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Politics, human values and climate change:

Investigating the determinants of climate change perceptions in
Europe

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Author: Alva Johansson

Supervisor: Therese Nilsson

Abstract

This paper empirically investigates the determinants of climate change perceptions across Europe, focusing on how political orientation and human values affect attribution- and trend belief, perceived impacts of climate change and climate concern. Previous studies in this field of research have ignored the risk of reverse causality, which is addressed in this paper by conducting the epidemiological method. By exclusively using information on second generation immigrants in 22 European countries and Israel, and information about 76 parental home countries, it is possible to rule out reverse causality. The paper uses individual, cross-sectional data from European Social Survey (ESS), the integrated European Value Study (EVS)/World Value Survey (WVS) and ancestral country averages from the World Bank. The results suggest that human values, i.e. objects that are of importance for individuals, measured according to *Schwartz theory of basic values*, are predictive of trend belief, perceived impacts and climate concern. Political orientation, measured by placement on the *right-left political scale*, is predictive of climate concern. These results are in line with previous research and indicates that reverse causality has not been a prevailing issue in earlier studies.

Keywords: Climate change perceptions, Political orientation, Human values, Epidemiological approach

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1. Introduction

Climate change is not only an environmental problem, but also one of the greatest threats to global security (Parry, 2007). A global temperature increase of 1.1 degrees was measured in 2019 and the consequences are already visible in the shape of extreme weathers, retreating ice, ocean acidification, record sea levels and sea temperatures (World Meteorological Organization, 2020). A future limit, that often is referred to when temperature increase is discussed, is at 1.5 degrees. This limit is associated with devastating impacts, and everything beyond this temperature increase is believed to threaten lives, economies and livelihoods (Intergovernmental Panel on Climate Change (IPCC), 2018).

To prevent global warming to go beyond 1.5 degrees, a reduction of emissions by 7.6 percent each year from 2019 until 2030 is required (United Nations Environment Programme, 2019). International attempts of reducing the global temperature rise has been made, one being the 2015 Paris Agreement where 184 countries agreed to cut their greenhouse gas emissions by 2030 and to keep global warming to well below 2.0 degrees (IPCC, 2018). However, most of the carbon emission pledges made during the Paris Agreement are not enough to keep global warming below this limit (Leahy, 2019) and more international agreements will likely be needed. This study contributes to the field of research on environmental attitudes and policy support by investigating the determinants of individual climate change perceptions.

97 percent of the publishing climate scientists share the consensus that humans are causing recent global warming (Cook et al., 2016), but the gap between scientific results and social responses remains large. Even though climate change deniers are a minority in Europe, an increasing trend of climate sceptics have been witnessed in countries such as the UK and Germany (Xifra, 2016). A survey of 10 countries in 2019 revealed that about 13 percent of the US population believed that climate changes are occurring, but that they are not caused by human activities. The same survey found that, out of the populations in Poland, Germany and France, six to eight percent of their populations are estimated to share this belief (Milman & Harvey, 2019). Hornsey and Fielding (2020) discuss the topic of climate change inaction and explains how, during the last 20 years, a change in the nature of climate change skepticism has transpired. Before the 21st century, the discussion revolved around whether or not temperature is increasing. More recently the debate has shifted into questioning whether the increase is caused by humans or if it simply is a part of the world's natural cycle.

An obvious success factor of international and national policies is population acceptance and support. An extensive body of research have investigated the determinants of proenvironmental actions and environmental policy support (e.g. Boto-García & Buccioli, 2020; Dienes, 2015). Common among a large extent of the research is that climate change beliefs and concerns are major factors in explaining environmental actions and policy support. Thus, the conflict between scientific knowledge and actual proenvironmental actions raises the question of which individual level determinants drive climate change perceptions.

Previous research suggest that beyond socio-economic and socio-demographic factors, such as education and age, key determinants of climate change perceptions are political orientation and human values (Poortinga, Whitmarsh, Steg, Böhm & Fisher, 2019). Human values can be explained as objects that are of importance for the individual and this concept has frequently been associated in research within climate change beliefs and actions. A theory commonly referred to when analyzing the relationship between individual motivational factors and proenvironmental behavior is the *value-belief-norm* (VBN) theory by Stern, Dietz, Kalof, Guagnano and Abel (1999). The theory suggests that a causal mechanism exists between human values and climate change beliefs, norms and actions. The causality assumption has not been questioned in research conducting the VBN theory nor in other empirical studies exploring the determinants of climate change perceptions. At the same time, previous studies in this field of research generally use cross sectional data from which is difficult to rule out reverse causality.

This paper aims at investigating the determinants of climate change perceptions, focusing on how political orientation and human values affect attribution- and trend belief, perceived impacts of climate change and climate concern. I apply the epidemiological method by Fernandez (2010) where ancestral variables are used in regressions on individual outcomes. By exclusively using information on second generation immigrants and information about parental home country, it is possible to hereby rule out reverse causality, since the climate change perceptions of an individual cannot affect political orientation and human values of the residents in the parent's ancestral country. This paper contributes to the research on climate change perceptions, by applying a more methodologically sophisticated method. The results are discussed relative to previous research and the VBN theory.

Individual, cross sectional data from ESS 2016/2017 (round eight) is used, including 22 European countries and Israel. The survey contains a questionnaire on climate and energy, as well as questions regarding socio-economic and socio-demographic factors. The ancestral country averages of political orientation and human values are computed using the integrated EVS/WVS questionnaire. Political orientation is measured by placement on the right-left political scale and human values are measured using Schwartz theory of basic values, which is a way to categorize values into the two dimensions; self-transcendence vs. self-enhancement and openness to change vs. conservation. The Schwartz theory has been proven to be robust across cultures (Schwartz, 2012) and is extensively used within this research area. Evidence of intergenerational transmission has been found on both political orientation (Jennings, Stoker & Bowers, 2001) and Schwartz's value domains (Grønhoj & Thøgersen, 2009), which speaks for the sufficiency of the proxies. Additionally, country averages from the World Bank are used, to account for ancestral country characteristics.

The results of this paper suggest that political orientation is a strong predictor of climate concern, where left-wing individuals are more concerned about climate change, in comparison to right-wing individuals. Additionally, self-transcendence vs. self-enhancement is predictive of trend belief and perceived impacts of climate change, while openness to change vs. conservation has significant impacts on climate concern and perceived impacts of climate change. These results are in line with previous studies. However, what should be emphasized is that political orientation is the only ancestral variable which is significant in all five model specifications.

The paper is disposed as follows: Chapter 2 presents the theoretical framework, followed by Chapter 3 which includes a selection of relevant literature on climate change beliefs, concerns and actions. Chapter 4 discusses the empirical strategy and Chapter 5 presents the data. Chapter 6 includes the main results of the paper, followed by the discussion and conclusion of the study in Chapters 7 and 8.

2. Theoretical framework

2.1 The value-belief-norm theory

This paper uses the VBN theory to explain the relationship between human values and climate change beliefs, causes, impacts and concerns. Stern et al. (1999) developed the VBN theory of environmentalism, linking a causal chain of six variables (see Figure 1) to identify the indirect relationship between human values and proenvironmental behaviors. The assumption in this model is that each variable directly affects the next one, but also affects other variables further down the chain (Stern et al., 1999). Since this research investigates the determinants of climate change perceptions, only the first three variables of the VBN chain is applied.

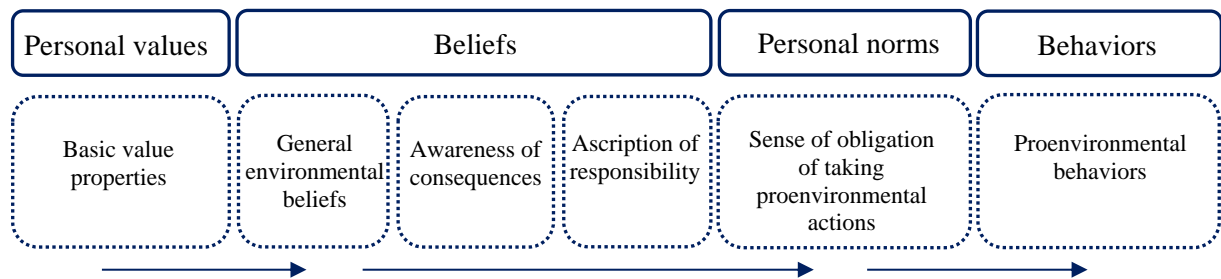


Figure 1: A schematic representation of the variables in the VBN theory (adapted from Stern, 2000).

As can be seen in Figure 1, *personal values* (or human values) directly affect the individuals' *general beliefs about the environment* and the effects that human actions have on it. This activates *awareness of consequences*; the belief that climate change is a threat to objects that the individual values. Further, this triggers *ascription of responsibility*, which is the belief that the individual can act to reduce this threat. This in turn activates *personal norms*; the sense of obligation in taking proenvironmental actions. Ultimately, this chain leads to different *proenvironmental behaviors*. An important element of this theory is that the link from values to proenvironmental actions is through beliefs, such as beliefs about who are affected by environmental conditions (Stern, 2000).

When compared with other socio-psychological theories of environmentalism, Stern et al. (1999) suggest that the VBN theory provides the best available explanation of support for proenvironmental behavior. The theory is mostly used within the field of environmental psychology but has also been tested in a range of contexts in economic literature when explaining

pro-environmental behaviors and preferences (e.g. Contu, Strazzeria & Mourato, 2016; Barbarossa, De Pelsmacker & Moons, 2017; Uehleke, 2016).

2.2 Schwartz theory of basic human values

The concept of human values is central in many disciplines, such a sociology and psychology, since it characterizes societies and individuals, distinguishes changes over time and explains the motivation behind different behaviors and attitudes (Schwartz, 2012). Schwartz (1992) developed one of the most prominent principles to classify values; the theory of basic human values. This theory summarizes all core values that can be found in different cultures around the world into 10 basic human values. Schwartz's theory is linked to the VBN-theory (Stern et al., 1999) and has been frequently used in research on climate change beliefs and actions (e.g. Poortinga et al., 2019; Boto-García & Buccioli, 2020).

Schwartz (2012) describes how each of the 10 values are motivationally distinct from each other and characterized by their main goals, namely; *self-direction*, *stimulation*, *hedonism*, *achievement*, *power*, *security*, *conformity*, *tradition*, *benevolence* and *universalism* (see Figure 2). Self-direction is defined by independent thought and action, for example exploring and creating. Stimulation is defined by excitement and challenge in life and hedonism is defined by pleasure and satisfaction. The defining goals of achievement and power is personal success according to social standards and social status. Security is defined by safety and harmony and conformity is defined by restraint of actions that are likely to harm others. The defining goal of tradition is respect and acceptance of cultures and religions. Benevolence is defined by protecting and enhancing the welfare of others, which one is in frequent personal contact with. Finally, the defining goal of universalism is to understand and protect the well-being of all, both of other people and of nature (Schwartz, 2012).

The circle in Figure 2 shows the relations and conflicts among the 10 values, where tradition and conformity are located together since they are especially close motivationally. The 10 values are divided into four groups, where *openness to change* includes self-direction, stimulation and hedonism, *self-enhancement* includes achievement and power, *conservation* includes security, conformity and tradition and lastly *self-transcendence* includes benevolence and universalism. Further, the values can be summarized within the two orthogonal dimensions; *self-transcendence vs. self-enhancement* and *openness to change vs. conservation*. The idea behind these dimensions is to demonstrate how the values contrast each other (Schwartz, 2012).

Especially self-transcendence vs. self-enhancement has been proven to explain environmental concern, where self-transcendence values are stronger for individuals that engage in proenvironmental actions (Stern, 2000). The findings of openness vs. conservation are less clear, although a negative relationship between conservatism and environmental concern have been found in several studies (Schultz & Zelezny, 1999; Stern et al., 1999). The circle represents a so-called *motivational continuum*, where the closer two values are to each other, in any direction of the circle, the more similar their underlying motivations are (Schwartz, 2012).

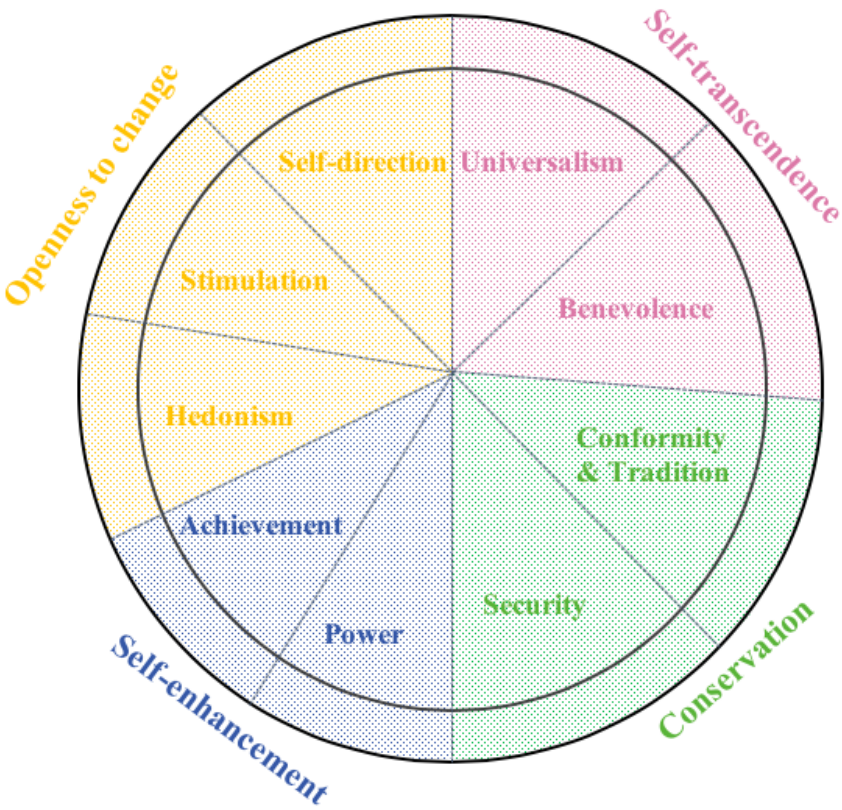


Figure 2: Theoretical model of the 10 types of values (adapted from Schwartz, 2012).

To measure these values, Schwartz developed the *Portrait Values Questionnaire* (PVQ). This questionnaire includes 40 different short, gender-matched, descriptions of people, where the respondent is asked to answer the question “How much like you is this person?”. Each question describes goals, wishes or aspirations, which point to the importance of each value. The six options for the respondents are: “very much like me”, “like me”, “somewhat like me”, “a little like me”, “not like me” and “not like me at all”. The two main advantages of this setting are that the questionnaire captures the respondent’s values without straight out asking about values, and that the respondent answers questions about similarity in goals and aspirations, rather than similarities to someone’s characteristics (Schwartz, 2012). Both ESS (Schwartz, 2003) and

WVS (Held, Müller, Deutsch, Grzechnik & Welzel, 2009) uses the PVQ as a basis for their surveys, where ESS includes 21 items and WVS 10 items, most of them directly taken from the questionnaire. This setting is less reliable, since it includes less questions regarding each value. Despite this, the shortened questionnaire has been proven to predict behaviors and attitudes systematically (Schwartz, 2003).

3. Literature review

Dienes (2015) investigates the relationship between climate change concern and proenvironmental actions. He uses cross sectional data from Life in Transition Survey of 35 countries, along with information regarding the financial crisis in 2008. The results show that individuals who are more concerned about climate change, also are more likely to pay for mitigating the climate change effects, as well as taking actions to minimize the effects of climate change. Additionally, the results indicate that the economic factor only has a moderating effect on these relationships, and points to the relevance of economic development, since significant effects of the financial crisis only is found in less developed countries. However, Dienes (2015) points to the importance of interpreting the results as correlations, and not causality, due to the insufficiency of the data.

Boto-García and Buccioli (2020) use the ESS dataset to investigate the relationship between proenvironmental actions and personal responsibility for climate change mitigation. They also examine the role of human values in shaping beliefs, actions and concerns, where values are measured by Schwartz's two dimensions. The results show that political orientation is significantly associated with climate concern, where left-wing individuals are more concerned about climate change in comparison to right-wing individuals. Responsibility is shown to be positively related to self-transcendence and openness, while actions to reduce energy use is positively associated with conservation. Among the control variables included, the results indicate that being religious and listening to news more than 30 minutes per day, is associated with higher levels of climate concern. The results also indicate that females and individuals with high education are more likely to feel responsible for climate change, and that responsibility increases with age, although at a decreasing rate (Boto-García & Buccioli, 2020).

Similar to Boto-García and Buccioli (2020), Poortinga et al. (2019) uses the ESS data, although ignore the dimension of proenvironmental actions and only examine the key factors which

explain climate change perceptions. Schwartz's two value dimensions are used as explanatory variables, alongside political orientation and controls for gender, age and education. The results show that self-transcendence vs. self-enhancement, political orientation and education are in particular strong predictors of climate change perceptions, where right-wing individuals, people with less education and those prioritizing self-enhancement over self-transcendence were more skeptical about climate change. The results of openness to change vs. conservation are less clear, although indicates that individuals who prioritize conservation over openness tends have lower levels of climate concern. The results of age were consistently associated with attribution skepticism, in which the belief that climate change is caused by human activity decrease with age (Poortinga et al., 2019).

Ziegler (2017) investigates the determinants of climate change beliefs and attitudes in Germany, China and the US. By comparing these countries, significant cross-country differences can be found, for instance revealing that political orientation is much more relevant in explaining climate change beliefs in the US, in comparison to Germany and China. The analysis also includes environmental values as explanatory variables, measured by the New Ecological Paradigm (NEP) scale. Environmental values are shown to be the major factor for climate change beliefs and attitudes in all three countries. Additionally, values weaken the differences in climate change beliefs and attitudes between individuals with left-wing and right-wing orientation, especially in the US. Environmental values are thus shown to play a central role in explaining climate change perceptions (Ziegler, 2017).

The relationship between political orientation and attitudes to climate change have been studied in several other papers. Neumayer (2004) investigates the relationship between placement on a right-left scale and pro-environmental beliefs, attitudes and behaviors, using data from EVS and WVS from 45 countries around the world. The results indicate that left-wing individuals are more pro-environmental, in comparison to right-wing individuals, regarding all three aspects. Similar results are found by Tjernström and Tietenberg (2008), who examine factors contributing to climate change attitudes, using data from the International Social Survey's program (ISSP) from 26 countries. Their results reveal a positive relationship between left-wing orientation and concern for climate change, alongside a significant and positive effect of education and urban residence. Additionally, age and income are shown to be negatively associated to climate change concern (Tjernström & Tietenberg, 2008).

Hamilton (2009) expand the literature on political orientation by testing for interaction-effects between education and party preference (republican or democrat) in predicting climate change concerns. The paper uses data from two telephone surveys, one from New Hampshire and one from Michigan. The results reveal that climate concern increase with education among democrats and decrease with education among republicans, especially in the Michigan sample. Both samples show similar results of gender, age and political orientation; women being more concerned about climate change in comparison to men, older respondents being less concerned than younger respondents and democrats being more concerned about climate change in contrast to republicans. Even though the results are regional, the findings generally point to the same direction as previous studies (Hamilton, 2009).

Table 1: Summary of relevant literature.

Author(s)	Research	Data	Countries	Explanatory variables	Main findings
Boto-García & Buccioli (2020)	Examine the relation between actions to reduce energy utilization and beliefs in personal responsibility for climate change mitigation.	Data from ESS of 44387 individuals (2016/2017).	23 (mostly) European countries.	Political orientation, Human values, Age (and Age ²), Education, Gender, Marital status, Children, Income, Employment, Health, Rural/Urban living, Religiosity and News.	Self-transcendence and openness are positively related to responsibility, while self-enhancement and conservation are negatively related. Right-wing orientation is related to lower levels of climate change concern.
Dienes (2015)	Examine the relationship between climate change concern, and individual actions of reducing the effects of climate change.	Data from Life in Transition Survey (2010).	35 (mostly) European countries.	Climate change perceptions, Age, Education, Gender, Income, Children, Economic crisis effect, EU Member state, Support of others, Health, Risk and Inequality aversion.	Climate change concern is positively correlated with actions of reducing climate change effects. Economic factors only have a moderating effect on the relationships.
Hamilton (2009)	Examine interaction effects of education and political orientation, in predicting concern about climate change.	Two telephone surveys with 541 and 1008 individuals respectively (2008).	Two states in the US.	Political orientation, Age, Education, Gender, Understanding of global warming.	Significant interactions between education and political orientation, in predicting public concern about climate change.
Neumayer (2004)	Examine the relationship between political orientation and pro-environmental beliefs, attitudes and behaviors.	Data from WVS and EVS of 40,585 individuals (1981-1984, 1990-1993 and 1995-1997).	45 countries from all over the world.	Political orientation, Age, Education, Gender, Marital status, Children, Religiosity, Social status, Size of settlement and Developing Country.	Left-wing parties- and individuals are more pro-environmental than their right-wing counterparts.
Poortinga, Whitmarsh, Steg, Böhm & Fisher (2019)	Examine the key socio-political and demographic factors in explaining climate change perceptions.	Data from ESS of 44387 individuals (2016/2017).	23 (mostly) European countries.	Political orientation, Human values, Age, Education and Gender.	Prioritizing Self-enhancement over Self-transcendence (human values), as well as right-wing political orientation, is associated with more climate skepticism.
Tjernström & Tietenberg (2008)	Examine which factors affect attitudes towards climate change.	Data from ISSP (2000).	26 countries from all over the world.	Affinity for the global community, Support for public goods, Demand for long-term goods, Political orientation, Age, Education, Income, Religion, Rural/urban living and Familiarity with climate change science.	Individuals with liberal (or left-wing) political values are more concerned about climate change. Additionally, age is negatively associated with climate change concern, alongside with income.
Ziegler (2017)	Examine the determinants of climate change beliefs and attitudes.	Data from computer-based surveys of approximately 3400 individuals (2013).	China, Germany and USA.	Political orientation, Environmental values (NEP), Age, Education and Gender.	Environmental values are the main factor for climate change beliefs and attitudes.

4. Empirical Strategy

4.1 Model specification

The aim of this paper is to investigate the determinants of climate change perceptions for individuals across Europe, where the main regressors of interest are political orientation and human values. Climate change perceptions are analyzed through four different variables, each run in a separate regression; trend belief, attribution belief, perceived impacts of climate change and climate concern. The possible problem with these regressions, is that climate change perceptions may shape values or political orientation and thus cause reverse causality. To address this problem, I use the epidemiological approach, in accordance with the theory of Fernandez (2010). She explains the epidemiological approach in the following way:

The essence of what I call the epidemiological approach is the attempt to identify the effect of culture through the variation in economic outcomes of individuals who share the same economic and institutional environment, but whose social beliefs are potentially different (Fernandez, 2010, p. 489).

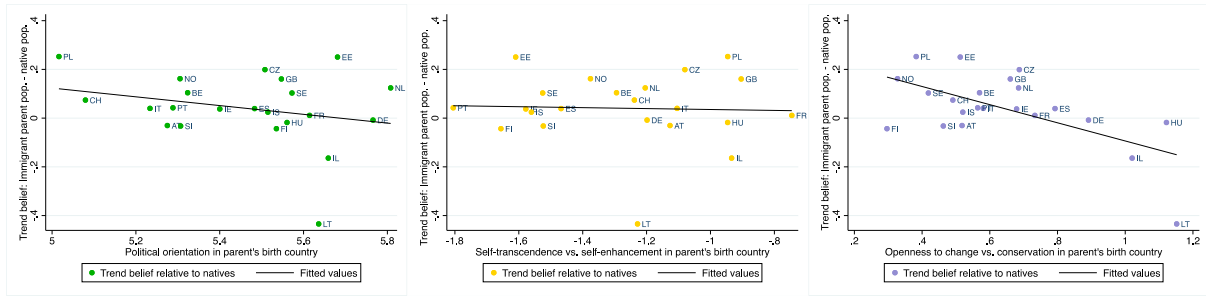
The idea is thus that parents that have immigrated from another country will transfer their values and political orientation to their children. Both values and political orientation will differ across immigrant groups and thus reflect the culture of the origin country. By exclusively using observations of second-generation immigrants in the ESS dataset, these individuals will have similar economic and institutional environments and primarily differ by their cultural differences, inherited by their parents. Applied to the theory of Fernandez (2010), these cultural differences will cause individuals to have different climate change perceptions.

The approach is illustrated in Figures 3-6. The vertical axes capture the differences between second generation immigrants and country natives in attribution- and trend belief, perceived impacts of climate change and climate concern, using averages across the 23 countries. The horizontal axes measure the placement on the left-right scale and on the two value dimensions in the ancestral countries (separately). As can be seen, the associations differ across the variables. In Figures 3-6 (a), political orientation displays a negative slope in all four graphs. This indicates that right-wing orientated ancestral countries are associated with lower levels of attribution- and trend belief, perceived impacts of climate change and climate concern, of the second-generation individual, in comparison to the natives. Similar trends can be seen in

Figures 3, 5 and 6 (b) and (c), where ancestral self-enhancement and conservation values are associated with lower levels of trend belief, perceived impacts of climate change and climate concern, of the second-generation individual, in comparison to the natives. Only Figures 4 (b) and (c) presents opposite trends. To estimate the relationships between climate change perceptions, human values and political orientation, the Ordinary Least Squares (OLS) estimator will be used:

$$CCP_{ica} = \beta_0 + \beta_1 Values_a + \beta_2 PO_a + \beta_3 X_{ica} + \gamma_c + \varepsilon_{ica} \quad (1)$$

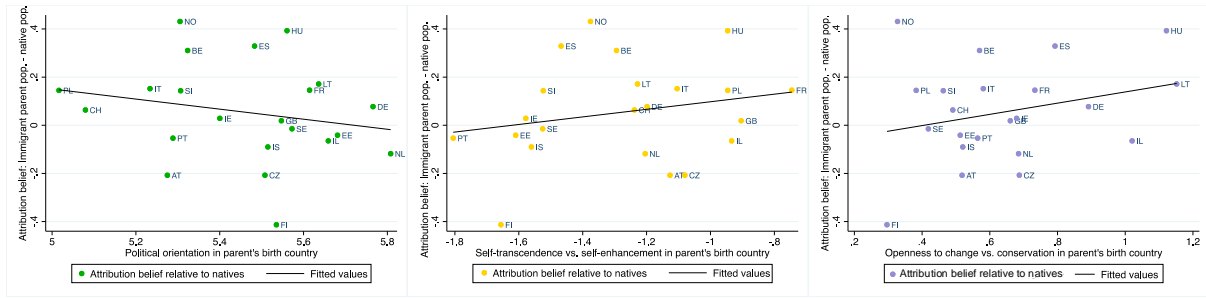
The dependent variable CCP_{ica} stands for climate change perceptions of the second-generation immigrant i , born and resident in country c , with a parent born in country a , where $a \neq c$. $Values_a$ consists of two variables representing the placement on the two value dimensions, measured as the mean of each ancestral country for each dimension, for the time period 2005-2014. PO_a stands for political orientation and is measured as the mean of self-placement on a right-left scale of each ancestral country, for the time period 1981-2014. Both $Values_a$ and PO_a is common for all individuals with a parent born in country a . X_{ica} consists of economic- and demographic controls that may affect climate change perceptions. γ_c is country of residence fixed effects, and ε_{ica} is the error term. The standard errors are clustered by the parent's birth country, which allows for correlations of the errors terms for individuals sharing the same ancestral country.



3 (a)

3 (b)

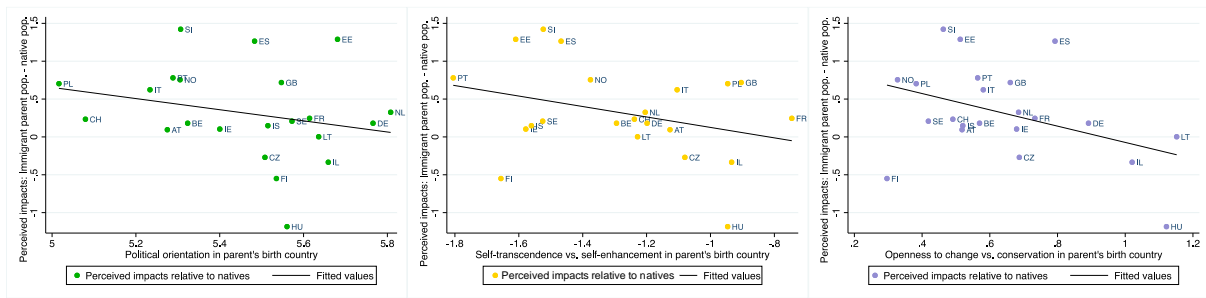
3 (c)



4 (a)

4 (b)

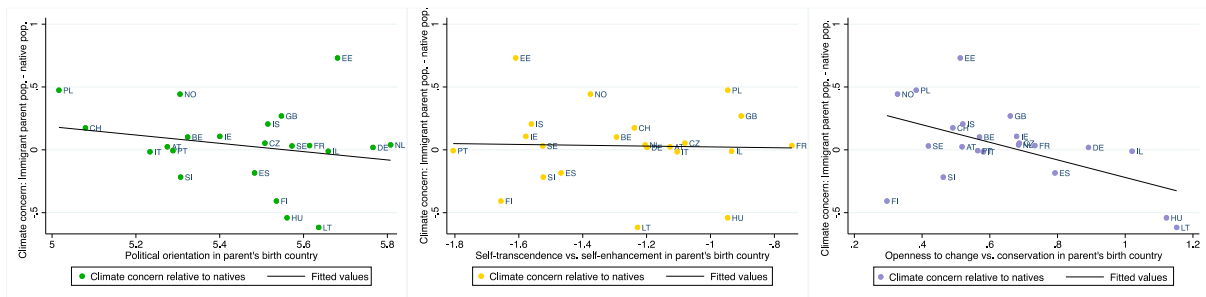
4 (c)



5 (a)

5 (b)

5 (c)



6 (a)

6 (b)

6 (c)

Figures 3-6: Associations of (3) trend belief, (4) attribution belief, (5) perceived impacts of climate change and (6) climate concern (immigrant parent population - native population) with (a) political orientation, (b) self-transcendence vs. self-enhancement and (c) openness to change vs. conservatism (ancestral countries).

Notes: The four variables of climate change perceptions are measured as immigrant parent population - native population. Political orientation ranges from 1 “left wing” to 10 “right wing”. Self-transcendence vs. self-enhancement is measured as self-enhancement - self-transcendence and openness to change vs. conservatism is measured as conservation – openness to change. Data are from ESS and the integrated EVS/WVS survey. Country labels follows ISO 3166-1.

4.2 Validity and limitations

By using the epidemiological method, it is possible to rule out reverse causality, since it is not likely that the climate change perceptions of individual i , born and raised in country c , can influence the average human values, or political orientation, of individuals residing in the ancestral country a . The country of residence fixed effects γ_c , accounts for unobserved differences in country c , and the economic and demographic controls in X_{ica} address the possibility of confounding background factors, such as gender, age or education.

This method does not, however, rule out other potential endogeneity issues. Even though a large set of control variables are used, alongside additional ancestral country characteristics, it is possible that the effects of the ancestral variables could be driven by unobserved characteristics. Another limitation of this study is the small sample size, caused by dropping the observations who are not defined as second-generation immigrants (which corresponds to about 90 percent of the original sample). This issue is aggravated by only being able to use one wave from ESS, since earlier surveys have not covered questions on climate change perceptions, and since not all ancestral countries are covered in the EVS/WVS surveys.

The choice of years, when constructing the ancestral variables, could also be a source of error. Since the 10 Schwartz variables only have been included in waves five and six of WVS, these were computed using averages of the years 2005-2014. Political orientation, on the other hand, was computed using averages over the years 1981-2014, since this variable has been included in all EVS and WVS waves. The optimal method for computing the ancestral variables would have been to use an average of the years 1970-1990, as was done with the ancestral country characteristics (GDP and Polity2). Most likely, this would have captured a time-period when many of the parents emigrated from their ancestral countries, in a better way.

Lastly, the variables used to compute ancestral values and political orientation, could be questioned. As mentioned, the 10-item version of the PVQ only includes one question for each value, and even though it has been proven to predict behaviors and attitudes systematically, it might not reflect the dimensions perfectly. Using right-left wing as a variable for political orientation, could also be problematic, since this only captures a one-dimensional view on the political spectrum.

5. Data

The main dataset comes from ESS round eight, which was designed to increase the understanding of environmental attitudes in Europe and therefore includes a questionnaire on Climate and Energy. The survey was conducted in 2016 and covers 22 European countries and Israel, with a total of 44387 respondents. The questionnaire includes variables regarding country of birth and residence of the respondent, as well as country of birth of the parents. This enables identifying which of the observations that are second generation immigrants; a requirement that is fulfilled when the individual is born in his/her country of residence and has at least one parent born in another country.

When the dataset is cleared of all observations that are not classified as second generation immigrants, the ancestral country averages, regarding values and political orientation, are added. These are computed using the integrated EVS/WVS questionnaire between the years 2005-2014 and 1981-2014. The ancestral country characteristics from the World Bank are also added, to account for omitted variables that systematically differs across countries. If both parents are foreign born, but from different countries, an average of the two countries is used when computing the ancestral country variables. In some cases, only one of the parent's origin countries can be measured, due to missing values or that the country no longer exists. In those cases, the country of the other parent is measured exclusively. The adjusted dataset covers individuals from 76 ancestral countries, which reduces the concern that the results are mainly driven by a small number of countries.

5.1 Climate change perceptions

Climate change perceptions is measured by four different variables included in the ESS questionnaire, covering the areas: 1. Trend belief, 2. Attribution belief, 3. Perceived impacts of climate change and 4. Climate concern. This is line with the approach of Poortinga et al. (2019). **Trend belief** is investigated by question 37 in the ESS survey: "You may have heard the idea that the world's climate is changing due to increases in temperature over the past 100 years. What is your personal opinion about this? Do you think the world's climate is changing?". The answers ranges from 1 "Definitely changing" to 4 "Definitely not changing". To simplify the interpretation of the results, the numbers are reversed, so that "Definitely not changing" equals 1 and "Definitely changing" equals 4. This means the numbers increase with climate belief and

decrease with climate skepticism. As can be seen in Table 2, the average trend belief is approximately 3.5 in both the immigrant parent sample and the native population sample.

To examine **attribution belief**, question 39 is used: “Do you think that climate change is caused by natural processes, human activity, or both?”, where the answers ranges from 1 “Entirely by natural processes” to 5 “Entirely by human activity”. The average attribution belief is 3.4 in both samples. **Perceived impacts of climate change** is investigated by question 42: “How good or bad do you think the impact of climate change will be on people across the world?”. The answers ranges from 0 “extremely bad” to 10 “extremely good”. The numbers are reversed, so that 0 equals “extremely good” and 10 equals “extremely bad”. The average is approximately 6.7 in both of the samples.

Lastly, to investigate **climate concern**, question 41 is used; “How worried are you about climate change?”, where the answers ranges from 1 “Not at all worried” to 5 “Extremely worried”. As can be seen below, the average climate concern in both samples is approximately 3.0. Applied to the VBN theory, trend- and attribution belief correspond to *general beliefs about the environment*, while perceived impacts of climate change and climate concern correspond to *awareness of consequences*. In Table 3, the pairwise correlation matrix of the four dependent variables is presented. The highest value obtained is 0.331 and overall the correlations are weak.

Table 2: Descriptive statistics of the dependent variables.

Variable	Immigrant parent sample			Native population sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Trend belief	3735	3.496	0.691	43289	3.477	0.689
Attribution belief	3622	3.420	0.820	41885	3.419	0.797
Perceived impacts of climate change	3556	6.657	2.331	41232	6.736	2.199
Climate concern	3719	2.983	0.984	42654	3.008	0.935

Notes: Data from ESS round eight is used. The immigrant parent sample denotes individuals born in their country of residence and has at least one foreign born parent, while the native population excludes individuals who are born abroad or have at least one foreign born parent.

Table 3: Pairwise correlations of the dependent variables.

	Trend belief	Attribution belief	Perceived impacts of climate change	Climate concern
Trend belief	1.000			
Attribution belief	0.215 ***	1.000		
Perceived impacts of climate change	0.220 ***	0.234 ***	1.000	
Climate concern	0.331 ***	0.307 ***	0.249 ***	1.000

Notes: Data from ESS round eight is used. *** p<0.01.

5.2 Human values

Human values are conducted in accordance with Schwartz (1992), which says that the individual's placement on the two orthogonal dimensions self-transcendence vs. self-enhancement and openness to change vs. conservation, can be measured using the 10 basic human values: self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence and universalism. These 10 values are captured by the modified 10-item version of the PVQ used by WVS, where each item directly corresponds to the 10 human values. As mentioned, the questionnaire is designed so that the respondents answer how much they recognize themselves in each of the descriptions, where they are asked the question "How much like you is this person?". The respondents answer on a six-point scale, ranging from 1 "very much like me" to 6 "not like me at all". To ease the interpretation, the answers are reversed so that 6 equals "very much like me" and 1 equal "not like me at all". This means, the numbers increase with the level of agreement to the descriptions.

The ancestral country average values are used as proxies for the individual's values. The ancestral proxies are calculated for each country and value, by taking the averages between the years 2005-2014. The choice of years is based on the years available, where WVS only included this questionnaire in waves five and six, and EVS have not included the questionnaire at all. The value proxies measure the level of self-transcendence vs. self-enhancement and openness to change vs. conservation, which are described below. The summary statistics for ancestral values are found in Table 4, where they are presented jointly with the individual values measured by ESS.

5.2.1 *Self-transcendence vs. self-enhancement*

The level of self-transcendence vs. self-enhancement is measured using the four values achievement, power, universalism and benevolence. **Achievement** is defined by: "Being very successful is important to him/her. He/she hopes people will recognize his/her achievements". **Power** is defined by "It is important to him/her to be rich. He/she wants to have a lot of money and expensive things.". The average achievement ranges from approximately 3.8 to 4.0, and the average power ranges from 2.9 to 3.1. The mean of correspondence of these two variables determines the level of self-enhancement.

Universalism is defined by “He/she strongly believes that people should care for nature. Looking after the environment is important to him/her”, and **benevolence** by “It’s very important to him/her to help the people around him/her. He/she wants to care for their well-being.”. The average universalism ranges from 4.4 to 4.8, and the average benevolence from 4.7 to 4.8. The mean of correspondence of these two statements determines the level of self-transcendence. The dimension self-transcendence vs. self-enhancement is measured by subtracting self-transcendence from self-enhancement. In Figure 7 (a), the dimension is plotted on the world map, to illustrate the cross-national variations. It ranges from [-2.119602, -1.735059] to [-0.8567233, 0.282176], where the numbers increase with the level of self-enhancement.

5.2.2 Openness to change vs. conservation

To measure the level of openness to change vs. conservation, the six variables hedonism, stimulation, self-direction, security, conformity and tradition are used. **Hedonism** is defined by: “Having a good time is important to him/her. He/she likes to “spoil” him/herself”, and **stimulation** by “He/she looks for adventures and likes to take risks. He/she wants to have an exciting life”. **Self-direction** is defined by “Thinking up new ideas and being creative is important to him/her. He/she likes to do things in her own original way”. The average hedonism ranges from 3.7 to 4.2 and stimulation from 3.0 to 3.3. The average self-direction ranges from 4.2 to 4.5, and the mean of the correspondence of these three statements determines the level of openness to change.

Security is defined by “It is important to him/her to live in secure surroundings. He/she avoids anything that might endanger his/her safety”, and **conformity** by “It is important to him/her always to behave properly. He/she wants to avoid doing anything people would say is wrong”. Lastly, **tradition** is defined by “Tradition is important to him/her. He/she tries to follow the customs handed down by his/her religion or his/her family”. The averages security ranges from 4.5 to 4.6, conformity from 4.2 to 4.3 and tradition from 4.1 to 4.5. These mean of correspondence of these three statements determine the level of conservation, and the dimension openness to change vs. conservation is measured by subtracting openness from conservation. The dimension is plotted in Figure 7 (b), where it ranges from [-0.0274711, 0.4068716] to [0.8729165, 1.816189]. The numbers increase with the level of conservation.

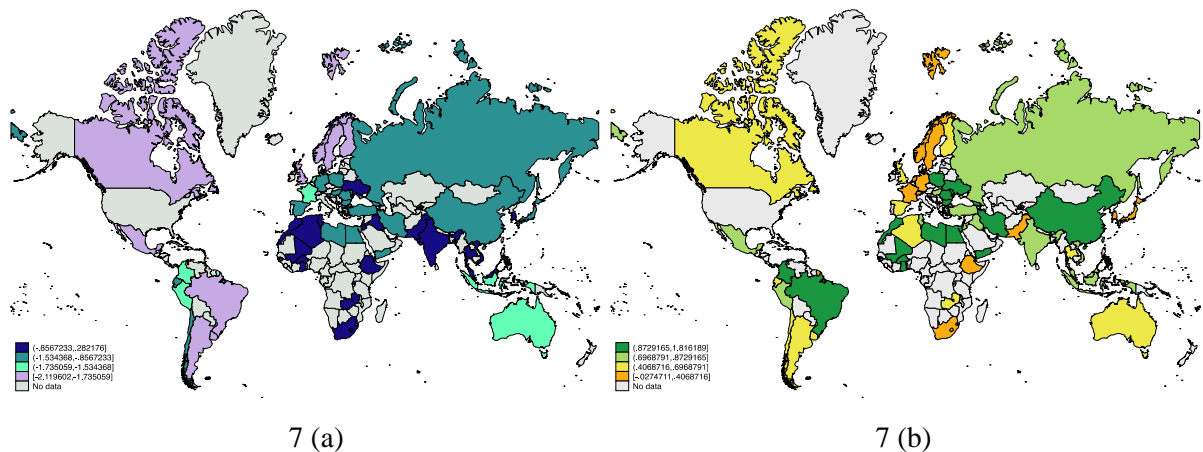


Figure 7: World map of (a) self-transcendence vs. self-enhancement and (b) openness to change vs. conservation.

Notes: Data from the integrated EVS/WVS questionnaire is used. The two value dimensions are computed using averages over the years 2005-2014, by subtracting self-transcendence from self-enhancement and openness to change from conservation.

5.3 Political orientation

Ancestral political orientation is used as a proxy for the individual's political orientation. The variable is captured by the standardized political scale question in the integrated EVS/WVS questionnaire, which is asked in the following way: "In political matters, people talk of 'the left' and 'the right'. How would you place your views on this scale generally speaking?". The respondents answer on a 10-point scale, 1 corresponding to 'left' and 10 corresponding to 'right'. The ancestral proxy is calculated by taking the average political orientation for each country between the years 1981-2014. The choice of years is based on the years available, where EVS and WVS have included the question since 1981. In Figure 8, political orientation is plotted on the world map, which illustrates the cross-national variations of political orientation. The summary statistics is found in Table 4, where the average political orientation ranges from 5.2 to 5.5. The pairwise correlation matrix for the ancestral variables is presented in Table 5, where the highest value obtained is 0.241. This means that the ancestral variables only are weakly correlated with each other.

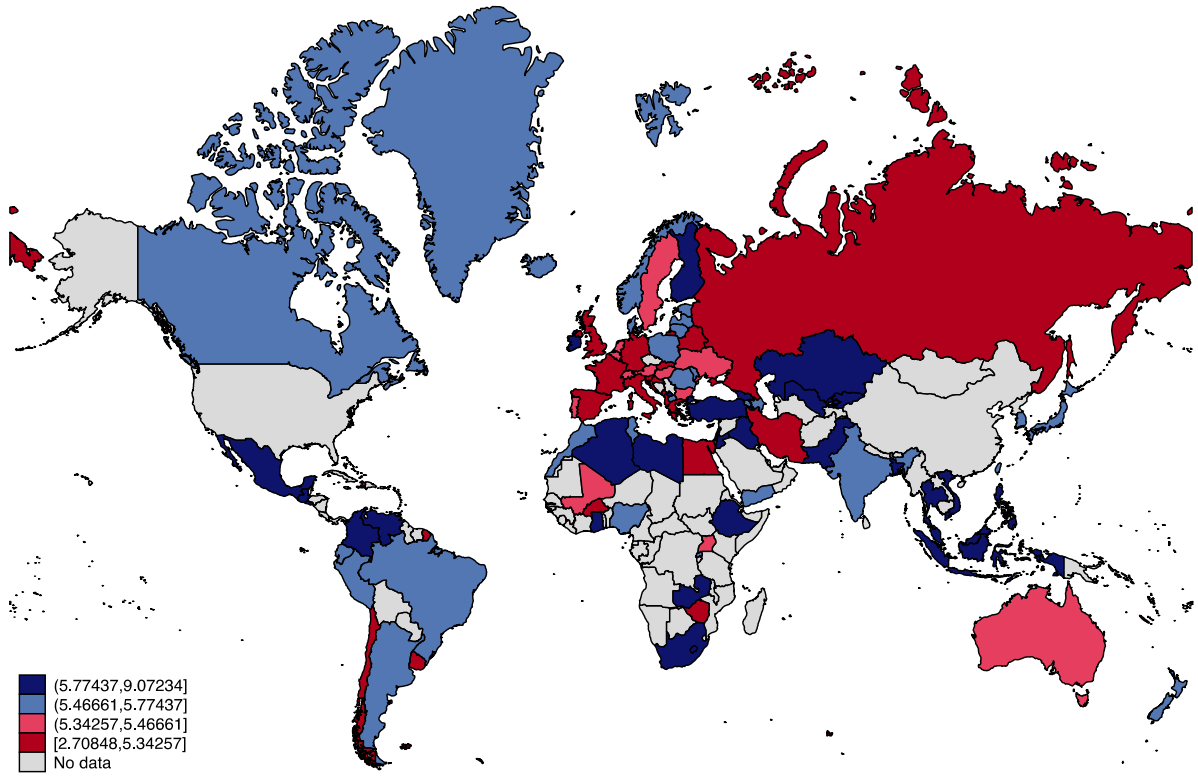


Figure 8: World map of political orientation.

Notes: Data from the integrated EVS/WVS questionnaire is used. Political orientation is computed using averages of the question “In political matters, people talk of ‘the left’ and ‘the right’. How would you place your views on this scale generally speaking?” over the years 1981-2014, measured on a 10-point scale and ranges from 1 “left” to 10 “right”.

Table 4: Descriptive statistics of human values and political orientation.

Variable	Immigrant parent sample			Native population sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Human values						
<i>Self-enhancement</i>						
Achievement	3794	3.952	1.382	43459	3.814	1.374
Achievement (ancestral)	2616	3.899	0.455			
Power	3802	2.990	1.372	43594	2.894	1.338
Power (ancestral)	2616	3.068	0.503			
<i>Self-transcendence</i>						
Universalism	3801	4.771	1.103	43628	4.825	1.048
Universalism (ancestral)	2616	4.448	0.322			
Benevolence	3798	4.849	1.025	43586	4.798	1.012
Benevolence (ancestral)	2616	4.712	0.209			
<i>Openness to change</i>						
Hedonism	3800	4.287	1.293	43571	4.084	1.331
Hedonism (ancestral)	2616	3.663	0.481			
Stimulation	3798	3.266	1.463	43548	3.149	1.448
Stimulation (ancestral)	2616	3.037	0.355			
Self-direction	3807	4.456	1.276	43540	4.408	1.261
Self-direction (ancestral)	2616	4.167	0.303			
<i>Conservation</i>						
Security	3798	4.546	1.295	43641	4.633	1.227
Security (ancestral)	2616	4.512	0.431			
Conformity	3789	4.222	1.296	43511	4.292	1.247
Conformity (ancestral)	2616	4.343	0.337			
Tradition	3789	4.115	1.429	43633	4.239	1.364
Tradition (ancestral)	2616	4.482	0.521			
Political orientation						
Political orientation	3485	5.203	2.359	38583	5.157	2.239
Political orientation (ancestral)	3471	5.459	0.444			

Notes: Data from ESS round eight and the integrated EVS/WVS questionnaire is used. The immigrant parent sample denotes individuals born in their country of residence and has at least one foreign born parent, while the native population excludes individuals who are born abroad or have at least one foreign born parent. (Ancestral) refers to the ancestral country average of each variable.

Table 5: Pairwise correlations of the ancestral variables.

	Political orientation (ancestral)	Self-transcendence vs. self-enhancement (ancestral)	Openness to change vs. conservation (ancestral)
Political orientation (ancestral)	1.000		
Self-transcendence vs. self-enhancement (ancestral)	0.202 ***	1.000	
Openness to change vs. conservation (ancestral)	0.241 ***	0.236 ***	1.000

Notes: Data from ESS round eight is used. *** p<0.01.

5.4 Individual control variables

Fernandez (2010) discusses the problem of heterogeneity across individuals, which must be addressed before drawing any conclusions of statistically significant results of the cultural proxies. For example, characteristics such as education and earnings could affect an individual's climate change perceptions, and at the same time be influenced by culture. The response to this problem is to include a set of individual characteristics in the regression, which tests whether the cultural proxy of values and political orientation affects climate change perceptions in other ways, beyond the effects that culture has on the characteristics included. By adding an extensive set of controls, this will increase the probability of obtaining a true, causal effect of human values and political orientation on climate change perceptions. The control variables used in this paper corresponds to the most commonly used controls in previous studies and the complete list is found in Table 6. The descriptive statistics are presented for both the immigrant parent sample and the native population sample and generally speaking, the samples are similar to each other.

As can be seen in Table 6, the average *Age* differs by approximately three years between the samples, where the mean age in the immigrant parent sample is approximately 46, and the mean age in the native population sample is 49. *Age2* will also be used as a control variable, to account for nonlinear effects. To control for gender, a dummy variable for *Male* is created, which equals 1 if the respondent is a male and 0 if the respondent is a female. Almost half the native population sample are men, which only differs marginally when moving to the immigrant parent sample. The variable *Married* is a dummy variable which equals 1 if the respondent is married and 0 otherwise. Approximately half of respondents are married in both samples. *Children* is also a dummy variable, coded as 1 if the respondent “has ever had children (own children, partners' children, foster-children or stepchildren) living in the household” and 0 otherwise. In both samples, approximately half of the respondents have had children living with them.

Good health is a dummy variable, which equals 1 if the respondents' subjective health is very good/good and 0 if the health is fair/bad/very bad. As can be seen in Table 4, approximately 70 percent of the respondents in both samples estimate themselves as having very good or good health. *News* is a dummy variable that takes the value 1 if the respondent spends > 30 minutes per day “listening to news about politics and current affairs”, coded in accordance with Boto-García and Bucciol (2020). Approximately half of the samples estimate that they listen to news

more than 30 minutes every day. The variable *Religious* is measured by the question “How religious are you?” on a 11-point scale, 0 being “Not at all religious” and 10 being “Very religious”, with a mean of approximately 4.5.

Education is coded as two dummy variables, one for *Tertiary* (university) degree or above, and one for *Upper secondary degree*. The excluded category is thus lower education. Approximately 40 percent, in both samples, have upper secondary degree as their highest attained level of education, and approximately 20-30 percent have a tertiary degree or above. Two dummy variables for employment status are included, one for being *Unemployed* and one for being *Out of the labor force*. Employed is thus the excluded category. Approximately four percent in both samples are classified as unemployed, and about 40 percent are classified as being out of the labor force.

Income level is captured by the two dummies; *Low income* and *Middle income*, leaving *High income* as the reference variable. Low income equals 1 if the individual is in the bottom three income deciles, and Middle income equals 1 if the individual is in the middle four deciles. The income levels are based on within country income, since income levels are different across countries. The income levels look very similar between the two samples, where the native population sample has a slightly larger share with middle income, and a slightly smaller share with low income. Approximately 30 percent in each sample are estimated as having low income, and approximately 40 percent as having middle income.

Since this paper relies on intergenerational transmission of human values and political orientation, two parental controls for *Working mother/father (at age 14)* are also added. These variables are coded as dummies, turning 1 if the parent was employed or self-employed, and 0 if the parent was not working, dead or absent, when the respondent was 14 years old. The share of working mothers and fathers differ somewhat between the samples, where the immigrant parent sample have a slightly smaller share of both mothers and fathers working, in comparison to the native population sample. Approximately 60 percent of the mothers, and 90 percent of the fathers, worked when the respondents were 14 years old.

5.5 Additional ancestral country characteristics

Fernandez (2010) also brings up the issue of omitted variables that systematically varies across ancestral countries for economic reasons, which much likely can reflect differences across individuals, rather than differences caused by culture. It is therefore important to account for country characteristics, since the analysis otherwise faces the risk of confusing country characteristics with values or political orientation, which could mislead the estimates. The variables Polity2 and log GDP per capita from the World Bank are used to control for this. These variables are computed using averages for each ancestral country between the years 1960-1990. Polity2 is an autocracy-democracy index on a 21-point scale, ranging from -10 to +10. The scale can be divided into three regime categories, where -10 to -6 are defined as autocracies, -5 to 5 are defined as anocracies and 5 to 10 are defined as democracies (World Bank, 2015). As can be seen in Table 6, the average ancestral country Polity score is approximately 1.7, and thus the average ancestral regime type is anocracy.

Table 6: Descriptive statistics of the control variables.

Variable	Immigrant parent sample			Native population sample		
	N	Mean	Std. Dev.	N	Mean	Std. Dev.
Age	3858	45.529	18.126	44232	49.143	18.613
Male	3875	0.473	0.499	44378	0.474	0.499
Married	3875	0.466	0.499	44387	0.489	0.499
Children	2431	0.457	0.498	28786	0.519	0.499
Good health	3875	0.685	0.465	44387	0.655	0.476
News	3875	0.582	0.493	44387	0.611	0.488
Religious	3845	4.504	3.224	43984	4.500	3.117
Upper secondary degree	3860	0.401	0.490	44170	0.359	0.480
Tertiary education	3860	0.263	0.440	44170	0.244	0.429
Unemployed	3811	0.040	0.196	43827	0.036	0.187
Out of labor force	3811	0.409	0.492	43827	0.435	0.496
Low income	3193	0.345	0.476	36445	0.325	0.468
Middle income	3193	0.427	0.495	36445	0.432	0.495
Working mother (at age 14)	3793	0.639	0.480	43415	0.595	0.491
Working father (at age 14)	3717	0.880	0.325	42703	0.887	0.316
Polity2 (ancestral)	2478	1.743	7.726			
Log GDP/capita (ancestral)	2736	6.884	1.498			

Notes: Data from ESS round eight and the World Bank is used. The immigrant parent sample denotes individuals born in their country of residence and has at least one foreign born parent, while the native population excludes individuals who are born abroad or have at least one foreign born parent. (Ancestral) refers to the ancestral country average of each variable.

6. Results

6.1 Main results

The results presented in Table 7-10 (a) are the multivariate regressions performed in accordance with Model 1, each using one of the four variables characterizing climate change perceptions. Each regression is performed by firstly including the ancestral measures of political orientation and human values (Column 1) and thereafter, each of the individual controls and the ancestral country characteristics are added (Columns 2-4). The three ancestral variables are also run separately and are presented in Tables 7-10 (b). Additional regressions are performed using the father's and mother's ancestral countries independently, to investigate whether the intergenerational transmission differ when moving between the samples. The regressions are presented in Appendix A and are similar to the main results. However, the results suggest that there are small differences in the intergenerational transmission between mothers and fathers.

All regressions include country fixed effects and standard errors are clustered by the parent's birth country. Clustering is done on the father's birth country if he is the immigrant parent, and the mother's birth country otherwise. If both parents are immigrants, but from different countries, the clustering is done on the father's birth country. This is done because it only is possible to cluster on one country, and clustering on the father's birth country systematically results in a slightly larger set of clusters. To address the concern of multicollinearity when running the multivariable analyses, the variance inflation factor (VIF) is measured for each separate full-set regression. The highest value obtained is 3.19. The general rule is that a variable with a VIF-value > 10 is considered to suffer from multicollinearity, even though lower values also can contribute to these types of problems (Hair, Black, Babin & Anderson, 2013). The choice of limit is therefore arbitrary, and the VIF-values will be considered acceptable in this research, due to the seemingly small impact which the covariates has on each other.

6.1.1 Trend belief

In Table 7 (a), the main results on trend belief are presented, revealing negative and significant effects of self-transcendence vs. self-enhancement on climate change belief, in three of the specifications. The interpretation is, the more the parent's origin country prioritize self-enhancement (achievement and power) over self-transcendence (universalism and benevolence), the less likely it is that the second-generation immigrant will believe in climate change. Similar results can also be seen in Table 7 (b), revealing that the effect of self-

transcendence vs. self-enhancement on trend belief is quite robust to including the other covariates.

Table 7 (a): Main results – trend belief.

	(1)	(2)	(3)	(4)
Political orientation (ancestral)	0.026 (0.031)	0.006 (0.035)	-0.007 (0.036)	0.07 (0.036)
Self-transcendence vs. self-enhancement (ancestral)	-0.104 (0.034) ***	-0.071 (0.041) *	-0.060 (0.042)	-0.117 (0.048) **
Openness to change vs. conservation (ancestral)	0.015 (0.042)	0.033 (0.046)	0.017 (0.051)	-0.161 (0.125)
Age		0.006 (0.005)	0.002 (0.006)	-0.001 (0.006)
Age ²		-0.000 (0.042)	-0.000 (0.000)	0.000 (0.000)
Male		-0.095 (0.041) **	-0.105 (0.041)	-0.098 (0.071)
Married		-0.054 (0.042)	-0.057 (0.041)	-0.004 (0.061)
Children		0.007 (0.040)	0.006 (0.046)	0.029 (0.058)
Good Health		0.017 (0.185)	0.000 (0.036)	0.018 (0.047)
News			0.035 (0.032)	0.005 (0.045)
Religious			-0.012 (0.008)	-0.021 (0.007) ***
Upper secondary degree			-0.059 (0.036)	-0.040 (0.049)
Tertiary education			0.090 (0.052)	0.082 (0.079)
Unemployed			-0.061 (0.112)	0.102 (0.132)
Out of labor force			-0.057 (0.032)	-0.056 (0.037)
Low income				0.091 (0.079)
Middle income				0.000 (0.070)
Working mother (at age 14)				0.033 (0.053)
Working father (at age 14)				-0.078 (0.063)
Polity2 (ancestral)				-0.009 (0.005)
Log GDP/capita (ancestral)				-0.016 (0.014)
Country fixed effects	Yes	Yes	Yes	Yes
R-squared	0.05	0.07	0.09	0.11
Observations	2502	1512	1473	794

Notes: The dependent variable is “Do you think the world’s climate is changing?”, and ranges from 1 “Definitely not changing” to 4 “Definitely changing”. The sample is on second generation immigrants. Standard errors are in parenthesis and are clustered on the parent’s birth country. If both parents are immigrants, but from different countries, the clustering is done on the father’s birth country. All estimations include a constant and all regressions include country fixed effects. * p<0.1; ** p<0.05; *** p<0.01.

Table 7 (b): Main results – trend belief.

	(1)	(2)	(3)
Political orientation (ancestral)	-0.002 (0.041)		
Self-transcendence vs. self-enhancement (ancestral)		-0.115 (0.050) **	
Openness to change vs. conservation (ancestral)			-0.163 (0.132)
Country fixed effects	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
R-squared	0.09	0.10	0.10
Observations	1005	799	799

Notes: The dependent variable is “Do you think the world’s climate is changing?”, and ranges from 1 “Definitely not changing” to 4 “Definitely changing”. The sample is on second generation immigrants. Standard errors are in parenthesis and are clustered on the parent’s birth country. If both parents are immigrants, but from different countries, the clustering is done on the father’s birth country. All estimations include a constant and all regressions include country fixed effects and the full set of control variables. * p<0.1; ** p<0.05; *** p<0.01.

6.1.2 Attribution belief

None of the ancestral variables have significant effects on attribution belief in Table 8 (a) and the same pattern can be seen in Table 8 (b). When observing the control variables, individuals with low or middle income are significantly less likely to believe that climate change is caused by human activity, in comparison to individuals with high income. Likewise, people who consider themselves as being religious, are also less likely to believe in climate change caused by human activity. The variables Age, Children and Tertiary education are somewhat significant and the same goes for Polity2 and GDP/capita, which interestingly show opposite effects on attribution belief.

Table 8a: Main results - attribution belief.

	(1)	(2)	(3)	(4)
Political orientation (ancestral)	0.019 (0.031)	0.012 (0.035)	0.018 (0.032)	-0.007 (0.050)
Self-transcendence vs. self-enhancement (ancestral)	0.021 (0.037)	0.019 (0.050)	0.032 (0.053)	-0.006 (0.059)
Openness to change vs. conservation (ancestral)	0.006 (0.059)	-0.039 (0.058)	-0.042 (0.061)	-0.006 (0.126)
Age		0.005 (0.007)	0.002 (0.007)	-0.001 (0.010)
Age ²		-0.000 (0.000) *	-0.000 (0.000)	-0.000 (0.000)
Male		0.092 (0.068)	0.094 (0.071)	-0.082 (0.010)
Married		-0.063 (0.062)	-0.057 (0.064)	0.003 (0.080)
Children		0.066 (0.049)	0.082 (0.046) *	0.116 (0.070)
Good Health		0.023 (0.038)	0.004 (0.042)	-0.080 (0.058)
News			0.061 (0.040)	-0.046 (0.044)
Religious			-0.015 (0.006) **	-0.024 (0.007) ***
Upper secondary degree			-0.051 (0.044)	0.024 (0.057)
Tertiary education			0.074 (0.062)	0.140 (0.080) *
Unemployed			0.105 (0.104)	0.154 (0.144)
Out of labor force			-0.024 (0.051)	0.054 (0.064)
Low income				-0.217 *** (0.080)
Middle income				-0.167 (0.057) ***
Working mother (at age 14)				-0.027 (0.043)
Working father (at age 14)				-0.012 (0.094)
Polity2 (ancestral)				-0.012 (0.094) *
Log GDP/capita (ancestral)				0.053 (0.029) *
Country fixed effects	Yes	Yes	Yes	Yes
R-squared	0.04	0.07	0.08	0.14
Observations	2413	1470	1432	775

Notes: The dependent variable is “Do you think that climate change is caused by natural processes, human activity, or both?”, and ranges from 1 “Entirely by natural process” to 5 “Entirely by human activity”. The sample is on second generation immigrants. Standard errors are in parenthesis and are clustered on the parent’s birth country. If both parents are immigrants, but from different countries, the clustering is done on the father’s birth country. All estimations include a constant and all regressions include country fixed effects. * p<0.1; ** p<0.05; *** p<0.01.

Table 8 (b): Main results – attribution belief.

	(1)	(2)	(3)
Political orientation (ancestral)	-0.025 (0.046)		
Self-transcendence vs. self-enhancement (ancestral)		0.005 (0.059)	
Openness to change vs. conservation (ancestral)			-0.004 (0.126)
Country fixed effects	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
R-squared	0.12	0.14	0.14
Observations	984	778	778

Notes: The dependent variable is “Do you think that climate change is caused by natural processes, human activity, or both?”, and ranges from 1 “Entirely by natural process” to 5 “Entirely by human activity”. The sample is on second generation immigrants. Standard errors are in parenthesis and are clustered on the parent’s birth country. If both parents are immigrants, but from different countries, the clustering is done on the father’s birth country. All estimations include a constant and all regressions include country fixed effects and the full set of control variables. * p<0.1; ** p<0.05; *** p<0.01.

6.1.3 Perceived impacts of climate change

Table 9 (a) and (b) show the results on perceived impacts of climate change, where self-transcendence vs. self-enhancement and openness to change vs. conservation are significant in Columns 1-3, but insignificant when run individually. The interpretation is, the more the ancestral country prioritize self-enhancement over self-transcendence, or conservation (security, conformity and tradition) over openness (hedonism, stimulation, self-direction), the less likely it is that the individual believes that the impacts of climate change will be bad. Although, these results are not significant when including controls for parent’s occupation and the ancestral country characteristics (Column 4). Continuing with the control variables, married individuals are significantly less likely to believe in bad impacts of climate change, as well as, quite surprisingly, individuals listening to news more than 30 minutes per day (Column 4). In Columns 3-4, the variable Religious, Low- and Middle show similar results to Table 8 (a), although at a lower significance-level. Lastly, Tertiary and Unemployed reveal positive and significant effects on perceived impacts of climate change.

Table 9 (a): Main results – perceived impacts of climate change.

	(1)	(2)	(3)	(4)
Political orientation (ancestral)	-0.025 (0.107)	0.010 (0.104)	-0.013 (0.100)	-0.098 (0.123)
Self-transcendence vs. self-enhancement (ancestral)	-0.229 (0.119) *	-0.301 (0.135) **	-0.262 (0.141) *	-0.127 (0.194)
Openness to change vs. conservation (ancestral)	-0.264 (0.539)	-0.480 (0.209) **	-0.471 (0.197) **	-0.240 (0.496)
Age		0.013 (0.019)	0.002 (0.022)	0.019 (0.032)
Age ²		-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Male		-0.017 (0.086)	-0.034 (0.087)	-0.037 (0.146)
Married		-0.431 (0.139) ***	-0.454 (0.126) ***	-0.474 (0.206) **
Children		0.178 (0.171)	0.253 (0.164)	0.124 (0.257)
Good Health		0.070 (0.114)	-0.056 (0.126)	-0.117 (0.145)
News			-0.020 (0.125)	-0.426 (0.141) ***
Religious			-0.056 (0.021) ***	-0.055 (0.028) *
Upper secondary degree			0.091 (0.133)	-0.042 (0.179)
Tertiary education			0.697 (0.206) ***	0.833 (0.264) ***
Unemployed			0.111 (0.219)	0.930 (0.328) ***
Out of labor force			0.043 (0.131)	0.210 (0.214)
Low income				-0.503 (0.198) **
Middle income				-0.560 (0.238) **
Working mother (at age 14)				-0.010 (0.163)
Working father (at age 14)				0.227 (0.207)
Polity2 (ancestral)				-0.007 (0.019)
Log GDP/capita (ancestral)				0.026 (0.079)
Country fixed effects	Yes	Yes	Yes	Yes
R-squared	0.05	0.07	0.09	0.14
Observations	2367	1447	1410	767

Notes: The dependent variable is “How good or bad do you think the impact of climate change will be on people across the world?”, and ranges from 0 “Extremely good” to 10 “Extremely bad”. The sample is on second generation immigrants. Standard errors are in parenthesis and are clustered on the parent’s birth country. If both parents are immigrants, but from different countries, the clustering is done on the father’s birth country. All estimations include a constant and all regressions include country fixed effects. * p<0.1; ** p<0.05; *** p<0.01.

Table 9 (b): Main results – perceived impacts of climate change.

	(1)	(2)	(3)
Political orientation (ancestral)	-0.076 (0.122)		
Self-transcendence vs. self-enhancement (ancestral)		-0.141 (0.196)	
Openness to change vs. conservation (ancestral)			-0.197 (0.485)
Country fixed effects	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
R-squared	0.12	0.05	0.14
Observations	976	770	770

Notes: The dependent variable is “How good or bad do you think the impact of climate change will be on people across the world?”, and ranges from 0 “Extremely good” to 10 “Extremely bad”. The sample is on second generation immigrants. Standard errors are in parenthesis and are clustered on the parent’s birth country. If both parents are immigrants, but from different countries, the clustering is done on the father’s birth country. All estimations include a constant and all regressions include country fixed effects and the full set of control variables. * p<0.1; ** p<0.05; *** p<0.01.

6.1.4 Climate concern

The results in Table 10 (a) and (b) include the regressions on climate concern. Ancestral political orientation is significant in all specifications, as well as when run individually, which indicates that the variable is robust. The result suggests that the more the ancestral country places their views to the right on the political scale, the less likely it is that the individual will be concerned about climate change. Openness to change vs. conservation show significant and negative results in the last specification of Table 10 (a), but not when run individually. The control variables for age reveal significant effects in different directions in Columns 2 and 3, which speaks for a non-linear relationship between age and climate concern. However, the coefficients of Age² are diminishingly small. Further, men are significantly less likely to be concerned about climate change, in comparison to women, and individuals listening to news more than 30 minutes a day are also more likely to be concerned. Finally, people with tertiary degree or above are significantly more likely to be concerned about climate change, in comparison to individuals with a low level of education.

Table 10 (a): Main results – climate concern.

	(1)	(2)	(3)	(4)
Political orientation (ancestral)	-0.092 (0.041) **	-0.109 (0.039) ***	-0.117 (0.040) ***	-0.147 (0.044) ***
Self-transcendence vs. self-enhancement (ancestral)	0.034 (0.066)	0.089 (0.066)	0.099 (0.069)	0.070 (0.082)
Openness to change vs. conservation (ancestral)	0.006 (0.089)	-0.083 (0.082)	-0.087 (0.087)	-0.385 (0.136) ***
Age		0.018 (0.006) ***	0.012 (0.007) *	0.003 (0.009)
Age ²		-0.000 (0.0000) ***	-0.000 (0.000) **	-0.000 (0.0000)
Male		-0.153 (0.048) ***	-0.157 (0.052) ***	-0.110 (0.054) **
Married		-0.021 (0.069)	-0.027 (0.069)	-0.106 (0.108)
Children		-0.063 (0.066)	-0.044 (0.069)	0.018 (0.095)
Good Health		-0.057 (0.062)	-0.106 (0.063) *	-0.123 (0.096)
News			0.182 (0.057) ***	0.148 (0.065) **
Religious			0.003 (0.008)	0.008 (0.011)
Upper secondary degree			-0.014 (0.058)	0.053 (0.069)
Tertiary education			0.245 (0.054) ***	0.272 (0.073) ***
Unemployed			-0.194 (0.110) *	0.135 (0.179)
Out of labor force			0.007 (0.059)	-0.065 (0.095)
Low income				-0.149 (0.116)
Middle income				-0.078 (0.097)
Working mother (at age 14)				0.016 (0.070)
Working father (at age 14)				-0.081 (0.131)
Polity2 (ancestral)				-0.011 (0.007)
Log GDP/capita (ancestral)				-0.009 (0.035)
Country fixed effects	Yes	Yes	Yes	Yes
R-squared	0.07	0.09	0.12	0.14
Observations	2503	1510	1470	793

Notes: The dependent variable is “How worried are you about climate change?”, and ranges from 1 “Not at all worried” to 5 “Extremely worried”. The sample is on second generation immigrants. Standard errors are in parenthesis and are clustered on the parent’s birth country. If both parents are immigrants, but from different countries, the clustering is done on the father’s birth country. All estimations include a constant and all regressions include country fixed effects. * p<0.1; ** p<0.05; *** p<0.01.

Table 10 (b): Main results – climate concern.

	(1)	(2)	(3)
Political orientation (ancestral)	-0.161 (0.052) ***		
Self-transcendence vs. self-enhancement (ancestral)		0.067 (0.094)	
Openness to change vs. conservation (ancestral)			-0.392 (0.151)
Country fixed effects	Yes	Yes	Yes
Control variables	Yes	Yes	Yes
R-squared	0.13	0.14	0.14
Observations	1002	796	796

Notes: The dependent variable is “How worried are you about climate change?”, and ranges from 1 “Not at all worried” to 5 “Extremely worried”. The sample is on second generation immigrants. Standard errors are in parenthesis and are clustered on the parent’s birth country. If both parents are immigrants, but from different countries, the clustering is done on the father’s birth country. All estimations include a constant and all regressions include country fixed effects and the full set of control variables. * p<0.1; ** p<0.05; *** p<0.01.

6.2 Interactions

To test for the possibility of interaction effects between ancestral variables and other covariates, an additional set of regressions are conducted. In accordance with the results of Hamilton (2009), interaction variables between tertiary education and political orientation, and news and political orientation, are tested. In addition to this, interaction variables between tertiary education and self-transcendence vs. self-enhancement, and news and self-transcendence vs. self-enhancement, are also tested. The interaction variables are systematically included in the regressions in which they were proven to be both significant and robust in the main results. Thus, only two of the dependent variables are run using the interaction variables, an no interactions are tested using the openness to change vs. conservation variable. The results are presented in the same ordering as above, starting with the results on perceived impacts of climate change and then moving on to climate concern. Each interaction variable is run in two separate regressions, first including only the interaction variables and then adding the control variables.

6.2.1 Perceived impacts of climate change

When observing the interaction variables in Table 11 it is clear that the results in Columns 1-2 are insignificant. Column 3 reveals that the interaction term between self-transcendence vs. self-enhancement and news, is significant when run without controls. This indicates that the effect of self-transcendence vs. self-enhancement on perceived impacts of climate change, changes at the news threshold. The sign of the interaction coefficient implies that individuals, whose ancestral country prioritize self-enhancement over self-transcendence, have a positive

effect of listening to news more than 30 minutes per day, on perceived impacts of climate change. Individuals, whose ancestral country prioritize self-transcendence over self-enhancement, instead have a negative effect of watching the news. However, this result is insignificant when including control variables, and the sign of the coefficient changes, which implies that this result should be interpreted with care.

Table 11: Interactions – perceived impacts of climate change.

	(1)	(2)	(3)	(4)
Self-transcendence vs. self-enhancement (ancestral)	-0.200 (0.139)	-0.093 (0.126)	-0.466 (0.141) ***	-0.099 (0.123)
Self-transcendence vs. self-enhancement (ancestral) x tertiary	-0.119 (0.297)	0.140 (0.373)		
Tertiary	0.364 (0.375)	1.010 (0.542) *		
Self-transcendence vs. self-enhancement (ancestral) x news			0.391 (0.181) **	-0.127 (0.246)
News			0.412 (0.221) *	-0.579 (0.315) *
Control variables	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes
R-squared	0.06	0.14	0.05	0.14
Observations	2367	767	2372	767

Notes: The dependent variable is “How good or bad do you think the impact of climate change will be on people across the world?”, and ranges from 0 “Extremely good” to 10 “Extremely bad”. Self-transcendence vs. Self-enhancement (ancestral) x Tertiary and Self-transcendence vs. Self-enhancement (ancestral) x News are interaction variables. The sample is on second generation immigrants. Standard errors are in parenthesis and are clustered on the parent’s birth country. If both parents are immigrants, but from different countries, the clustering is done on the father’s birth country. All estimations include a constant and all regressions include country fixed effects. Both interaction variables are run with and without including the other control variables. * p<0.1; ** p<0.05; *** p<0.01.

6.2.2 Climate concern

In Table 12, the interaction variable of political orientation and tertiary education is insignificant when run without control variables, but significant when all controls are added (although only at 10 percent level). The positive coefficient implies that individuals, whose ancestral country is centered to the right, have a larger, positive effect of tertiary education, in comparison to individuals whose ancestral country is centered to the left. In other words, the negative effect of the right-wing political orientation, is compensated by tertiary education. However, the coefficients changes sign in the two specifications, indicating that the effect is highly sensitive to the composition of independent variables, and should thus be interpreted with care.

In Columns 3-4, the results of the interaction variable of political orientation and news is significant at 10 percent-level when run separately, but insignificant when using control variables. The sign of the coefficient indicates that individuals, whose ancestral country is centered to the right, have a larger, positive effect of listening to the news more than 30 minutes per day, in comparison to individuals whose ancestral country is centered to the left. These variables are, however, sensitive to the composition of the model, since the significance is lost when including controls.

Table 12: Interaction variables – climate concern.

	(1)	(2)	(3)	(4)
Political orientation (ancestral)	-0.052 (0.039)	-0.103 (0.060) *	-0.130 (0.050) **	-0.202 (0.063) ***
Political orientation (ancestral) x tertiary	-0.079 (0.065)	0.184 (0.109) *		
Tertiary	0.624 (0.348) *	1.296 (0.601) **		
Political orientation (ancestral) x news			0.101 (0.054) *	0.099 (0.082)
News			-0.431 (0.296)	-0.398 (0.422)
Control variables	No	Yes	No	Yes
Country fixed effects	Yes	Yes	Yes	Yes
R-squared	0.07	0.15	0.07	0.15
Observations	3318	793	3328	793

Notes: The dependent variable is “How worried are you about climate change?”, and ranges from 1 “Not at all worried” to 5 “Extremely worried”. Political orientation (ancestral) x Tertiary and Political orientation (ancestral) x News are interaction variables. The sample is on second generation immigrants. Standard errors are in parenthesis and are clustered on the parent’s birth country. If both parents are immigrants, but from different countries, the clustering is done on the father’s birth country. All estimations include a constant and all regressions include country fixed effects. Both interaction variables are run with and without including the other control variables. * p<0.1; ** p<0.05; *** p<0.01.

7. Discussion

The main results suggest that the effects of self-transcendence vs. self-enhancement on climate change perceptions are in line with previous research, in which individuals who prioritize universalism and benevolence over achievement and power, have been found to be less skeptic about climate change (Poortinga et al., 2019; Stern, 2000). The ancestral variable self-transcendence vs. self-enhancement has negative effects on trend belief and perceived impacts of climate change in a majority of the specifications. This indicates that individuals, whose ancestral country prioritize self-enhancement over self-transcendence, are less likely to believe in climate change, and more likely to perceive less negative climate change impacts. However, the variable has insignificant effects on attribution belief and climate concern which contradicts the results of Poortinga et al. (2019). Nevertheless, the results indicate that self-transcendence

and self-enhancement values are, to some extent, predictive of individual climate change perceptions.

Even though the openness to change vs. conservation dimension has not been as extensively examined in previous research as self-transcendence vs. self-enhancement, research indicates that conservatism has negative impacts of environmental concern (Poortinga et al., 2019; Schultz & Zelezny, 1999, Stern et al., 1999). The findings of this paper suggest that individuals, whose ancestral country prioritize security, conformity and tradition over hedonism, stimulation and self-direction, are more likely to perceive less negative climate change impacts, and to be less concerned about climate change, which is indicated by the negative coefficients. However, the results on trend- and attribution belief are insignificant and the effect on perceived impacts of climate change loses its significance when all control variables are added. The overall results are thus in line with previous research, where significant effects of openness to change vs. conservation mainly have been found on climate concern.

The ancestral variable for political orientation was non-significantly associated with both trend- and attribution skepticism, as well as perceived impacts of climate change. However, the variable shows significant and negative effects on climate concern, which is robust to adding the other ancestral variables and the control variables. This result suggests that left-wing political orientation is related to higher levels of climate concern. This is in line with previous research, which continuously have shown that individuals with right-wing political orientation are less concerned about climate change (Boto-García & Buccioli, 2020; Neumayer, 2004; Tjernström & Tietenberg, 2008). However, the results of Poortinga et al. (2019) indicated that political orientation also is associated with trend belief, which could not be confirmed in this study. Additionally, Ziegler (2017) suggested that values weaken the differences in climate change perceptions between individuals with left-wing and right-wing identification. This, as well, could not be confirmed in this study, although might reflect the different approaches in how values are measured.

The control variables Religious, Low income and Middle income were significant in all specifications of attribution belief and perceived impacts of climate. This indicates that, the more religious an individual is, or the lower income an individual has, the less likely he/she is to believe that climate change is caused by humans, and that the impacts of climate change will be bad. Compared to Tjernström and Tietenberg (2008) and Boto-García and Buccioli (2020),

the results are contradictory. This might however reflect that income and religion affect climate concern, belief and perceived impacts differently. Tertiary and Married revealed significant results on perceived impacts of climate change and climate concern, which suggests that individuals with university education, and individuals that are not married, are more likely to believe in bad impacts of climate change, and to be concerned about climate change. Lastly, Male had significant and negative effects on climate concern, and News the other way around. Especially News, Tertiary and Male are in line with previous research, while the earlier studies investigating the effects of marital status have been less clear.

The results of the interaction variables were ambiguous in the sense that none of the variables were significant when both run separately, and when adding controls. This sensitivity, also shown by the coefficients changing signs in a majority of the regressions made, indicates that the effects should be interpreted with care. However, the results in which tertiary education and news seems to “compensate” the negative impact of left-wing political orientation on climate concern, is interesting since it contradicts the results of Hamilton (2009). It might however be problematic to compare these results, since Hamilton uses US data. Further research on these interaction variables is needed to investigate whether Europeans has similar effects as Americans of education and knowledge on climate change perceptions.

To sum up, the results of this paper suggest that self-transcendent values are positively associated with trend belief and perceived impacts of climate change, while conservation values are negatively associated with perceived impacts of climate change and climate concern, although not significant in all specifications. Political orientation has negative and robust effects on climate concern, which means that placement to the right on the political scale is associated with less concern about climate change. The overall results thus indicate that human values and political orientation has partly significant effects on climate change perceptions, when ancestral variables are used as proxies. The only dependent variable which is not significantly associated with any of the ancestral values, is attribution belief. The results of this study are in line with previous research, and thus suggest that the causal chain between values and beliefs in the VBN model holds and that reverse causality has not been a prevailing issue in earlier studies. The results should however be interpreted with care, due to the limitations of the study discussed in Chapter 4.

8. Conclusion

The aim of this study was to investigate the determinants of climate change perceptions, focusing on how political orientation and human values affect attribution- and trend belief, perceived impacts of climate change and climate concern. This is interesting in an environmental point of view, due to the urgent matter of reducing the gap between scientific knowledge and proenvironmental actions and to prevent global warming to go beyond 1.5 degrees.

The empirical findings of this research suggest that self-transcendence values are positively associated with trend belief, and to some extent predictive of perceived impacts of climate change. The results also indicate that conservation values are negatively associated with perceived impacts of climate change and climate concern. However, none of these values demonstrate significant results in all specifications. Lastly, the results show significant and negative effects of political orientation on climate concern in all five model specifications, which makes this variable especially robust.

This study contributes to earlier research by finding similar results, while using a more methodologically sophisticated method. This paper is, to my knowledge, the first one applying the epidemiological approach to this field of research and ultimately allows me to rule out the issue of reverse causality. Further, the results of this this paper suggest that 1. there exist intergenerational transmission of human values and political orientation, 2. the causal chain between values and beliefs in the VBN model holds, and 3. reverse causality has not been a prevailing issue in earlier studies. Although, to draw any solid conclusions further research is needed.

The relationship between climate change beliefs, concerns and actions has not been determined in this paper since the main focus was to investigate the determinants of climate change perceptions. It would, however, be interesting to apply the epidemiological method on this relationship as well and ultimately test the full VBN chain. The ambiguous results of the interaction variables also evoke an interest to further examine the relationships between political orientation, education and news. Does education and knowledge have the opposite effects on individuals with different political orientation in Europe, as have been shown in the

US? Or does there exist a “compensation effect”, implying that right-wing individuals have a greater, positive effect of education and knowledge, in comparison to left-wing individuals?

Due to the acute need to combat global warming, there is an urgent need to understand which factors lead to proenvironmental actions and policy acceptance. An important part in trying to solve this big puzzle is to investigate what drives climate change beliefs and concerns. The findings provided in this research, in which previous found determinants of climate change perceptions are observed when reverse causality is not an issue, could bring research one step further in the challenge of decelerating global warming.

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Appendix A

Table A.1: Additional results - immigrant mother

	Trend belief				Attribution belief				Perceived impacts of climate change				Climate concern			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Political orientation (ancestral)	-0.035 (0.057)			0.094 (0.080)	0.064 (0.042)			0.000 (0.100)	-0.017 (0.118)			0.097 (0.241)	-0.066 (0.042)			-0.208 (0.109) *
Self-transcendence vs. self-enhancement (ancestral)		-0.199 (0.084) **		-0.092 (0.099)		0.004 (0.069)		-0.155 (0.071) **		-0.249 (0.150)		0.044 (0.232)		0.018 (0.070)		0.155 (0.109)
Openness to change vs. conservation (ancestral)			0.136 (0.088)	-0.077 (0.157)			-0.099 (0.069)	0.090 (0.180)			-0.008 (0.191)	-0.328 (0.692)			0.128 (0.101)	0.259 (0.166)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.04	0.05	0.05	0.25	0.03	0.04	0.04	0.21	0.04	0.05	0.05	0.15	0.06	0.07	0.07	0.15
Observations	1315	1043	1043	186	2174	1668	1668	400	2130	1633	1633	392	2239	1734	1734	404

Notes: The dependent variable in Trend belief is “Do you think the world’s climate is changing?”, and ranges from 1 “Definitely not changing” to 4 “Definitely changing”. The dependent variable in Attribution belief is “Do you think that climate change is caused by natural processes, human activity, or both?”, and ranges from 1 “Entirely by natural process” to 5 “Entirely by human activity”. The dependent variable in Perceived impacts of Climate Change is “How good or bad do you think the impact of climate change will be on people across the world?”, and ranges from 0 “Extremely good” to 10 “Extremely bad”. The dependent variable in Climate Concern is “How worried are you about climate change?”, and ranges from 1 “Not at all worried” to 5 “Extremely worried”. The sample is on second generation immigrants, whose mothers are born in another country. Standard errors are in parenthesis and are clustered on the mother’s birth country. All estimations include a constant and all regressions include country fixed effects. * p<0.1; ** p<0.05; *** p<0.01.

Table A.2: Additional results - immigrant father

	Trend belief				Attribution belief				Perceived impacts of climate change				Climate concern			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Political orientation (ancestral)	-0.011 (0.039)			-0.020 (0.047)	0.027 (0.036)			0.098 (0.090)	-0.189 (0.117)			0.105 (0.243)	-0.082 (0.041) **			-0.081 (0.084)
Self-transcendence vs. self-enhancement (ancestral)		-0.053 (0.048)		-0.123 (0.057) **		-0.046 (0.048)		0.015 (0.079)		-0.198 (0.167)		-0.025 (0.304)		0.038 (0.071)		-0.037 (0.100)
Openness to change vs. conservation (ancestral)			0.022 (0.047)	-0.114 (0.144)			-0.005 (0.093)	-0.030 (0.197)			-0.447 (0.214) **	-0.897 (0.641)			-0.089 (0.112)	-0.690 (0.199) ***
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.05	0.05	0.05	0.22	0.03	0.04	0.04	0.18	0.04	0.05	0.05	0.18	0.07	0.07	0.07	0.24
Observations	2384	1758	1758	383	2296	1681	1681	368	2252	1647	1647	361	2379	1757	1757	376

Notes: The dependent variable in Trend belief is “Do you think the world’s climate is changing?”, and ranges from 1 “Definitely not changing” to 4 “Definitely changing”. The dependent variable in Attribution belief is “Do you think that climate change is caused by natural processes, human activity, or both?”, and ranges from 1 “Entirely by natural process” to 5 “Entirely by human activity”. The dependent variable in Perceived impacts of Climate Change is “How good or bad do you think the impact of climate change will be on people across the world?”, and ranges from 0 “Extremely good” to 10 “Extremely bad”. The dependent variable in Climate Concern is “How worried are you about climate change?”, and ranges from 1 “Not at all worried” to 5 “Extremely worried”. The sample is on second generation immigrants, whose fathers are born in another country. Standard errors are in parenthesis and are clustered on the father’s birth country. All estimations include a constant and all regressions include country fixed effects. * p<0.1; ** p<0.05; *** p<0.01.