	-.341	-.335
Elitene («toppene» innen politikk, forvaltning, næringsliv, osv.) bestemmer samfunnsutviklingen over hodene på vanlige folk		.763	
Vanlige folk er ærligere enn politikere		.739	
Eksperter uten praktisk erfaring bestemmer for mye her i landet		.734	
Politikerne er mest opptatt av å sikre seg selv og sine egne posisjoner		.705	
Folk som meg kan godt stemme ved valg, men vi har ingen innflytelse over politikken og samfunnsutviklingen		.696	
Sunt folkevett er bedre enn formell utdannelse		.664	
Politikk gjøres ofte så innviklet at vanlige folk ikke kan forstå hva det dreier seg om		.636	
Politikere har egentlig liten innflytelse, det er pengene som rår		.607	
Jeg syns det er riktig at norsk naturvernlovgivning har naturens egenverdi som utgangspunkt			-.723
Balansen i naturen er skjør og kan lett forstyrres av menneskelige aktiviteter			-.722
Klimaendringene er vår tids største miljøproblem			-.714
Klimaforskningen overdriver klimaproblemene (reverse coded)			-.713
At naturen har en såkalt egenverdi er en naiv og feilaktig ide (reverse coded)			-.697
Økonomisk vekst er den største trusselen mot et bærekraftig miljø			-.584
Klimaforskere	.403		-.534
Biologer	.458		-.461

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.
a. Rotation converged in 24 iterations.

[Chapter 7.2: Testing Hypothesis 2: Mediation analysis with a simple mediation model]

G.2: SPSS syntax for computing the variable *Conservative Voting*

```
COMPUTE ConserVoting = 1.
IF ((Stortingsvalg = 2) OR (Stortingsvalg = 3)) ConserVoting = 1.
IF  ((Stortingsvalg  = 1) OR  (Stortingsvalg  =4) OR (Stortingsvalg  =5) OR (Stortingsvalg  =6) OR
(Stortingsvalg  =7) OR (Stortingsvalg  =8) OR
(Stortingsvalg  =9) OR (Stortingsvalg  =10) OR (Stortingsvalg  =11) OR (Stortingsvalg  =12) OR
(Stortingsvalg  =13) OR (Stortingsvalg  =14 ) ) ConserVoting=0.
EXECUTE.
```

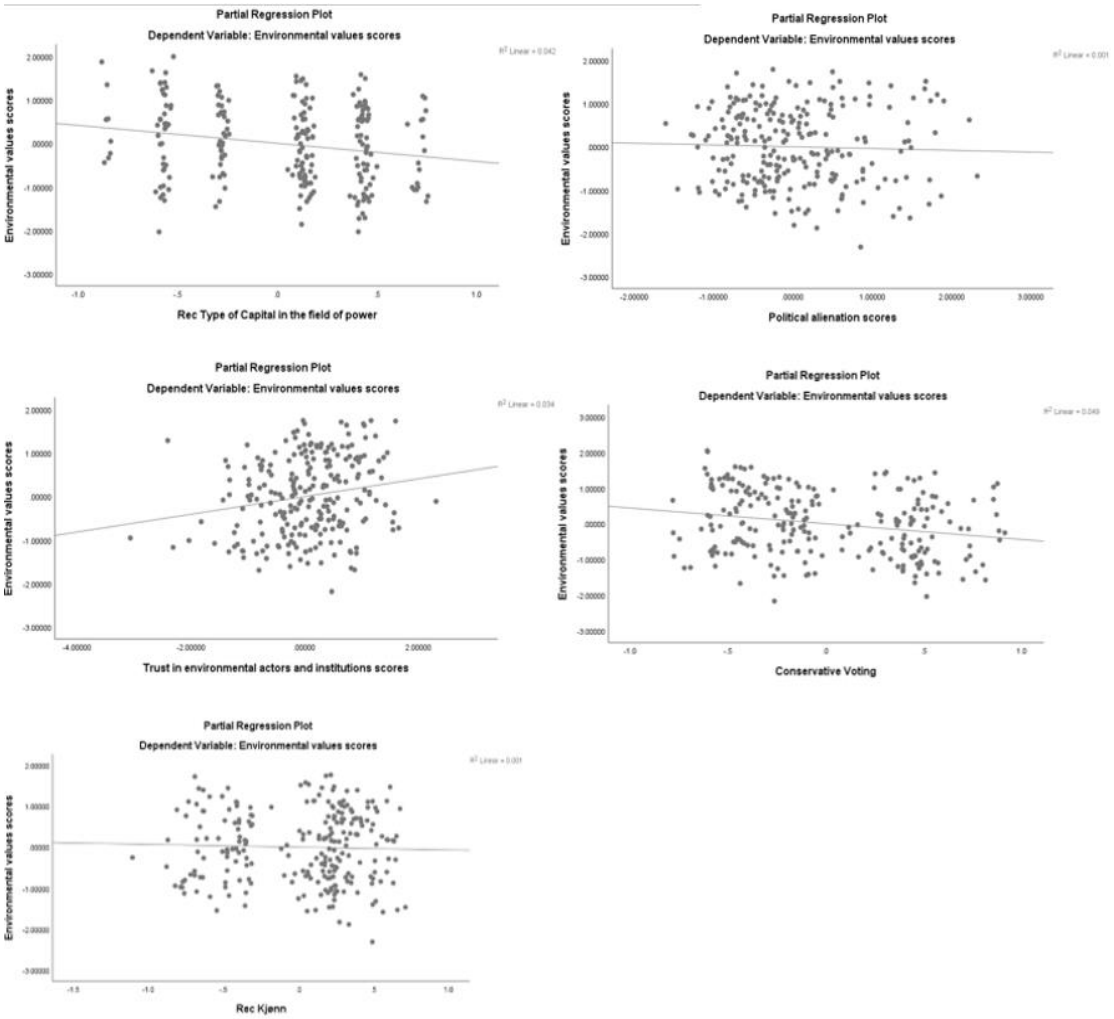
Table G.4: Casewise Diagnostics[a] of the linear regression with *Environmental values* as the outcome variable

Case Number	Std. Residual	Environmental values	Predicted Value	Residual
2774	-2.132	-1.41850	.4481060	-1.86661008
2778	2.003	1.91904	.1654579	1.75357914
2856	-2.071	-1.89284	-.0794190	-1.81342428
2915	2.031	1.81646	.0381720	1.77828338
2945	-2.608	-1.63443	.6487962	-2.28322546

Table G.5: Part of the Case Summaries table from the SPSS output for the linear regression with *Environmental values* as the outcome variable

Case Number	Mahalanobis Distance	Cook's Distance	Centered Leverage Value	COVRATIO
1	20.29352	.00283	.09343	1.13551
2	13.84820	.	.06376	.
3	13.70974	.05355	.06312	.97240
4	13.61242	.	.06267	.
5	12.99089	.00072	.05981	1.09762
6	11.81727	.	.05441	.
7	11.34791	.01289	.05225	1.05175

Figure G.4: Partial plots of the residuals of the outcome variable *Environmental values* and each of the predictor variables in the linear regression model



G.3: SPSS syntax for computing the natural log transformations of the original predictor variables

```
compute PolitAlienln = ln(PolitAlien+4).
compute EnvironValuesln = ln(EnvironValues+4).
compute TrustActInstitln = ln(TrustActInstit+4).
```

G.4: SPSS syntax for examining linearity for logistic regression (Box-Tidwell transformation test)

```
LOGISTIC REGRESSION VARIABLES Climate_change_attitude
/METHOD=ENTER PolitAlien EnvironValues TrustActInstit
  PolitAlienln*PolitAlien
  EnvironValues*EnvironValuesln
  TrustActInstitln*TrustActInstit
  RecType_Of_Capital_field_of_power ConserVoting Rec_Kjønn
 /CRITERIA=PIN(0.05) POUT(0.10) ITERATE(20) CUT(0.5).
```

Table G.6: Crosstabulation of *Conservative Voting * Climate change attitude * Type of Capital in the field of power* for examining expected frequencies of categorical predictor variables included in the model of logistic regression (with bold those expected frequencies < 5)

Expected Count

Type of Capital in the field of power			Climate change attitude: Climate change acceptance	Climate change attitude: Climate change denial	Total
High Cultural Capital	Conservative Voting	No	56.6	13.4	70.0
		Yes	15.4	**3.6**	19.0
	Total		72.0	17.0	89.0
High Economic Capital	Conservative Voting	No	30.8	25.2	56.0
		Yes	40.2	32.8	73.0
	Total		71.0	58.0	129.0
Total	Conservative Voting	No	82.7	43.3	126.0
		Yes	60.3	31.7	92.0
	Total		143.0	75.0	218.0

Table G.7: Crosstabulation of *Kjønn * Climate change attitude * Type of Capital in the field of power* for examining expected frequencies of categorical predictor variables included in the model of logistic regression

Expected Count

Type of Capital in the field of power			Climate change attitude: Climate change acceptance	Climate change attitude: Climate change denial	Total
High Cultural Capital	Kjønn	Kvinne	38.7	9.3	48.0
		Mann	32.3	7.7	40.0
	Total		71.0	17.0	88.0
High Economic Capital	Kjønn	Kvinne	14.7	12.3	27.0
		Mann	55.3	46.7	102.0
	Total		70.0	59.0	129.0
Total	Kjønn	Kvinne	48.7	26.3	75.0
		Mann	92.3	49.7	142.0
	Total		141.0	76.0	217.0

Table G.8: Crosstabulation of *Conservative Voting * Climate change attitude * Kjønn* for examining expected frequencies of categorical predictor variables included in the model of logistic regression (with bold those expected frequencies < 5)

Expected Count

Kjønn			Climate change attitude		
			Climate change acceptance	Climate change denial	Total
Kvinne	Conservative Voting	No	43.2	10.8	54.0
		Yes	16.8	**4.2**	21.0
	Total		60.0	15.0	75.0
Mann	Conservative Voting	No	41.3	30.7	72.0
		Yes	40.7	30.3	71.0
	Total		82.0	61.0	143.0
Total	Conservative Voting	No	82.1	43.9	126.0
		Yes	59.9	32.1	92.0
	Total		142.0	76.0	218.0

Table G.9: Crosstabulation of *Kjønn * Climate change attitude * Conservative Voting * Type of Capital in the field of power* for examining expected frequencies of categorical predictor variables included in the model of logistic regression (with bold those expected frequencies < 5)

Expected Count

Type of Capital in the field of power	Conservative Voting			Climate change attitude		
				Climate change acceptance	Climate change denial	Total
High Cultural Capital	No	Kjønn	Kvinne	33.1	**4.9**	38.0
			Mann	27.9	**4.1**	32.0
		Total		61.0	9.0	70.0
	Yes	Kjønn	Kvinne	5.6	**4.4**	10.0
			Mann	**4.4**	**3.6**	8.0
		Total		10.0	8.0	18.0
	Total	Kjønn	Kvinne	38.7	9.3	48.0
			Mann	32.3	7.7	40.0
		Total		71.0	17.0	88.0
High Economic Capital	No	Kjønn	Kvinne	11.5	**4.5**	16.0
			Mann	29.5	11.5	41.0
		Total		41.0	16.0	57.0
	Yes	Kjønn	Kvinne	**4.5**	6.5	11.0
			Mann	25.5	36.5	62.0
		Total		30.0	43.0	73.0
	Total	Kjønn	Kvinne	14.7	12.3	27.0
			Mann	56.3	46.7	103.0
		Total		71.0	59.0	130.0
Total	No	Kjønn	Kvinne	43.4	10.6	54.0
			Mann	58.6	14.4	73.0
		Total		102.0	25.0	127.0
	Yes	Kjønn	Kvinne	9.2	11.8	21.0
			Mann	30.8	39.2	70.0
		Total		40.0	51.0	91.0
	Total	Kjønn	Kvinne	48.9	26.1	75.0
			Mann	93.1	49.9	143.0
		Total		142.0	76.0	218.0

[Association of *Conservative Voting* with *Climate change attitude*]

Table G.10: *Conservative Voting * Climate change attitude* crosstabulation

			Climate change attitude		
			Climate change acceptance	Climate change denial	Total
Conservative Voting	No	Count	102_a	24_b	126
		Expected Count	82.7	43.3	126.0
		% within Conservative Voting	81.0	19.0	100.0
		% within Climate change attitude	71.3	32.0	57.8
		% of Total	46.8	11.0	57.8
		Standardized Residual	2.1	-2.9	
	Yes	Count	41_a	51_b	92
		Expected Count	60.3	31.7	92.0
		% within Conservative Voting	44.6	55.4	100.0
		% within Climate change attitude	28.7	68.0	42.2
		% of Total	18.8	23.4	42.2
		Standardized Residual	-2.5	3.4	
Total		Count	143	75	218
		Expected Count	143.0	75.0	218.0
		% within Conservative Voting	65.6	34.4	100.0
		% within Climate change attitude	100.0	100.0	100.0
		% of Total	65.6	34.4	100.0

Each subscript letter denotes a subset of *Climate change attitude* categories whose column proportions do not differ significantly from each other at the .05 level.

Table G.11: *Conservative Voting * Climate change attitude* chi-square tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	31.197[a]	1	.000		
Continuity Correction[b]	29.606	1	.000		
Likelihood Ratio	31.491	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	31.054	1	.000		
N of Valid Cases	218				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 31.65.
b. Computed only for a 2x2 table

[Association of *Kjønn* with *Climate change attitude*]

Table G.12: *Kjønn * Climate change attitude* crosstabulation

			Climate change attitude		
			Climate change acceptance	Climate change denial	Total
Kjønn	Kvinne	Count	61_a	15_b	76
		Expected Count	49.6	26.4	76.0
		% within Kjønn	80.3	19.7	100.0
		% within Climate change attitude	42.7	19.7	34.7
		% of Total	27.9	6.8	34.7
		Standardized Residual	1.6	-2.2	
	Mann	Count	82_a	61_b	143
		Expected Count	93.4	49.6	143.0
		% within Kjønn	57.3	42.7	100.0
		% within Climate change attitude	57.3	80.3	65.3
		% of Total	37.4	27.9	65.3
		Standardized Residual	-1.2	1.6	
Total		Count	143	76	219
		Expected Count	143.0	76.0	219.0
		% within Kjønn	65.3	34.7	100.0
		% within Climate change attitude	100.0	100.0	100.0
		% of Total	65.3	34.7	100.0

Each subscript letter denotes a subset of *Climate change attitude* categories whose column proportions do not differ significantly from each other at the .05 level.

Table G.13: *Kjønn * Climate change attitude* chi-square tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	11.505[a]	1	.001		
Continuity Correction[b]	10.516	1	.001		
Likelihood Ratio	12.120	1	.000		
Fisher's Exact Test				.001	.000
Linear-by-Linear Association	11.453	1	.001		
N of Valid Cases	219				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 26.37.

b. Computed only for a 2x2 table

G.5: Part of the SPSS output from binary logistic regression for predicting climate change denial:

Block 0: Beginning Block

Classification Table [a,b]

			Predicted		
			Climate change attitude		
	Observed		Climate change acceptance	Climate change denial	Percentage Correct
Step 0	Climate change attitude	Climate change acceptance	142	0	100.0
		Climate change denial	76	0	.0
	Overall Percentage				65.3

a. Constant is included in the model.

b. The cut value is .500

Block 1: Method = Enter

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	105.514	6	.000
	Block	105.514	6	.000
	Model	105.514	6	.000

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	176.275[a]	.383	.529

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Classification Table[a]

			Predicted		
			Climate change attitude		
	Observed		Climate change acceptance	Climate change denial	Percentage Correct
Step 1	Climate change attitude	Climate change acceptance	126	17	88.3
		Climate change denial	20	56	73.7
	Overall Percentage				83.2

a. The cut value is .500

G.6: SPSS syntax for mediation analysis with the simple mediation model through the PROCESS tool

process y= Climate_change_attitude/x= RecType_Of_Capital_field_of_power/m= EnvironValues/ cov= PolitAlien TrustActInstit ConserVoting Rec_Kjønn/model=4/total=1/boot=10000/ seed=23543.

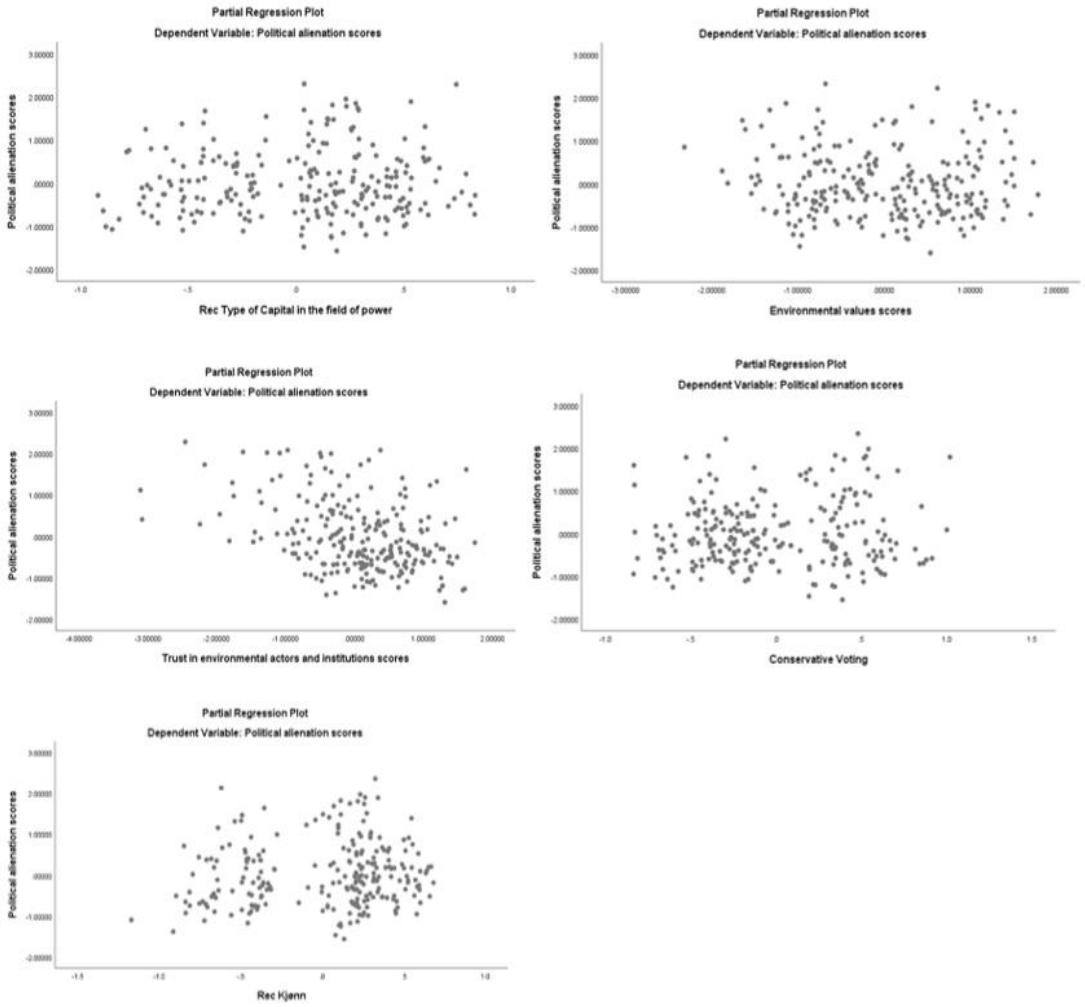
[Chapter 7.3: Testing Hypothesis 2: Mediation analysis with a parallel multiple mediation model]

[Linear regression with *Political alienation* as the outcome variable]

Table G.14: Casewise Diagnostics in the linear regression with *Political alienation* as the outcome variable

Case Number	Std. Residual	Political alienation	Predicted Value	Residual
74	2.189	.62518	-1.0777450	1.70292871
104	2.150	1.81869	.1461260	1.67256887
115	2.316	1.83917	.0374199	1.80175119
120	-2.040	-1.61847	-.0319098	-1.58656382
124	2.213	1.59549	-.1259756	1.72146792
151	2.273	1.44322	-.3251744	1.76838951
161	2.385	1.38292	-.4725926	1.85551305
163	2.486	1.55538	-.3783914	1.93376910
194	2.182	1.15947	-.5380405	1.69750987
222	2.355	.97569	-.8561531	1.83183906
224	2.881	1.13515	-1.1058912	2.24104470
225	2.957	1.51293	-.7874847	2.30041145

Figure G.5: Partial plots of the residuals of the outcome variable *Political alienation* and each of the predictor variables in the linear regression model

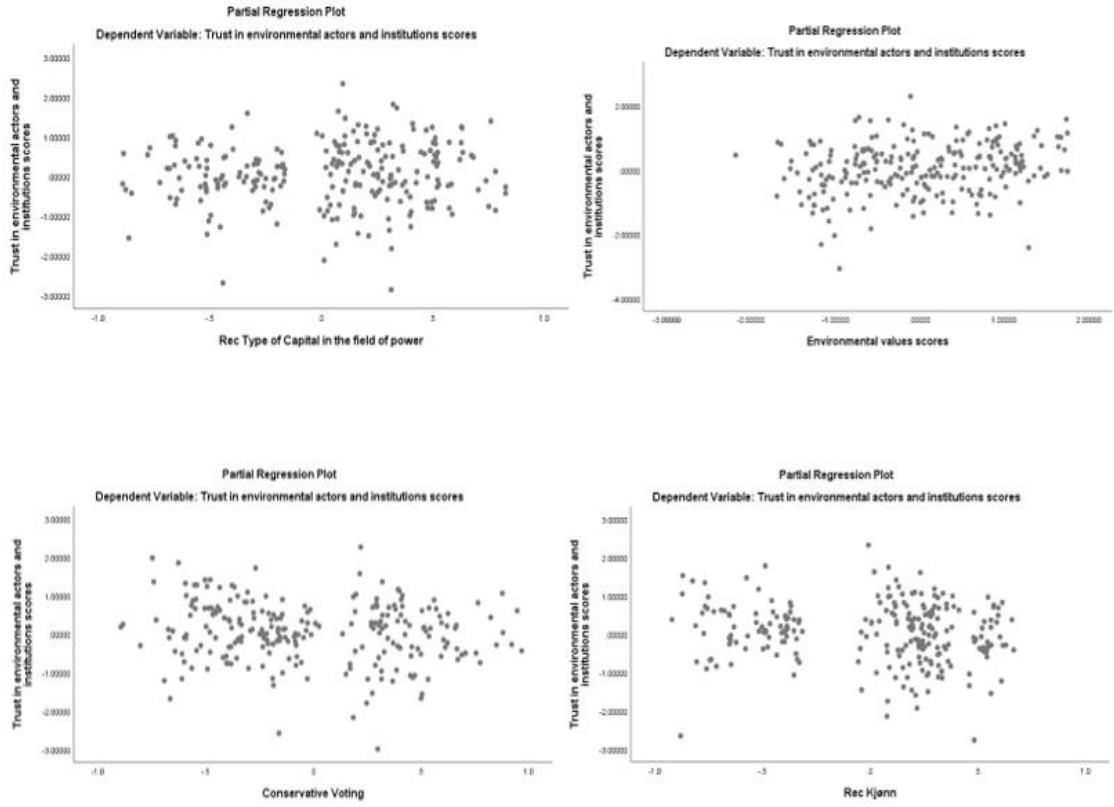


[Linear regression with *Trust in environmental actors and institutions* as the outcome variable]

Table G.15: Casewise Diagnostics in the linear regression with *Trust in environmental actors and institutions* as the outcome variable

Case Number	Std. Residual	Trust in environmental actors and institutions	Predicted Value	Residual
1	-3.673	-3.02399	-.1199258	-2.90406251
2	-3.315	-2.59857	.0223166	-2.62088671
6	-2.678	-2.71868	-.6019094	-2.11677127
12	-2.359	-1.73052	.1347162	-1.86523764
25	-2.178	-2.30336	-.5812287	-1.72213267
27	2.122	1.88824	.2104948	1.67774985
63	2.078	2.05208	.4089387	1.64314589
79	2.242	1.30218	-.4698560	1.77203977
84	2.941	1.34557	-.9794132	2.32498098
152	2.065	.77126	-.8613338	1.63259501

Figure G.6: Partial plots of the residuals of the outcome variable *Trust in environmental actors and institutions* and each of the predictor variables in the linear regression model



G.7: SPSS syntax for mediation analysis with the parallel multiple mediation model through the PROCESS tool

process y= Climate_change_attitude/x= RecType_Of_Capital_field_of_power/m= EnvironValues PolitAlien TrustActInstit / cov= ConserVoting Rec_Kjønn/model=4/contrast=2/total=1/boot=10000/ normal=1/ modelbt=1 / hc=3/ seed=23543.

G.8: Complete output for the parallel multiple mediation model in SPSS through PROCESS

```
Run MATRIX procedure:
 *************** PROCESS Procedure for SPSS Version 3.3 ******************
          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3
 **************************************************************************
Model  : 4
    Y  : Climate_
    X  : RecType_
   M1  : EnvironV
   M2  : PolitAli
   M3  : TrustAct

Covariates:
 ConserVo Rec_Kjø

Sample
Size:  237

Custom
Seed:     23543
 **************************************************************************
OUTCOME VARIABLE:
 EnvironV

Model Summary
         R       R-sq        MSE     F(HC3)        df1        df2          p
     .4453      .1983      .8138    21.8553     3.0000   233.0000      .0000

Model
               coeff    se(HC3)          t          p       LLCI       ULCI
  constant      .8685      .1056     8.2281      .0000      .6606     1.0765
  RecType_     -.4367      .1420    -3.0763      .0023     -.7164     -.1570
  ConserVo     -.6062      .1323    -4.5821      .0000     -.8669     -.3456
   Rec_Kjø     -.1375      .1408     -.9771      .3295     -.4149      .1398

 **************************************************************************
OUTCOME VARIABLE:
 PolitAli

Model Summary
         R       R-sq        MSE     F(HC3)        df1        df2          p
     .3132      .0981      .7167     8.1115     3.0000   233.0000      .0000

Model
               coeff    se(HC3)          t          p       LLCI       ULCI
  constant     -.9330      .0975    -9.5688      .0000    -1.1251     -.7409
  RecType_      .1104      .1224      .9016      .3682     -.1308      .3516
  ConserVo      .3107      .1239     2.5067      .0129      .0665      .5549
   Rec_Kjø      .3572      .1165     3.0651      .0024      .1276      .5868

 **************************************************************************
OUTCOME VARIABLE:
 TrustAct

Model Summary
         R       R-sq        MSE     F(HC3)        df1        df2          p
     .3592      .1290      .7532    13.9021     3.0000   233.0000      .0000

Model
               coeff    se(HC3)          t          p       LLCI       ULCI
  constant      .7679      .0838     9.1607      .0000      .6028      .9331
  RecType_      .0078      .1336      .0584      .9535     -.2555      .2711
  ConserVo     -.4771      .1269    -3.7611      .0002     -.7270     -.2272
   Rec_Kjø     -.4119      .1312    -3.1396      .0019     -.6703     -.1534

 **************************************************************************
```

```
OUTCOME VARIABLE:
 Climate_

Coding of binary Y for logistic regression analysis:
  Climate_  Analysis
       .00       .00
      1.00      1.00

Model Summary
      -2LL    ModelLL         df          p   McFadden   CoxSnell   Nagelkrk
  193.8175   109.2576     6.0000      .0000      .3605      .3693      .5118

Model
               coeff         se          Z          p       LLCI       ULCI
  constant    -1.4508      .4713    -3.0784      .0021    -2.3744     -.5271
  RecType_      .3192      .4356      .7329      .4636     -.5344     1.1729
  EnvironV    -1.5158      .2415    -6.2758      .0000    -1.9892    -1.0424
  PolitAli      .4567      .2230     2.0483      .0405      .0197      .8937
  TrustAct      .1838      .2237      .8216      .4113     -.2547      .6223
  ConserVo      .9363      .3832     2.4437      .0145      .1853     1.6873
   Rec_Kjø      .3622      .4424      .8187      .4130     -.5048     1.2291

These results are expressed in a log-odds metric.

 ****************** DIRECT AND INDIRECT EFFECTS OF X ON Y *****************

Direct effect of X on Y
     Effect         se          Z          p       LLCI       ULCI
      .3192      .4356      .7329      .4636     -.5344     1.1729

Indirect effect(s) of X on Y:
            Effect     BootSE   BootLLCI   BootULCI
TOTAL         .7138      .2790      .2600     1.3599
EnvironV      .6620      .2639      .2372     1.2718
PolitAli      .0504      .0727     -.0584      .2302
TrustAct      .0014      .0427     -.0910      .0962
(C1)          .6116      .2635      .1633     1.1972
(C2)          .6606      .2631      .2081     1.2378
(C3)          .0490      .0668     -.0699      .1999

   Normal theory test for indirect effect(s):
            Effect    se(HC3)          Z          p
EnvironV      .6620      .2421     2.7344      .0062
PolitAli      .0504      .0669      .7534      .4512
TrustAct      .0014      .0387      .0370      .9705

Specific indirect effect contrast definition(s):
(C1)          EnvironV  minus   PolitAli
(C2)          EnvironV  minus   TrustAct
(C3)          PolitAli  minus   TrustAct

Contrasts are differences between absolute values of indirect effects

 *********** BOOTSTRAP RESULTS FOR REGRESSION MODEL PARAMETERS ************

OUTCOME VARIABLE:
 EnvironV

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant      .8685      .8685      .1053      .6626     1.0743
RecType_     -.4367     -.4389      .1392     -.7098     -.1633
ConserVo     -.6062     -.6047      .1294     -.8608     -.3501
Rec_Kjø      -.1375     -.1370      .1392     -.4120      .1321

----------

OUTCOME VARIABLE:
 PolitAli
```

```
              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant     -.9330     -.9339      .0971    -1.1209     -.7478
RecType_      .1104      .1099      .1201     -.1250      .3425
ConserVo      .3107      .3127      .1236      .0722      .5631
Rec_Kjø       .3572      .3578      .1149      .1306      .5826

----------

OUTCOME VARIABLE:
 TrustAct

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant      .7679      .7693      .0839      .6025      .9347
RecType_      .0078      .0064      .1324     -.2523      .2703
ConserVo     -.4771     -.4770      .1254     -.7262     -.2365
Rec_Kjø      -.4119     -.4128      .1301     -.6649     -.1512

----------

OUTCOME VARIABLE:
 Climate_

              Coeff   BootMean     BootSE   BootLLCI   BootULCI
constant    -1.4508    -1.5338      .4720    -2.5303     -.6725
RecType_      .3192      .3433      .4859     -.5900     1.3209
EnvironV    -1.5158    -1.5898      .2584    -2.1458    -1.1380
PolitAli      .4567      .4820      .2353      .0475      .9674
TrustAct      .1838      .1993      .2533     -.2817      .7080
ConserVo      .9363      .9701      .4170      .1573     1.8123
Rec_Kjø       .3622      .3858      .4751     -.5374     1.3398

 ************************ ANALYSIS NOTES AND ERRORS ************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  10000

NOTE: A heteroscedasticity consistent standard error and covariance matrix
estimator was used.

NOTE: Total effect model not available with dichotomous Y

NOTE: Direct and indirect effects of X on Y are on a log-odds metric.

NOTE: Variables names longer than eight characters can produce incorrect
output.
      Shorter variable names are recommended.

                           ------ END MATRIX -----
```