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Climate change preferences and attitudes and related policy and voting choices

Empirical "data and theory driven" analyses in the European context

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Abstract

This thesis enters the political economy literature related to environmental issues and climate change with an empirical approach. The objective is to analyze the role of different socio-economic characteristics and personal attributes (values, preferences, trust, social relations, etc.) with respect to some environmental dimensions such as involvement and awareness towards climate change, support for policies to counter it, as well as political preferences and consensus towards environmental parties. The case study focuses on the European context, attempting to identify which characteristics are relevant across different dimensions and comparing them to trace any differences and similarities in environmental attitudes. The analysis methodology employs both Machine Learning computational techniques to leverage particularly large and diverse databases, as well as more traditional tools for assessing the impact of events.

In the first chapter, a data-driven study of cross-country differences in preferences and attitudes on climate change in Europe is conducted. The second chapter involves a model selection study on attitudes toward climate change and related policies within the context of the European Union. At the end, the third chapter offers an examination of the impact of the recent Ukrainian-Russian conflict on the environmental and voting attitudes of European citizens.

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Chapter 1

Who is looking up? A data-driven study on cross-country differences in preferences and attitudes on climate change in Europe

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Abstract

Addressing climate change presents a coordination challenge for national institutions, given that local-scale issues have global-scale implications. To address this, our article employs data-driven methodologies to group and rank different countries based on various dimensions related to people's preferences and attitudes toward climate change.

Using data from the European Social Survey (ESS) covering 23 countries, the study utilizes fuzzy logic systems to limit distortions from metric scales and clustering tools, aiding in the understanding of the multidimensionality of characteristics within both countries and populations.

The conclusion reveals the emergence of a three-speed Europe: Central and Northern Europe demonstrates greater sensitivity to the problem, Western and Southern Europe exhibit average performance, while Eastern Europe is poised to follow. Conversely, when examining the broader European population, differences are no longer confined to three well-defined levels of performance but are more focused on individual preferences regarding specific dimensions of the problem. This suggests the necessity of a regional focus for the implementation of different policies.

Key words: Climate Change attitudes, Environmental preferences, Sustainability indices, Data-driven study, Fuzzy logic systems, Multi-criteria decision-making methods and Ranking and clustering applications.

1.1 Introduction

The title is a quote from the recent film "Don't Look Up", directed by McKay (2021), in which a group of researchers discovers an imminent natural catastrophe that, without prompt and decisive intervention, will result in the end of humanity. Similar to the protagonists in the film, when it comes to the issue of climate change, our choices lie between denying the facts to cling to our beliefs or making an effort to become aware of reality and avoid certain and catastrophic consequences.

Climate change is one of the most critical challenges facing the world. Throughout history, the failure to timely comprehend changes in the environmental context has already led to the decline of advanced populations in various parts of the globe (Diamond, 2015). As highlighted by the UN-FCCC (2015) the significant difference from the past is that today, we are confronting not a local but a global emergency with irreversible and exceptional consequences (Logan, 2022; UNEP, 2022b).

The increase in global temperatures beyond a safe threshold (Masson-Delmotte et al., 2018; UNEP, 2022a) is resulting in the intensification of natural disasters such as droughts, floods, or hurricanes (Hansen et al., 2016; Ranasinghe et al., 2021), the melting of glaciers, and the subsequent rise in sea levels (Fox-Kemper, 2021; Kraaijenbrink et al., 2017). Additionally, there is an unprecedented loss of biodiversity and ecosystems (Pivello et al., 2021), posing a real risk to the availability of drinking water and food security in different areas of the Earth (Betts et al., 2018; Watts et al., 2021), along with the spread of diseases and health problems (Atwoli et al., 2021).

The negative impact of environmental deterioration also reverberates in the economy, undermining its stability (Battiston et al., 2021; Kiley, 2021; Schnabel, 2020; Yeyati and Filippini, 2021), destroying wealth (Guo et al., 2021), exacerbating inequalities (Althor et al., 2016; Cuomo, 2011; Guo et al., 2021; Nielsen et al., 2021), and driving people to migrate between and within countries(Clement et al., 2021).

While the anthropocentric influence of the phenomenon is unequivocal (Arias et al., 2021; Pachauri et al., 2014), a concrete solution still appears elusive due to the difficulty of balancing the needs of the global political forces involved. Special or private interests continue to play a significant role in hindering the definition of strict policies for environmental protection (IlPost, 2021a,b; Monbiot, 2021; Rachman and Mundy, 2021; Vidal, 2021).

Recognizing the imperative for collaboration among national-level public decision-makers to implement urgent and impactful climate protection policies aimed at mitigating the issue and enhancing the resilience of territories, this study investigates variations in preferences and opinions regarding specific dimensions of climate change across countries. Analyzing data from 23 European countries (Austria, Belgium, Switzerland, Czech Republic, Germany, Estonia, Spain, Finland, France, England, Hungary, Ireland, Israel, Iceland, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Russia, Sweden, Slovenia), we employ Multi-Criteria Decision Analysis (MCDA) tools to cluster and rank countries based on the public's level of interest and preferences across multiple dimensions related to the climate crisis.

This study, beyond contributing to the expansion of existing literature on the sub-

ject, aims to bolster the development of more efficient and effective intervention policies. It seeks to enhance governments' and organizations' awareness of people's preferences, thereby encouraging actions that align with public expectations.

The study begins with a review of the literature on people's preferences regarding climate change, along with indicators that characterize countries' commitment to climate protection and the overall level of environmental awareness. Subsequently, the analysis defines eighteen environmental variables within the European Social Survey (ESS) database, identifying five fundamental dimensions of climate change: people's sensitivity to climate change (Climate Change Sensitivity), inclination toward individual action for environmental protection (Environment Care), trust in public and private efforts to address climate change (Trust in Actions), support for environmental policies (Policy Support), and aversion to non-renewable energy production (Renewable). To mitigate distortions arising from metric scales, these macro-areas are then summarized using Fuzzy Logic tools. The study proceeds with the construction of a ranking of countries based on their citizens' attitudes toward climate change using the TOPSIS multi-criteria decision-making method. Finally, to enrich the multidimensionality of available information, a cluster analysis is conducted, initially on the average of individual indicators per country and subsequently on the entire population, to identify common traits.

1.2 Literature review: identification of the problem and people preferences

The scientific literature addressing the environment and climate change is vast and rich. In this paper, we initially examined various levels of research to explore common methodologies employed for assessing the impact and efforts of countries and regions on the issue. In contrast, our approach focuses on people's preferences and attitudes. The second part delves into the multidimensionality of the phenomenon related to people's preferences and behaviors, emphasizing the necessity to explore each dimension more autonomously.

The contribution of Working Group III, titled "Climate Change 2022: Mitigation of Climate Change", to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (Shukla et al., 2022), marks the latest in a series of significant scientific assessment reports, special reports, technical papers, methodology reports, and other products designed to furnish policymakers with reliable and valuable information on climate change. The report reveals a global increase in Greenhouse Gas (GHG) emissions from human activities since 2020, impacting key economic sectors, with a growing contribution from urban areas. Moreover, the collective efforts of countries to reduce CO2 emissions from fossil fuels and industrial processes have been hampered by the surge in global economic activity across industry, energy supply, transport, agriculture, and construction. The report highlights substantial variations in regional contributions to GHG emissions, partially justified by differing developmental levels. However, notable differences persist even within similar income brackets. Only 18 countries have achieved significant reductions in air pollution emissions for over a decade, and the negative impact of the top 10% of households with the highest per capital income-to-emission ratio is disproportion-

ately large compared to the remaining share.

In monitoring the 13th Sustainable Development Goal, "Climate Action", one of the 17 global common goals established in 2015 by the United Nations General Assembly (UN-GA) to ensure the sustainability and prosperity of people and the planet, the UN (2022) "Sustainable Development Goals Report" underscores that out of the 193 countries or areas involved, only approximately 20% have comparable data for the eight indicators defined by UNSTAT (2022) for the period 2015 or later on this topic. Health (Goal 3) and Energy (Goal 7) exhibit the highest data availability. Although 2020 witnessed the largest drop in global carbon dioxide (CO2) emissions in contemporary history, at 5.2%, thanks to reduced energy demand resulting from health policies introduced for the COVID-19 emergency in most countries, this achievement was not sustained. With the removal of COVID-19 restrictions in 2021, a strong rebound occurred, reaching a peak of 6%, driven by a growing demand for polluting energy sources such as coal, oil, and gas.

It is estimated that 3.3 to 3.6 billion people are highly vulnerable to the effects of climate change. The OECD (2022) report, conducted using the latest financial data available, analyzes compliance with the stipulated agreement by developed countries to make a fund of USD 100 billion available annually by 2020. This fund aims to contribute to climate action in developing countries through mitigation actions and implementation transparency. The agreement was introduced at COP15 in 2009 in Copenhagen, formalized at COP16 in 2010 in Cancun, and extended to 2023 at COP21 in 2015 in Paris (UNFCCC, 2009, 2010, 2015). Focused on the 2016-2020 period, the report reveals that expectations have not been met. Although the amount of USD mobilized over time increased from 58.5 billion in 2016 to 83.3 billion in 2020, it still falls short of the target of 100 billion by 16.7 billion. Mitigation finance represents the largest part of the fund, accounting for 58% in 2022, followed by Adaptation finance (34%), which shows an increasing trend due to large infrastructure projects. Mitigation finance was predominantly used to support the energy and transport sectors, while Adaptation finance has a broader application. Loans are the most widely used financial instrument, comprising over 70% of the total available. Half of the total amount financed was utilized in 20 countries in Asia, Africa, and the Americas, representing almost three-quarters of the total population of developing countries. However, estimates from the IPCC (2018) suggest that even if the annual funding target is met, the world's transition to a low-carbon future and the effort to avoid warming above 1.5°C will cost between 1.6 trillion and 3.8 trillion each year through 2050.

The Yale Center for Environmental Law & Policy, founded in 1994 by the Yale School of Forestry & Environmental Studies and the Yale Law School in collaboration with Columbia University's Center for International Earth Science Information Network, developed the Environmental Performance Index (EPI). This composite index is used to rank 180 countries based on 40 performance indicators across 11 categories and 3 main objectives: climate change performance (climate change mitigation), environmental health (air quality, waste management, products and sanitation, and heavy metals), and ecosystem vitality (biodiversity & habitat, ecosystem services, fisheries, agriculture, acid rain, and water resources). In an effort to assess the sustainability performance of countries using the EPI, Wolf et al. (2022) positioned 23 European states in the top 25, with the majority from central and northern

Europe. Denmark emerged as the top performer in each category, notably for its efforts to promote a clean energy future and sustainable agriculture. The United Kingdom and Finland secured second and third place, respectively, due to their strong commitment to reducing greenhouse gas emissions. The United States of America is placed 43rd, while India ranks at the bottom of the list, below Pakistan, Bangladesh, Vietnam, and Myanmar. The analysis indicates that only a handful of countries are currently projected to achieve carbon neutrality by 2050. Furthermore, if current trends persist, four countries (China, India, the United States, and Russia) will contribute to over 50% of global greenhouse gas emissions by that time. Additionally, 24 countries will be responsible for nearly 80% of world pollution.

In the financial sector, prompted by the United Nations, a debate has emerged among financial institutions regarding corporate social responsibility. Today, Environmental, Social, and Corporate Governance (ESG) data serve as a measure to evaluate the impact of corporate activity in the three areas related to the environment, society, and governance. Empirical evidence indicates that portfolios constructed based on an analysis incorporating ESG criteria generally demonstrate better investment performance. Therefore, these factors should be given significant consideration for making profitable investment decisions (Maiti, 2021).

The research conducted by Friede et al. (2015) reviews studies on the relationship between ESG indicators and Corporate Financial Performance (CFP) dating back to the 1970s. The study found over 2,000 empirical works, with around 90% showing a non-negative result in the ESG-CFP relationship. The majority of these studies yield positive results with a stable effect over time. While the relationship between ESG principles and value creation has been established in many studies (Henisz et al., 2019), Garcia et al. (2017), with the aim of filling a gap in the scientific literature due to the lack of data available in emerging countries, explore the correlation between the best ESG performances and financial results in a selection of 365 sensitive industries between 2010 and 2012 in the BRICS countries: Brazil, Russia, India, China, and South Africa. Using linear regression with panel data and controlling for company size and country, the study finds a strong positive relationship. Another empirical analysis conducted by Alsayegh et al. (2020) on the Asian corporate market from 2005 to 2017 examines the impact of ESG information disclosure in relation to corporate economic, environmental, and social sustainability performance. The results show that social and environmental performance is significantly positive in relation to sustainable economic performance, suggesting an interdependence between internal and external sustainability. This finding aligns with another study by Tarmuji et al. (2016), which analyzed non-financial data of Asian countries for the period 2010-2014.

In addition to analyzing how the environmental problem and climate change are identified in the literature, the implementation of concrete policies capable of addressing increasingly stringent needs requires essential support from public opinion. Therefore, there is a need to observe people's preferences with reference to the topic in its various dimensions.

The latest surveys on Climate Change and Energy-related problems conducted by the European Commission (2021, 2022) in the 27 European Union Member States reveal broad support for European energy independence policies, particularly through

strong investments in renewable energies. The fight against climate change is perceived as a suitable moment to improve health and promote innovation, opportunity, and well-being. While a portion of the population expresses concern about possible short-term economic repercussions, it still anticipates a positive trend in the medium and long term due to preventive actions against more serious consequences. Analyzing the four main areas of the 2021 report (perceptions, actions, attitudes, and projections), we find that Europeans consider climate change the most serious problem the world is facing, surpassing, for the first time, concerns about poverty, hunger, and lack of drinking water. Since 2019, the idea of a shared responsibility involving all social actors has increased. Even though the perception of personal responsibility is lower than that attributed to national governments, companies, and the European Union, two-thirds of the respondents declare that they take actions in favor of the environment. In addressing climate change, Europeans not only claim to recycle and limit waste, but they also alter their consumption choices, with more than 30% opting for more organic food and reducing meat consumption

Using text mining models, Kaushal et al. (2022) conducted an exploration within the popular social discussion platform Reddit, analyzing approximately 1.7 billion posts across 55 thematic rooms related to climate from 2008 to 2021. Employing the Universal Sentence Encoder (USE) and a K-means machine learning clustering algorithm, they automatically classified posts, observing trends and novel developments over time in 12 main fundamental areas, listed in order of prevalence: Energy, Wildlife, Climate Science, Population & Economy, Administration, Natural Catastrophes, Carbon Emissions, Agriculture, Global Warming, Plastic & Waste, General Posts, and Undefinable. The study suggests that public institutions have been successful in spreading awareness about environmental problems but have not been as effective in communicating the specific causes and actors responsible for them. Another European study on climate change and energy issues, conducted by Loureiro and Alló (2020), focused on text mining analysis of the social media platform Twitter for the United Kingdom and Spain during 2019. Using natural language processing (NLP) tools, they discovered that sentiments related to climate change in the UK are less negative compared to Spain, where fear is the most prevalent sentiment. Regarding energy preferences, there are no significant differences between the countries, with both showing a greater prevalence of positive feelings toward renewable energies, negative feelings toward fossil fuels, and ambiguous sentiments toward nuclear energy.

The multidimensionality of the problem is highlighted by Hornsey et al. (2016) in a meta-analysis examining the relationship between belief in climate change and twenty-seven variables representing demographic and psychological characteristics of the subjects. The result is that climate change skepticism seems to be less affected by demographic variables such as gender, age, sex, race, income, education, (subjective) knowledge, and experience with extreme weather events compared to the role of psychological variables such as values, ideologies, and political affiliation. To enhance consensus on climate protection actions, the research suggests to invest more in communication aligning with people's values related to patriotic choices or the opportunities presented by green technologies. Another significant finding is that belief in climate change has only a modest influence on people's pro-climate behavior and support for specific public policy interventions. Additionally, similar

reactions are observed when examining the relationship between hoped-for behaviors and actual actions. The multidimensionality of environmental protection is also addressed in a recent study by Skeirytė et al. (2022) on the perception-behavior relationship between different age groups (Baby Boomer generation, Generations X, Y and Z) in Europe. The emerging result indicates that young people feel closer to the problem of climate change but engage in less direct action, possibly due to an emerging attribution of responsibility to governments and businesses rather than themselves. An important but often overlooked factor is the consideration of territorial differences in preferences and behaviors, where significant variations emerge, as shown in the study by Poortinga et al. (2019) across the European region. The analysis, conducted in 23 countries, finds more consistency between countries for variables related to human values, political orientation, and education than for gender and age. However, the size of the effect still differs, at least for the macro-regions. Feeling politically closer to the left, having a higher level of education, and aligning more with less materialistic values (referred to as self-transcendence) consistently show a greater sensitivity to environmental problems for all countries. Meanwhile, age and gender have a more ambiguous effect in terms of significance and trend. Despite the impact, it appears that demographic and political factors are stronger in Western Europe compared to Eastern Europe.

The purpose of this work is to contribute to the existing literature on the topic and leveraging the available data from the European Social Survey, the initial objective is to identify different dimensions of the climate change problem. Subsequently, the aim is to rank countries based on people's preferences related to these dimensions. Finally, a cluster analysis will be implemented to better examine similarities and distinctions among groups within the European context.

1.3 Data

The database used for the analyses is the European Social Survey (ESS), a public database active since 2001 that collects individual data through interviews every two years. It is a European academic research program officially recognized by the European Union.

The ESS collects a large amount of information in more than thirty countries, covering different spheres of citizens' lives, including crime, democracy and politics, values, immigration, use of the media, national identity, ethnicity, perception of discrimination, religion, social exclusion, trust in others and in institutions, psychophysical well-being, and socio-demographic characteristics. Depending on the years, modules dedicated to specific themes are added.

Round 8 of 2016 is used for this work, because it is the only one where we find extended views on welfare, climate change, and energy production and use. The number of interviewees is 44,387, who are part of 23 countries: Austria, Belgium, Switzerland, Czech Republic, Germany, Estonia, Spain, Finland, France, England, Hungary, Ireland, Israel, Iceland, Italy, Lithuania, the Netherlands, Norway, Poland, Portugal, Russia, Sweden and Slovenia.

1.4 Methodology

After defining 18 variables (Table A.1) that belong to different dimensions of the climate change problem, 5 indices are constructed to identify these dimensions through the use of fuzzy logic systems (commonly known as fuzzy logic). Fuzzy logic is useful for solving problems in a context of ambiguity and uncertainty, such as in survey analysis, to consider the nuanced or imprecise opinions of participants instead of limiting the answers to categories expressed in binary terms. Subsequently, given the importance of interaction between countries, the indices were used to derive a ranking of European countries most sensitive to climate change using the TOPSIS technique (Technique for Order of Preference by Similarity to Ideal Solution), which is commonly exploited in Multiple Criteria Decision Making (MCDM) problems. Finally, to leverage the large amount of information available, a cluster analysis was also implemented using the k-means technique, both at the level of countries and individuals.

1.4.1 Fuzzy Logic

Conventional mathematics enables the processing of precise information. However, in reality, we often encounter inaccurate information, such as sufficient well-being, the level of quality of life, or the degree of greenness.

For years, the use of inaccurate information in methods based on conventional mathematics has been challenging. The efficiency of many controls, mathematical models, predictions, and decisions has, therefore, been negatively impacted, as inaccurate information is often the only one available.

The theory of fuzzy sets, in conjunction with conventional mathematics, allows the processing of this type of information (Giribone et al., 2016; Zadeh, 1988).

In this paper, we will use fuzzy logic to define five indices of greenness for 23 European countries.

The fuzzy inference process includes three main steps:

- Membership functions
- Operations on fuzzy sets
- Inference rules

A membership function is a curve that defines how each point in the input space is mapped to the fuzzy set with a membership value (μ) between 0 and 1; the shape of this function can be tailored as needed.

If X is the domain of the input variable, and its elements are x, and A is a fuzzy set, then μA(x) will be the membership function of x for A.

The standard set of operations that can be performed on the fuzzy set includes union (OR), intersection (AND), and complement (NOT).

By the inference rule, we mean an "if – then rule" that has the form "if x is A, then z is C," where A and C are linguistic variables defined by fuzzy sets in domains X and Z, respectively.

For the use of these tools, fuzzy theory usually includes three phases: fuzzification, evaluation of the inference rules, and defuzzification of fuzzy outputs. Fuzzification is the process that defines inputs and outputs along with their respective membership functions, transforming the input values into degrees of belonging to a fuzzy set that explains the characteristics of the variables.

Once the input is fuzzified, you can evaluate the inference rules, which allow you to obtain different fuzzy set outputs (one for each rule). The outputs obtained must then be combined to make a decision, and aggregation can be achieved with the max(), min(), or sum() method. The last step is defuzzification, which takes the aggregated fuzzy set and returns a number.

1.4.2 Multi-Criteria Decision Making (MCDM): TOPSIS

MCDM methods have been employed across various sectors for the evaluation and classification. MCDM, a branch of operations research, deals with the design of mathematical and computational tools to support the evaluation of a finite number of alternatives. Among the numerous methods developed to solve real-world classification problems, the 'Technique for Order Preference by Similarity to Ideal Solution' (TOPSIS) is a highly effective technique. TOPSIS, developed by Hwang and Yoon (1981), is a simple classification method. The standard TOPSIS method aims to select alternatives that simultaneously have the shortest distance from the ideal positive solution and the greatest possible distance from the ideal negative solution.

The ideal positive solution maximizes the benefit criteria and minimizes the cost criteria, while for the ideal negative solution, it minimizes the benefit criteria and maximizes the cost criteria.

Taking into account $X = \{x_{ij}\}$ with $i = 1, \ldots, N$ and $j = 1, \ldots, P$ the data matrix that contains the coordinates of the points, the steps to implement the TOPSIS methodology are:

1. Construction of a normalized decision matrix

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{i=1}^{N} x_{ij}^2}} \qquad \forall i = 1, \ldots, N, \forall j = 1, \ldots, P \tag{1.1}$$

   where x and r are, respectively, the original and normalized values of the X matrix.

2. Construction of the weighted normalized decision matrix

$$v_{ij} = w_j r_{ij} \qquad \forall i = 1, \ldots, N, \forall j = 1, \ldots, P \tag{1.2}$$

   where $W = \{w_j\}$ with $j = 1, \ldots, P$, is the list of weights containing one weight for each criterion.

3. Determine the ideal positive and negative solution

$$A^* = [v_1^*, \ldots, v_p^*] \qquad A^- = [v_1^-, \ldots, v_p^-] \tag{1.3}$$

where:
$v_j^* = \{max(v_{ij})\ i = 1, \ldots, N$ if j is a benefit attribute ; $min(v_{ij})\ i = 1, \ldots, N$ if j is a cost attribute $\}$
$v_j^- = \{max(v_{ij})\ i = 1, \ldots, N$ if j is a cost attribute ; $min(v_{ij})\ i = 1, \ldots, N$ if j is a benefit attribute $\}$

4. Calculation of the separation measure for each alternative.

$$S_i^* = \sqrt{\sum_{j=1}^{P}(v_{ij} - v_j^*)^2} \qquad \forall i = 1, \ldots, N \tag{1.4}$$

$$S_i^- = \sqrt{\sum_{j=1}^{P}(v_{ij} - v_j^*)^2} \qquad \forall i = 1, \ldots, N \tag{1.5}$$

This indicates for each point the distance between the point and the positive and negative ideal solution.

5. Calculation of the relative measure of distance from the ideal solution.

$$V_i = \frac{S_i^-}{S_i^- + S_i^*} \qquad \forall i = 1, \ldots, N \tag{1.6}$$

where the value varies between 0 and 1 depending on whether the point is respectively close to the ideal negative solution or the ideal positive solution respectively.

The weights W used for the construction of the weighted normalized decision matrix can be calculated or chosen by the evaluator, according to the result to be obtained.

One method for calculating weights is entropy, which measures the amount of uncertainty given by the attribute $j = 1, \ldots, P$ that can be calculated using the formula:

$$e_j = -\sum_{i=1}^{N} \frac{r_{ij} * ln(r_{ij})}{ln(N)} \qquad \forall j = 1, \ldots, P \tag{1.7}$$

The information contained in each variable can be calculated as the complementary of the entropy:

$$d_j = 1 - e_j \qquad \forall j = 1, \ldots, P \tag{1.8}$$

Therefore, it is possible to calculate the weight proportional to the information content of each variable using

$$w_j = \frac{d_j}{\sum_{j=1}^{P} d_j} \qquad j = 1, \ldots, P \tag{1.9}$$

1.4.3 K-Means Clustering

The clustering problem is defined as the task of identifying homogeneous groups of points within a data set. Each of these groups is referred to as a cluster and can

be defined as a region where the density of objects is locally higher than in other regions.

The simplest form of clustering is partition clustering, which aims to divide a given set of data into disjoint subsets (clusters) to optimize specific clustering criteria. The most commonly used criterion is the clustering error criterion, which, for each point, calculates its squared distance from the center of the corresponding cluster and then sums up these distances for all points in the data set. A popular clustering method that minimizes clustering error is the k-means algorithm.

The k-means algorithm starts from a set of N points that count P variables for each point which must be divided into K classes $(C_1, \ldots, C_k)$ where C_k is the set of n_k points in cluster k and K is the number of cluster. If $X = \{x_{ij}\}$ with $i = 1, \ldots, N$ and $j = 1, \ldots, P$ is the data matrix which contains the coordinates of the points, the algorithm constructs the clusters in such a way as to minimize the sum of the squares of the Euclidean distance between each object and the centroid vector of the respective cluster. The centroid vector of the cluster C_k is a point of dimension P which can be calculated by averaging the values of each variable for each point belonging to the cluster.

With the notation just introduced, we can now proceed to describe the typical operations of the k-means algorithm:

1. Considering K initial points of dimension P, where S_k is the k-th point $S_k = (s_1, \ldots, s_P)$. These points are considered the centroids of the clusters and can be randomly chosen from the X matrix.

   To calculate the distance of a point x_{ij} from the centroid S_k it is possible to use the following formula or any other distance measurement that is considered useful for the specific case:

   $$dist(x_{ij}, S_k) = \sum_{j=1}^{P} (x_{ij} - s_j)^2 \qquad \forall k = 1, \ldots, K, \forall i = 1, \ldots, N \tag{1.10}$$

   Each point of the X matrix is placed in the cluster where the distance between the point and the centroid of the cluster is smaller.

2. The centroids of the clusters are re-calculated by averaging the values of each variable for each point belonging to the cluster.

3. The N points are reassigned to the cluster with the closest centroid.

Steps 2 and 3 of the algorithm are iteratively performed until no further changes in the allocation between points and clusters occur from one iteration to the next.

1.5 Results

In the first part of this chapter, following the previously presented methodology, starting from 18 green attitude variables in the database and identifying groups and subgroups, we initially create, for each country, the 5 climate sustainability indices under investigation by aggregating them through the use of fuzzy logic. Subsequently, using the same indices, with the application of the multi-criteria decision

making tool TOPSIS, we develop a classification of countries to compare their environmental performances and create a ranking.

1.5.1 Climate sustainability indices

From the database, 18 greenness variables were categorized (extensively presented in Table A.1 and A.2 in the Appendix A, along with some descriptive statistics). Subsequently, by analyzing the literature and the correlation matrix (see Table A.3 in the Appendix A), five macrogroups were identified, representing different facets of the climate change problem: people's sensitivity to climate change (Climate Change Sensibility), propensity for individual action in environmental protection (Environment Care), trust in public and private efforts to mitigate climate change (Trust in Actions), support for public policies addressing climate change (Policy Support), and aversion towards energy production based on non-renewable sources (Renewable).

Given the context of uncertainty regarding people's real positions on the issues presented through their answers to the questions, after normalizing the variables, we decided to code these five macro-groups into indices using fuzzy logic systems.

Climate Change Sensibility represents the sensitivity of subjects to climate change, understood as the importance they attribute to the protection of the environment and nature, their perception and concern about climate change and its effects, and their opinion on the anthropogenic origin of this phenomenon. In this dimension, three subgroups are identified. The first subgroup pertains to awareness of climate change, comprising the variables Green1 and Green2. The second subgroup identifies the sense of concern about climate change, utilizing the variables Green3 and Green4. The last subgroup represents the importance placed on environmental protection and is composed of Green5.

Environmental Care indicates the extent to which people are inclined to take actions to protect the environment, such as reducing their energy consumption, purchasing high-energy efficiency equipment, and gauging their personal responsibility for climate change. Two subgroups have been introduced for this index. The first consists of Green6 and Green7, indicating people's propensity to take actions against energy waste. The second, including Green8 and Green9, measures personal responsibility toward climate change.

Trust in Actions, assesses the extent to which individuals trust the efficacy of both private and public initiatives in addressing the challenges posed by climate change. This index is derived from the analysis of variables Green10, Green11, and Green12.

Policy Support gauges individuals' level of support for public climate protection policies, encompassing measures such as the taxation of fossil fuels, subsidies for renewable energy, and the prohibition of low-energy efficiency household appliances. It is composed by Green13, Green14, and Green15.

Renewable reflects the extent of individuals' reluctance towards national energy production derived from non-renewable sources such as coal, natural gas, and nuclear power. This index is constructed by aggregating the variables Green16, Green17, and Green18.

With fuzzy logic systems, each subgroup for each index is studied first, from which the final indices are subsequently processed and defined.

Due to the short Likert scales applied to Green1, Green2, Green3, Green4, Green5, Green6, Green13, Green14, Green15, Green16, Green17, and Green18, we chose to use triangular fuzzy numbers with three categorized dimensions: Low, Medium, and High (Figure A.1 in the Appendix A).

For Green7, Green8, Green9, Green10, Green11, and Green12, which are formed by Likert scales of larger dimensions, trapezoidal fuzzy numbers were preferred. These numbers consistently represent three categorized dimensions: Low, Medium, and High (Figure A.2 in the Appendix A).

In pairwise comparisons of two variables, the defuzzification rules are outlined in Table 1.1, which also depict the logic employed for comparisons in groups of three.

Table 1.1: Fuzzy rules matrix for two-variable analysis

	L	**M**	**H**
L	L	L	M
M	L	M	H
H	M	H	H

The fuzzy output is defuzzified by applying the triangular fuzzy values of three categorized sets: Low, Medium and High (Fiugue A.3 in the Appendix A).

The results are presented as an average for each country in the following Table 1.2.

Table 1.2: Average indices values defuzzified by country

	Renew.	**Policy Sup.**	**Trust Act.**	**Env. Care**	**C. C. Sens.**
Austria	0,7305	0,6249	0,5563	0,5344	0,6414
Belgium	0,6762	0,6075	0,5696	0,5381	0,6316
Switzerland	0,7088	0,6428	0,5687	0,5471	0,6604
Czechia	0,5576	0,5494	0,5300	0,5189	0,6052
Germany	0,7067	0,6363	0,5485	0,5525	0,6429
Estonia	0,6880	0,5628	0,5181	0,5244	0,6311
Spain	0,6369	0,5908	0,5600	0,5422	0,6718
Finland	0,6515	0,6217	0,5578	0,5383	0,6505
France	0,6450	0,5879	0,5594	0,5501	0,6476
United Kindom	0,6098	0,5798	0,5574	0,5355	0,6319
Hungary	0,5758	0,6151	0,5540	0,5281	0,6547
Ireland	0,6610	0,5482	0,5617	0,5339	0,6354
Israele	0,5389	0,5880	0,5492	0,5261	0,6282
Iceland	0,8055	0,5772	0,5714	0,5351	0,6422
Italy	0,6547	0,5895	0,5615	0,5413	0,6483
Lithuania	0,5799	0,5616	0,5553	0,5328	0,6156
Netherlands	0,7126	0,6112	0,5560	0,5298	0,6279
Norway	0,7459	0,6268	0,5571	0,5373	0,5991
Poland	0,5504	0,5810	0,5522	0,5373	0,6375
Portugal	0,6726	0,5999	0,5713	0,5463	0,6436
Russia	0,5202	0,5453	0,5242	0,5005	0,6263
Sweeden	0,7011	0,6379	0,5709	0,5447	0,6301
Slovenia	0,6186	0,6430	0,5426	0,5406	0,6679

It can be observed that the countries with the highest aversion to national energy production based on non-renewable sources (column "Renew." in Table 1.2) are

Iceland, Norway, and Austria, whereas Russia, Israel, and Poland have the lowest aversion.

The strongest support for public policies addressing climate change (column "Policy Sup." in Table 1.2) is evident in Slovenia, Switzerland, and Norway, while Russia, Ireland, and the Czech Republic exhibit the least favorable stance.

High levels of confidence in climate protection interventions (column "Trust Act." in Table 1.2) are reported in Iceland, Portugal, and Sweden, contrasted with lower confidence levels in Estonia, Russia, and the Czech Republic.

Germany, France, and Switzerland display a population more attuned to environmental concerns (column "Env. Care" in Table 1.2), with Russia, the Czech Republic, and Estonia ranking lower.

It is notable that Switzerland, Spain, and Slovenia lead in terms of population sensitivity to climate change (column "C. C. Sens." in Table 1.2), while Norway, the Czech Republic, and Lithuania report the lowest sensitivity levels.

Table 1.3: indices correlation matrix

	Renewable	**Policy Sup.**	**Trust Act.**	**Env. Care**	**C. C. Senss**
Renewable	1				
Policy Sup.	0,4541**	1			
Trust Act.	0,4846**	0,4212**	1		
Env. Care	0,5020**	0,6178***	0,6861***	1	
C. C. Sens.	0,0821	0,3875*	0,2714	0,4522**	**1**

From Table 1.3, that represent the correlation matrix of the four indices, it is evident that the indices are strongly correlated with each other, showing statistically significant coefficients, all with positive signs. The most notable correlation is observed between individuals' environmentally friendly activities and their confidence in climate protection interventions, as well as their support for public policies to address climate change.

1.5.2 Country classification

In the following step, we aimed to establish a ranking of the countries under investigation based on their greenness using the five indices. The chosen tool for this analysis is TOPSIS, as introduced in Section 1.4. TOPSIS is a technique for ordering preferences in multidimensional MCDM problems that compares each value by its distance from the contextual ideal solution.

Since it was not necessary to normalize the data, as it had already been normalized in the previous phases, we proceeded directly to assign weights to the various dimensions. To determine the weights, we opted for a data-driven method that attributes weights based on the information content of the various variables, utilizing an entropic method based on Shannon's entropy calculation (1948). This method is often employed in the literature for calculating TOPSIS weights, as seen in Behzadian et al. (2012).

The resulting weights are shown in Table 1.4 below. These weights give only a marginally higher preference to the "Renewable" and "Policy Support" variables, which are the dimensions that have the greatest impact on climate protection.

Table 1.4: Weights

Renewable	PolicySup.	Trust Act.	Env. Care	C. C. Sens.
0.2002	0.2001	0.1999	0.1999	0.1999

After identifying the Ideal best and Ideal worst values, as shown in Table 1.5, the countries are sorted by calculating the Euclidean, Manhattan, and Mahalanobis distances, which are presented in Table 1.6. These results exhibit a certain consistency in defining three groups of countries: Central and Northern Europe, Southern and Western Europe, and Eastern Europe. In Figure 1.1, the spatial representation of the indices calculated with the Euclidean distance, the most conventionally used, can be observed.

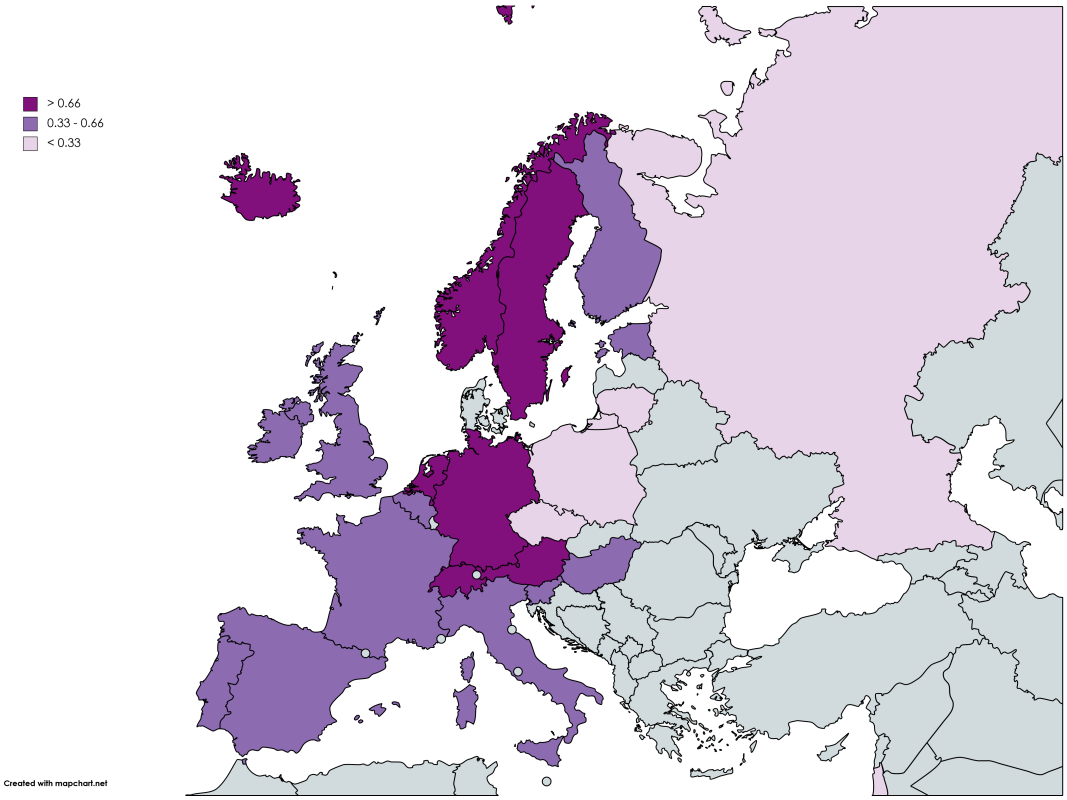
Table 1.5: Ideal best and Ideal worst values

V+	0,1613	0,1287	0.1142	0.1104	0.1343
V-	0.1041	0.1091	0.1036	0.1001	0.1198

Table 1.6: Comparison of the order of the countries with the use of the three different distances

	Eucleidian		**Manhattan**		**Mahalanobis**	
Iceland	0,8001	1	0,7989	1	0,6485	3
Austria	0,7310	2	0,7205	3	0,6315	4
Norway	0,7157	3	0,6825	6	0,4739	19
Switzerland	0,7035	4	0,7923	2	0,7228	1
Germany	0,6760	5	0,7196	4	0,5960	8
Sweeden	0,6577	6	0,7156	5	0,5615	11
Netherlands	0,6553	7	0,6316	7	0,5294	14
Belgium	0,5648	8	0,6057	9	0,5485	12
Portugal	0,5604	9	0,6245	8	0,6115	6
Estonia	0,5205	10	0,4300	17	0,4940	16
Finland	0,5173	11	0,5998	10	0,6030	7
Italy	0,4983	12	0,5563	13	0,6137	5
France	0,4735	13	0,5466	14	0,5903	9
Spain	0,4688	14	0,5676	12	0,6582	2
Ireland	0,4663	15	0,4578	15	0,5475	13
Slovenia	0,4605	16	0,5873	11	0,5878	10
United Kindom	0,3517	17	0,4120	18	0,4930	17
Hungary	0,3284	18	0,4358	16	0,5045	15
Lithuania	0,2459	19	0,2886	20	0,4302	20
Poland	0,2279	20	0,3120	19	0,4756	18
Israele	0,1968	21	0,2622	21	0,3874	21
Czechia	0,1366	22	0,1389	22	0,2927	22
Russia	0,0817	23	0,0593	23	0,2721	23

Figure 1.1: Distribution map of the different countries ordered with the Euclidean distance



In section A.2 of the Appendix A, we followed the same procedure as above, but applied subjective weights to the TOPSIS to give greater importance to dimensions presumed to have the greatest impact on climate protection, such as Policy Support and Renewable, and less importance to those more related to feelings, awareness, and trust, such as Climate Change Sensibility and Trust in Actions (Table A.5). In the end, the distribution of countries into three groups remains very similar to that found with the previously imposed weights, confirming the presence of three different models within the sample (Tables A.5, A.6, and Figure A.4).

1.5.3 Discussion

In the TOPSIS analysis, although with different nuances given by the various methodologies for calculating distances or the choice of weights, three macro-regions can be identified, based on the greater or lesser greenness of the countries. In terms of performance, from best to worst, we find Northern and Central Europe, followed by Southern and Western Europe, and lastly, Eastern Europe.

Considering the results obtained through the use of the Euclidean distance, the most conventionally used, the first macro-area, characterized by greater attention to the climate, includes Iceland, Austria, Norway, Switzerland, Germany, Sweden, and Netherlands. The second group, which includes Mediterranean countries and some Baltic countries, is represented by Italy, France, Spain, Portugal, Finland, Estonia,

Belgium, Ireland, and Slovenia. The last group, with a lower greenness index than the previous ones, is represented mostly by countries in Eastern Europe: Russia, Czech Republic, Poland, Lithuania, and Hungary, as well as Israel and England.

As mentioned above, this spatial distribution, characterized by three geographical macro-areas, is also observed in studies conducted using Manhattan and Mahalanobis distances, although for the latter, the coefficients obtained lead to a greater concentration of countries at a level of moderate greenness.

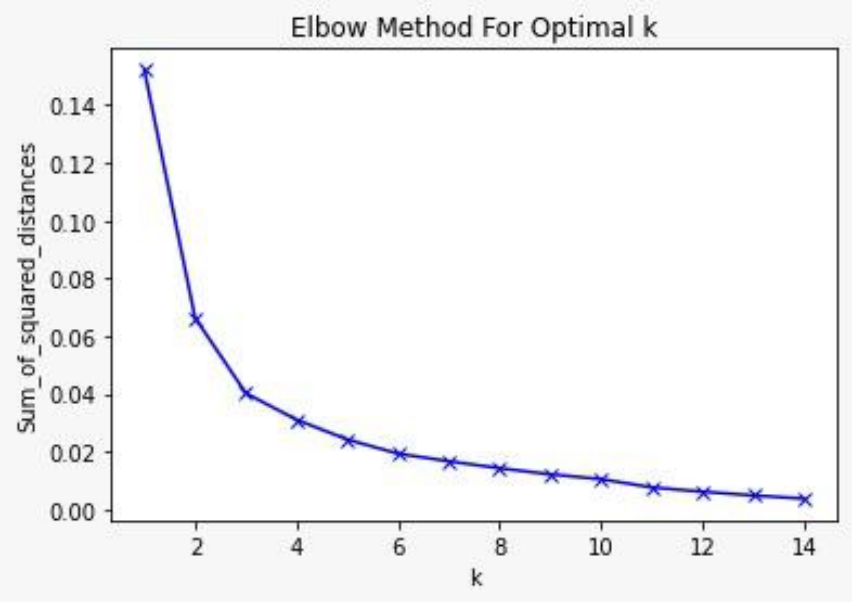
1.6 Cluster analysis

Considering the wealth of information provided by the multidimensionality of the indices, it was decided to further develop the research with a cluster analysis on the sample, both at the country level and for individuals, to identify the dimensions that best suit them.

1.6.1 Cluster analysis: countries

Beginning with the analysis of the countries, as depicted in Figure 1.2, the Elbow method was employed to determine the optimal number of clusters. The results indicate that the most suitable dimension for our groups is 3, further confirming what we observed empirically through the TOPSIS analysis.

Figure 1.2: Elbow rule for choosing the best number of clusters for countries



By configuring the number of clusters to 3, utilizing the L2 distance, or Euclidean distance, and initializing from randomly selected points within the data set through the kmeans method, three country groups are identified. As shown in Table 1.7, which presents the averages for each indicator in each cluster, these groups exhibit variations in their overall performance concerning climate change. Cluster

1, consisting of Germany, Switzerland, Austria, the Netherlands, Norway, Sweden, and Holland, performs the best, followed by Cluster 2, comprising Italy, France, Spain, Portugal, Slovenia, Belgium, England, Ireland, Finland, and Estonia. Lastly, Cluster 3, with Russia, Poland, Czech Republic, Hungary, Lithuania, and Israel, demonstrates the least favorable performance.

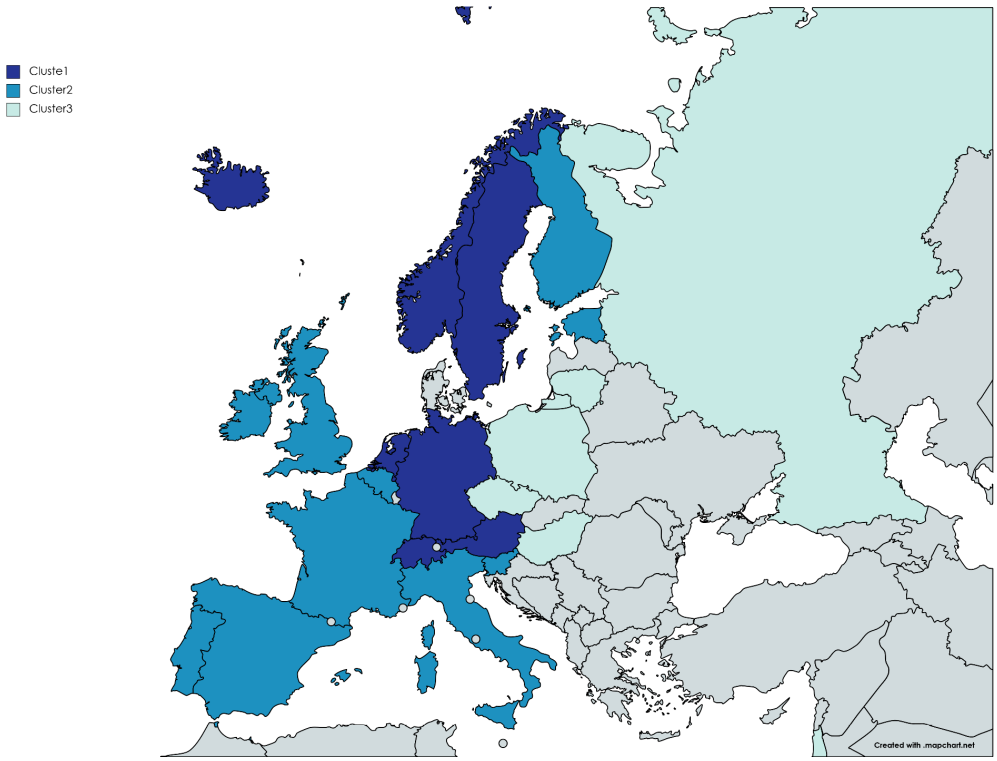
A more detailed analysis reveals that the three clusters primarily differ in people's aversion to national energy production based on non-renewable sources, with Cluster 1 displaying significantly higher values than Cluster 2, and a notable difference between Cluster 2 and Cluster 3. Although with smaller amplitudes, these differences persist for the other indicators, except for the index of people's sensitivity to climate change, where Cluster 2 performs the best.

In general, as depicted in Figure 1.3, the spatial representation of the clusters closely mirrors the patterns identified in the previous TOPSIS analysis, allowing us to still identify the three regional models categorized based on greenness performance.

Table 1.7: Indices averages by weight cluster countries (cluster centroid)

	Renewable	Policy Sup.	Trust Act.	Env. Care	C. C. Sens.	Obs	
Cluster1	0.7302	0.6224	0.5613	0.5401	0.6349	7	
Cluster2	0.6514	0.5931	0.5559	0.5391	0.6460	10	
Cluster3	0.5538	0.5734	0.5441	0.5240	0.6279	6	
						23	Tot

Figure 1.3: Spatial representation of the three clusters

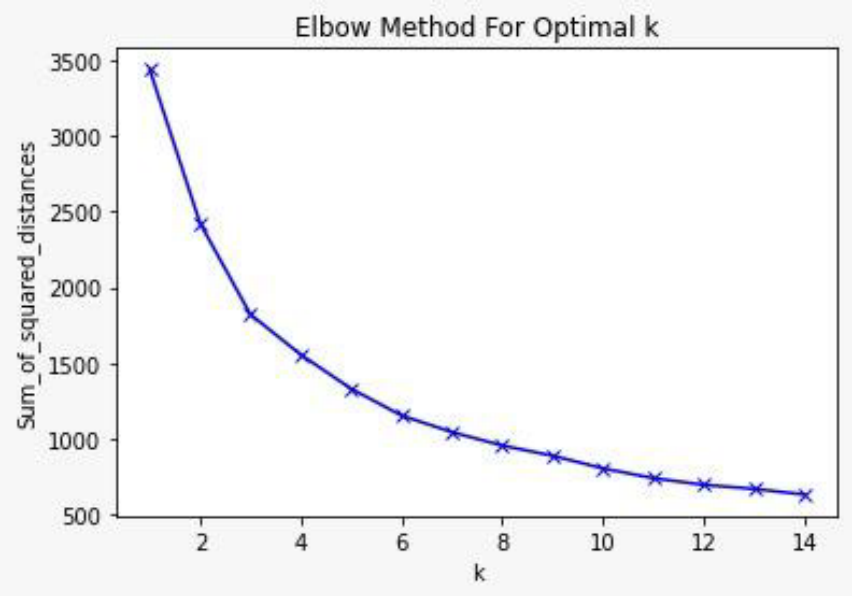


1.6.2 Cluster analysis: individuals

Considering the level of detail of the information within our database, we opted for an additional phase of the investigation, delving from the country level and directly clustering the population to unveil its composition into groups with similar characteristics.

The clustering methodology employed replicate that used for countries. The elbow rule, as depicted in Figure 1.4, once again suggests the existence of 3 groups.

Figure 1.4: Elbow rule for choosing the best number of clusters for the population



From Table 1.9, which illustrates the distribution of the population of the countries across various clusters, we observe that approximately half of the total population is allocated to Cluster 3. Additionally, Table 1.8, displaying the averages of each index for the different clusters, reveals that Cluster 3 exhibits the poorest overall greenness performance compared to the other two in all the dimensions analyzed. For most countries, Cluster 3 represents the largest group, and the countries where this is not the case are also those identified in the previous analysis as belonging to the best-performing clusters.

While Cluster 3 is the most numerous and exhibits lower index values, the other two clusters, with a fairly balanced distribution of the remaining population, do not significantly differ from each other in terms of overall better or worse performance. However, their divergence becomes evident when considering specific index groups.

Cluster 1, as observed in Table 1.8, is characterized by a high level of support for public intervention policies. It also shows better values for the Trust in Actions, Environment Care, and Claimant Change Sensibility indices. On the other hand, concerning people's aversion to energy production based on non-renewable sources, Cluster 2 has a markedly higher index.

Table 1.8: Indives averages per cluster population (cluster centroid)

	Renewable	Policy Sup.	Trust Act.	Env. Care	C. C. Sens	Obs	
Cluster1	0.6933	0.8172	0.5755	0.5541	0.6737	12324	
Cluster2	0.8187	0.5155	0.5755	0.5541	0.6737	11518	
Cluster3	0.5138	0.5041	0.5432	0.5235	0.6183	20545	
						44387	Tot

Table 1.9: Population distribution in clusters

	Cluster1		**Cluster2**		**Cluster3**		**Tot**
Austria	702	34,93%	893	44,43%	415	20,65%	2010
Belgium	533	30,18%	507	28,71%	726	41,11%	1766
Switzerland	599	39,28%	487	31,93%	439	28,79%	1525
Czechia	533	23,49%	207	9,12%	1529	67,39%	2269
Germany	1094	38,36%	913	32,01%	845	29,63%	2852
Estonia	327	16,20%	909	45,02%	783	38,78%	2019
Spain	545	27,83%	448	22,88%	965	49,28%	1958
Finland	598	31,06%	425	22,08%	902	46,86%	1925
France	520	25,12%	509	24,59%	1041	50,29%	2070
United Kindom	450	22,97%	346	17,66%	1163	59,37%	1959
Hungary	556	34,45%	214	13,26%	844	52,29%	1614
Ireland	586	21,25%	900	32,64%	1271	46,10%	2757
Israele	640	25,03%	280	10,95%	1637	64,02%	2557
Iceland	185	21,02%	633	71,93%	62	7,05%	880
Italy	672	25,59%	749	28,52%	1205	45,89%	2626
Lithuania	407	19,18%	407	19,18%	1308	61,64%	2122
Netherlands	549	32,66%	620	36,88%	512	30,46%	1681
Norway	559	36,18%	681	44,08%	305	19,74%	1545
Poland	366	21,61%	175	10,33%	1153	68,06%	1694
Portugal	436	34,33%	373	29,37%	461	36,30%	1270
Russia	296	12,18%	180	7,41%	1954	80,41%	2430
Sweeden	622	40,10%	465	29,98%	464	29,92%	1551
Slovenia	549	42,00%	177	15,07%	561	42,92%	1307
Tot	12324	27,76%	11518	25,95%	20545	46,29%	44387

1.7 Conclusions

Beginning with the assumption that facing climate change requires collective cooperation policies among countries worldwide, attributing blame and responsibility cannot be confined to an analysis based solely on greenhouse gas emissions without considering the broader context. Without acknowledging various local realities and their multidimensional preferences, effective interaction between countries becomes challenging, especially given the voluntary, non-binding nature of proposed policies and their susceptibility to political fluctuations. Therefore, in this analysis, incorporating insights from the existing literature and observing population preferences, our initial aim was to establish a ranking of countries based on the citizens attitudes on five relevant dimensions of the climate problem. Subsequently, we conducted a cluster analysis to identify similar characteristics among them.

In the first segment of the research, we observed a three-speed Europe concerning the environmental dimension. Northern and central European countries demonstrate advanced climate efforts, followed by western and southern European countries with moderate performances, and eastern European countries lagging behind,

likely due to their heavy reliance on non-renewable energies. In the second part of the study, the cluster analysis continued to reveal three divisions within Europe: a high-performing group, an average-performing group, and a lower-performing group. However, the key distinction between the high-performing and average-performing groups lies primarily in their aversion to non-renewable energies, while sensitivity to climate change remains relatively consistent across all groups.

Finally, in the population-level cluster analysis, distinct and nuanced patterns emerge. The presence of three groups persists, with a dominant less-performing group (comprising almost 50% of individuals). However, among the remaining two groups (equally distributed), neither stands out as categorically superior. Instead, two models emerge, one more sensitive to non-renewable energies and another more interventionist. This conclusion underscores the imperative for in-depth regional investigations to inform and implement effective public interventions, garnering the requisite support.

Chapter 2

Exploring the Multifaceted Relationship between Environmental Attitudes and Political Voting

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Abstract

Understanding the intricate connection between various individual attitudes towards the environment and support for environmental political parties is essential. In this study, we use the 2016 climate change module from the European Social Survey, employing a wide range of individual features and a machine learning approach to explore this complex relationship. Our analysis reveals a decoupling between personal and political dimensions of pro-environmental attitudes. While pro-environmental sensitivity and climate change awareness primarily identify individuals engaged in ecologically-conscious personal behavior, they do not necessarily indicate support for eco-friendly policies. Furthermore, while sensitivity and engagement are associated with increased civic participation and less support for populist political parties, increased support for pro-environmental parties is primarily linked to policy support for eco-friendly initiatives. These findings emphasize the need for comprehensive strategies to garner support for environmental policies in both personal and political realms.

Key words: Climate Change, Policy preferences, Voting, Environmental attitudes, Machine Learning.

2.1 Introduction

The pressing need for policies confronting climate change, as emphasized by UNFCC (2015), begs for a better understanding of the dynamics of political support for pro-environmental political parties. In particular, the relationship between individual attitudes towards the environment and voting for environmental changes remains inadequately understood. Current research has predominantly concentrated on various "green" attitudes and isolated instances of "green" voting, mostly without recognizing that pro-environmental attitudes encompass diverse dimensions (see Drews and Van den Bergh 2016, for a comprehensive review).

One such dimension is general sensitivity to the environment, which is well reflected in responses to questions regarding the degree of care for nature (Perkins, 2010), while a potentially distinct one is awareness of the significance, scale, and causes of climate change (Poortinga et al., 2019)[1]. These attitudes can be considered as potential motivational factors underlying ecologically-conscious behavior and support for eco-friendly policies (e.g., Casaló and Escario 2018; Iwińska et al. 2023; Sharpe et al. 2021). Each of these attitudes and choices may be related to pro-environmental voting, but probably not in the same way and to the same extent. A priori, it cannot be ruled out that such a relationship may be either nonexistent or weak. Environmentally conscious individuals, for instance, might abstain from voting for pro-environment parties if they prioritize other issues during elections. Conversely, if they mistrust pro-environmental political parties advocating eco-friendly policies, they may abstain from voting altogether or support populist parties.

Analyzing the intricate relationships among these various environmental attitudes and voting is the focus of this paper. Our aim is to clarify these relationships and the underlying factors, rather than focusing on a causal analysis of specific mechanisms linking these attitudes. The relationships we discover may help suggest new hypotheses and guide future research efforts aimed at carefully identifying specific mechanisms. In other words, we identify in our analysis "who" the individuals holding these attitudes and voting preferences are using a large set of predictors and in this way we open up new possible insights on "why". In this sense, our comprehensive approach is complementary to causal analysis, rather than substituting for it. By uncovering (unexpected) patterns in the data, it may bring to the surface overlooked explanations that can then be considered for further investigation. When it comes to specific mechanisms, we already have some papers taking steps in this direction. For instance, Schumacher (2014) finds a significant association between awareness of global environmental issues and voting for the Green party in Germany. Schwirplies (2018) examines the relationship between specific beliefs on climate, climate change awareness, and policy support, identifying a robust correlation between the first two and the latter variables. When looking at individual drivers of several climate change perceptions, Poortinga et al. (2019) find that all perceptions seem to be associated with left-right political orientation. Similarly, Häkkinen and Akrami

[1]In this paper, we do not differentiate between climate change awareness and denial, treating denial as the opposite of awareness. However, we acknowledge that some studies view denial as the outright rejection of climate change, while awareness is often associated with uncertainty over its reality and degree (Lübke, 2022).

(2014) delve into awareness in connection with political attitudes, finding a strong link with traditionalism and a weak one with left-right political orientation. Following the lead of these papers, we explore various dimensions of "green" preferences and behavior. Differently from them, we consider relationships across a broad range of environment-related attitudes and pro-environmental voting behavior alongside an examination of a large range of predictors.

To reach our objective, we opt for a machine learning analysis of these relations by building upon the methodology initially introduced by Becker et al. (2017). With linear regressions, the high correlations among these variables would lead to interpretational challenges. Machine learning offers the clear advantage in this context of allowing us to utilize a large number of predictors to explore these relationships while maintaining interpretability (Tibshirani, 1996). This is essential to our analysis, as only with a substantial number of predictors for each attitude and voting preference we can accurately evaluate the relationships between them.

Leveraging the 2016 module on climate change from the European Social Survey, we initially employ LASSO regressions to probe the connection between various individual characteristics and opinions, and different facets of "green" preferences, encompassing sensitivity to nature, climate awareness, personal engagement, and policy support. We then use pairwise cosine similarity measures to assess the similarity in terms of predictors of these different preferences. A noteworthy decoupling between personal and political dimensions is revealed: individuals with higher sensitivity to nature and climate change awareness tend to engage more with pro-environmental personal behavior, while those with heightened policy support stand apart.

Subsequently, we apply the same LASSO regressions to scrutinize voting behavior, classifying European political parties based on environmentalism, left-right political orientation, cosmopolitanism, and populism using the Chapel Hill Expert Survey. The cosine similarity between the predictors of voting and green preferences reaffirms the decoupling between personal and political dimensions of pro-environmental attitudes. Voting for pro-environmental or Green parties is primarily associated with individuals who strongly support eco-friendly policies. The intersection between predictors identifies a group of individuals who are predominantly females, young, highly educated, not retired, working in services related to art or leisure more than in manufacturing, residing in large cities, politically active, positive towards politics and political parties, immigration-friendly, supportive of LGBT rights, and averse to inequality.

Instead, individuals with pro-environmental sensitivity and engagement exhibit higher levels of civic engagement, as they participate more to elections, albeit not necessarily aligned with pro-environmental political parties. In comparison with the previously listed characteristics, these individuals are older, patriotic, more religious, with higher levels of life satisfaction, not characterized on migration or inequality issues but believing the government should take care of fragile people, and not employed as manual workers. Lastly, sensitivity to nature is also associated to less support for populist parties, with age, gender, feelings toward one's country and the European Union, religiosity, life satisfaction, attitudes toward migration, and occupation type playing pivotal roles in driving the wedge between the "green" preference and the political behavior.

Our contribution spans across various facets of existing literature. The first strand examines the determinants influencing support for Green parties (e.g., Grant and Tilley 2019; Hoffmann et al. 2022; Michallet et al. 2015; Schumacher 2014). Both macro and individual-level analyses indicate that factors such as high income and education, coupled with low levels of inequality, contribute to the emergence of Green parties and the propensity of individuals to vote for them. An unresolved question in the current political landscape concerns the relationship between pro-environmental preferences and populism within political parties. Kroll and Zipperer (2020) discover that progress towards more sustainable development goals diminishes populist voting, while numerous papers in political science explore how populist attitudes often coincide with low climate change awareness (e.g., Fiorino 2022; Jylhä and Hellmer 2020). A significant dimension capturing opposition to pro-environmental parties in conjunction with populism is the urban-rural divide, often coinciding with a cosmopolitan-traditionalist one (Arndt et al., 2023; De Vries, 2018). Our contribution to this literature is threefold. Firstly, we extend the analysis of voting for Green parties by exploring voting patterns for parties that can be categorized as pro-environment, even if environmental issues are not their primary focus. Secondly, we delve into the relationship between voting behavior and attitudes, thereby expanding upon the initial findings by Schumacher (2014). Thirdly, we examine how pro-environmental attitudes correlate with political dimensions such as populism and post-materialist voting.

Diving into another facet of literature, researchers have explored support for pro-environmental policies and behavior. Some studies utilize specific referenda on "green" policies to gauge individuals' willingness to bear economic costs for advancing such initiatives. High levels of education consistently align with support for pro-environmental policies, while the correlation with income remains a subject of debate (e.g., Bornstein and Lanz 2008; Nelson et al. 2007; Thalmann 2004; Wu and Cutter 2011). Survey-based studies reveal that education, concerns about fairness, misconceptions about policy effectiveness, and political ideology play substantial roles in explaining resistance to climate change mitigation policies (Aasen and Vatn, 2018; Anderson et al., 2023; Attari et al., 2009; Contu et al., 2016; Douenne and Fabre, 2020, 2022; Maestre-Andrés et al., 2019; Sælen and Aasen, 2023; Sommer et al., 2022; Ziegler, 2017). Research from the U.S. highlights how campaigns questioning scientific agreement on the climate phenomenon drive misperceptions of the problem and thus a reduction in support for public policies and interventions (Ding et al., 2011; McCright et al., 2013). Kauder et al. (2018) delve into psychological factors and find that, in conjunction with political ideology, they can account for a significant portion of the variability in support for environmental protection policies. When elucidating pro-environmental engagement, Lades et al. (2021) suggest that pro-social preferences matter more than other individual characteristics or attitudes. We contribute to these studies with a more precise analysis of the connections between closely related concepts such as sensitivity towards the environment, climate change awareness, ecologically-conscious behavior and support for eco-friendly policies together with the individual characteristics that better predict them.

The paper is organized as follows. Section 2 introduces the methodology and Section 3 describes the outcome variables and the predictors considered in the analysis. In Section 4, we present our results, while Section 5 has some additional robustness

checks. Section 6 discusses the results and concludes with some policy implications.

2.2 Methodology

We use a methodology that consists of two steps. Moving in the direction of Levi and Patriarca (2020) and Becker et al. (2017), we first apply a machine learning procedure, without a priori theoretical restrictions, to obtain a prediction model for each outcome variable from a very large intial set of possible predictors. Next, the relationships between the different dimensions under scrutiny are explored through pairwise similarity indices of the vectors of best predictors.

The outcomes j are four indices for pro-environmental preferences and attitudes and seven indices for political preferences, which will be presented in detail in the next section. For each of these indices j, we look for a predictive model having the following linear specification:

$$y_i^j = \alpha^j + \beta^{1(j)} z_i^{1(j)} + ... + \beta^{k(j)} z_i^{k(j)} + c^j(i) + \epsilon_i^j \tag{2.1}$$

where $i \in [1, n]$ is the individual respondent in the sample, $c^j(i)$ is the country fixed effect and ϵ_i^j is the error term and $z^{1(j)}; ...; z^{k(j)}$ are the variable selected as best predictors among an extensive initial set of possible predictors. To make the coefficients β^j comparable across models, the indices are all scaled to the $[0, 1]$ interval and the predictors are standardized using the z-score method.

To select the variables to include in each index j model, we employ the Least Absolute Shrinkage and Selection Operator (LASSO). The primary aim of utilizing LASSO is to enhance the model's prediction accuracy by effectively reducing the complexity of the model (see Tibshirani (1996)). This is achieved through the selective shrinkage of less significant predictors towards zero, thus excluding them from the final model. By doing so, LASSO aids in mitigating the risk of overfitting and ensures that our model remains robust and interpretable[2][3].

Once we have obtained the best prediction model for each of the indices, we arrange the corresponding coefficients in vectors representing each single index. With these vectors, we can then we can then proceed to comparing pairs of models. Such vectors have different dimensions since each model contains its specific set of predictor. Some of them may be common to other models, while others may not. We then use a similarity index that allows us to handle both different dimensions of the vector and different signs of the single elements: the Cosine Similarity. This index helps

[2]To determine the optimal level of penalization and to finalize the model selection, we rely on the Bayesian Information Criterion (BIC) as our guiding metric. The BIC allows us to balance the model's fit with the number of predictors, favoring models that achieve a high level of accuracy with a minimal number of variables. This approach ensures that our selected model is not only predictive but also parsimonious, making it well-suited for practical applications where interpretability and efficiency are paramount.

[3]In general terms, the equation of the LASSO regression with the parameters λ is:

$$\hat{\beta}_{E.N.} = argmin_\beta \sum_{I=1}^{n} (y_i - x_i\beta)^2 + \lambda \sum_{K=1}^{k} |\beta_k| \tag{2.2}$$

where λ is the penalization parameter.

identify relationships and facilitates the interpretation of data in a multidimensional space with a large amount of information.

To calculate the cosine similarity between two numerical vectors, A and B, we use the following formula:

$$S_C(A;B) = \frac{\sum_{K=1}^{n} A(k)B(k)}{\sqrt{\sum_{K=1}^{n} A(k)^2}\sqrt{\sum_{K=1}^{n} B(k)^2}} \qquad \forall k = 1, \ldots, K \tag{2.3}$$

which returns a value ranging from -1 to +1, where +1 indicates that the two vectors are equal, -1 indicates that they are exact opposites, and 0 indicates that the vectors are orthogonal, meaning they share no common non-zero dimensions. By considering K as the set of all possible predictors, taking the set of the estimated coefficients of each model and setting the coefficients of the excluded variables to 0, we can compute the cosine similarity for each pair $(j_1; j_2)$ of estimated models. A value equal to 1 results when the two models are exactly equal, i.e., same predictors with same coefficients. A value -1 means that the two models have still the same predictors with the same magnitudes, however this time with opposite sign. In general, the index is higher when the coefficients of shared predictors are similar and when there are many of them. Conversely, it is lower when the coefficients of the common predictors are opposite in sign or when there are few of them[4][5].

2.3 Data Description

2.3.1 Data sources

The analysis relies on two publicly available survey data sources: individual-level data are drawn from the European Social Survey (ESS), while political party classifications come from the Chapel Hill Expert Survey (CHES).

The ESS is a cross-national survey that has been implemented throughout Europe from 2001 onwards. The survey covers various aspects of citizens' lives, attitudes, and behaviors. For this paper, we rely on the 2016 wave (Round 8), where the ad hoc module was on welfare, climate change, and energy production and use. In our analysis, we will only focus on voting-eligible adults from 18 European countries: Austria, Belgium, Czech Republic, Germany, Estonia, Spain, Finland, France, the United Kingdom, Hungary, Ireland, Italy, Lithuania, the Netherlands, Poland, Portugal, Sweden, and Slovenia. We obtain a harmonized sample of 27,231 observations. The ESS also provides population weights that are applied in the model estimation as specified in Equation 2.1.

The CHES classifies political parties worldwide by their ideological stance, political positions, and international relations (dataset). This classification is based on

[4] A low absolute value of the index can be found, then, either if there are few common predictors or if coefficients with the same sign compensate coefficients with opposite signs.

[5] Note that, according to the specification in Equation 2.1, the country level fixed effects are always included in the final models. As to focus on the relevance of the factors characterizing the attitudes and attributes of individuals, the coefficients corresponding to the country-level fixed effects are not included in the computation of the cosine similarity.

answers from a large pool of experts from each country so that the classification is not biased by the opinion of any specific expert. We use the 2019 CHES wave to link voting preferences from our ESS sample to voting for a pro-environmental, a left-wing, a cosmopolitan, and a populist political party. We could match approximately 98% of our listed 18,585 voters to CHES information on political parties[6].

2.3.2 Indices of green attitudes and beliefs

To measure individual attitudes and beliefs on climate change, we aggregate 13 variables from the ESS to create 4 indices of green attitudes and beliefs. We use the item "Important to care for nature and environment" as a general measure of *Environmental Sensitivity*, in the spirit of other papers that have discussed the relevance of biospheric values and of love for nature (De Groot and Steg, 2008; Perkins, 2010; Sharpe et al., 2021). As a more specific measure of beliefs related to climate change, we build an index we call *Climate Change Awareness* that includes all items related to climate change perceptions, including its anthropic dimension as a cause (Capstick et al., 2015; Poortinga et al., 2019). *Environment Engagement* combines four items on personal responsibility towards climate change, willingness to modify behavior related to energy usage and actual energy usage behavior. Similar questions from surveys have often been used in the literature to capture pro-environmental behavior (e.g. Attari et al. 2009; Casaló and Escario 2018). Finally, we consider the willingness to support policies that would result in more efficient energy consumption (e.g. Sælen and Aasen 2023; Sharpe et al. 2021). More specifically, in *Policy Preference* we include items on preferences for taxation, subsidies, and ban of the least-energy efficient home appliances. It is to note that the first two indices refer to motivational aspects, distinguishing between one that is more related to individual values and preferences and the other that relates more to the recognition of risk factors. The latter, represented by the awareness index, if read in the opposite way also measures the level of climate change denial or skepticism. The other two indices have more to do with actions, specifically with personal behavior and policy preferences. To build the indices, the original items - reported in their full length in Table B.3 - are first rescaled and then averaged. Descriptive statistics of the original variables and of the synthetic indices are reported in the Appendix B in the Tables B.2 and B.4.

2.3.3 Indices of Political preferences and behavior

To derive voting preferences, we exploit the information contained in the ESS concerning answers to the questions "Which party did you vote for in that election?" and "Did you vote in the last national election?". The second question is directly used as a dummy variable (*Vote*) representing political participation and civic engagement. Regarding the former question, we first construct a dummy variable (*Green Party*) that takes value 1 if the voted party is affiliated with the Green Party in the European Parliament, or if it can be directly classified as following a "green ideology" by the party name or by its specific identity. Then, part of our contribution is to go beyond merely considering Green political parties. To this end, we build five other

[6]Only in the case of the variable "Environmental salience" the information available in the CHES leads to a somewhat smaller sample, as shown in the Appendix B (Table B.7).

variables by matching the variable on the voted party with information on parties' policy positions contained in the CHES database. The first one is a dummy variable (*Environment*) that represents the voted party's stance on the economic costs of environmental sustainability. We assign value 1 to this dummy variable if the voted party's position is greater than or equal to 8 (over 10) on a pro-environmentalist policy scale in the CHES[7]. The other four variables classify each party based on the importance given to sustainability in the public stance (*Environmental Salience*), the traditional left-right axis (*Left-wing*), the Libertarian vs Traditional view (*Cosmopolitanism*), and the level of populism (*Populism*). We normalize them from the original 0-10 Likert scales on a scale of 0 to 1 for the sake of comparability of the regression coefficients with the model on Environment. Table B.5 summarizes all these variables. The list of green parties selected through their political affiliation to the European Parliament and their ideology, included in the Green Party variable, is reported in the Appendix B at Table B.7, along with the descriptive statistics of the 7 indices in Table B.6.

2.3.4 Predictors

For the selection of the best predictors, we start with 62 variables drawn from the ESS, representing an extensive set of individual characteristics and attitudes. We selected the predictors that are in someway related to environmental attitudes and behaviors, either because they are often mentioned in public debate, in combination with environmental issues, or because the literature has already considered them as determinants of these attitudes and behaviors. The full list of the 62 variables is reported in Tables B.8 and B.9, and the descriptive statistics are provided in the Appendix B in Tables B.10 to B.20.

All the socio-demographic and economic individual characteristics are used as potential best predictor candidates. Socio-demographic characteristics such as age, education and income have extensively been studied as possible determinants of environmental attitudes and this is why we include them in the present analysis (e.g. Thalmann 2004). For better readability, we aggregate similar attitude variables in some cases by extracting the first component of an associated Principal Component Analysis (PCA)[8][9]. Table B.12 summarizes the results of the variable aggregation and Table 2.1 shows the final list of predictors classified into categories. Their extended definitions and the statistics of the PCA analysis are shown in the Appendix B (Tables B.21 through B.42). The *Political Role* variable captures perceptions of one's capability to influence political spheres, while *Trust in institutions* aggregates responses related to various institutions, providing a nuanced measure of individuals' overall trust in societal and political pillars. *Political activism* encompasses actions like signing petitions, and participating in demonstrations, reflecting civic engagement. To these PCAs, we add *Time spent watching news*, *Interest in politics*, *Feeling close to a party*, and *Attachment* towards one's own country or Europe. All these attitudes are shown in several studies to be positively associated with envi-

[7]The values on this scale are on a Likert scale from 0 "Strongly supports economic growth even at the cost of environmental protection" to 10 "Strongly supports environmental protection even at the cost of economic growth".

[8]In all cases, the first component explains a relatively large share of the overall variability.

[9]As a robustness check we also consider a full model with all 62 variables.

ronmental attitudes (Cologna and Siegrist, 2020; Shah and Asghar, 2024; Taniguchi and Marshall, 2018). Additionally, *Sociability* integrates indicators of personal social interactions and activities, reflecting individuals' sociable tendencies, and the *Opinion about People* composite encompasses interpersonal trust, perceptions of fairness, and perceived helpfulness, offering insights into social trust[10]. These variables reflect social behavior and attitudes, respectively, related to altruism and social norms (Yang et al., 2024), while *Safety* and *Victim of a burglary* reflect the opposite feeling of insecurity (Carro et al., 2010). *Happiness and Life Satisfaction* is a composite variable combining measures of life satisfaction and self-reported happiness, providing a holistic assessment of overall well-being. The relation between well-being and pro-environmental attitudes and choices is well established, although there is disagreement over the direction of the association (Ferrer-i Carbonell and Gowdy, 2007; Venhoeven et al., 2013). The same can be said of *Belonging to a religion* or of the PCA capturing attitudes related to *Religion* (Preston and Baimel, 2021), which we capture with measures of religiosity, including intensity, attendance, and prayer frequency. We then aggregate several items into three distinct variables that reflect post-materialist values. These values are considered crucial for explaining the emergence of environmentalism and, as a backlash, of populist parties (Inglehart, 1981; Norris and Inglehart, 2019). We consider *Opinion on Lgtb topics*, which gauges attitudes towards sexual freedom and gay people, *Aptitudes toward immigration* encapsulating attitudes towards various aspects of immigration, and *Aptitudes toward inequalities* reflecting opinions on government responsibility, income differences acceptance, and perceptions of a fair society. Finally, *Feeling of social responsibilities* aggregates opinions on if the government should take responsibilities towards fragile people, such as children, the elderly, and the unemployed, and *Social benefits for inequalities* capture opinions on social benefits, covering aspects like sensitivity to poverty and equity. These attitudes are both related to preferences for redistribution which could well matter for pro-environmental attitudes and voting preferences (Armingeon and Bürgisser, 2021).

Table 2.1: Regressors in PCA models divided by groups

Politics	Time spent watching news, interest in politics, political role, feeling close to a party
Attachment - Voice	Trust in institutions, political activism, attached to own Country, attached to Europe
Aptitudes	Sociability, feelings about people, happiness and life satisfaction, feeling of safety, victim of a burglary
Religion	Belonging to a religion, religious attitude
Discrimination and Immigration	Opinions on Lgtb topics, attitudes toward immigration
Inequality and Social Policy	Attitudes toward inequalities, feeling of social responsibilities, social benefits for inequalities

[10] We consider interpersonal trust as fundamentally distinct from trust in institutions and politics, as in economics it is usually related more to social preferences (Fehr et al., 2005) than to political beliefs. This is why in the Tables we classify trust in institutions into *Attachment - Voice* and interpersonal trust into *Aptitudes*.

Socio-Demographic	Number of house members, presence of children at home, personal investment in knowledge improvement, level of education (ISCED), living in a big city, health (self evaluation), gender, age, Country citizen, born in Country, belonging to a minority, father born in Country, mother born in Country, foreign parents, EU Country
Economic	Occupation (ISCO8), employment sector (NACER2), kind of employment, type of work contract, activity, income (perceived)

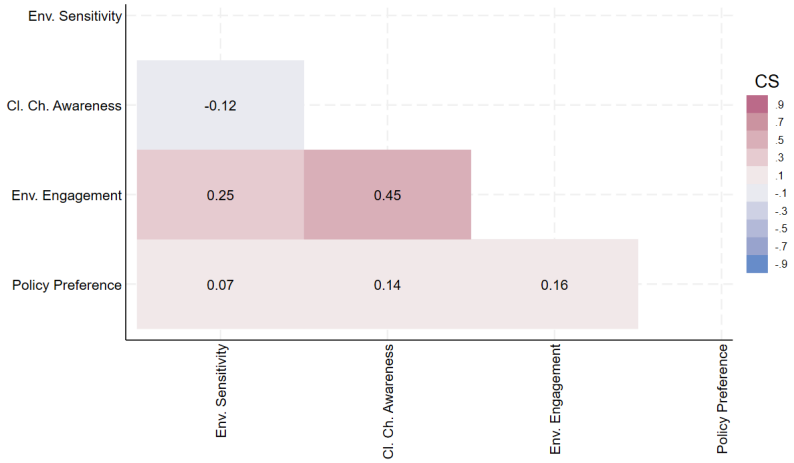
2.4 Results

We start by analyzing similarities and differences among various attitudes and beliefs regarding the environment and climate change, and subsequently examine their relationships with political preferences and behavior. Since our focus is not on the single predictive models, the full results of the best predictors models are reported in the Appendix B (Tables B.33 through B.35); instead, we focus on the analysis of matrices depicting cosine similarities between predictive models. Subsequently, we deepen the analysis by focusing on the common predictors of "similar" indices.

2.4.1 Green attitudes and beliefs

Figure 2.1 desplays a heatplot graph the cosine similarity between all 6 possible pairs of the 4 indices. More intense colors or higher values of the cosine similarity correspond to a higher overlap between the two corresponding predictive models.

Figure 2.1: Cosine similarity matrix of best predictor models Attitudes and Beliefs



The clearest evidence is the good fit between Awareness and Engagement predictors: being aware of climate change and having pro-environmental habits are predicted by

similar individual features. Sensitivity also has some similarities with Engagement, though to a lesser extent. While the two preferences that can be interpreted as motivations appear to be linked, on the side of choices, to personal commitment, they do not match Policy Preference at all. Indeed, all the other possible pairs do not show strong similarities, with only a very light association between Policy Preference and Engagement. Such low cosine similarities imply that the correspondent pairs of predictive models include very different variables. Although small in magnitude, the negative cosine distance between Awareness and Sensitivity even indicates that, within the very few common predictors, some of them have opposite signs. To sum up, predictors for Sensitivity and Awareness, the two motivational aspects of environmental care, despite being very different between each other, both match some features of Engagement. Sensitivity, Awareness and Engagement, instead, are not well alligned with Policy Preference.

For simplicity, we focus on shared predictors with the same signs. The first column of Table 2.2 shows the individual predictors that are common and concordant to all four prediction models. The overlapping predictors can be grouped in three areas: the political dimension (political and party interest, activism and attachment to Europe); the values dimension in terms of liberal and solidarity attitudes towards horizontal and vertical inequalities; the socio-demographic dimension, with educated profiles and a gender characterisation. Attitudes and lifestyles, the relationship with religion, economic and employment aspects are not common traits. These are the dimensions on which differentiation between models is determined. Age profiles are also missing from the common traits, which contradicts the possible hypothesis of an overall generational gradient in environmental attitudes.

Table 2.2: Common and equal sign predictors

Categories	**Common predictors All environmental indices**	**Other common predictors Engagement, Sensitivity and Awareness**
Politics	Interest in politics (+) Feel close to a party (+)	
Attachment Voice	Political activism (+) Attached to Europe (+)	Trust in institutions (-)
Aptitudes		
Religion		Religious attitude (+)
Discrimination and Immigration	Aptitudes toward immigration (+) Opinions on Lgtb topics (+)	
Inequality and Social Policy	Aptitudes toward inequalities (+) Feeling of social responsibilities (+)	
Socio - Demographics	*Educ.:* Lower secondary (-) *Educ.:* Higher tertiary (+) Female (+)	*Age.:* 41-50 (+) Born in country (-)
Economic		*Occ.:* Craft and Related.. (+)

Notes: Positive signs coefficients (+), negative signs coefficients (-). Variable category in Italic. Category reference classes: Age -21-30-, Education -Upper secondary- and Occupation -Professionals-. Complete list of categories in Table B.9.

In the second column of Table 2.2, we examine additional common predictors across Engagement, Sensitivity and Awareness, i.e. the three indices for which the higher similarities are recorded. The common traits mainly pertain to the sphere of socio-

demographic and religious attitudes. We observe a common characterization among *Religious attitude*, *Craft and related occupations*, middle age and, finally, in *Trust in institutions* and *Born in country* with negative sign.

Table 2.3: Others common and equal sign predictors

Categories	**Common predictors Engagement and Awareness (Excluded previous)**	**Other predictors Policy Preference (Excluded previous)**
Politics	Political role (+)	
Attachment Voice		Trust in institutions (+)
Aptitudes	Victim of burglary (+)	
Religion		
Discrimination and Immigration		
Inequality and Social Policy		Social benefits for inequalities (+)
Socio - Demographics	Inv. in knowledge impr. (+) Number of house members (+) *Educ.* Less than lower sec. (-) *Age.:* 81-90 (-) *Age.:* 91-100 (-)	*Educ.:* Lower tertiary (+) Living in a big city (+) *Age:* 31-40 (+) *Age:* 71-80 (-)
Economic	*Occ.:* Skilled agricultural (-)	Income (perceived) (+) *Occ.:* Elementary.. (-) *Wor. sec.:* Electricity.. (-) *Wor. sec.:* Human.. (+) *Wor. sec.:* Arts.. (+) *Act.:* Retired (-)

Notes: Common positive signs coefficients (+), common negative signs coefficients (-). Variable category in Italic. Category reference classes: Age -21-30-, Education -Upper secondary-, Occupation -Professionals-, Working sector -Manufacturing- and Activity -Paid work-. Complete list of categories in Table B.9.

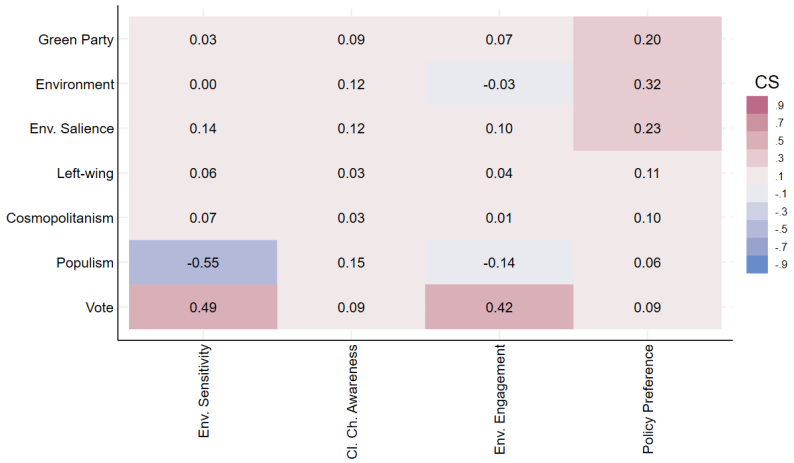
For completeness, the specific similarities between Engagement and Awareness are shown in the left-hand column of Table 2.3. This link - the strongest one from Figure 2.1 - is characterised on the side of non-socio-economic features by the perception of being more able to play a political role and having been a victim of burglary. Additionally, results show a higher educational profile, living in larger families, working less in the agricultural sector and not being relatively younger. Finally, we look at the specific predictors of Policy Preference in the right-hand column of the same Table 2.3. Most of them are economic and socio-demographic traits. The relevance of the urban-rural divide and income levels is noteworthy, marked by a positive coefficient for income and urban areas, and a negative coefficient for the elderly demographic and low-skilled occupational categories. It's also worth mentioning that the only other included individual characteristics are *Trust in Institutions* and *Social benefits for inequalities*.

2.4.2 Political preferences and behavior

We now shift our focus to exploring the relationship of pro-environmental attitudes with political choices and electoral participation. The corresponding cosine similarity matrix is presented in Figure 2.2. The predictors of Sensitivity, Engagement

and Awareness significantly diverge from those associated with pro-environmental parties, regardless of how the latter are defined. In contrast, the connection between Policy Preferences and pro-environmental voting behavior is quite strong. This link is more pronounced when considering all parties with pro-environmental platforms than specifically Green parties. The traditional left-right axis voting does not reveal any significant alignment with any of the indices. Instead, Left-wing voting only shows a slight proximity to Policy Preference. A similar trend is observed with voting for Cosmopolitan parties with liberal and non-authoritarian platforms, where the linkage is weak. Nonetheless, the patterns of the first three environmental indices do not diverge entirely from all the political variables examined. Notably, there is a discernible overlap between the patterns of Engagement and Sensitivity with those related to voting participation. Furthermore, when considering voting for populist parties, there is a noticeable negative overlap with Sensitivity.

Figure 2.2: Cosine similarity matrix
Voting preferences and environmental indices



Shifting our analysis to shared predictors, we aim to explore in greater detail three key observations: a) the relationship of "green" voting with Policy Preference; b) the linkage between participation in voting and the indices of Engagement and Sensitivity; c) the negative relationship between Sensitivity and Populism.

Table 2.4: Common predictors with equal sign of Policy Preference and Environment

Categories	**Common predictors to all environmental indices**	**Other predictors for Policy Preference and Environment**
Politics	Feel close to a party (+)	Political role (+)
Attachment - Voice	Political activism (+)	
Aptitudes		
Religion		
Discrimination and Immigration	Aptitudes toward immigration (+), Opinions on Lgtb topics (+).	

Inequality and Social Policy	Aptitudes toward inequalities (+)	Social benefits for inequalities (+)
Socio - Demographics	*Educ.* Higher tertiary (+), Female (+)	*Educ.* Lower tertiary (+), Living in a big city (+), *Age* 31-40 (+)
Economic		*Wor. sec.:* Arts.. (+), *Act.* Retired (-)

Notes: Same sign coefficients: (+) positive signs, (-) negative signs. Variable category in Italic. Category reference classes: Age -21-30-, Education -Upper secondary-, Working sector -Manufacturing-, and Activity -Paid work-. Complete list of categories in Table B.9.

The predictive model of Environment includes predictors that are common to all pro-environmental attitudes and behaviors (see Table 2.4). In fact, both *Feel close to a party* and *Political activism* remain, as do attitudes towards inequalities, as well as higher educational groups and gender. Some predictors are, instead, specific to the relation between policy preferences and voting for pro-environmental parties. Specifically, the place of residence (urban vs rural areas), a younger age profile, confidence in one's ability to play a political role, views on social benefits, artistic occupations, and not being retired. Compared to Policy Preference (see Table 2.3), the strong economic characterization by occupation, industry and income levels disappear. Therefore, it seems that, in the transition from preferences to voting, there are obstacles that can be found in the specific economic conditions of individuals.

Table 2.5: Common predictors with equal sign of Engagement, Sensitivity and Vote

Categories	**Common predictors to all environmental indices**	**Other predictors for Engagement, Sensitivity and Vote**
Politics	Political interest (+), Feel close to a party (+)	
Attachment - Voice	Political activism (+)	Attached to own Country (+)
Aptitudes		Happiness and life satisfaction (+)
Religion		Religious attitude (+)
Discrimination and Immigration	Opinions on Lgtb topics (+)	
Inequality and Social Policy	Feeling of social responsibilities (+)	
Socio - Demographics	*Educ.* Lower secondary (-), *Educ.* Higher tertiary (+), Female (+)	*Age* 41-50 (+), *Age* 51-60 (+), *Age* 61-70 (+)
Economic		*Occ.* Craft.. (-)

Notes: Same sign coefficients: (+) positive signs, (-) negative signs. Variable category in Italic. Category reference classes: Age -21-30-, Education -Upper secondary- and Occupation -Professionals-. Complete list of categories in Table B.9.

We now come to a rather unexpected piece of evidence: the relationship between voting participation and Engagement and Sensitivity. The right-hand column of Table 2.5 shows the shared predictors to the three corresponding models. The overlapping variables are mostly socio-demographic and economic, specifically, an older age profile and lower representation of manual work activities. All three models also include attachment to the country, happiness and life satisfaction, and attitudes towards religion. It is precisely these latter dimensions belonging to the sphere

of lifestyle attitudes and values that seem to mark the distance between voting participation and voting for pro-environmental parties.

Table 2.6: Common predictors with opposite sign of Sensitivity and Populism

Categories	**Common predictors to all environmental indices**	**Other predictors for Sensitivity and Populism**
Politics		
Attachment - Voice	Attached to Europe (+;-)	Attached to own Country (+;-)
Aptitudes		Happiness and life satisfaction (+;-)
Religion		Religious attitude (+;-)
Discrimination and Immigration	Aptitudes toward immigration (+;-)	
Inequality and Social Policy		
Socio - Demographics	Female (+;-)	*Age* 51-60 (+;-), *Age* 61-70 (+;-), *Age* 71-80 (+;-), *Age* 81-90 (+;-)
Economic		*Occ.* Technicians.. (+;-), *Occ.* Craft.. (-;+), *Occ.* Plant.. (-;+), *Empl.* Self-employed (+;-)

Notes: Opposite signs in parenthesis respectively for "Env. Sensitivity" then "Populism". Variable category in Italic. Category reference classes: Age -21-30-, Occupation -Professionals- and Employment -Employee-. Complete list of categories in Table B.9.

The last piece of evidence concerns the relationship between Sensitivity and populist voting as shown in Table 2.6, which, unlike the other relationships examined so far, has a negative sign. From the left-hand column, we can see that the predictors of populism do not match the common core of predictors of the environmental indices, with the exception of the gender gradient, attitudes towards immigration and attachment to Europe, which are all key issues for populist parties. In short, the overlap concerns the same characteristics shared by Sensitivity, Engagement and Vote just outlined above, with the addition of economic characteristics, and implicitly with a greater correspondence of coefficients, albeit of opposite signs. Populist voting is, in fact, characterised by an age profile that is complementary to that of Sensitivity and an opposite role of the predictors pertaining to very subjective dimensions (religion, happiness, attachment to country). Economic characterisations by occupation and labour sector also show an opposite polarisation.

2.5 Robustness Analyses

In this last section, we examine the sensitivity of our results to the way we define the predictors and build the indices. First, we may be concerned that the aggregation of predictors through PCAs, by being somewhat discretionary, confounds our results. Therefore, we replicate our analysis with the original set of all predictors to check that the relations between preferences are not altered. Figure 2.3 and 2.4 report the pairwise cosine similarities for such models. It is reassuring to note that results look almost indistinguishable from our main ones.

Figure 2.3: Cosine similarity matrix - Environmental indices - All variables

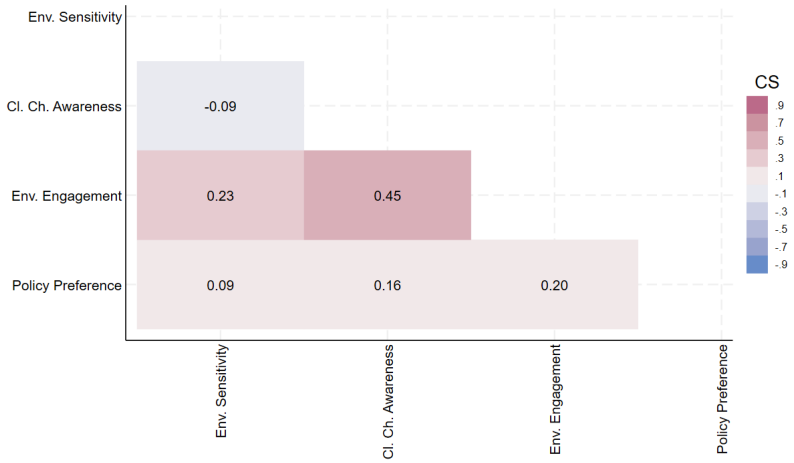
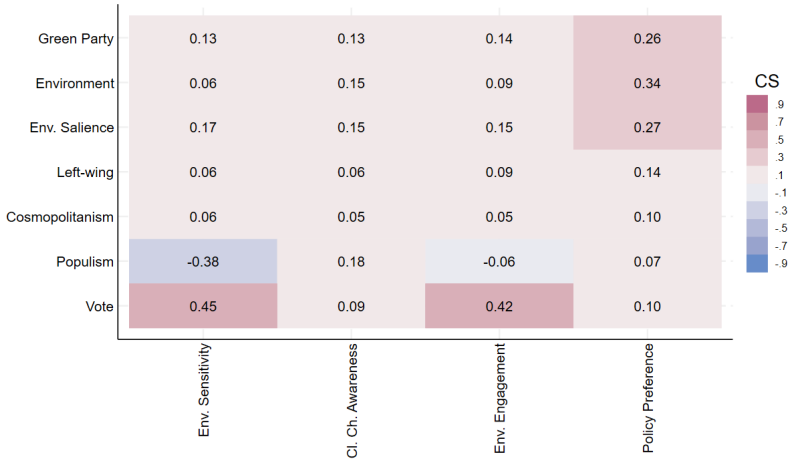


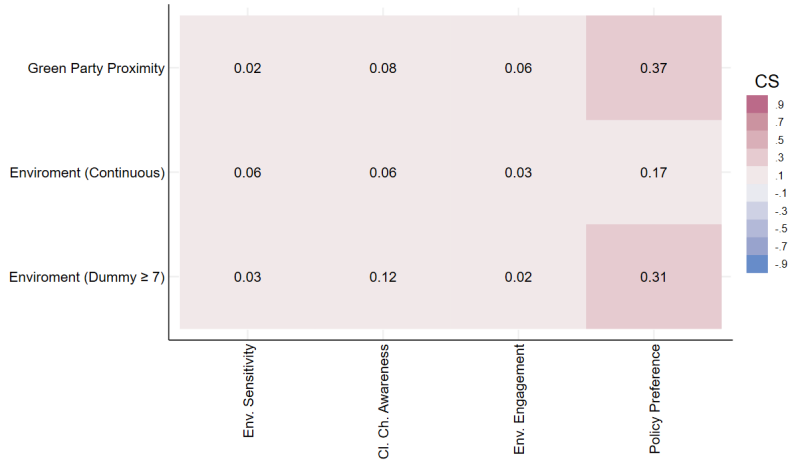
Figure 2.4: Cosine similarity matrix - Voting preferences and environmental indices - All variables



The second robustness check concerns how voting variables are defined. We may be worried that a different classification of pro-environmental parties may lead to different results. First, as an alternative to the Green Party voting, we considered answers to the question about the party one feels closest to. As shown in the first row of Figure 2.5, the results become even stronger. The other checks concern Environment. Since we were interested in identifying cases where the voting expression is in favour of parties with a marked environmental stance, we had set the threshold for identifying them in the CHES to 8 out of 10 and we had built a dummy. This specification also helps avoiding to force a cardinal classification into a continuous variable. However, this procedure could be seen as somewhat arbitrary. Therefore,

we test two alternative specifications: a) we keep the variable continuous and b) we change the threshold to 7. The corresponding results are in the second and third row in Figure 2.5, respectively. Results are confirmed, although they are unsurprisingly slightly weaker for the continuous variable. Additionally, in the Appendix B (Figure B.3), we use a different CHES variable for defining political parties in terms of left-right orientation. Again, the null results are confirmed.

Figure 2.5: Cosine similarity matrix - Green Party proximity and environmental variables



In the Appendix B we also report results from an Elastic Net model with a second order penalization (Tables B.1 and B.2). For the main analysis, we chose a LASSO regression with first order penalties, since it selects a more parsimonious specification. It is reassuring that the cosine similarities based on the Elastic Net model strongly confirm the same patterns. The coefficients are also very similar.

2.6 Discussion and conclusions

Compared to most papers in the literature on public attitudes on the environment or on "green" voting preferences, we analyze relationships between a broader range of variables. These range from the simplest feelings towards nature and the environment to the more demanding voting for pro-environmental parties. We cover potential motivators, attitudes, personal and political behaviors. This limits our ability to explore specific attitudes and causal relationships, and these are limitations we acknowledge. For instance, Poortinga et al. (2019) only consider left-right political orientation as the political variable, while we also analyse voting for Green, pro-environmental, cosmopolitan and populist parties, as well as voter participation[11]. They go deeper than us on specific attitudes though, as we encompass all

[11] Poortinga et al. (2019) finds a positive association between left-right positioning and all the perception variables. In our results, although within a different setting, and also using different political variables (party voted for vs. self-positioning), we find a similar link, albeit weaker.

the indicators they use into *Climate change awareness*[12]. Similarly, Schumacher (2014) only considers voting for the Green party and a limited range of values and attitudes concerning politics and the environment. However, thanks to the panel dimension of his dataset, he is able to address endogeneity issues that we do not cover.

The study's application of machine learning techniques is instrumental in unraveling the complex interconnections between various dimensions of environmental attitudes and political preferences. Results underscore a significant divide between personal environmental attitudes and political actions. While individuals may exhibit high levels of environmental awareness and engage in eco-conscious behaviors, this may not necessarily translate into political support for environmental parties or policies. This finding is pivotal, as it suggests that personal environmental consciousness may not necessarily lead to environmental political choices. Instead, pro-environmental political choices are mostly associated with having pro-environmental policy preferences. While certain individual characteristics and opinions, such as feeling close to a party, political activism, attitudes towards immigration and LGBT topics, being female, highly educated, and supportive of redistribution, predict all pro-environmental attitudes and environmental voting, others do not. Being young, believing in the accessibility of political roles, residing in urban areas, working in services, and not being retired are good predictors only for supporting eco-friendly policies and voting for pro-environmentalist parties. Differently, being older, more patriotic, happier, and more religious are associated only with pro-environmental behavior and with more environmental sensitivity and awareness.

These differences correspond to well-known cleavages in political economy. First, the urban-rural divide, until now usually associated to differential voting on migration (Dustmann et al., 2019; Levi et al., 2020, 2024), to support for populism in reaction to post-materialist values (Norris and Inglehart, 2019) and backlash against mainstream politicians (Cramer, 2016), seems to be relevant in explaining the (lack of) support for pro-environmental political parties. This is consistent with findings by Arndt et al. (2023), and it also qualifies them as the divide is found to be relevant for political preferences but not for personal attitudes associated with climate change. Second, post-materialistic values seem to matter also in a slightly different sense. Individuals expressing high levels of happiness and life satisfaction show stronger personal pro-environmental attitudes while income is left out as a predictor. This qualification is also associated to generalized civic engagement in the form of more voter participation and less populist voting. This evidence combined suggests that post-materialistic values may be related to ecologically conscious and civically-engaged lifestyles, but they may not translate well into specific green voting behaviors. Lastly, a generational wedge, which has already been found in consumer studies (Kanchanapibul et al., 2014; Lee, 2008) and in political studies (Dolezal, 2013), seem to be relevant more for the political than the personal dimensions. Somewhat contrary to expectations, older individuals personally engage in pro-environmental behavior and are sensitive towards nature too. However, they may not necessarily vote for pro-environmental political parties, perhaps out of habit or because they prioritize other policy issues at the elections.

[12]See also footnote 1 on how we interpret awareness in relation to climate change skepticism.

This decoupling between a personal and political dimension may have relevant policy implications. It suggests that simply increasing environmental sensitivity and personal engagement - through education policies or increased issue salience - may not be sufficient to garner support for pro-environmental policies at the national and supranational levels. Future research may first focus on causally testing this conclusion. Next, our results suggest several avenues for exploring the underlying reasons for the disconnect between personal environmental behaviors and political support for environmental policies. One such avenue is related to the supply side of the political market: perhaps pro-environmental and Green parties are unattractive to rural and older pro-environmental people because of the political identity of these parties. The fact that these parties are often protest parties with well-defined ideologies may push these voters away (Michallet et al., 2015; Schumacher, 2014; Unsworth and Fielding, 2014). Another possible avenue is related to the demand side of politics. In fact, of all the individuals with pro-environmental attitudes, the environment may be a politically salient issue only for the youngest, more urban and with a more positive view of politics. In this regard, then, there is already some evidence that issue salience influences climate policy adoption (Bromley-Trujillo and Poe, 2020). To conclude, understanding the barriers to translating personal environmental concern into political action is essential to developing effective strategies to increase support for environmental policies and parties.

Chapter 3

The impact of Ukraine's war outbreak on green preferences in Europe

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Abstract

This study examines the impact of the Ukraine war on pro-environmental attitudes. Using the 2021-2022 wave of the European Social Survey, we leverage the timing of the war's outbreak in February 2022 as a natural experiment. By comparing the pro-environmental preferences of individuals interviewed just before and after the war's onset across nine European countries, we find a significant decline on political preferences for pro-environmental political parties and concerns for climate change. Further investigation reveals that rising energy prices and the salience of the war itself, as measured by Google searches, partially mediate these effects.

Key words: Climate Change | Environmental Preferences | War

3.1 Introduction

The war between Ukraine and Russia may have marked a shift in the way Europeans see environmental issues. The problematic future of the soon-to-be-implemented European Green Deal makes this issue especially compelling. Before the war, pro-environmental attitudes were gaining ground[1], while now the level of economic and policy uncertainty has risen and other issues, like energy prices and the war itself, may have become more salient. Furthermore, the Green political parties were not able to repeat the impressive outcome of the 2019 European elections, when they were able to reach 10% of the votes. There was a reversion to the mean with the recent 2024 European Parliamentary elections, when especially the German and French Green parties - the largest and oldest ones in Europe - almost halved their votes. We empirically test in this paper if the war indeed negatively impacted pro-environmental preferences; we find that it did.

So far, many papers have discussed the determinants of pro-environmental support (see Drews and Van den Bergh 2016 for a review) and of voting for Green political parties (Grant and Tilley, 2019; Hoffmann et al., 2022; Schumacher, 2014). However, to the best of our knowledge, an investigation on how conflicts directly influence pro-environmental support is still missing. Conflicts seem to increase in-group cooperation (e.g. Bauer et al. 2016; Voors et al. 2012), which could potentially lead to more pro-environmental support. This evidence considers the influence of conflicts over the same population that underwent the conflict, which is not the case for Europe in the war in Ukraine though. The Ukraine war may be considered more akin to a period of financial distress for Europe, due to heightened uncertainty. On this, while the effect of recessions on pro-environmental preferences is sometimes negative (Hartmann and Preisendörfer, 2024; Kenny, 2020; Meyer, 2022), some studies find a null effect (e.g. Kenny 2024). Alternatively, the war may have changed the relative salience of the political issues, increasing the salience of the war itself at the expense of all other not directly related issues, i.e. among them the environment (Ansolabehere and Iyengar, 1994; Bordalo et al., 2022; Bromley-Trujillo and Poe, 2020).

In the Ukraine war, we consider the timing of the outburst of the war, 24 February 2022, as a natural experiment. In fact, while since the end of 2021 there was a partial sense in the public opinion that the war could break out, the specific timing was unknown to everyone, including the public opinion of Russia and Ukraine. We use the European Social Survey (ESS) data from the 2022 wave and exploit the date of the interviews: in a nutshell, we compare pro-environmental preferences of individuals just before and after the outburst of the war within each country for which the timing of the survey fielding works (Belgium, Switzerland, Spain, the UK, Greece, Italy, the Netherlands, Norway, Poland). We run regressions that control for country fixed effects with an event study approach first, then in a reduced form framework. Both approaches confirm that the war in Ukraine reduced both closeness to pro-environmental political parties and concerns about climate change,

[1]We document this increasing trend in pro-environmental attitudes in Appendix C.4. It is outside of the scope of the paper to investigate its determinants, but it could be due to changes in the composition of the population over time or to the influence of the "Fridays for future" movements.

while the effect is not significant on personal responsibility over climate change. Further analyses suggest that these effects are partly mediated by energy prices and the salience of the war, measured with "Ukraine" Google searches.

3.2 Data sources and preparation

The main data source is the ESS, a well-established biennial European level survey. Wave 10 covers the period of interest around the war's outbreak, wave 8 and 9 are used to estimate monthly trends control variables. The 4 dependent variables cover several dimensions of attitudes toward the environment and policy preferences:

- *Climate Change Worry*: a sentiment variable indicating people's concerns about climate change.
- *Personal Responsibility*: a measure for the personal responsibility to reduce climate change.
- *Environmental Salience*: a political variable ranking the party to which individuals feel closest, based on the salience of ecology and sustainability issues in its statements.
- *Environmental Position*: a political variable ranking the party to which individuals feel closest, based on its positions on environmental protection and sustainability, even at the cost of sacrificing economic growth.

To obtain the first two variables we consider the questions from the ESS "How worried about climate change" and "To what extent do you feel personal responsibility to reduce climate change", respectively, both of them originally defined on a Likert scale. To obtain the political variables, we consider the answer to the question "Which party feel close to" and match it with the party classifications from the Chapel Hill Expert Survey (CHES) about "importance/salience of environmental sustainability" ranging from "0 - not important at all" and"10 - extremely important", and the classification about "position towards environmental sustainability" ranging from "0 - strongly supports environmental protection even at the cost of economic growth" and "10 - strongly supports economic growth even at the cost of environmental protection" (reverted). For greater comparability of the results across the different outcomes, we standardized the 4 dependent variables.

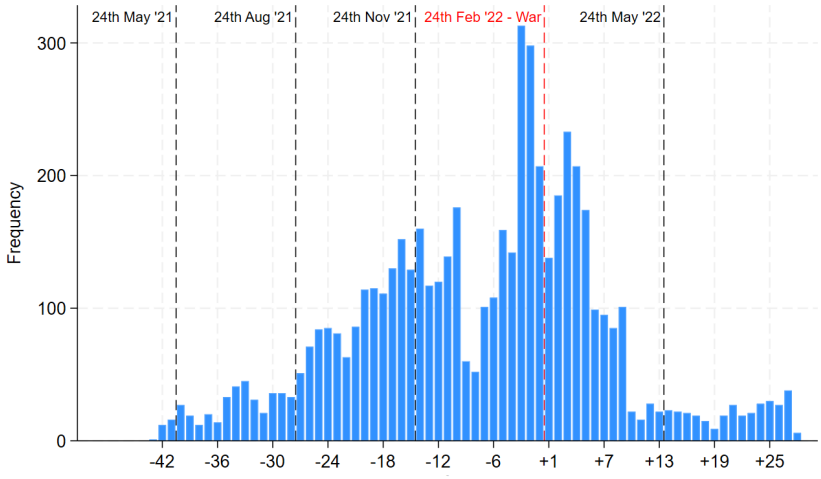
The analysis includes the countries that are both in the ESS and in the CHES database, among which we exclude countries who had more than 90% interviews before war's outbreak or more than 90% after. Accordingly, the analysis covers Belgium, Switzerland, Spain, UK, Greece, Italy, Netherlands, Norway, and Poland. Main control variables are also drawn from the ESS: a dummy distinguishing between rural and urban areas, age-groups, gender, educational level from ISCED classification, main activity performed in the last seven days, and perceived income. Descriptive statistics on these variables are shown in Supplementary Information Appendix C.1.

In further analyses, we also consider energy prices and the frequencies of weekly Google searches for the term 'Ukraine' at country level from Google Trends. For energy prices we rely on data of the national bidding zones of the European Network

of Transmission System Operators for Electricity (ENTSO-E)[2]. Energy prices have been considered in log and in their monthly average. Since perception of prices can differ from actual prices, we considered a one-month lag to allow energy prices to reflect in consumer perceptions[3].

3.3 Methodology

Figure 3.1: Weekly temporal distribution of interview completion dates



Vertical lines mark the time boundaries of sub-periods in the event study.

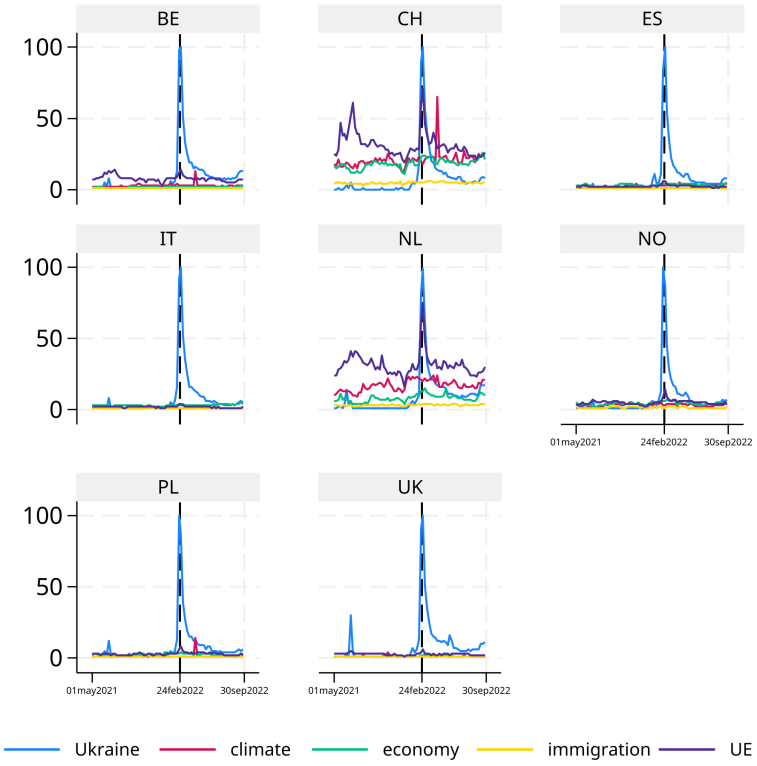
The identification strategy relies on the availability of interview dates, most of which were conducted around the outbreak of the war (Figure 3.1). This information is used to perform both an event study and a broader pre-post analysis. For the event study, we employed quarterly intervals—the shortest span that ensured a sufficient number of observations in each time period. This approach covers an entire calendar year. In our framework, the control group consists of individuals interviewed in the quarter preceding the war's outbreak, specifically between November 21, 2021, and February 24, 2022. This methodology aligns with previous studies that have examined the impacts of nationwide or international events in the absence of a contemporaneous control group (e.g. Garcia 2013; Szeidl and Szucs 2021). A standard assumption for identification is the exogeneity of the event's timing, which is supported in our case by multiple accounts of the invasion. The news reports from those days and recent recounts of the invasion in books (eg., Kostyuchenko et al. 2024) are very clear on this point. It seems that even high officials in Moscow and

[2]We downloaded this data from the ENTSO-E transparency portal. The data is originally hourly; we consider the monthly average in our analysis. For countries that have more than one bidding zone, e.g. Italy, we build a country-level average. These are the prices generators receive for selling electricity on the spot market. Fluctuations in these prices are translated to consumer prices usually after one or two months, while - to our advantage - not being differentiated by the type of consumer, e.g. businesses or consumers, or being affected by subsidies or taxes.

[3]In Appendix C.5 we consider different time lags for robustness, more specifically no lags, two and three months lags, and the results are qualitatively the same.

Kiev were unaware of the specific starting date of the invasion. We look at Google searches for several topics (climate change, the economy, immigration and the European Unione) alongside "Ukraine" in all the countries under analysis and find that there was an abrupt spike in searches for "Ukraine" in the week of the outbreak in each country with no pre-trends (see Figure 3.2). Furthermore, we do not see spikes on the other topics if not for a moderate spike on searches related to the European Union in some countries - probably related to its response to the war -, suggesting that in the quarter under consideration no other major event happened that was as relevant as the war. Additionally, we employ several methods and robustness tests to ensure that our results are not influenced by seasonal effects or long-term trends in pro-environmental attitudes. For the pre-post analysis, we use a dummy variable that equals zero before February 24, 2022, and one thereafter.

Figure 3.2: Google searches over several topics



In each panel weekly Google searches on Ukraine or on several topics (climate, the economy, immigration, UE) are represented for a specific country (Belgium, Switzerland, Spain, Italy, the Netherlands, Norway, Poland, the UK). The vertical line marks the 24th of February 2022, the outbreak of the war.

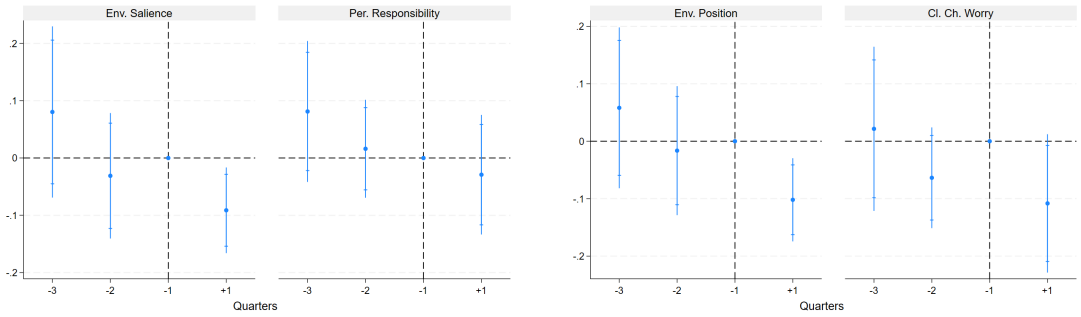
The model specification that we estimate with OLS is:

$$y_i^j = \alpha^j + \gamma^j T_i + \boldsymbol{\beta}^j \mathbf{X}_i + c_i^j + \epsilon_i^j \tag{3.1}$$

where $j \in (1, 4)$ identifies the specific dependent variable of interest, and i represents the individual. $\mathbf{X}_i$ denotes the vector of controls, c_i^j represents the country fixed effects, and ϵ_i^j is the error term. The coefficient of interest, γ^j, is associated with the variable T_i, which indicates whether the individual was interviewed before or after the war's outbreak, or in the case of the event study, during specific three-month intervals. To address potential seasonality effects or time trends in the event study, we include in $\mathbf{X}_i$ a variable derived from the coefficients of month fixed effects obtained from regressions on the same dependent variables using previous ESS waves since 2016 (see Table C.14 for these regression results). Controls include gender, living in a big city, income, education, age groups, main activity, and country fixed effects. To account for differences in individuals' characteristics (including country-level variations) across periods, we apply a weighting approach using the inverse probability weighting (IPW) method. For the event studies, the IPW weights are based on the sample composition of the benchmark quarter, while for the pre-post regressions, they are based on the pre-war period. Standard errors are robust.

3.4 Results

Figure 3.3: Event Study



Event graphs come from OLS regressions on 5026 observations on standardized variables over closeness to parties with a strong focus on the environment, personal responsibility towards climate change, closeness to pro-environmental parties and concern about climate change. Controls include gender, living in a big city, income, education, age-groups, main activity, a control for monthly trends and country fixed effects. Independent variables of interest are quarters with 24th November - 23rd February 2022 (-1) as the benchmark. Confidence intervals are at 90% and 95%. The full results from the regression can be found in Table C.8.

Figure 3.3 presents the results of the event study for the four pro-environmental measures described above. The analysis includes three quarters before and one quarter after the outbreak of the war, using the quarter immediately preceding the outbreak (-1) as the benchmark and excluding sparse data from periods outside this range (see Fig. 3.1). The results reveal a negative and significant impact of the war on variables related to closeness to political parties—both when these parties are ranked by the salience of environmental issues in their platforms and by the greenness of their proposed policies—as well as on the variable measuring concerns about climate change. These effects are substantial, corresponding to decreases of

Table 3.1: OLS Regressions on pro-environmental preferences

	Env. Sal.	**Env. Pos.**	**Per. Resp.**	**Worry**
Post	-0.0993***	-0.0930***	-0.0401	-0.0884***
	(0.0332)	(0.0331)	(0.0321)	(0.0331)
Energy	-0.1922***	-0.1699**	-0.1295**	-0.0851
	(0.0663)	(0.0694)	(0.0555)	(0.0634)
GTrends	-0.0016**	-0.0013*	-0.001	-0.0014**
	(0.0006)	(0.0007)	(0.0006)	(0.0007)
Post	-0.0715**	-0.0692**	-0.0172	-0.0829**
	(0.0322)	(0.0328)	(0.0329)	(0.0333)
Energy	-0.1434**	-0.1227*	-0.1178**	-0.0286
	(0.0691)	(0.0666)	(0.0565)	(0.0640)
Post	-0.0761*	-0.0775*	-0.015	-0.0683*
	(0.041)	(0.0404)	(0.0392)	(0.0406)
GTrends	-0.0008	-0.0005	-0.0009	-0.0007
	(0.0008)	(0.0009)	(0.0008)	(0.0009)

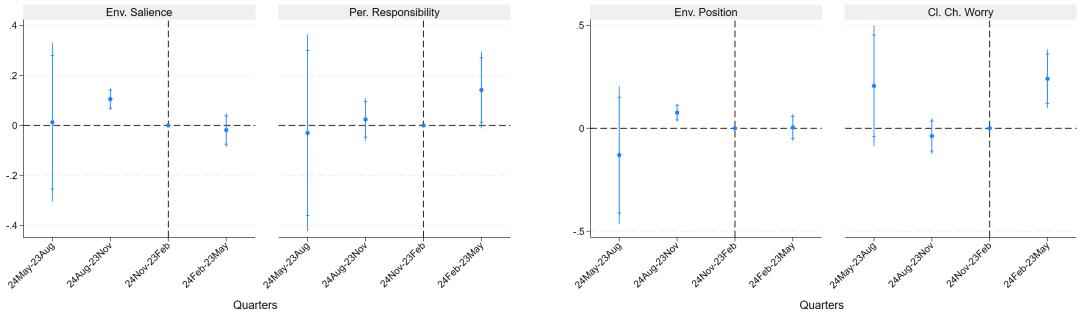
OLS regressions on 5408 observations on standardized variables over closeness to parties with a strong focus on the environment, personal responsibility towards climate change, closeness to pro-environmental parties and concerns for climate change. Each panel shows results of a separate regression, where the independent variables of interest are either Post war's outbreak, Energy prices, or GTrends on "Ukraine", Post together with, alternatively, the other two. Controls include gender, living in a big city, income , education, age-groups, main activity, and country fixed effects. The full results of the regressions can be found from Table C.9 to C.13. *** p<0.01, ** p<0.05, * p<0.10

9.51%, 9.95%, and 10.20% of a standard deviation, respectively. In contrast, the measure of personal responsibility remains unaffected.

In Table 3.1, we present the coefficients of interest from the OLS estimations, where the time dimension is reduced to two periods (pre- and post-war outbreak). Additionally, we incorporate energy prices in the local bidding zones (lagged by one month) and Google search trends for the term "Ukraine" from Google Trends in separate models (see the Supplementary Information for further details).

The first model reaffirms the findings of the event study. When considered individually in the same model, both Google searches and energy prices are significantly correlated with environmental preferences. In the final models, we examine how much the war's impact is mediated by these two variables by assessing the reduction in the pre-post war coefficient when they are separately included as controls. Our results indicate that the war's effect is partially mediated by rising energy prices and, to a lesser extent, by the salience of the war. Depending on the outcome variable, the pre-post war coefficient decreases by 7% to 25%. Notably, the energy price channel exhibits an independent effect beyond the war event, as its associated coefficient is significant in all regressions except for the one concerning climate change concerns.

Figure 3.4: Placebo event study on 2016-2019



Event graphs come from OLS regressions on 12640 observations on standardized variables over closeness to parties with a strong focus on the environment, personal responsibility towards climate change, closeness to pro-environmental parties and concern about climate change. The sample for Pers. Responsibility and Cl. Ch. Worry is restricted to 2016 and 2017 (6231 observations) because of data availability. Controls include gender, living in a big city, income, education, age-groups, main activity, a control for a year trend and country fixed effects. Independent variables of interest are quarters with 24th November - 23rd February (-1) as the benchmark. Confidence intervals are at 90% and 95%. Results from the full regression are in Table C.14.

Our regressions already control for short-time trends because of the inclusion in the event study of the variable that incorporates month fixed effects from 2016 and 2017 as control. However, to check that our results are not driven by long-time declining trends in pro-environmental attitudes, we perform a placebo test where the same model is applied to ESS data from 2016 to 2019[4]. The event study is represented in Figure 3.4 and it shows that, if anything, closeness to pro-environmental parties in a normal year seems to be higher in the quarter before the benchmark, that is between September and November. As a further check, we explore long-time trends in all our outcome variables by considering an extended time period between 2016 and 2022 (either with or without 2020, the year when COVID exploded) and testing in our baseline model for the presence of a trend at daily level (see Tables C.18 and C.19). We find a strongly significant and positive trend in all our outcomes, which goes counter the idea that our results may be driven by a long-term declining trend, and is more consistent with the hypothesis that pro-environmental preferences are slowly increasing over time due to increased awareness of the dangers of climate change.

These results are robust to several additional tests detailed in the Appendix C.5. In all tests, we add an alternative variable to personal responsibility representing individual sensitivity to the environment to confirm that there are no effects of the war on policy-unrelated variables. First, we exclude IPW weights (Table C.20 and C.21), the control for seasonality (Table C.22) or both (Table C.23). Then, we consider alternative lag specifications for energy prices (Tables C.24, C.25 and C.26). Finally, we use a leave-one-out validation to check that no specific country

[4]We miss data on personal responsibility and climate change concerns for 2018 and 2019. We substitute in these regressions the control for seasonality - because it produces collinearity with the time variables of interest - with a year trend. Anyway, as we show in Table C.22 the exclusion of this control has no impact on our results.

is driving our results (from Table C.27 to C.35). All results are robust to these tests and results on sensitivity confirm that the war had no clear effect on policy-unrelated outcomes. A specific concern could be that the timing of the interviews is correlated with political orientation and interest into politics; this is why we reproduce the event study with the inclusion of these two additional controls[5] (see Figure C.1). Unsurprisingly, we find that left-wing individuals and individuals who are more interested into politics are more pro-environmental. However, the results related to the effect of the war are indistinguishable from our main results, which not only alleviates this concern but also suggests that these two political variables are not in the causal chain from war to reduced pro-environmental attitudes.

3.5 Conclusions

The outbreak of Ukraine war reduced pro-environmental preferences. The war in Gaza and further uncertainty related to the electoral outcome in the US may render our results even more relevant now than when the war broke out. Unfortunately, we cannot really study the persistence of the effect in our setup because we cannot use data from after August. This is because the ESS follows a cyclical pattern in fielding the survey by country, meaning that in each country interviews are concentrated in a limited time-period. Interviews fielded after August 2022 would not be comparable to the pre-outburst period anymore, as they would be coming from different countries altogether. This is why we leave an investigation of the medium-run effect of the war for future research.

Our result, especially in the light of the moderating role of energy prices, seems at first sight in line with previous evidence that materialistic concerns crowd out concerns about the environment. However, the mediating role of Google searches suggests a further channel related to the reduced salience of environmental issues after the war. Consistently with political science and political economy literature, a shift in issue salience may have brought about a corresponding change in environmental political preferences (Ansolabehere and Puy, 2018; Bélanger and Meguid, 2008; Bromley-Trujillo and Poe, 2020). Besides, by additional heterogeneity analyses on political opinions, we find that effect of the war is negative regardless of income or education (see Tables C.16 and C.17). Furthermore, it is statistically significant for richer individuals only and larger in size for both rich and highly educated ones. So the effect may be mediated by materialistic concerns but not so much by economic distress after all! The simplest explanation is that in our data rich and highly educated individuals have more environmentally-friendly political opinions in the first place and so there is more scope for them to shy away from these opinions. Another one is that uncertainty in energy prices had more severe consequences for entrepreneurs and richer individuals than for low-income workers, who were also subsidized by government across Europe in their energy consumption. Unfortunately, we have no way of testing for these explanations and we leave it for

[5]Political orientation is identified using the ESS item on self-placement on a 0/10 left-right scale, where answers are coded for our analysis into three categories: 0-3 for left-wing, 4-6 for center, and 7-10 for right-wing political orientation. Interest into politics is an ESS item that asks to specify how much one is interested into politics in a 4-Likert scale between "very" and "not interested". We consider each possible answer as a separate category.

future work.

Finally, our results reveal an additional dimension of complexity. The war had relevant consequences on political opinions and concerns about climate change, yet it did not affect people's personal responsibility with environmental issues. This suggests that political preferences over the environment may be more sensitive to shifts in external conditions while basic pro-environmental attitudes may be more stable over time. This is reassuring for the future of the European Green Deal, as political shifts may not last forever and the underlying pro-environmental attitudes may move the pendulum back to a stronger support for eco-friendly policies.

Chapter 4

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Appendix A

Appendix A: Who is looking up? A data-driven study on cross-country differences in preferences and attitudes on climate change in Europe

A.1 Descriptive statistics

Table A.1: List of the 18 initial Green variables

Green1	Climate change caused by natural processes, human activity, or both
Green2	Do you think world's climate is changing
Green3	Climate change good or bad impact across world
Green4	How worried about climate change
Green5	Important to care for nature and environment
Green6	How often do things to reduce energy use
Green7	How likely to buy most energy efficient home appliance
Green8	To what extent feel personal responsibility to reduce climate change
Green9	How confident you could use less energy than now
Green10	Imagine large numbers of people limit energy use, how likely reduce cl. ch.
Green11	How likely, governments in enough countries take action to reduce cl. ch.
Green12	How likely, limiting own energy use reduce climate change
Green13	Favour increase taxes on fossil fuels to reduce climate change
Green14	Favour subsidise renewable energy to reduce climate change
Green15	Favour ban sale of least energy efficient household appliances to reduce cl. ch.
Green16	How much electricity in [country] should be generated from coal
Green17	How much electricity in [country] should be generated from natural gas
Green18	How much electricity in [country] should be generated from nuclear power

Table A.2: Descriptive statistics of the 18 initial Green variables

	Obs	Mean	Std. Dev.	Min	Max
Green1	41885	3,42	0,80	1	5
Green2	43289	3,48	0,69	1	4
Green3	41232	6,74	2,20	0	10
Green4	42654	3,01	0,93	1	5
Green5	43628	4,82	1,05	1	6
Green6	43836	4,15	1,21	1	6

Green7	43276	7,77	2,29	0	10
Green8	41927	5,58	2,73	0	10
Green9	43435	6,04	2,63	0	10
Green10	41132	5,61	2,32	0	10
Green11	41078	4,60	2,20	0	10
Green12	41654	4,35	2,65	0	10
Green13	42401	2,77	1,23	1	5
Green14	42983	3,94	1,07	1	5
Green15	42699	3,53	1,17	1	5
Green16	40690	3,95	1,02	1	5
Green17	41042	3,13	1,02	1	6
Green18	40983	3,88	1,25	1	6

Table A.3: Correlation matrix of the 18 initial Green variables

	Green1	Green2	Green3	Green4	Green5	Green6	Green7	Green8	Green9	Green10	Green11	Green12	Green13	Green14	Green15	Green16	Green17	Green18
Green1	1																	
Green2	0.2337***	1																
Green3	0.2514***	0.2663***	1															
Green4	0.3081***	0.3420***	0.2878***	1														
Green5	0.0935***	0.1519***	0.1502***	0.2485***	1													
Green6	0.0437***	0.1302***	0.0845***	0.2101***	0.2502***	1												
Green7	0.0601***	0.1363***	0.0811***	0.1825***	0.2343***	0.3385***	1											
Green8	0.2358***	0.2062***	0.1031***	0.4526***	0.2089***	0.2040***	0.2003***	1										
Green9	0.0748***	0.0883***	0.0185***	0.1411***	0.0389***	0.0953***	0.1396***	0.3130***	1									
Green10	0.2137***	0.1489***	0.0428***	0.2736***	0.1212***	0.1066***	0.1223***	0.3971***	0.2269***	1								
Green11	0,0034	-0.0157***	-0.1349***	0.0468***	0.0303***	0.0234***	0.0408***	0.1403***	0.1144***	0.2425***	1							
Green12	0.1090***	0.0733***	-0.0394***	0.2391***	0.1140***	0.0974***	0.1109***	0.4281***	0.2482***	0.4399***	0.3340***	1						
Green13	0.1385***	0.0917***	0.0686***	0.1763***	0.0797***	0.0134***	0.0304***	0.2442***	0.1507***	0.1844***	0.0857***	0.1758***	1					
Green14	0.1573***	0.1754***	0.1488***	0.1848***	0.1551***	0.0995***	0.1236***	0.1994***	0.0862***	0.1456***	0.0326***	0.0980***	0.2392***	1				
Green15	0.1476***	0.1502***	0.1319***	0.2222***	0.1753***	0.1480***	0.2452***	0.2194***	0.0917***	0.1647***	0.0413***	0.1316***	0.2272***	0.2898***	1			
Green16	0.0935***	0.1336***	0.1237***	0.0998***	0.0771***	0.1123***	0.1106***	0.1477***	0.1061***	0.0515***	-0.0457***	-0.0000	0.1411***	0.1538***	0.0890***	1		
Green17	0.0745***	0.0739***	0.0802***	0.0622***	0,0009	0.0327***	0,0032	0.0693***	0.0415***	-0,0004	-0.0581***	-0.0168***	0.1140***	0.0609***	0.0182***	0.3712***	1	
Green18	0.1041***	0.1312***	0.1113***	0.1087***	0.0755***	0.0817***	0.0607***	0.1519***	0.0607***	0.0998***	-0.0628***	0.0449***	0.0467***	0.1527***	0.0985***	0.2249***	0.1967***	1

*** p<0.01, ** p<0.05 and * p<0.1

Figure A.1: Triangular fuzzy

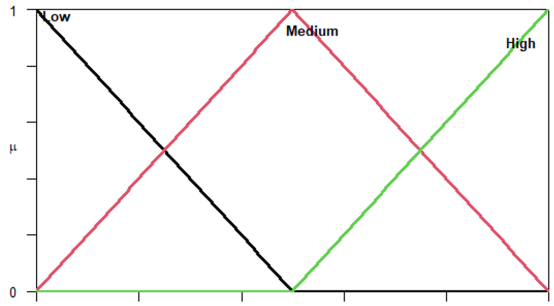


Figure A.2: Trapezoidal fuzzy

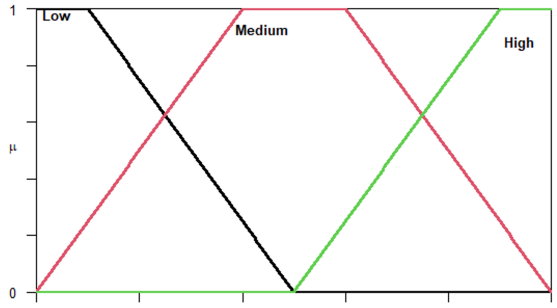
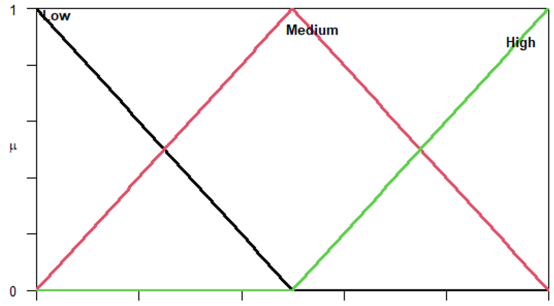


Figure A.3: Triangular fuzzy outputs



A.2 A Theory-driven Weighting Approach in TOPSIS

Table A.4: Weights

Renewable	Policy Sup.	Trust Act.	Env. Care	C. C. Sens.
0.3	0.3	0.1	0.2	0.1

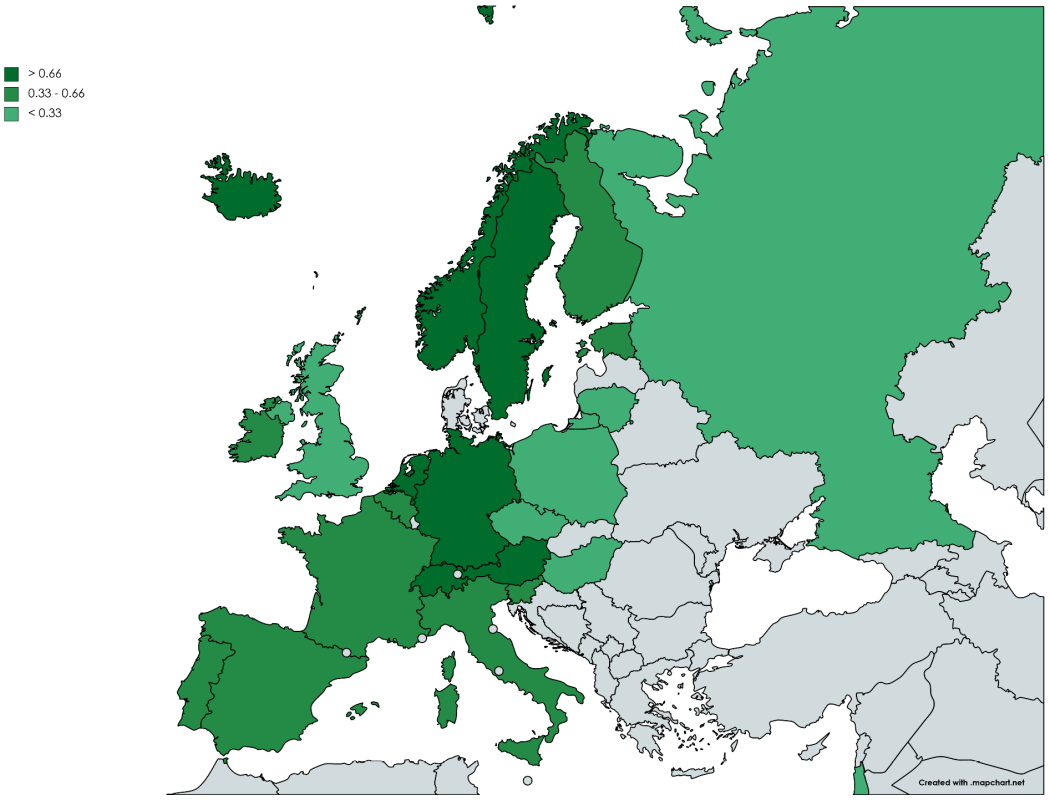
Table A.5: Ideal best and Ideal worst values

V+	0.2416	0,1929	0.0571	0.1105	0.0672
V-	0.156	0.1636	0.0518	0.1001	0.0599

Table A.6: Comparison of the order of the countries with the use of the three different distances

	Eucleidian		**Manhattan**		**Mahalanobis**	
Iceland	0,8104	1	0,8100	1	0,6485	3
Norway	0,7820	2	0,7497	3	0,4739	19
Austria	0,7417	3	0,7380	4	0,6315	4
Switzerland	0,6907	4	0,7711	2	0,7228	1
Germany	0,6791	5	0,7329	5	0,5960	8
Netherlands	0,6710	6	0,6528	7	0,5294	14
Sweeden	0,6616	7	0,7199	6	0,5615	11
Belgium	0,5588	8	0,5902	8	0,5485	12
Portugal	0,5428	9	0,5874	9	0,6115	6
Estonia	0,5390	10	0,4610	15	0,4940	16
Finland	0,4993	11	0,5727	10	0,6030	7
Italy	0,4763	12	0,5152	12	0,6137	5
Ireland	0,4529	13	0,4189	16	0,5475	13
France	0,4475	14	0,5011	13	0,5903	9
Slovenia	0,4336	15	0,5526	11	0,5878	10
Spain	0,4264	16	0,4964	14	0,6582	2
United Kindom	0,3270	17	0,3731	18	0,4930	17
Hungary	0,2877	18	0,3793	17	0,5045	15
Lithuania	0,2173	19	0,2510	19	0,4302	20
Poland	0,1742	20	0,2492	20	0,4756	18
Israele	0,1590	21	0,2144	21	0,3874	21
Czechia	0,1299	22	0,1302	22	0,2927	22
Russia	0,0296	23	0,0242	23	0,2721	23

Figure A.4: Distribution map of the different countries ordered with the Euclidean distance



Appendix B

Appendix B: Exploring the Multifaceted Relationship between Environmental Attitudes and Political Voting

B.1 Descriptive statistics

Table B.1: The initial 13 green variables

Green1	Important to care for nature and environment
Green2	Do you think world's climate is changing
Green3	Climate change caused by natural processes, human activity, or both
Green4	Climate change good or bad impact across world
Green5	Imagine large numbers of people limit energy use, how likely reduce cl. ch.
Green6	To what extent feel personal responsibility to reduce climate change
Green7	How likely to buy most energy efficient home appliance
Green8	How often do things to reduce energy use
Green9	How confident you could use less energy than now
Green10	Favour increase taxes on fossil fuels to reduce climate change
Green11	Favour subsidise renewable energy to reduce climate change
Green12	Favour ban sale of least energy efficient household appliances to reduce cl. ch.
Green13	How worried are you about climate change

Table B.2: Descriptive statistics of the initial 13 green variables

	Original					**Harmonized**				
	Obs	Mean	Std. dev.	Min	Max	Obs	Mean	Std. dev.	Min	Max
Green1	31620	4.862	1.018	1	6	27351	4.890	1.000	1	6
Green2	31491	1.502	0.659	1	4	27351	1.447	0.576	1	3
Green3	30723	2.576	0.782	1	5	27351	2.562	0.773	1	5
Green4	30290	3.231	2.186	0	10	27351	3.227	2.189	0	10
Green5	30653	4.394	2.702	0	10	27351	4.194	2.598	0	10
Green6	30189	5.601	2.298	0	10	27351	5.660	2.273	0	10
Green7	31389	7.979	2.135	0	10	27351	8.027	2.084	0	10
Green8	31715	4.262	1.165	1	6	27351	4.278	1.138	1	6
Green9	31488	6.036	2.615	0	10	27351	6.186	2.542	0	10
Green10	30909	2.726	1.236	1	5	27351	2.780	1.232	1	5
Green11	31224	3.954	1.074	1	5	27351	3.994	1.047	1	5
Green12	31037	3.562	1.178	1	5	27351	3.609	1.162	1	5

Green13	31136	3.036	0.928	1	5	27315	3.090	0.908	1	5

Table B.3: Indices on attitudes and beliefs and related question sources (resumed)

Environmental Sensitivity	How much important is to care for nature and environment.
Climate Change Awareness	How worried are you about climate change; Do you think world's climate is changing; Is climate change caused by natural processes, human activity, or both; Is climate change having a positive or negative impact around the world; If a large number of people limit their energy use would it reduce the climate change.
Environment Engagement	To what extent do you feel personal responsibility to reduce climate change; How likely would you buy most energy efficient home appliance; How often you do things to reduce energy use; How much confident are you in being able to use less energy than now.
Policy Preference	Favour at increasing taxes on fossil fuels to reduce climate change; Favour at subsidising renewable energy to reduce climate change; Favour at banning sale of least energy efficient household appliances.

Table B.4: Descriptive statistics of the 4 environmental indices (Scaled 0-1)

	Original					**Harmonized**				
	Obs	Mean	SD	Min	Max	Obs	Mean	SD	Min	Max
Env. Sens.	31620	0.772	0.204	0	1	27351	0.778	0.200	0	1
Cl. Ch. Awar.	29360	0.646	0.142	.067	1	27315	0.648	0.142	.067	1
Env. Eng.	29431	0.657	0.140	0	1	27351	0.661	0.138	0	1
Policy Pref.	30294	0.605	0.205	0	1	27351	0.615	0.201	0	1

Table B.5: Indices of political preferences and behavior

Green Party	Dummy - Political position and ideology of the party voted Green Party in EU Parliament or clear green ideology
Environment	Dummy - Position towards environmental sustainability ≥8 "Strongly supports env. protection even at the cost of economic growth"
Env. Salience	Importance/salience of env. sustainability in the party's public stance From 0 "No importance" to 10 "Great importance"
Left-wing	Overall ideological position of the party on a left-right dimension From 0 "Extreme right" to 10 "Extreme left"

Cosmopolitanism	Cultural ideology, position of the party on social and cultural values From 0 "Traditional/Authoritarian" to 10 "Libertarian/ Post-materialist"
Populism	Overall ideological position of the party on a populist scale From 0 to 10 "Extreme populist"
Vote	Dummy - Participation in last national election Specifies whether or not the person voted in the last national election

Table B.6: Descriptive statistics of the 7 voting indices (Scaled 0-1)

	Original					**Harmonized**				
	Obs	Mean	SD	Min	Max	Obs	Mean	SD	Min	Max
Gr. Party	20782	0.061	0.238	0	1	18585	0.063	0.244	0	1
Envir.	20277	0.075	0.263	0	1	18131	0.079	0.270	0	1
Envi. Sal.	18035	0.509	0.176	.1	1	16089	0.515	0.177	.1	1
Left-wing	20293	0.460	0.221	0	1	18142	0.464	0.221	0	1
Cosmopol.	20293	0.498	0.237	0	1	18142	0.507	0.235	0	1
Populism	20293	0.391	0.235	.1	1	18142	0.388	0.233	.1	1
Vote	32007	0.769	0.421	0	1	27351	0.789	0.408	0	1

Table B.7: List of green parties used for political closeness by country

Austria	Grüne
Belgium	Groen!, Ecolo
Czech Republic	N/A
Germany	Alliance 90/The Greens (Bündnis 90/Die Grünen)
Estonia	Erakond Eestimaa Rohelised (Estonia Greens)
Spain	N/A
Finland	Green League
France	EELV (Europe Ecologie Les Verts), Autres mouvements écologistes
United Kingdom	Green Party of England and Wales
Ungery	LMP (Lehet Más A Politika)
Ireland	Green Party
Italia	Sinistra Ecologia e Libertà (SEL)
Lithuania	Lithuanian Peasant and Greens Union (LVZS), Lithuanian Greens Party (LZP)
Netherlands	Green Left
Poland	N/A
Portugal	MPT - Partido da Terra, PAN - Pessoas-Animais-Natureza
Sweden	Miljöpartiet de gröna (The Green Party)
Slovenia	VERJAMEM - Stranka Igorja Šoltesa (I BELIEVE - The party of Igor Šoltes)

Table B.8: Selected initial variables by group aggregation

Politics	Time spent watching news, interest in politics, perceived ability to have influence in government and in politics, confidence in own ability to participate in politics, feeling close to a party
Attachment - Voice	Trust in politician, trust in parties, signed petitions, joined demonstrations, trust in the legal system, trust in the police, attached to own Country, attached to Europe
Aptitudes	Social meeting, social activities, feeling of people's fairness, feeling of people's helpfulness, trust in people, satisfaction in life, how much happy, feeling of safety, victim of a burglary
Religion	Belonging to a religion, how much religious, attendance to religious services, how much pray
Discrimination and Immigration	Favor toward sexual freedom, feeling of shame toward gay, support for the reception of refugees, allow immigrants of different race, allow immigrants of same race, immigrants good for the economy
Inequality and Social Policy	Acceptance of income difference, opinion on a fair society, inequality Government responsibility, unemployed social responsibility, childcare social responsibility, elders social responsibility, support to social benefits in prevention of poverty, support to social benefits for equity
Socio - Demographic	Number of house members, presence of children at home, personal investment in knowledge improvement, level of education (ISCED), living in a big city, health (self evaluation), gender, age, Country citizen, born in Country, belonging to a minority, father born in Country, mother born in Country, foreign parents, EU Country
Economic	Occupation (ISCO8), employment sector (NACER2), kind of employment, type of work contract, activity, income (perceived)

Table B.9: List of categorical variables

Age	18-20, 21-30, 31-40, 41-50, 51-60, 61-70, 71-80, 81-90, 91-100
Education	Less than lower secondary, lower secondary, lower upper secondary, upper secondary, adv. vocational sub-degree, lower tertiary, higher tertiary
Occupation	Armed Forces, Managers, Professionals, Technicians and Associate Professionals, Clerical Support Workers, Services and Sales Workers, Skilled Agricultural, Forestry and Fishery Workers, Craft and Related Trades Workers, Plant and Machine Operators And Assemblers, Elementary Occupations

Working sector	Agriculture forestry and fishing, Mining and quarrying, Manufacturing, Electricity gas steam and air conditioning supply, Water supply sewerage waste management and remediation activities, Construction, Wholesale and retail trade repair of motor vehicles and motorcycles, Transportation and storage, Accommodation and food service activities, Information and communication, Financial and insurance activities, Real estate activities, Professional scientific and technical activities, Administrative and support service activities, Public administration and defence; compulsory social security, Education, Human health and social work activities, Arts entertainment and recreation, Other service activities, Activities of households as employers, Activities of extraterritorial organisations and bodies
Employment	Employee, Self-employed, Working for own family business
Work Contract	Unlimited, Limited, No contract
Activity	Paid Work, Unemployed, Retired, Education, Housework, Other
EU Country	Austria, Belgium, Czech Republic, Germany, Estonia, Spain,Finland, France, England, Hungary, Ireland, Italy, Lithuania, Netherlands, Poland, Portugal, Sweden, Slovenia

Notes: Underlined the category reference in the elaborations

Table B.10: List of the 62 explanatory variables

Time Watching News	How much time for day do you spend on news about politics and current affairs?
Political Interest	How much interested in politics
Influence In Government	Political system allows people to have a say in what government does
Influence In Politic	Political system allows people to have influence on politics
Political Participation	Confident in own ability to participate in politics
Feel Close To Party	Feel closer to a particular party than all other parties
Trust Politician	Trust in politicians
Trust Parties	Trust in political parties
Sign Petition	Signed petition last 12 months
Part In Demonstration	Taken part in lawful public demonstration last 12 months
Trust Legal System	Trust in the legal system
Trust Police	Trust in the police
Attached To Country	How much emotionally attached to [country]
Attached To Europe	How much emotionally attached to Europe
Social Meeting	How often socially meet with friends, relatives or colleagues
Social Activities	Take part in social activities compared to others of same age
People Fairness	Most people try to take advantage of you, or try to be fair
People Helpful	Most of the time people helpful or mostly looking out for themselves
Trust In People	Most people can be trusted or you can't be too careful
Life Satisfaction	How much satisfied with life as a whole
How much Happy	How happy are you
Feeling Safe	Feeling of safety of walking alone in local area after dark

Victim Burglary	Respondent or household member victim of burglary/assault last 5 years
How much Religious	How much religious are you
Religious Services	How often attend religious services apart from special occasions
How much Pray	How often pray apart from at religious services
Belonging Religion	Belonging to particular religion or denomination
Country Citizen	Citizen of country
Born In Country	Born in country
Belong To Minority	Belong to minority ethnic group in country
Father Born In Country	Father born in country
Mother Born In Country	Mother born in country
Foreign Parents	Both parents are foreigners
Immigrants Different Races	Allow many/few immigrants of different race/ethnic group from majority
Immigrants Good	Immigration bad or good for country's economy
Refugee Reception	Government should be generous judging applications for refugee status
Immigrants Same Race	Allow many/few immigrants of same race/ethnic group as majority
Sexual Freedom	Gays and lesbians free to live life as they wish
Gay Shame	Ashamed if close family member gay or lesbian
Inequality Gov. Resp.	Government should reduce differences in income levels
Income Acceptance	Large differences in income acceptable to reward talents and efforts
Fair Society	For fair society, differences in standard of living should be small
Elders Social Resp.	Standard of living for the old, governments' responsibility
Unemployed Social Resp.	Standard of living for the unemployed, governments' responsibility
Childcare Social Resp.	Child care services for working parents, governments' responsibility
Social Benefits For Poverty	Social benefits/services prevent widespread poverty
Social Benefits For Equity	Social benefits/services lead to a more equal society
House Members	Number of house members
Children At Home	Children living at home or not
knowledge Improvement	Improve knowledge/skills: course/lecture/conference, last 12 months
Education (ISCED)	Highest level of education, ES - ISCED *(Less than lower secondary, Lower secondary, Lower upper secondary, Upper secondary, Adv. vocational sub-degree, Lower tertiary, Higher tertiary)*
Big City	Context dimension
Health (self evaluation)	Subjective general health
Female	Gender
Age	18-20, 21-30, 31-40, 41-50, 51-60, 61-70, 71-80, 81-90, 91-100
EU Country	*Austria, Belgium, Czech Republic, Germany, Estonia, Spain,Finland, France, England, Hungary, Ireland, Italy, Lithuania, Netherlands, Poland, Portugal, Sweden, Slovenia*
Occupation (ISCO8)	Occupation, ISCO08. What is/was the name or title of your main job? *(Armed Forces, Managers, Professionals, Technicians and Associate Professionals, Clerical Support Workers, Services and Sales Workers, Skilled Agricultural, Forestry and Fishery Workers, Craft and Related Trades Workers, Plant and Machine Operators And Assemblers, Elementary Occupations, Out of the labor market)*

Working sector (NACER2)	Industry, NACE rev.2. What the firm you work/worked for mainly make or do? *(Agriculture forestry and fishing, Mining and quarrying, Manufacturing, Electricity gas steam and air conditioning supply, Water supply sewerage waste management and remediation activities, Construction, Wholesale and retail trade repair of motor vehicles and motorcycles, Transportation and storage, Accommodation and food service activities, Accommodation and food service activities, Information and communication, Financial and insurance activities, Real estate activities, Professional scientific and technical activities, Administrative and support service activities, Public administration and defence; compulsory social security, Education, Human health and social work activities, Arts entertainment and recreation, Other service activities, Activities of households as employers, Activities of extraterritorial organisations and bodies, Out of the labor market)*
Employment	Employment relation. In your main job are/were you... *(Employee, Self-employed, Working for own family business, Out of the labor market)*
Work Contract	Do/did you have a work contract of unlimited or limited duration *(Unlimited, Limited, No contract, Work Contract N.A.)*
Activity	Paid Work, Unemployed, Retired, Education, Housework, Other
Income (perceived)	Feeling about household's income nowadays

Table B.11: Descriptive stat. of the 62 explanatory continuous, discrete and dummy variables

	Original					**Harmonized**				
	Obs	Mean	SD	Min	Max	Obs	Mean	SD	Min	Max
Time Watch. News	31683	87.049	137.510	0	1428	27351	85.062	130.541	0	1428
Politic. Interest	31959	2.414	0.913	1	4	27351	2.480	0.897	1	4
Influence In Gov.	31512	2.162	0.902	1	5	27351	2.208	0.892	1	5
Influence In Politic	31556	2.109	0.895	1	5	27351	2.160	0.885	1	5
Politic. Participa.	31427	2.092	1.025	1	5	27351	2.158	1.018	1	5
Feel Close To Party	31277	0.476	0.499	0	1	27351	0.494	0.496	0	1
Trust Politicians	31744	3.487	2.379	0	10	27351	3.568	2.350	0	10
Trust Parties	31648	3.459	2.340	0	10	27351	3.551	2.310	0	10
Signed Petition	31885	0.247	0.431	0	1	27351	0.269	0.443	0	1
Part In Demon.	31924	0.073	0.259	0	1	27351	0.077	0.267	0	1
Trust Legal System	31561	5.276	2.584	0	10	27351	5.365	2.541	0	10
Trust Police	31855	6.483	2.308	0	10	27351	6.540	2.255	0	10
Att. To Country	31889	7.835	2.149	0	10	27351	7.812	2.134	0	10
Att. To Europe	31587	5.761	2.552	0	10	27351	5.838	2.476	0	10
Social Meeting	31899	4.730	1.551	1	7	27351	4.797	1.507	1	7
Social Activities	31504	2.698	0.907	1	5	27351	2.727	0.896	1	5
People Fairness	31831	5.754	2.178	0	10	27351	5.842	2.118	0	10
People Helpful	31907	5.123	2.236	0	10	27351	5.190	2.186	0	10
Trust In People	31953	5.189	2.360	0	10	27351	5.290	2.306	0	10
Life Satisf.	31886	7.090	2.061	0	10	27351	7.169	1.998	0	10
How Happy	31869	7.391	1.844	0	10	27351	7.469	1.775	0	10
Feeling Safe	31703	3.010	0.760	1	4	27351	3.037	0.750	1	4
Victim Burglary	31931	0.151	0.358	0	1	27351	0.157	0.363	0	1
How Religious	31772	4.500	3.123	0	10	27351	4.416	3.097	0	10
Religious Services	31846	2.531	1.512	1	7	27351	2.478	1.487	1	7
How Pray	31383	3.188	2.384	1	7	27351	3.113	2.347	1	7
Belonging Religion	31844	0.577	0.494	0	1	27351	0.559	0.496	0	1
Country Citizen	32002	0.983	0.128	0	1	27351	0.984	0.126	0	1
Born In Country	32001	0.935	0.246	0	1	27351	0.935	0.246	0	1
Belong To Minority	31741	0.039	0.193	0	1	27351	0.037	0.1890	0	1

Father Born In C.	31838	0.901	0.299	0	1	27351	0.900	0.299	0	1
Mother Born In C.	31939	0.908	0.289	0	1	27351	0.907	0.290	0	1
Foreign Parents	31819	0.068	0.251	0	1	27351	0.068	0.251	0	1
Imm. Diff. Race	31273	2.493	0.900	1	4	27351	2.546	0.878	1	4
Imm. Good	31066	4.943	2.508	0	10	27351	5.056	2.451	0	10
Refugee Reception	31206	2.880	1.194	1	5	27351	2.910	1.182	1	5
Imm. Same Race	31314	2.810	0.864	1	4	27351	2.862	0.830	1	4
Sexual Freedom	31296	3.930	1.135	1	5	27351	4.008	1.087	1	5
Gay Shame	30914	3.897	1.209	1	5	27351	3.973	1.161	1	5
Inequ. Gov. Resp.	31616	3.882	0.996	1	5	27351	3.869	1.000	1	5
Income Acceptance	31491	2.983	1.147	1	5	27351	2.971	1.142	1	5
Fair Society	31559	3.605	0.958	1	5	27351	3.592	0.957	1	5
Elders Social Resp.	31876	8.105	1.813	0	10	27351	8.067	1.784	0	10
Unem. Social Resp.	31690	6.660	2.250	0	10	27351	6.601	2.203	0	10
Child. Social Resp.	31674	7.862	2.060	0	10	27351	7.845	2.031	0	10
Soc. Ben. For Pov.	31246	3.439	0.984	1	5	27351	3.452	0.972	1	5
Soc. Ben. For Equ.	31088	3.257	1.003	1	5	27351	3.271	0.992	1	5
House Members	31911	2.480	1.273	1	9	27351	2.506	1.270	1	9
Children At Home	32006	0.352	0.478	0	1	27351	0.360	0.480	0	1
knowledge Improv.	31829	0.283	0.451	0	1	27351	0.307	0.460	0	1
Big City	31977	0.290	0.454	0	1	27351	0.297	0.457	0	1
Feeling Health	31971	3.746	0.906	1	5	27351	3.790	0.883	1	5
Female	32005	0.530	0.499	0	1	27351	0.520	0.500	0	1
Income Feeling	31790	3.062	0.801	1	4	27351	3.117	0.777	1	4
EU Country	32007	-	-	1	18	27351	-	-	1	18
Age	31896	-	-	1	9	27351	-	-	1	9
Activity	31924	-	-	1	6	27351	-	-	1	6
Occupation	31494	-	-	1	11	27351	-	-	1	11
Working sector	31464	-	-	1	22	27351	-	-	1	22
Education	31866	-	-	1	7	27351	-	-	1	7
Employment	31892	-	-	1	4	27351	-	-	1	4
Work Contract	31766	-	-	1	4	27351	-	-	1	4

Table B.12: Composition of the variable aggregated through PCA

Political Role	Able to have political participation, or influence in politics and in government
Trust in institutions	Trust in politicians, parties, Legal system and Police
Political activism	Signed petitions, joined demonstrations
Sociability	Personal social meetings and social activities
Feelings about people	Trust in people, feeling of people's fairness, and helpfulness
Happiness and life satisfaction	Life satisfaction and how much happy
Religious attitude	How much religious, attendance to religious services, how much pray
Opinions on Lgtb topics	Feeling of shame toward gay and opinions on sexual freedom
Aptitudes toward immigration	Acceptance for immigrant from different races, same race or refugees and if immigrant are good for the society
Aptitudes toward inequalities	Inequality Government responsibility, acceptance of income differences and an unequal society

Feeling of social responsibilities	Social responsibility of child care, the elderly and the unemployed
Social benefits for inequalities	Social benefits for poverty and equity

Table B.13: Descriptive statistics EU Country

	Original	**Harmonized**		**Original**	**Harmonized**
	Percent	Percent		Percent	Percent
AT	5.83	5.88	IE	7.91	7.88
BE	4.72	5.41	IT	6.92	6.26
CZ	6.50	6.15	LT	6.16	4.73
DE	7.75	8.64	NL	4.84	5.09
EE	5.39	5.66	PL	4.95	4.33
ES	5.52	4.83	PT	3.78	3.86
FI	5.64	6.28	SE	4.52	4.86
FR	5.47	6.05	SI	3.71	3.94
GB	5.78	6.22	Total	100.00	100.00
HU	4.62	3.92			

Table B.14: Descriptive statistics Age

	Original	**Harmonized**		**Original**	**Harmonized**
	Percent	Percent		Percent	Percent
18-20	1.47	1.48	61-70	18.44	18.28
21-30	12.76	13.09	71-80	10.86	10.12
31-40	15.62	16.30	81-90	4.16	3.31
41-50	17.48	18.03	91-100	0.36	0.21
51-60	18.86	19.18	Total	100.00	100.00

Table B.15: Descriptive statistics Education (ISCED)

	Original	**Harmonized**		**Original**	**Harmonized**
	Percent	Percent		Percent	Percent
Less Low. sec.	9.73	8.08	Adv. voc.	13.58	14.21
Low. sec.	15.49	14.27	Low. ter.	10.64	11.36
Low. up. sec.	16.91	17.19	High. ter.	13.01	14.00
Upper sec.	20.64	20.89	Total	100.00	100.00

Table B.16: Descriptive statistics Activity

	Original	**Harmonized**		**Original**	**Harmonized**
	Percent	Percent		Percent	Percent
Paid Work	53.53	55.76	Housework	6.52	6.28
Unemployed	5.23	4.93	Other	3.54	3.41
Retired	27.59	25.87	Total	100.00	100.00
Education	3.58	3.75			

Table B.17: Descriptive statistics Occupation (ISCO8)

	Original	**Harmonized**		**Original**	**Harmonized**
	Percent	Percent		Percent	Percent
Armed Forces	0.32	0.34	Skilled Agric...	2.92	2.61
Managers	7.18	7.64	Craft and Trad...	11.26	11.03
Prof.	17.10	18.39	Plant and Mac...	8.02	7.67
Technicians..	14.00	14.77	Elem. Occ.	9.02	8.03
Cler. Support..	8.68	8.99	Out of the lab...	5.27	4.36
Serv. and Sal...	16.23	16.18	Total	100.00	100.00

Table B.18: Descriptive statistics Working Sector (NACER2)

	Original	**Harmonized**		**Original**	**Harmonized**
	Percent	Percent		Percent	Percent
Agr., for...	4.67	3.99	Prof., scient...	4.15	4.44
Min. and quar.	0.51	0.46	Admin. and...	4.08	4.13
Manuf.	16.03	15.78	Public admin...	5.39	5.51
Elec., gas..	0.89	0.95	Education	8.26	8.58
Water supply..	0.53	0.54	Health..	10.00	10.52
Const.	6.94	6.89	Arts, entert...	1.65	1.73
Whol. and ret...	12.77	12.87	Other serv...	2.46	2.44
Transp. and..	5.16	5.24	Act. of hous...	0.88	0.80
Ac. and food..	4.45	4.42	Act. of extr....	0.03	0.04
Inf. and comm.	2.59	2.82	Out labor..	5.27	4.36
Fin. and ins...	2.71	2.89	Total	100.00	100.00
Real estate act.	0.58	0.60			

Table B.19: Descriptive statistics Employment

	Original	**Harmonized**
	Percent	Percent
Employee	81.21	81.99
Self-employed	11.85	11.97
Family business	1.74	1.72
Out of the labor..	5.20	4.30
Total	100.00	100.00

Table B.20: Descriptive statistics Work Contract

	Original	**Harmonized**
	Percent	Percent
Unlimited	65.12	66.25
Limited	11.98	11.92
No contract	5.79	5.53
Work Contract N.A.	17.11	16.30
Total	100.00	100.00

B.2 Descriptive principal component analysis

Table B.21: Principal component analysis Activism

	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.282	0.563	0.641	0.641
Comp2	0.718	.	0.359	1.000

	Comp1	Comp2	Unexplained
Signed Petitions	0.707	0.707	0.000
Part In Demonstrations	0.707	-0.707	0.000

Table B.22: Principal component analysis Trust in istitutions

	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.740	1.963	0.685	0.685
Comp2	0.777	0.419	0.194	0.879
Comp3	0.358	0.233	0.090	0.969
Comp4	0.125	.	0.031	1.000

	Comp1	Comp2	Comp3	Unexplained
Trust Politician	0.539	-0.413	0.150	0.065
Trust Parties	0.529	-0.456	0.172	0.060
Trust Legal Sistem	0.502	0.318	-0.804	0.000
Trust Police	0.422	0.721	0.549	0.000

Table B.23: Principal component analysis Political Role

	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.858	1.075	0.619	0.619
Comp2	0.783	0.424	0.261	0.880
Comp3	0.359	.	0.120	1.000

	Comp1	Comp2	Comp3	Unexplained
Influence In Government	0.613	-0.429	0.664	0.000
Influence In Politics	0.644	-0.217	-0.734	0.000
Able Political Participation	0.458	0.877	0.143	0.000

Table B.24: Principal component analysis Sociability

	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.345	0.691	0.673	0.673
Comp2	0.655	.	0.327	1.000

	Comp1	Comp2	Unexplained

Social Meeting	0.707	0.707	0.000
Social Activities	0.707	-0.707	0.000

Table B.25: Principal component analysis People

	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.047	1.518	0.682	0.682
Comp2	0.528	0.104	0.176	0.858
Comp3	0.425	.	0.142	1.000

	Comp1	Comp2	Comp3	Unexplained
People Fairness	0.589	-0.357	-0.725	0.000
People Helpful	0.557	0.829	0.044	0.000
Trust In People	0.585	-0.430	0.687	0.000

Table B.26: Principal component analysis Benefit1

	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.501	1.002	0.750	0.750
Comp2	0.499	.	0.250	1.000

	Comp1	Comp2	Unexplained
Social Benefits For Poverty	0.707	0.707	0.000
Social Benefits For Equity	0.707	-0.707	0.000

Table B.27: Principal component analysis Social Responsibility

	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.833	1.176	0.611	0.611
Comp2	0.657	0.147	0.219	0.830
Comp3	0.510	.	0.170	1.000

	Comp1	Comp2	Comp3	Unexplained
Unemployed Social Responsibility	0.568	-0.656	0.498	0.000
Childcare Social Responsibility	0.555	0.752	0.357	0.000
Elders Social Responsibility	0.608	-0.073	-0.791	0.000

Table B.28: Principal component analysis Inequality

	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.709	1.000	0.570	0.570
Comp2	0.709	0.127	0.236	0.806
Comp3	0.582	.	0.194	1.000

	Comp1	Comp2	Comp3	Unexplained
Inequality Gov. Responsibility	0.600	-0.313	-0.736	0.000
Income Acceptance	0.540	0.837	0.084	0.000
Fair Society	0.590	-0.448	0.671	0.000

Table B.29: Principal component analysis Lgtb Support

	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.584	1.167	0.792	0.792
Comp2	0.416	.	0.208	1.000

	Comp1	Comp2	Unexplained
Sexual Freedom	-0.707	0.707	0.000
Gay Ashamed	0.707	0.707	0.000

Table B.30: Principal component analysis Immigration

	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.443	1.701	0.611	0.611
Comp2	0.742	0.194	0.186	0.796
Comp3	0.548	0.282	0.137	0.933
Comp4	0.266	.	0.067	1.000

	Comp1	Comp2	Comp3	Unexplained
Immigrants Different Race	-0.564	0.245	0.207	0.154
Immigrants Good	0.490	0.068	0.863	0.003
Refugee Reception	0.408	0.850	-0.313	0.003
Immigrants Same Race	0.408	0.850	-0.313	0.003

Table B.31: Principal component analysis Religion

	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.311	1.931	0.770	0.770
Comp2	0.380	0.072	0.127	0.897
Comp3	0.309	.	0.103	1.000

	Comp1	Comp2	Comp3	Unexplained
How Religious	0.578	0.557	-0.597	0.000
Religious Services	-0.568	0.800	0.196	0.000
How Pray	0.586	0.225	0.778	0.000

Table B.32: Principal component analysis Happy-Satisfied

	Eigenvalue	Difference	Proportion	Cumulative

Comp1	1.688	1.375	0.844	0.844
Comp2	0.312	.	0.156	1.000

	Comp1	Comp2	Unexplained
Life Satisfaction	0.707	0.707	0.000
How Happy	0.707	-0.707	0.000

B.3 Full models and robustness checks

Figure B.1: Cosine similarity matrix - Environmental indices - Elastic Net

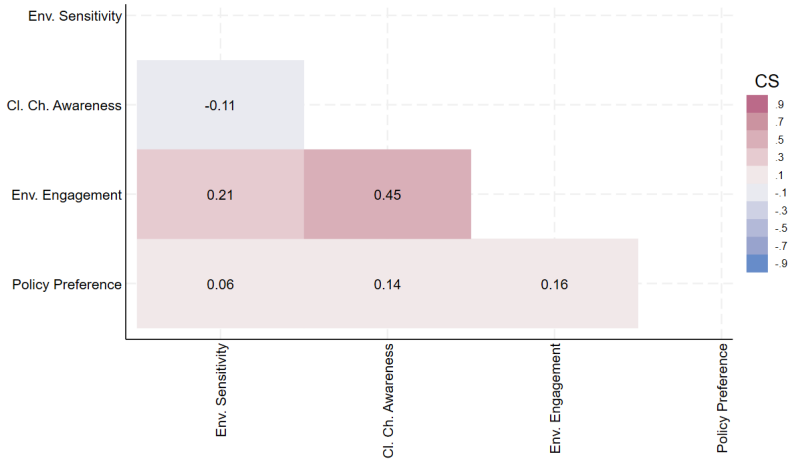


Figure B.2: Cosine similarity matrix - Voting preferences and environmental indices - Elastic Net

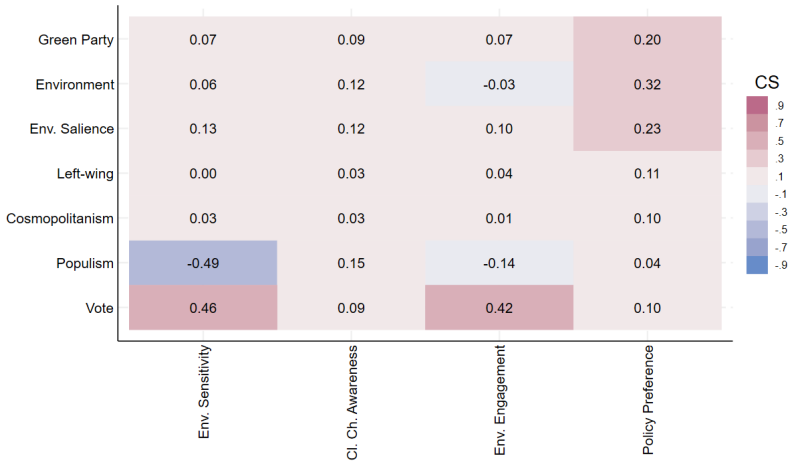


Figure B.3: Cosine similarity matrix - Left-Wing variables and environmental indices

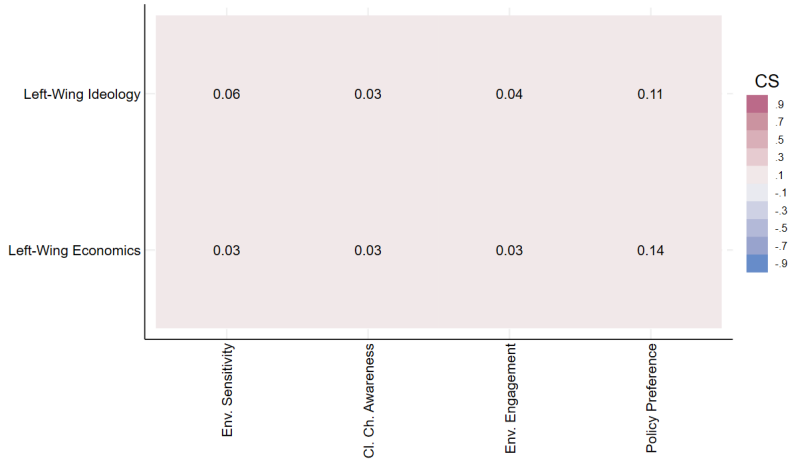


Table B.33: Lasso regression of the 4 Env. Indices

	Env. Sens.	Cl. Ch. Awar.	Env. Eng.	Policy Pref.
Time spent watching news				
Interest in politics	1.0067***	0.9813***	0.6814***	0.4944**
Political role		0.3754***	0.2138*	0.1459
Feel close to party	0.4853	0.6752***	0.6385**	1.4510***
Political activism	0.9352***	0.7434**	0.4470***	0.6615***
Trust in institutions	-0.8412***	-0.6129***	-0.0654	0.5742***
Attached to own Country	1.3935***		0.6407***	
Attached to Europe	1.3082***	0.8694***	1.0064***	0.8886***
Feelings about people		-0.3196***	0.2287**	
Happiness and life satisfaction	0.2825*		0.6936***	
Feeling of safety				
Victim of a burglary		0.3789	0.5573*	

Religious attitude	0.6724***	0.2773***	0.3798***	
Aptitudes toward immigration	0.7240***	0.9016***	0.4798***	1.9294***
Opinions on Lgtb topics	1.3584***	1.0394***	0.4019***	0.9359***
Aptitudes toward inequalities	0.9368***	0.9395***	0.4257***	1.4420***
Feeling of social responsibilities	1.4357***	0.8913***	0.9647***	0.7993***
Social benefits for inequalities	0.2906*		0.1265	1.1534***
Number of house members	-0.2201	0.0728	0.1796	
Presence of children at home			0.6029*	
Investment in knowledge improvement		1.4718***	1.2517***	0.7271*
Education				
Less than lower secondary		-1.3031**	-0.5998	-1.9081***
Lower secondary	-0.2354	-0.5829	-0.8372**	-0.8283
Lower upper secondary	-0.3049			
Adv. vocational sub-degree			-0.0143	
Lower tertiary	1.4270**	1.2789***		1.4178**
Higher tertiary	0.4433	1.2186***	0.2556	1.2992**
Living in a big city		0.6646**		0.8590**
Health (self evaluation)			0.3929***	
Gender	0.6756*	0.653**	1.1837***	1.2603***
Age				
18_20	-2.7834*			
31_40		1.3133***		1.4438***
41_50	2.9411***	0.5671	1.8896***	
51_60	4.7648***		1.7032***	
61_70	4.5763***	-0.7403*	1.9410***	
71_80	4.7353***	-2.2012***		-0.5417
81_90	6.7559***	-2.9805***	-0.7307	
91_100		-7.1988***	-5.2596**	
Born In Country	-0.6896	-0.2703	-0.9768*	
Occupation (ISCO8)				
Technicians..	0.2294		0.5382*	
Clerical..	-0.7963			
Skilled..	1.3298	-1.9648**	-2.4537***	
Craft..	-0.6994	-0.1935	-0.2640	
Plant..	-0.8521			
Elementary..			-0.6023	-1.8138**
Working sector (NACER2)				
Electricity..				-6.4332***
Construction			-0.4536	
Wholesale..	-1.8141***			
Information..		0.7849		
Public..				
Education	0.1414			
Human..	-0.2716			0.6410
Arts..				2.4807*
Organisations..		12.2292***		
Employment				
Selfemp..	0.8910			
Work Contract				
No Contract			-0.2307	
Activity				
Retired	0.9324	-0.592		-1.2668***
Education		1.4679**		
Other	0.7304	1.8741***		
Income Feeling (perceived)				0.6661***
Out of the labour market			-1.2355*	
_cons	73.1814***	62.4834***	64.7418***	58.0013***
N	27351	27315	27351	27351
adj. R^2	0.1047	0.1829	0.1115	0.1328
AIC	-1.31e+04	-3.54e+04	-3.47e+04	-1.54e+04
BIC	-1.27e+04	-3.49e+04	-3.43e+04	-1.50e+04

*** p≤0.01, ** p≤0.05, * p≤0.10 - Coefficients multiplied by 100
Country-level fixed effects excluded

Table B.34: Lasso regression of the 3 environment voting variables

	Green Party	Environment	Env. Salience
Interest in politics		-1.1874***	
Political role	0.6081***	0.7533***	0.0189
Feel close to party		0.4244	

Political activism	0.8601***	1.4512***	0.6058***
Attached to own Country	-0.7858***	-0.8198**	-0.9941***
Attached to Europe	0.4169		1.2866***
Feelings about people	0.4994***		0.2849*
Happiness and life satisfaction		-0.7011***	
Feeling of safety	-0.2942	-0.1379	-0.1890
Belonging to a religion	-2.5353***	-2.9574***	-0.8168
Religious attitude	0.0759	-0.0266	-0.0578
Aptitudes toward immigration	1.1452***	1.3421***	1.7342***
Opinions on Lgtb topics	0.5325**	0.7358**	0.5831***
Aptitudes toward inequalities	1.0049***	1.5566***	1.3472***
Social benefits for inequalities		0.4061	
Investment in knowledge improvement	-0.0168		-0.0487
Education			
Lower upper secondary	-2.3255***	-2.2868***	-1.1944**
Lower tertiary		0.9332	
Higher tertiary	0.0736	0.5811	0.0766
Living in a big city	0.2739	0.8184	0.8264**
Health (self evaluation)	0.2199	0.7111**	
Gender	0.7106	1.2565*	1.0685***
Age			
31_40		0.7773	
61_70		-1.3550*	
Occupation (ISCO8)			
Managers		-1.2466	-0.9077
Services..		-0.8130	
Working sector (NACER2)			
Wholesale..		-1.9532**	-2.7397***
Information..		0.7238	
Education	1.9710**	1.8336	0.9266
Arts..		3.6010	
Activity			
Retired	-2.5822***	-3.3266***	-1.2049***
Education	1.0658	3.3174	2.2752*
Housework		-1.9162	
Out of the labour market		1.6581	
_cons	-0.0367	3.7602***	48.7532***
N	18585	18131	16089
adj. R^2	0.0980	0.1182	0.2909
AIC	-3.07e+03	4119.7699	-1.50e+04
BIC	-2.77e+03	4502.2335	-1.47e+04

*** p≤0.01, ** p≤0.05, * p≤0.10 - Coefficients multiplied by 100
Country-level fixed effects excluded

Table B.35: Lasso regression of the 4 general voting variables

	Left-Wing	Cosmopolitanism	Populism	Vote
Time spent watching news		0.1086	-0.2342	0.2259
Interest in politics				6.0396***
Political role				0.2855
Feel close to party		-1.4180***	1.4859***	10.7371***
Political activism	1.2012***	1.1832***	1.6216***	1.4706***
Trust in institutions			-1.2008***	1.1143***
Attached to own Country	-1.9251***	-1.8811***	-0.7918***	1.9642***
Attached to Europe	1.2086***	1.7150***	-2.3881***	
Sociability				0.6016*
Feelings about people	0.5430***	0.5825***		0.3941
Happiness and life satisfaction	-0.5891***	-0.5169**	-0.1970	0.7635**
Feeling of safety	-0.4510*	-0.4842*		
Victim of a burglary			0.1984	
Belonging to a religion	-1.7522***	-1.7789***	-2.9387***	3.4546***
Religious attitude	-1.3183***	-1.5505***	-0.7806***	0.1923
Aptitudes toward immigration	3.0108***	3.2079***	-1.1659***	
Opinions on Lgtb topics		1.0470***		0.4223
Aptitudes toward inequalities	2.9916***	2.0468***	1.2356***	
Feeling of social responsibilities	0.9905***	0.7090***	0.8460***	0.0990
Number of house members				1.1225**
Presence of children at home				0.6730
Investment in knowledge improvement		-0.1639		1.3926
Education				

Less than lower secondary	1.7599*	2.1862**		-3.8253**
Lower secondary				-3.9788***
Lower upper secondary	-1.3672**	-1.3588**		-0.7591
Adv. vocational sub-degree				2.8170**
Lower tertiary				3.4802***
Higher tertiary		1.0757*		2.1894*
Living in a big city	2.3841***	2.3791***		
Health (self evaluation)	-0.4499*			
Gender	1.1451**	1.5493***	-0.8880*	0.5770
Age				
18_20				-17.3802***
31_40			-0.7324	
41_50	-0.9038			8.8634***
51_60			-2.0354***	10.7130***
61_70	1.1727**		-3.6913***	13.6664***
71_80			-4.3543***	11.2819***
81_90			-4.1913***	9.6067***
91_100				-14.5850*
Country Citizen				35.7292***
Born In Country				2.1365
Belonging to a minority	5.8560***	4.7414***		
Fat. born in the Coun.	-2.0674	-2.3831*		3.7678
Mot. born in the Coun.	-0.2064	0.0429		
Foreign parents	1.0809	-0.1739		-2.0403
Occupation (ISCO8)				
Armed..	-6.9571**	-6.9370**		
Managers	-1.4754*		-1.2068	1.5263
Technicians..			-0.9522	
Clerical..				1.8907
Services..			1.0479	-2.2437*
Skilled..		1.5368		-2.9313
Craft..			2.8566***	-2.7114*
Plant..			1.5759	-2.0120
Elementary..			2.0027*	-5.5757***
Working sector (NACER2)				
Agriculture..	-3.4817***	-5.6149***	-0.2725	
Mining..				7.5481
Construction		-4.0994***	1.8379	-1.5366
Wholesale..	-2.4333***	-2.8603***		
Accommodation..				-3.4129*
Financial..	-2.6580**			
Real..	-4.8972*	-3.4771		
Public..				1.7715
Education	1.2304	0.9384		1.1854
Human..	2.6192***	2.0351***		
Arts..		0.0591	3.9240*	
Other..		-3.2780**		
Employment				
Selfemp..	-2.3430***	-1.5319**	-1.1549	
Familybus..	-1.4298	-0.4282		
Work Contract				
Limited			0.1849	-3.6425***
Activity				
Unemployed	2.3130*		1.3331	-0.5509
Retired	-0.2169		0.2087	1.0729
Education		1.0473		
Housework	-1.4088*	-1.8073**	-3.1642***	
Other			1.6731	-5.1907**
Income Feeling (perceived)	-0.6870**		-0.4362	0.7268
Out of the labour market				-4.6191**
_cons	48.7101***	54.6037***	48.9192***	23.8756***
N	18142	18142	18142	27351
adj. R^2	0.2477	0.2882	0.3158	0.2117
AIC	-7.65e+03	-6.60e+03	-5.39e+03	2.18e+04
BIC	-7.23e+03	-6.16e+03	-4.97e+03	2.24e+04

*** p≤0.01, ** p≤0.05, * p≤0.10 - Coefficients multiplied by 100
Country-level fixed effects excluded

Appendix C

Appendix C: The impact of Ukraine's war outbreak on green preferences in Europe

C.1 Descriptive statistics

The war period (+1) covers from February 24, 2022, to May 23, 2022, while sub-period -1 ranges from August 24, 2021, to November 23, 2021, and sub-period -2 from May 24, 2021, to August 23, 2021. Observations outside this interval, accounting for just under 7%, were excluded due to the limited number of observations[1]. In some cases the interview can last more than one day and we have information on both the dates when the interviews starts and when they finish. If the start and end dates of an interview fall into different sub-periods, since it's unclear when responses to specific questions were given, that data was excluded. This involves a sample reduction of less than 1%.

Table C.1: Descriptive stat. of the 5 dependent variables

	Obs	**Mean**	**Std. dev.**	**Min**	**Max**
Env. Salience	5408	5.3277	2.0394	1	10
Env. Position	5408	4.9175	2.1985	1	9
CL. Ch. Worry	5408	3.4345	0.9154	1	5
Per. Responsibility	5408	6.8597	2.2289	0	10
Env. Sensitivity	4484	4.9173	0.9785	1	6

[1] All the results are robust even when all information are considered, i.e. when we include one quarter before 24rd May 2021 and two quarters after 23th May 2022. In this case the correspondent coefficients of these further periods are not significant with very large confidence intervals as a result of the low number of observations.

Table C.2: Descriptive stat. of the independent variables

	Obs	**Mean**	**Std. dev.**	**Min**	**Max**
Post	5408	0.3127	0.4636	0	1
Big City	5408	0.3291	0.4699	0	1
Female	5408	0.4702	0.4992	0	1
Income Perceived	5408	-	-	1	4
Education	5408	-	-	1	7
Age	5408	-	-	1	8
Activity	5408	-	-	1	9
Country	5408	-	-	1	9
Energy price (log - lag1)	5408	5.0705	0.5089	3.7015	6.1051
Google Trends	5408	13.2229	23.1754	0.5	100

Table C.3: Descriptive statistics of Income perceived

	Freq.	Percent
Very difficult	170	3.14
Difficult	699	12.93
Coping	1951	36.08
Living comfortably	2588	47.86
Total	5408	100.00

Table C.4: Descriptive statistics of Education (ISCED)

	Freq.	Percent
Less than lower secondary	379	7.01
Lower secondary	738	13.65
Lower tier upper secondary	632	11.69
Upper tier upper secondary	930	17.20
Advanced vocational	582	10.76
Lower tertiary education	1007	18.62
Higher tertiary education	1140	21.08
Total	5408	100.00

Table C.5: Descriptive statistics of Age

	Freq.	Percent
15-20	214	3.96
21-30	565	10.45
31-40	701	12.96
41-50	886	16.38
51-60	1073	19.84
61-70	993	18.36
71-80	745	13.78
81-90	231	4.27
Total	5408	100.00

Table C.6: Descriptive statistics of Activity

	Freq.	Percent

Paid work	2892	53.48
Education	342	6.32
Unemp. looking for job	137	2.53
Unemp. not looking for job	63	1.16
Permanent sick or disabled	147	2.72
Retired	1424	26.33
Housework	375	6.93
Total	28	0.52
Total	5408	100.00

Table C.7: Descriptive statistics of Country

	Freq.	Percent
Belgium	564	10.43
Spain	753	13.92
the UK	517	9.56
Greece	740	13.68
Italy	512	9.47
Norway	881	16.29
Poland	161	2.98
Switzerland	642	11.87
the Netherlands	638	11.80
Total	5408	100.00

C.2 Full models

This appendix presents the complete models of the results shown in the main body of the paper in Figure 2 and Table 1, to which it also adds models for the variable Sensitivity, which is not part of the main analysis as it is not available for some of the countries under investigation (Spain and Poland).

Table C.8: Event study models

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Pre-Post Quorters					
+1 (24Feb-23May)	-0.0913**	-0.1082*	-0.0292	-0.1020***	-0.0352
-2 (24Aug-23Nov)	-0.0311	-0.0636	0.0161	-0.0164	0.0345
-3 (24May-23Aug)	0.0803	0.0216	0.0812	0.0582	0.0832
Quorters (ESS9-ESS8)	0.1536	0.0399	0.0601	-0.2673	0.1145
Big City	0.1366***	0.032	-0.0346	0.1794***	0.0517
Female	0.1211***	0.1915***	0.2296***	0.1780***	0.1251***
Income Perceived					
Difficult	0.0547	0.0329	-0.1978*	0.0795	-0.0906
Coping	-0.0319	-0.0657	-0.2580**	-0.0601	-0.1463
Living comfortably	-0.0272	-0.0985	-0.2665**	-0.0765	-0.1449
Education					
Less than lower sec.	-0.0236	-0.0093	-0.0796	-0.0329	-0.2412**
Lower secondary	-0.1214**	-0.051	-0.0709	-0.1110*	-0.0411
Lower upper sec.	-0.2319***	-0.0482	-0.0122	-0.1367**	-0.0058
Adv. Vocational	-0.0931	-0.0511	0.0537	-0.0326	-0.0278
Lower tertiary	0.0962*	0.1813***	0.1764***	0.1214**	0.1530**
Higher tertiary	0.2405***	0.3133***	0.1981***	0.3105***	0.2332***

Age					
15-20	0.0586	0.0799	-0.0849	0.0923	-0.0814
31-40	0.036	0.0451	0.0263	0.0814	-0.0781
41-50	-0.1076	0.036	0.1392*	-0.0038	0.0179
51-60	-0.0786	0.0351	0.2401***	0.0141	-0.0007
61-70	-0.1364*	0.1826**	0.2685***	-0.008	0.0713
71-80	-0.2379***	0.0181	0.2252**	-0.2016**	0.0944
81-90	-0.3712***	-0.1779	-0.0984	-0.3007***	-0.0487
Activity					
Education	0.1281	0.11	0.0713	0.2281**	0.0102
Un. looking for job	0.2155**	0.0747	-0.035	0.2545***	0.1799*
Un. not looking for job	0.0613	0.0105	-0.1631	-0.0378	0.0548
Permanent sick or dis.	-0.1481	-0.0374	0.0307	0.0404	0.1195
Retired	0.0497	0.0291	-0.1332**	0.1147*	0.0553
Military service	-0.4949	0.5860**	1.0368*	0.289	0.9909*
Housework	0.0825	0.0675	0.0249	0.0664	0.0843
Other	-0.2511	-0.089	-0.0709	-0.379	
Country					
Belgium	-0.0309	0.0779	0.0494	-0.0291	-0.0317
Spain	0.3806***	0.1837***	0.3825***	0.1059	
the UK	0.4376***	0.1009	0.4887***	0.6739***	-0.0564
Greece	-0.1987***	-0.1055	-0.2923***	-0.4265***	-0.4027***
Norway	0.3144***	-0.2509***	0.1773**	0.1102	-0.6948***
Poland	-0.1851***	-0.1982**	0.2275**	-0.6063***	
Switzerland	0.4192***	0.0114	0.4497***	0.2460***	-0.1636**
the Netherlands	0.4034***	-0.0542	0.2097***	-0.0656	-0.2887***
_cons	-0.2175*	-0.1192	-0.2106	-0.1799	0.2374
N	5026	5026	5026	5026	4116
adj. R-sq	0.1062	0.0481	0.0984	0.1314	0.0687
AIC	1.35E+04	1.41E+04	1.39E+04	1.35E+04	1.15E+04
BIC	1.37E+04	1.43E+04	1.42E+04	1.38E+04	1.17E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work-, Country -Italy- and Pre-Post Quorters - -1 (24Nov-23Feb)-

Table C.9: Benchmark models

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.0993***	-0.0884***	-0.0401	-0.0930***	-0.053
Big City	0.1539***	0.0846**	0.0094	0.1585***	0.0586
Female	0.1844***	0.2003***	0.2105***	0.2265***	0.1322***
Income Perceived					
Difficult	0.1341	0.0302	-0.2207**	0.1438*	-0.1686
Coping	0.1003	-0.098	-0.2854***	0.0494	-0.2164**
Living comfortably	0.1442*	-0.0859	-0.2631***	0.0454	-0.1677
Education					
Less than lower sec.	0.043	-0.0084	-0.0415	0.0167	-0.1954**
Lower secondary	-0.1226**	-0.0402	-0.1319**	-0.1492**	-0.0356
Lower upper sec.	-0.2262***	-0.0376	-0.0297	-0.1672**	0.0148
Adv. Vocational	-0.0519	-0.0028	0.0319	-0.0496	0.0702
Lower tertiary	0.1182**	0.2588***	0.1775***	0.1159**	0.1445**
Higher tertiary	0.2701***	0.3414***	0.1589***	0.2896***	0.2384***
Age					
15-20	0.0585	0.1002	-0.0799	0.0962	-0.1417
31-40	0.0597	0.0137	0.0797	0.1036	-0.0027
41-50	-0.0241	0.0197	0.1277*	0.0268	0.1123

51-60	-0.0118	0.0584	0.2204***	0.0363	0.0665
61-70	-0.1485*	0.1541*	0.2134***	-0.0577	0.1352
71-80	-0.1862**	0.0103	0.1035	-0.1935**	0.1106
81-90	-0.2235*	-0.0259	-0.1577	-0.2645**	0.0259
Activity					
Education	0.1752	0.1009	0.0153	0.2129**	0.0771
Un. looking for job	0.2631***	0.0825	-0.0548	0.2240*	0.2112**
Un. not looking for job	0.0205	0.2820*	0.0844	0.0754	0.085
Permanent sick or dis.	-0.0441	0.0471	0.0586	0.1303	0.1153
Retired	0.0663	-0.0527	-0.0856	0.1174**	0.1183
Housework	0.0625	0.0121	-0.0094	0.0556	0.0687
Other	-0.2723	0.099	0.0199	-0.3496*	
Country					
the UK	0.3747***	0.0467	0.4384***	0.6512***	-0.1046
Belgium	0.0242	0.0181	0.0553	0.1148	-0.1087*
Spain	0.3621***	0.1680***	0.3658***	0.1077*	
Norway	0.2895***	-0.2989***	0.1736***	0.1221*	-0.6838***
Poland	-0.1789**	-0.1062	0.2572**	-0.6137***	
Switzerland	0.3857***	-0.0152	0.4408***	0.2467***	-0.1232
the Netherlands	0.3687***	-0.0667	0.1935***	-0.038	-0.3240***
Greece	-0.1300*	-0.1700***	-0.3717***	-0.3354***	-0.4351***
_cons	-0.4483***	-0.1409	-0.1354	-0.3338***	0.2119
N	5408	5408	5408	5408	4484
adj. R-sq	0.0953	0.0605	0.1001	0.124	0.0695
AIC	1.48E+04	1.50E+04	1.47E+04	1.46E+04	1.26E+04
BIC	1.50E+04	1.52E+04	1.49E+04	1.49E+04	1.28E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.10: Benchmark models with Google Trends

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.0761*	-0.0683*	-0.015	-0.0775*	-0.0549
Google Trends	-0.0008	-0.0007	-0.0009	-0.0005	0.0001
Big City	0.1552***	0.0857**	0.0108	0.1593***	0.0584
Female	0.1829***	0.1990***	0.2089***	0.2255***	0.1323***
Income Perceived					
Difficult	0.1318	0.0283	-0.2232**	0.1422*	-0.1685
Coping	0.0999	-0.0983	-0.2859***	0.0491	-0.2165**
Living comfortably	0.1438*	-0.0862	-0.2635***	0.0452	-0.1677
Education					
Less than lower sec.	0.0446	-0.007	-0.0397	0.0178	-0.1955**
Lower secondary	-0.1233**	-0.0408	-0.1327**	-0.1496**	-0.0355
Lower upper sec.	-0.2248***	-0.0364	-0.0282	-0.1663**	0.0147
Adv. Vocational	-0.0525	-0.0033	0.0312	-0.05	0.0703
Lower tertiary	0.1195**	0.2599***	0.1789***	0.1167**	0.1445**
Higher tertiary	0.2706***	0.3418***	0.1594***	0.2900***	0.2383***
Age					
15-20	0.0572	0.099	-0.0813	0.0953	-0.1416
31-40	0.0589	0.013	0.0788	0.103	-0.0027
41-50	-0.0248	0.0192	0.1270*	0.0264	0.1123
51-60	-0.0121	0.0582	0.2201***	0.0361	0.0665
61-70	-0.1485*	0.1541*	0.2134***	-0.0577	0.1352
71-80	-0.1860**	0.0105	0.1036	-0.1934**	0.1106
81-90	-0.2243*	-0.0266	-0.1586	-0.2650**	0.0259

Activity					
Education	0.1774	0.1027	0.0176	0.2143**	0.0769
Un. looking for job	0.2599***	0.0797	-0.0583	0.2219*	0.2114**
Un. not looking for job	0.0211	0.2825*	0.0851	0.0758	0.085
Permanent sick or dis.	-0.0426	0.0484	0.0602	0.1313	0.1151
Retired	0.0663	-0.0527	-0.0856	0.1174**	0.1182
Housework	0.0651	0.0143	-0.0066	0.0573	0.0684
Other	-0.2764	0.0955	0.0154	-0.3524*	
Country					
Belgium	0.0163	0.0113	0.0468	0.1095	-0.1080*
Spain	0.3685***	0.1735***	0.3727***	0.1120*	
the UK	0.3673***	0.0403	0.4303***	0.6462***	-0.104
Greece	-0.1279*	-0.1682***	-0.3695***	-0.3340***	-0.4353***
Norway	0.2868***	-0.3013***	0.1707***	0.1202*	-0.6836***
Poland	-0.1659**	-0.095	0.2713**	-0.6050***	
Switzerland	0.3881***	-0.0131	0.4434***	0.2483***	-0.1234
the Netherlands	0.3727***	-0.0632	0.1979***	-0.0353	-0.3243***
_cons	-0.4437***	-0.1368	-0.1304	-0.3307***	0.2116
N	5408	5408	5408	5408	4484
adj. R-sq	0.0954	0.0605	0.1003	0.1239	0.0693
AIC	1.48E+04	1.50E+04	1.47E+04	1.46E+04	1.26E+04
BIC	1.50E+04	1.52E+04	1.49E+04	1.49E+04	1.28E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.11: Benchmark models with Energy prices

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.0715**	-0.0829**	-0.0172	-0.0692**	-0.0467
Energy price (log - lag1)	-0.1434**	-0.0286	-0.1178**	-0.1227*	-0.0266
Big City	0.1527***	0.0843**	0.0084	0.1574***	0.0583
Female	0.1847***	0.2004***	0.2107***	0.2267***	0.1324***
Income Perceived					
Difficult	0.1392*	0.0313	-0.2166**	0.1481*	-0.1675
Coping	0.1038	-0.0973	-0.2826***	0.0524	-0.2157**
Living comfortably	0.1477*	-0.0852	-0.2603***	0.0484	-0.1669
Education					
Less than lower sec.	0.0419	-0.0086	-0.0423	0.0158	-0.1955**
Lower secondary	-0.1243**	-0.0405	-0.1333**	-0.1506**	-0.0358
Lower upper sec.	-0.2290***	-0.0381	-0.032	-0.1696**	0.0141
Adv. Vocational	-0.0528	-0.003	0.0311	-0.0503	0.07
Lower tertiary	0.1158**	0.2583***	0.1755***	0.1138**	0.1440**
Higher tertiary	0.2682***	0.3410***	0.1573***	0.2880***	0.2378***
Age					
15-20	0.0616	0.1008	-0.0774	0.0989	-0.1418
31-40	0.0605	0.0138	0.0804	0.1043	-0.0029
41-50	-0.0238	0.0198	0.1279*	0.0271	0.1122
51-60	-0.0113	0.0585	0.2208***	0.0367	0.0662
61-70	-0.1508**	0.1536*	0.2114***	-0.0598	0.1342
71-80	-0.1880**	0.01	0.102	-0.1951**	0.1098
81-90	-0.2234*	-0.0259	-0.1576	-0.2644**	0.0254
Activity					
Education	0.1698	0.0998	0.0108	0.2082**	0.0758
Un. looking for job	0.2568**	0.0813	-0.06	0.2186*	0.2098**
Un. not looking for job	0.0166	0.2812*	0.0812	0.0721	0.0838

Permanent sick or dis.	-0.048	0.0463	0.0554	0.127	0.1144
Retired	0.0636	-0.0532	-0.0878	0.1150**	0.1176
Housework	0.0603	0.0117	-0.0112	0.0537	0.068
Other	-0.2678	0.0999	0.0236	-0.3458*	
Country					
Belgium	-0.0101	0.0113	0.0271	0.0854	-0.1151*
Spain	0.3379***	0.1632***	0.3459***	0.087	
the UK	0.3514***	0.0421	0.4192***	0.6313***	-0.1089
Greece	-0.1423**	-0.1724***	-0.3819***	-0.3460***	-0.4375***
Norway	0.1247	-0.3318***	0.0382	-0.019	-0.7144***
Poland	-0.2652***	-0.1235	0.1863	-0.6876***	
Switzerland	0.3252***	-0.0273	0.3911***	0.1949*	-0.1344
the Netherlands	0.3174***	-0.0769	0.1514**	-0.0819	-0.3335***
_cons	0.3263	0.0137	0.501	0.329	0.3556
N	5408	5408	5408	5408	4484
adj. R-sq	0.0964	0.0604	0.1008	0.1247	0.0693
AIC	1.48E+04	1.50E+04	1.47E+04	1.46E+04	1.26E+04
BIC	1.50E+04	1.52E+04	1.49E+04	1.49E+04	1.28E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.12: Models with only Energy prices

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Energy price (log - lag1)	-0.1922***	-0.0851	-0.1295**	-0.1699**	-0.0595
Big City	0.1519***	0.0834**	0.0082	0.1566***	0.0577
Female	0.1849***	0.2007***	0.2108***	0.2269***	0.1330***
Income Perceived	0	0	0	0	0
Difficult	0.1409*	0.0332	-0.2162**	0.1498*	-0.166
Coping	0.1053	-0.0955	-0.2822***	0.0538	-0.2147**
Living comfortably	0.1495*	-0.0831	-0.2598***	0.0501	-0.1654
Education					
Less than lower sec.	0.0415	-0.009	-0.0424	0.0155	-0.1953**
Lower secondary	-0.1253**	-0.0418	-0.1335**	-0.1516**	-0.0365
Lower upper sec.	-0.2306***	-0.04	-0.0324	-0.1711**	0.0127
Adv. Vocational	-0.0527	-0.0029	0.0311	-0.0503	0.0696
Lower tertiary	0.1150**	0.2574***	0.1754***	0.1131**	0.1431**
Higher tertiary	0.2671***	0.3397***	0.1571***	0.2869***	0.2358***
Age					
15-20	0.064	0.1036	-0.0768	0.1012	-0.1425
31-40	0.0612	0.0146	0.0805	0.1049	-0.0037
41-50	-0.0234	0.0203	0.1280*	0.0275	0.1117
51-60	-0.0109	0.0591	0.2209***	0.0372	0.0648
61-70	-0.1518**	0.1525*	0.2112***	-0.0607	0.1313
71-80	-0.1888**	0.0091	0.1018	-0.1959**	0.1077
81-90	-0.2258*	-0.0288	-0.1582	-0.2668**	0.0218
Activity					
Education	0.1692	0.099	0.0107	0.2076**	0.0743
Un. looking for job	0.2541**	0.0782	-0.0606	0.2160*	0.2100**
Un. not looking for job	0.0154	0.2797*	0.0809	0.0709	0.0795
Permanent sick or dis.	-0.0477	0.0466	0.0555	0.1272	0.1135
Retired	0.0643	-0.0524	-0.0877	0.1157**	0.1172
Housework	0.0604	0.0117	-0.0112	0.0538	0.0672
Other	-0.2657	0.1024	0.0241	-0.3438*	
Country					

Belgium	-0.0219	-0.0023	0.0243	0.074	-0.1230**
Spain	0.3297***	0.1537***	0.3439***	0.079	
the UK	0.3433***	0.0327	0.4173***	0.6235***	-0.1142*
Greece	-0.1465**	-0.1772***	-0.3829***	-0.3500***	-0.4405***
Norway	0.0684	-0.3971***	0.0246	-0.0734	-0.7523***
Poland	-0.2928***	-0.1555	0.1797	-0.7143***	
Switzerland	0.3047***	-0.051	0.3861***	0.1751	-0.1481
the Netherlands	0.2998***	-0.0973	0.1472**	-0.0989	-0.3453***
_cons	0.5582	0.2824	0.5569*	0.5534	0.5143
N	5408	5408	5408	5408	4484
adj. R-sq	0.0954	0.059	0.1009	0.1238	0.0691
AIC	1.48E+04	1.50E+04	1.47E+04	1.46E+04	1.26E+04
BIC	1.50E+04	1.52E+04	1.49E+04	1.49E+04	1.28E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.13: Models with only Google Trends

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Google Trends	-0.0016**	-0.0014**	-0.001	-0.0013*	-0.0005
Big City	0.1561***	0.0865**	0.011	0.1602***	0.0593
Female	0.1815***	0.1978***	0.2086***	0.2241***	0.1316***
Income Perceived					
Difficult	0.1295	0.0262	-0.2237**	0.1399*	-0.1694
Coping	0.0998	-0.0984	-0.2859***	0.049	-0.2160**
Living comfortably	0.1440*	-0.0861	-0.2635***	0.0453	-0.1667
Education					
Less than lower sec.	0.0462	-0.0055	-0.0394	0.0195	-0.1945**
Lower secondary	-0.1244**	-0.0418	-0.1329**	-0.1508**	-0.0366
Lower upper sec.	-0.2240***	-0.0357	-0.0281	-0.1655**	0.0154
Adv. Vocational	-0.0528	-0.0036	0.0312	-0.0503	0.0694
Lower tertiary	0.1208**	0.2611***	0.1792***	0.1181**	0.1443**
Higher tertiary	0.2707***	0.3419***	0.1595***	0.2900***	0.2379***
Age					
15-20	0.057	0.0988	-0.0814	0.0952	-0.1435
31-40	0.0585	0.0126	0.0787	0.1026	-0.0031
41-50	-0.0251	0.0189	0.1269*	0.0261	0.1121
51-60	-0.0121	0.0581	0.2201***	0.0361	0.0656
61-70	-0.1487*	0.1539*	0.2133***	-0.0579	0.1336
71-80	-0.1860**	0.0105	0.1037	-0.1934**	0.1096
81-90	-0.2273*	-0.0293	-0.1592	-0.2681**	0.0228
Activity					
Education	0.1805	0.1055	0.0182	0.2174**	0.0792
Un. looking for job	0.2562***	0.0764	-0.059	0.2181*	0.2116**
Un. not looking for job	0.0218	0.2831*	0.0852	0.0765	0.0831
Permanent sick or dis.	-0.0397	0.0509	0.0608	0.1342	0.1174
Retired	0.0676	-0.0515	-0.0854	0.1187**	0.1192
Housework	0.0683	0.0172	-0.006	0.0606	0.0703
Other	-0.28	0.0922	0.0147	-0.3561*	
Country					
Belgium	0.0084	0.0042	0.0452	0.1014	-0.1141*
Spain	0.3748***	0.1792***	0.3739***	0.1184*	
the UK	0.3597***	0.0336	0.4289***	0.6386***	-0.1096
Greece	-0.1259*	-0.1663***	-0.3691***	-0.3319***	-0.4336***
Norway	0.2839***	-0.3039***	0.1701***	0.1173*	-0.6858***

Poland	-0.1514**	-0.082	0.2742**	-0.5903***	
Switzerland	0.3906***	-0.0109	0.4439***	0.2508***	-0.1215
the Netherlands	0.3766***	-0.0597	0.1987***	-0.0313	-0.3213***
_cons	-0.4661***	-0.157	-0.1348	-0.3535***	0.1963
N	5408	5408	5408	5408	4484
adj. R-sq	0.0946	0.0599	0.1005	0.123	0.069
AIC	1.48E+04	1.50E+04	1.47E+04	1.46E+04	1.26E+04
BIC	1.50E+04	1.52E+04	1.49E+04	1.49E+04	1.28E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.14: Models for seasonal trends

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Month					
February	0.0515	-0.0046	0.009	0.058	0.0191
March	0.0011	0.2115	0.12	0.0057	-0.0954*
April	0.0638	0.0575	0.106	0.0356	0.1107
May	0.0593	0.0845	0.2232	0.0511	0.1408
June	0.248	0.2835	-0.3597	0.0512	0.6979***
July	0	0	0	0	0
August	0.0775	0.0904	0.016	0.0289	-0.1933
September	0.1786***	-0.0231	-0.028	0.1263***	-0.0640*
October	0.1322***	-0.0145	0.0085	0.0827**	-0.0649*
November	0.1249***	-0.0584	-0.0685	0.0639*	-0.0268
December	0.0588	0.0066	-0.0543	-0.0101	-0.0174
Big City	0.1391***	0.1171***	0.0591**	0.1359***	-0.0276
Female	0.1409***	0.1127***	0.0742***	0.1551***	0.0883***
Income Perceived					
Difficult	0.1088*	-0.1487	0.0547	0.0313	-0.1126*
Coping	0.0448	-0.2985***	0.0138	-0.0312	-0.1698***
Living comfortably	-0.0378	-0.3643***	0.0289	-0.1627***	-0.1747***
Education					
Less than lower sec.	-0.1390***	-0.2088***	-0.2373***	-0.1448***	-0.1405***
Lower secondary	-0.1558***	-0.1444***	-0.1502***	-0.1443***	-0.1227***
Lower upper sec.	-0.2035***	-0.1436***	-0.0842*	-0.1540***	-0.0689*
Adv. Vocational	-0.0382	-0.0831*	0.022	-0.0498	0.0362
Lower tertiary	0.1383***	0.0940**	0.1660***	0.1325***	0.0879***
Higher tertiary	0.2383***	0.1135**	0.1974***	0.2129***	0.1432***
Age					
15-20	-0.0447	0.0676	0.0559	-0.069	-0.0861
31-40	-0.0346	0.0241	0.1854***	-0.0207	0.1316***
41-50	-0.1010***	-0.0498	0.1497***	-0.0804**	0.1364***
51-60	-0.0368	-0.0717	0.1397***	-0.0297	0.2774***
61-70	-0.1042**	-0.0264	0.1668***	-0.0874**	0.3030***
71-80	-0.1966***	-0.1085	0.1076	-0.1921***	0.2686***
81-90	-0.2198***	-0.2599***	-0.3872***	-0.1903***	0.3140***
Activity					
Education	0.2029***	0.2169***	0.1699**	0.2285***	0.1790***
Un. looking for job	0.1590***	-0.0241	-0.0114	0.1598***	0.1191**
Un. not looking for job	0.2021**	0.0238	0.0067	0.119	-0.0559
Permanent sick or dis.	0.0624	0.1382*	0.1224	0.0494	0.0876
Retired	-0.0075	-0.0596	-0.1165**	-0.0023	0.0880***
Military service	-0.1008	0.1118	0.2057	-0.0456	0.0812
Housework	-0.0634	-0.0071	-0.0093	-0.0585	0.0994***

Other	0.0237			0.0312	0.3163***
Country					
Spain	0.2149***	0.102	0.0239	-0.1263***	0.1021***
the UK	-0.1147***	-0.3226***	0.0914*	0.1142***	-0.1446***
Belgium	-0.2399***	-0.0071	0.1325**	-0.2131***	-0.0553
Norway	0.0147	-0.3537***	0.1198**	-0.2418***	-0.5131***
Poland	-0.4942***	-0.4993***	0.0211	-1.1320***	-0.0107
Switzerland	0.0850*	-0.1139**	0.4535***	-0.0814*	0.1426***
the Netherlands	0.0447	-0.1686***	0.054	-0.3951***	-0.1655***
_cons	-0.1003	0.4744***	-0.2528*	0.1793**	0.0309
N	12614	6221	6221	12614	12534
adj. R-sq	0.0729	0.0841	0.0698	0.1303	0.0613
AIC	3.49E+04	1.71E+04	1.72E+04	3.41E+04	3.47E+04
BIC	3.52E+04	1.74E+04	1.75E+04	3.44E+04	3.51E+04

*** p<0.01, ** p<0.05, * p<0.10
Category reference classes: Month -January-, Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work-, Country -Italy- and Pre-Post Quorters - -1 (24Nov-23Feb)-

Table C.15: Placebo event study on 2016-2019

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Quarters					
24May-23Aug	0.0126	0.2062	-0.0298	-0.1301	0.039
24Aug-23Nov	0.1052***	-0.0378	0.0239	0.0763***	0.0006
24Feb-23May	-0.0186	0.2405***	0.1415*	0.004	-0.0219
Big City	0.1402***	0.1184***	0.0577**	0.1374***	-0.0262
Female	0.1410***	0.1136***	0.0759***	0.1554***	0.0895***
Income Perceived					
Difficult	0.1094*	-0.1435	0.0567	0.031	-0.1162*
Coping	0.0468	-0.2930***	0.0165	-0.0303	-0.1671***
Living comfortably	-0.0361	-0.3579***	0.0325	-0.1619***	-0.1701***
Education					
Less than lower sec.	-0.1347***	-0.2027***	-0.2374***	-0.1416***	-0.1335***
Lower secondary	-0.1546***	-0.1400***	-0.1495***	-0.1425***	-0.1173***
Lower upper sec.	-0.2019***	-0.1355***	-0.0763	-0.1514***	-0.0650*
Adv. Vocational	-0.0382	-0.0769	0.0236	-0.0492	0.0372
Lower tertiary	0.1390***	0.0976**	0.1668***	0.1335***	0.0888***
Higher tertiary	0.2384***	0.1211***	0.2002***	0.2124***	0.1436***
Age					
15-20	-0.0434	0.0718	0.0579	-0.0681	-0.088
31-40	-0.0339	0.0267	0.1906***	-0.0179	0.1335***
41-50	-0.1003***	-0.0457	0.1551***	-0.0779**	0.1400***
51-60	-0.0371	-0.0662	0.1437***	-0.029	0.2800***
61-70	-0.1034**	-0.0196	0.1725***	-0.0840**	0.3042***
71-80	-0.1992***	-0.1019	0.1109	-0.1895***	0.2617***
81-90	-0.2223***	-0.2478***	-0.3718***	-0.1903***	0.3059***
Activity					
Education	0.1987***	0.2247***	0.1786***	0.2277***	0.1738***
Un. looking for job	0.1652***	-0.0285	-0.0101	0.1659***	0.1258**
Un. not looking for job	0.1842**	0.0197	0.0076	0.1092	-0.0724
Permanent sick or dis.	0.0648	0.1391*	0.1217	0.0513	0.0886
Retired	-0.0045	-0.0639	-0.1183**	-0.0007	0.0896***
Military	-0.12	0.1098	0.1979	-0.0701	0.0289
Housework	-0.0621	-0.0091	-0.0122	-0.0563	0.1000***
Other	-0.0037			0.0156	0.2538**
Year	0.0300***	-0.0127	0.0437	0.0171**	0.0630***

Country					
Spain	0.2454***	0.002	0.0344	-0.1182***	0.1415***
the UK	-0.0756**	-0.3414***	0.1356*	0.1309***	-0.1085***
Belgium	-0.1984***	-0.0251	0.1752**	-0.2016***	-0.0095
Norway	0.0517	-0.3648***	0.1631*	-0.2310***	-0.4664***
Poland	-0.4595***	-0.5352***	0.0436	-1.1343***	0.0474
Switzerland	0.1378***	-0.1335	0.4912***	-0.058	0.1809***
the Netherlands	0.0853**	-0.1886**	0.0933	-0.3839***	-0.1216***
_cons	-0.1675**	0.4991***	-0.3927**	0.1381*	-0.1973**
N	12640	6231	6231	12640	12560
adj. R-sq	0.073	0.085	0.0699	0.1304	0.0645
AIC	3.50E+04	1.71E+04	1.72E+04	3.42E+04	3.47E+04
BIC	3.52E+04	1.74E+04	1.75E+04	3.44E+04	3.50E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work-, Country -Italy- and Quorters -(24Nov-23Feb)-

C.3 Heterogeneity

This appendix shows the complete models of the heterogeneity analysis of the results for subjects disaggregated by income level and education.

Table C.16: Benchmark models with income interaction

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.1129***	-0.0787**	-0.0384	-0.1046***	-0.0503
Poor	-0.1856**	0.1157	0.2681***	-0.081	0.1762
Post#Poor	0.082	-0.059	-0.01	0.0705	-0.0169
Big City	0.1536***	0.0848**	0.0095	0.1582***	0.0586
Female	0.1843***	0.2004***	0.2105***	0.2264***	0.1323***
Income Perceived	0	0	0	0	0
Difficult	0.134	0.0303	-0.2207**	0.1437*	-0.1686
Coping	-0.0441	-0.012	-0.0223	0.0038	-0.0487
Living comfortably	0	0	0	0	0
Education	0	0	0	0	0
Less than lower sec.	0.0458	-0.0104	-0.0418	0.0192	-0.1959**
Lower secondary	-0.1218**	-0.0408	-0.1320**	-0.1484**	-0.036
Lower upper sec.	-0.2256***	-0.038	-0.0298	-0.1667**	0.0147
Adv. Vocational	-0.0516	-0.003	0.0318	-0.0493	0.0702
Lower tertiary	0.1184**	0.2586***	0.1775***	0.1161**	0.1446**
Higher tertiary	0.2701***	0.3414***	0.1589***	0.2896***	0.2384***
Age	0	0	0	0	0
15-20	0.0568	0.1014	-0.0797	0.0947	-0.1411
31-40	0.0594	0.0139	0.0797	0.1033	-0.0027
41-50	-0.0248	0.0202	0.1277*	0.0263	0.1124
51-60	-0.0116	0.0583	0.2204***	0.0365	0.0664
61-70	-0.1477*	0.1536*	0.2133***	-0.0571	0.1351
71-80	-0.1863**	0.0104	0.1035	-0.1937**	0.1106
81-90	-0.2227*	-0.0265	-0.1578	-0.2638**	0.0258
Activity	0	0	0	0	0
Education	0.1749	0.1012	0.0153	0.2125**	0.0772
Un. looking for job	0.2605***	0.0844	-0.0545	0.2218*	0.2116**
Un. not looking for job	0.0225	0.2805*	0.0842	0.0771	0.0847
Permanent sick or dis.	-0.0455	0.0481	0.0588	0.1291	0.1156
Retired	0.0653	-0.0519	-0.0855	0.1165**	0.1185
Housework	0.0609	0.0133	-0.0092	0.0542	0.069

Other	-0.2757	0.1015	0.0203	-0.3526*	
Country	0	0	0	0	0
Belgium	0.0243	0.018	0.0553	0.1149	-0.1088*
Spain	0.3614***	0.1685***	0.3659***	0.1071	
the UK	0.3731***	0.0478	0.4386***	0.6499***	-0.1044
Greece	-0.1303*	-0.1697***	-0.3717***	-0.3357***	-0.4351***
Norway	0.2883***	-0.2981***	0.1738***	0.1210*	-0.6836***
Poland	-0.1811**	-0.1046	0.2575**	-0.6156***	
Switzerland	0.3851***	-0.0148	0.4409***	0.2462***	-0.1231
the Netherlands	0.3676***	-0.0659	0.1937***	-0.0389	-0.3238***
_cons	-0.2964***	-0.2324***	-0.3995***	-0.2817***	0.0427
N	5408	5408	5408	5408	4484
adj. R-sq	0.0953	0.0604	0.1	0.124	0.0693
AIC	1.48E+04	1.50E+04	1.47E+04	1.46E+04	1.26E+04
BIC	1.50E+04	1.52E+04	1.49E+04	1.49E+04	1.28E+04
Wald test P-value Post + Post#Low Educ.	0.6614	0.0762	0.5315	0.6069	0.4477

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.17: Benchmark models with education interaction

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.1280**	-0.0787	-0.0783	-0.1155**	-0.1315**
Low Education	-0.2939***	-0.3333***	-0.1905***	-0.3083***	-0.3021***
Post#Low Educ.	0.0475	-0.0161	0.0633	0.0373	0.1276
Big City	0.1546***	0.0844**	0.0103	0.1590***	0.0603
Female	0.1839***	0.2005***	0.2098***	0.2261***	0.1304***
Income Perceived					
Difficult	0.1347	0.03	-0.2200**	0.1442*	-0.1682
Coping	0.1004	-0.098	-0.2853***	0.0495	-0.2184**
Living comfortably	0.1447*	-0.0861	-0.2624***	0.0458	-0.1675
Education					
Less than lower sec.	0.0435	-0.0086	-0.0407	0.0172	-0.1949**
Lower secondary	-0.1224**	-0.0403	-0.1316**	-0.1490**	-0.0354
Lower upper sec.	-0.2262***	-0.0376	-0.0297	-0.1672**	0.0147
Adv. Vocational	-0.0515	-0.0029	0.0324	-0.0493	0.0706
Lower tertiary	-0.1521***	-0.0825	0.0184	-0.1739***	-0.0948
Higher tertiary	0	0	0	0	0
Age					
15-20	0.0587	0.1001	-0.0796	0.0964	-0.1399
31-40	0.059	0.0139	0.0787	0.103	-0.0034
41-50	-0.0247	0.0199	0.1268*	0.0263	0.112
51-60	-0.0129	0.0588	0.2189***	0.0354	0.0638
61-70	-0.1508*	0.1549*	0.2103***	-0.0595	0.1292
71-80	-0.1886**	0.0112	0.1002	-0.1955**	0.1043
81-90	-0.2253*	-0.0253	-0.16	-0.2659**	0.0218
Activity					
Education	0.1745	0.1012	0.0143	0.2123**	0.073
Un. looking for job	0.2641***	0.0822	-0.0535	0.2248*	0.2107**
Un. not looking for job	0.0244	0.2807*	0.0897	0.0785	0.0983
Permanent sick or dis.	-0.0426	0.0466	0.0606	0.1315	0.1198
Retired	0.0674	-0.053	-0.0841	0.1182**	0.1216*
Housework	0.0624	0.0122	-0.0096	0.0555	0.0682
Other	-0.2728	0.0992	0.0192	-0.3501*	

Country					
Belgium	0.0246	0.018	0.0559	0.1151	-0.1079*
Spain	0.3612***	0.1683***	0.3646***	0.107	
the UK	0.3742***	0.0469	0.4377***	0.6508***	-0.106
Greece	-0.1300*	-0.1699***	-0.3718***	-0.3354***	-0.4355***
Norway	0.2884***	-0.2985***	0.1721***	0.1212*	-0.6871***
Poland	-0.1789**	-0.1062	0.2572**	-0.6137***	
Switzerland	0.3864***	-0.0154	0.4417***	0.2472***	-0.1217
the Netherlands	0.3682***	-0.0665	0.1928***	-0.0384	-0.3257***
_cons	-0.163	0.1953	0.0437	-0.0323	0.4934***
N	5408	5408	5408	5408	4484
adj. R-sq	0.0952	0.0603	0.1002	0.1239	0.0702
AIC	1.48E+04	1.50E+04	1.47E+04	1.46E+04	1.26E+04
BIC	1.50E+04	1.52E+04	1.49E+04	1.49E+04	1.28E+04
Wald test P-value Post + Post#Low Educ.	0.0553	0.0286	0.7196	0.0629	0.9407

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

C.4 Trends in enviromental preferences and voting

In this appendix, we test for the presence of a trend over our entire sample. In fact, the presence of a declining trend would pose a serious threat to our identification strategy. We deal with this in several ways. First, we include in the regressions controls for seasonality effects (see section 3.3 for details). If there was a declining trend over time, this should be captured by this control. Then, we directly tested for these trends over a time period ranging from 2016 to 2022, both excluding and including the COVID year 2020. The year 2020 is not considered in our main analyses so as not to fall into error from variation in people's preferences in the pandemic period. However, this group, interviewed at the tail end of wave 9, is very small. The results obtained reinforce those of our main analysis, as we find a significant and increasing trend.

Table C.18: Models for daily trends before war - 2016-2019 and 2021-2022

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
TREND	0.00005***	0.00015***	0.00017***	0.00007***	0.00003***
Big City	0.1443***	0.0792***	0.031	0.1424***	-0.0116
Female	0.1440***	0.1497***	0.1362***	0.1701***	0.1101***
Income Perceived					
Difficult	0.1028*	-0.0937	-0.0376	0.0281	-0.1468***
Coping	0.0416	-0.2477***	-0.0878	-0.0431	-0.2086***
Living comfortably	-0.0133	-0.2735***	-0.0699	-0.1453***	-0.1902***
Education					
Less than lower sec.	-0.0989***	-0.2106***	-0.2351***	-0.1204***	-0.1537***
Lower secondary	-0.1587***	-0.1307***	-0.1662***	-0.1545***	-0.1125***
Lower upper sec.	-0.2187***	-0.1329***	-0.1014***	-0.1624***	-0.0860***
Adv. Vocational	-0.0484	-0.0575	0.0116	-0.0567*	0.0276
Lower tertiary	0.1342***	0.1455***	0.1675***	0.1375***	0.0953***
Higher tertiary	0.2416***	0.1820***	0.1872***	0.2283***	0.1549***
Age					
15-20	-0.0283	0.1104*	0.0487	-0.0334	-0.0723
31-40	-0.0164	0.0465	0.1512***	-0.0111	0.1165***
41-50	-0.1148***	-0.0139	0.1491***	-0.0790**	0.1266***
51-60	-0.0624*	-0.029	0.1624***	-0.041	0.2373***

61-70	-0.1203***	0.0643	0.2000***	-0.0803**	0.2881***
71-80	-0.2145***	-0.0322	0.1084*	-0.1999***	0.2543***
81-90	-0.2649***	-0.1661**	-0.2853***	-0.2263***	0.2619***
Activity					
Education	0.2020***	0.1632***	0.1314**	0.2382***	0.1428***
Un. looking for job	0.1624***	-0.0129	-0.0358	0.1686***	0.0969**
Un. not looking for job	0.1447*	0.0625	-0.0105	0.0743	-0.0531
Permanent sick or dis.	0.0649	0.1388**	0.1200*	0.0668	0.0945*
Retired	0.0085	-0.0413	-0.1002***	0.024	0.0661**
Military	-0.0677	0.0979	0.2127	-0.0069	0.0999
Housework	-0.0314	0.0063	-0.0126	-0.0354	0.0869***
Other	-0.0897	-0.1864	-0.0775	-0.1018	0.3083***
Country					
Belgium	-0.1522***	0.0375	0.1728***	-0.1475***	-0.0785**
Spain	0.2162***	0.2357***	0.2079***	-0.1137***	0.1132***
the UK	0.0014	-0.2033***	0.1998***	0.2083***	-0.1670***
Greece	-0.4669***	-0.1735***	-0.3252***	-0.6902***	-0.4015***
Norway	0.0853***	-0.2694***	0.1736***	-0.1765***	-0.5331***
Poland	-0.4333***	-0.3736***	0.0667	-1.0754***	0.0032
Switzerland	0.2346***	-0.0201	0.4957***	0.0243	0.0464
the Netherlands	0.1489***	-0.1086**	0.1259***	-0.3281***	-0.1997***
_cons	-0.1398**	0.1035	-0.3992***	0.1248*	0.0429
N	16357	9948	9948	16357	15688
adj. R-sq	0.0812	0.0839	0.0951	0.1278	0.0611
AIC	4.51E+04	2.73E+04	2.72E+04	4.42E+04	4.35E+04
BIC	4.54E+04	2.76E+04	2.75E+04	4.45E+04	4.38E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Month -January-, Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.19: Models for daily trends before war - 2016-2022

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
TREND	0.00005***	0.00015***	0.00017***	0.00007***	0.00003***
Big City	0.1448***	0.0792***	0.031	0.1435***	-0.0114
Female	0.1458***	0.1497***	0.1362***	0.1713***	0.1096***
Income Perceived					
Difficult	0.0993*	-0.0937	-0.0376	0.0281	-0.1438***
Coping	0.039	-0.2477***	-0.0878	-0.0418	-0.2055***
Living comfortably	-0.0155	-0.2735***	-0.0699	-0.1453***	-0.1883***
Education					
Less than lower sec.	-0.0994***	-0.2106***	-0.2351***	-0.1222***	-0.1511***
Lower secondary	-0.1570***	-0.1307***	-0.1662***	-0.1536***	-0.1092***
Lower upper sec.	-0.2177***	-0.1329***	-0.1014***	-0.1616***	-0.0840***
Adv. Vocational	-0.0469	-0.0575	0.0116	-0.0539*	0.0311
Lower tertiary	0.1325***	0.1455***	0.1675***	0.1368***	0.0975***
Higher tertiary	0.2409***	0.1820***	0.1872***	0.2292***	0.1567***
Age					
15-20	-0.0268	0.1104*	0.0487	-0.0285	-0.0712
31-40	-0.0179	0.0465	0.1512***	-0.0138	0.1135***
41-50	-0.1155***	-0.0139	0.1491***	-0.0800**	0.1245***
51-60	-0.0620*	-0.029	0.1624***	-0.0397	0.2370***
61-70	-0.1241***	0.0643	0.2000***	-0.0823**	0.2877***
71-80	-0.2184***	-0.0322	0.1084*	-0.2023***	0.2505***
81-90	-0.2701***	-0.1661**	-0.2853***	-0.2284***	0.2624***
Activity					

Education	0.1999***	0.1632***	0.1314**	0.2342***	0.1429***
Un. looking for job	0.1663***	-0.0129	-0.0358	0.1720***	0.0968**
Un. not looking for job	0.1325*	0.0625	-0.0105	0.0668	-0.0604
Permanent sick or dis.	0.0665	0.1388**	0.1200*	0.0676	0.0957*
Retired	0.0117	-0.0413	-0.1002***	0.0266	0.0657**
Military	-0.0779	0.0979	0.2127	-0.0667	0.042
Housework	-0.0318	0.0063	-0.0126	-0.0373	0.0865***
Other	-0.0872	-0.1864	-0.0775	-0.0994	0.3071***
Country					
Belgium	-0.1520***	0.0375	0.1728***	-0.1477***	-0.0787**
Spain	0.2086***	0.2357***	0.2079***	-0.1222***	0.1146***
the UK	0.0014	-0.2033***	0.1998***	0.2079***	-0.1673***
Greece	-0.4654***	-0.1735***	-0.3252***	-0.6887***	-0.4021***
Norway	0.0855***	-0.2694***	0.1736***	-0.1767***	-0.5342***
Poland	-0.4336***	-0.3736***	0.0667	-1.0765***	0.0026
Switzerland	0.2344***	-0.0201	0.4957***	0.0239	0.0463
the Netherlands	0.1490***	-0.1086**	0.1259***	-0.3283***	-0.2003***
_cons	-0.1381**	0.1035	-0.3992***	0.1249**	0.0382
N	16476	9948	9948	16476	15805
adj. R-sq	0.0809	0.0839	0.0951	0.1272	0.0613
AIC	4.54E+04	2.73E+04	2.72E+04	4.46E+04	4.38E+04
BIC	4.57E+04	2.76E+04	2.75E+04	4.49E+04	4.41E+04

*** p<0.01, ** p<0.05, * p<0.10
Category reference classes: Month -January-, Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

C.5 Robustness checks

We run many robustness analyses. First, we do a leave-one-out validation by excluding from our main regressions one country at a time (Tables from C.27 to C.35), and then we also run our regressions without IPW weights (Tables C.20 and C.21). Results are not driven by a specific country and are reassuringly similar without the IPW weights. Then, in the event study, we also excluded monthly controls for seasonality (Table C.22). Also this check strongly confirms the results.

This part of the appendix also presents a robustness check where we include two categorical political variables as additional controls: political orientation on a left-right scale and interest in the politics. Below is the figure showing the event study which, as in the main analysis, gives the trend and significance of the period coefficients with respect to the periods before the outbreak of war (see Figure C.1). Again the results appear clear and stable.

The decision to lag energy prices by one month was subjected to a robustness check, considering specifications with no lag (Table C.26) as well as with lags of two (Table C.24) and three months (Table C.25). The specification with a one-month lag was found to perform relatively better, in terms of the significance of the coefficients, the adjusted R-squared, and the informational criteria AIC and BIC.

Finally, as a further check that the effect of the war is not significant on environmental attitudes that are unrelated to policy, we consider in all models an alternative outcome (not available in the ESS for Spain and Poland): the answer to the question "how important to care for nature and environment". Both the event study and the pre-post regression do not show a significant effect and estimations are very close to the case of the Responsibility variable confirming the main results.

Table C.20: Benchmark models without weights

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**

Post	-0.0825***	-0.0691**	-0.0221	-0.0779**	-0.0394
Big City	0.1495***	0.0500*	-0.0094	0.1610***	0.0422
Female	0.1419***	0.1908***	0.2174***	0.1917***	0.1394***
Income Perceived					
Difficult	0.0796	0.0164	-0.1807**	0.0728	-0.1965*
Coping	0.0361	-0.1086	-0.2391***	-0.0204	-0.2343**
Living comfortably	0.0479	-0.084	-0.2254**	-0.0464	-0.1795*
Education					
Less than lower sec.	0.0332	-0.0701	-0.0769	-0.0005	-0.2208***
Lower secondary	-0.1375***	-0.0758	-0.1237**	-0.1557***	-0.0313
Lower upper sec.	-0.2371***	-0.0838	-0.0925*	-0.1804***	-0.0951
Adv. Vocational	-0.0525	-0.0109	0.0221	-0.0605	0.0364
Lower tertiary	0.1204***	0.2256***	0.1832***	0.1353***	0.1544***
Higher tertiary	0.2796***	0.3082***	0.1731***	0.2953***	0.2273***
Age					
15-20	0.1083	0.1581*	0.0359	0.1184	-0.1212
31-40	0.0598	0.0377	0.1064*	0.0617	-0.0157
41-50	-0.0851	0.0248	0.1689***	-0.0247	0.0582
51-60	-0.0873	0.0102	0.2183***	-0.0423	0.0448
61-70	-0.1589**	0.1436**	0.2706***	-0.0736	0.1507**
71-80	-0.2250***	0.0016	0.1576**	-0.2343***	0.1137
81-90	-0.3704***	-0.1147	-0.1141	-0.3470***	-0.0006
Activity					
Education	0.1515*	0.0248	0.0503	0.2059**	0.065
Un. looking for job	0.1897**	-0.0045	-0.0835	0.1952**	0.1029
Un. not looking for job	0.0224	0.1131	-0.063	0.0207	0.0715
Permanent sick or dis.	-0.0586	0.034	0.0347	0.058	0.122
Retired	0.0491	0.009	-0.0863*	0.1100**	0.0452
Housework	0.0745	0.0101	-0.0264	0.0554	0.0607
Other	-0.2904	0.0034	-0.0566	-0.3953*	
Country					
Belgium	0.0112	0.0155	0.0268	0.0709	-0.0939*
Spain	0.3626***	0.1958***	0.3786***	0.104	
the UK	0.3554***	0.0205	0.4192***	0.6232***	-0.1250**
Greece	-0.1769***	-0.1133*	-0.3297***	-0.3864***	-0.4061***
Norway	0.2857***	-0.2443***	0.2038***	0.1157**	-0.6177***
Poland	-0.1937***	-0.1477*	0.2360**	-0.5864***	
Switzerland	0.4818***	0.026	0.5087***	0.3191***	-0.1271**
the Netherlands	0.3827***	-0.081	0.2074***	-0.0568	-0.2879***
_cons	-0.3051***	-0.103	-0.2200*	-0.1868*	0.2657**
N	5408	5408	5408	5408	4484
adj. R-sq	0.1026	0.0479	0.0966	0.1227	0.0613
AIC	1.48E+04	1.51E+04	1.48E+04	1.47E+04	1.25E+04
BIC	1.50E+04	1.53E+04	1.51E+04	1.49E+04	1.27E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.21: Event study without weights

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Pre-Post Quorters					
+1 (24Feb-23May)	-0.0990***	-0.0824	-0.0084	-0.0963***	-0.0245
-2 (24Aug-23Nov)	-0.0024	-0.0891**	0.021	0.0035	0.0419
-3 (24May-23Aug)	0.0458	-0.0149	0.0502	0.0265	0.0766

Quorters (ESS9-ESS8)	-0.2128	-0.0932	-0.0656	-0.4686	0.1353
Big City	0.1443***	0.0464	-0.0066	0.1545***	0.043
Female	0.1401***	0.2025***	0.2319***	0.1985***	0.1598***
Income Perceived					
Difficult	0.095	0.0383	-0.1827**	0.0951	-0.1941*
Coping	0.0438	-0.0702	-0.2292**	-0.0076	-0.2242**
Living comfortably	0.0523	-0.0602	-0.2180**	-0.0322	-0.1594
Education					
Less than lower sec.	0.0426	-0.0736	-0.0595	0.0033	-0.2013**
Lower secondary	-0.1441***	-0.0696	-0.1119**	-0.1551***	-0.0438
Lower upper sec.	-0.2697***	-0.0952*	-0.0997*	-0.2012***	-0.092
Adv. Vocational	-0.0656	-0.0124	0.0223	-0.0576	0.0011
Lower tertiary	0.1110**	0.2302***	0.1887***	0.1438***	0.1548***
Higher tertiary	0.2358***	0.2931***	0.1653***	0.2617***	0.2334***
Age					
15-20	0.0459	0.1302	-0.0202	0.0812	-0.12
31-40	0.035	0.0158	0.0678	0.0331	-0.0167
41-50	-0.1043*	0.0104	0.1446**	-0.043	0.0555
51-60	-0.0985*	0.0166	0.2197***	-0.0456	0.0639
61-70	-0.1635**	0.1317**	0.2521***	-0.0619	0.1563**
71-80	-0.2468***	-0.0068	0.1295*	-0.2277***	0.133
81-90	-0.3926***	-0.1342	-0.1397	-0.3463***	0.0251
Activity					
Education	0.1431*	0.046	0.0359	0.2017**	0.0893
Un. looking for job	0.2015**	0.0535	-0.0398	0.2183**	0.1065
Un. not looking for job	0.0438	0.1203	-0.0772	0.0134	0.0292
Permanent sick or dis.	-0.0499	0.0699	0.0609	0.0617	0.1443
Retired	0.0477	0.0163	-0.0885*	0.1034**	0.0284
Military service	0.292	0.4077	0.4508	0.5572	0.7595
Housework	0.0745	0.015	-0.0274	0.0531	0.0545
Other	-0.2994*	0.0026	-0.0591	-0.4036*	
Country					
Belgium	-0.0171	0.0421	0.0445	0.0378	-0.097
Spain	0.3731***	0.1950***	0.3829***	0.1237*	
the UK	0.3608***	0.0456	0.3887***	0.6207***	-0.1565**
Greece	-0.1931***	-0.1212*	-0.3286***	-0.4024***	-0.3878***
Norway	0.2998***	-0.2024***	0.1865***	0.1275**	-0.6381***
Poland	-0.1827***	-0.1551*	0.2471**	-0.5690***	
Switzerland	0.4971***	0.0545	0.4805***	0.3279***	-0.1833***
the Netherlands	0.4021***	-0.0496	0.2016***	-0.0422	-0.2949***
_cons	-0.2669**	-0.1133	-0.2190*	-0.1703	0.2313*
N	5026	5026	5026	5026	4116
adj. R-sq	0.1036	0.0492	0.0995	0.1209	0.0619
AIC	1.37E+04	1.40E+04	1.38E+04	1.36E+04	1.15E+04
BIC	1.40E+04	1.43E+04	1.40E+04	1.39E+04	1.17E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secon.-, Age -21-30-, Activity -Paid Work-, Country -Italy- and Pre-Post Quorters - -1 (24Nov-23Feb)-

Table C.22: Event study without monthly trends

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Pre-Post Quorters					
+1 (24Feb-23May)	-0.0951***	-0.1020***	-0.0216	-0.0995***	-0.0365
-2 (24Aug-23Nov)	-0.0184	-0.0641	0.0153	-0.0307	0.0278

-3 (24May-23Aug)	0.0843	0.0261	0.079	0.0602	0.094
Big_City	0.1367***	0.032	-0.0347	0.1796***	0.0509
Female	0.1211***	0.1915***	0.2296***	0.1781***	0.1250***
Income Perceived					
Difficult	0.0546	0.0325	-0.1978*	0.0797	-0.089
Coping	-0.0317	-0.066	-0.2579**	-0.0602	-0.1447
Living comfortably	-0.0273	-0.0987	-0.2664**	-0.0764	-0.1444
Education					
Less than lower sec.	-0.0234	-0.0094	-0.0797	-0.033	-0.2409**
Lower secondary	-0.1210**	-0.051	-0.0708	-0.1115*	-0.041
Lower upper sec.	-0.2318***	-0.0481	-0.0124	-0.1370**	-0.007
Adv. Vocational	-0.0924	-0.0512	0.0536	-0.0332	-0.0277
Lower tertiary	0.0962*	0.1812***	0.1765***	0.1206**	0.1533**
Higher tertiary	0.2401***	0.3134***	0.1981***	0.3105***	0.2309***
Age					
15-20	0.0583	0.0795	-0.0847	0.0923	-0.0837
31-40	0.0362	0.0449	0.0263	0.081	-0.0767
41-50	-0.1073	0.0361	0.1395**	-0.0044	0.0179
51-60	-0.0783	0.0351	0.2403***	0.0135	0.0001
61-70	-0.1364*	0.1825**	0.2691***	-0.009	0.0724
71-80	-0.2379***	0.0181	0.2260**	-0.2027**	0.0946
81-90	-0.3713***	-0.1777	-0.0979	-0.3020***	-0.0489
Activity					
Education	0.1282	0.1103	0.0715	0.2272**	0.0111
Un. looking for job	0.2152**	0.0751	-0.0352	0.2553***	0.1784*
Un. not looking for job	0.0621	0.0105	-0.1635	-0.0372	0.0539
Permanent sick or dis.	-0.1487	-0.037	0.0308	0.0404	0.1181
Retired	0.0497	0.0292	-0.1337**	0.1153*	0.055
Military service	-0.4871	0.5880**	1.0322*	0.2899	1.0056*
Housework	0.0824	0.0677	0.0247	0.0664	0.0836
Other	-0.2507	-0.0889	-0.0706	-0.3803	
Country					
Belgium	-0.0302	0.0782	0.0511	-0.0303	-0.0305
Spain	0.3800***	0.1847***	0.3836***	0.1005	
the UK	0.4390***	0.1009	0.4893***	0.6722***	-0.0561
Greece	-0.2015***	-0.1043	-0.2924***	-0.4217***	-0.4061***
Norway	0.3145***	-0.2506***	0.1778**	0.1094	-0.6990***
Poland	-0.1865***	-0.1973**	0.2287**	-0.6099***	
Switzerland	0.4213***	0.0119	0.4490***	0.2440***	-0.1594**
the Netherlands	0.4030***	-0.0535	0.2094***	-0.0641	-0.2908***
_cons	-0.21	-0.12	-0.2119	-0.1863	0.2384
N	5026	5026	5026	5026	4116
adj. R-sq	0.1064	0.0483	0.0986	0.1316	0.0689
AIC	1.35E+04	1.41E+04	1.39E+04	1.35E+04	1.15E+04
BIC	1.37E+04	1.43E+04	1.42E+04	1.38E+04	1.17E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secon.-, Age -21-30-, Activity -Paid Work-, Country -Italy- and Pre-Post Quorters - -1 (24Nov-23Feb)-

Table C.23: Event study without monthly trends and weights

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Pre-Post Quorters					
+1 (24Feb-23May)	-0.0939***	-0.0973***	-0.0167	-0.0925***	-0.0266
-2 (24Aug-23Nov)	-0.0202	-0.0877**	0.0219	-0.0225	0.035
-3 (24May-23Aug)	0.0407	-0.0245	0.0525	0.0297	0.0893

Big City	0.1444***	0.0465	-0.0066	0.1551***	0.0413
Female	0.1402***	0.2024***	0.2318***	0.1984***	0.1590***
Income Perceived					
Difficult	0.0953	0.0388	-0.1826**	0.0961	-0.1927*
Coping	0.0436	-0.0697	-0.2290**	-0.0071	-0.2228**
Living comfortably	0.0525	-0.0598	-0.2180**	-0.0314	-0.1592
Education					
Less than lower sec.	0.0425	-0.0733	-0.0596	0.0032	-0.2012**
Lower secondary	-0.1444***	-0.0697	-0.1121**	-0.1563***	-0.0438
Lower upper sec.	-0.2704***	-0.095	-0.0995*	-0.2022***	-0.0924
Adv. Vocational	-0.0666	-0.012	0.0224	-0.0589	0.0011
Lower tertiary	0.1107**	0.2305***	0.1886***	0.1423***	0.1550***
Higher tertiary	0.2360***	0.2933***	0.1651***	0.2616***	0.2316***
Age					
15-20	0.0465	0.1311	-0.0204	0.0816	-0.1232
31-40	0.0346	0.016	0.0679	0.0327	-0.0149
41-50	-0.1048*	0.0102	0.1446**	-0.0437	0.0556
51-60	-0.0990*	0.0166	0.2198***	-0.0463	0.0654
61-70	-0.1636**	0.1319**	0.2520***	-0.0631	0.1573**
71-80	-0.2469***	-0.0065	0.1291*	-0.2294***	0.1327
81-90	-0.3930***	-0.1343	-0.1397	-0.3483***	0.0259
Activity					
Education	0.1421*	0.0455	0.036	0.2003**	0.0915
Un. looking for job	0.2012**	0.0528	-0.0395	0.2190**	0.1064
Un. not looking for job	0.044	0.1208	-0.0771	0.0144	0.0281
Permanent sick or dis.	-0.0499	0.0697	0.0606	0.0608	0.1446
Retired	0.0474	0.0159	-0.0882*	0.1040**	0.0286
Military service	0.2784	0.4012	0.4573	0.5555	0.7872
Housework	0.0744	0.0147	-0.0271	0.0533	0.0547
Other	-0.3000*	0.0027	-0.0593	-0.4043*	
Country					
Belgium	-0.0184	0.042	0.0441	0.0378	-0.096
Spain	0.3734***	0.1928***	0.3818***	0.1143*	
the UK	0.3587***	0.0447	0.3881***	0.6177***	-0.1586**
Greece	-0.1903***	-0.1240**	-0.3286***	-0.3967***	-0.3922***
Norway	0.2990***	-0.2036***	0.1857***	0.1251**	-0.6456***
Poland	-0.1812***	-0.1574*	0.2459**	-0.5756***	
Switzerland	0.4930***	0.0522	0.4815***	0.3233***	-0.1774***
the Netherlands	0.4019***	-0.0511	0.2019***	-0.0405	-0.2975***
_cons	-0.2765**	-0.1116	-0.2177*	-0.1808*	0.2328*
N	5026	5026	5026	5026	4116
adj. R-sq	0.1037	0.0494	0.0997	0.1209	0.0619
AIC	1.37E+04	1.40E+04	1.38E+04	1.36E+04	1.15E+04
BIC	1.40E+04	1.43E+04	1.40E+04	1.39E+04	1.17E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secon.-, Age -21-30-, Activity -Paid Work-, Country -Italy- and Pre-Post Quorters - -1 (24Nov-23Feb)-

Table C.24: Models with only Energy prices lagged by 2 months

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Energy price (log - lag2)	-0.0973	-0.0765	-0.0755	-0.0744	-0.0652
Big City	0.1527***	0.0835**	0.0088	0.1574***	0.0577
Female	0.1830***	0.1992***	0.2093***	0.2254***	0.1316***
Income Perceived					
Difficult	0.1361*	0.0318	-0.2191**	0.1453*	-0.1663

Coping	0.1026	-0.0961	-0.2838***	0.0512	-0.2144**
Living comfortably	0.1473*	-0.0834	-0.2611***	0.048	-0.1647
Education					
Less than lower sec.	0.0449	-0.0068	-0.04	0.0183	-0.1935**
Lower secondary	-0.1229**	-0.0405	-0.1318**	-0.1495**	-0.0356
Lower upper sec.	-0.2244***	-0.0362	-0.0279	-0.1660**	0.0163
Adv. Vocational	-0.0516	-0.0025	0.0319	-0.0492	0.0696
Lower tertiary	0.1185**	0.2590***	0.1777***	0.1161**	0.1438**
Higher tertiary	0.2716***	0.3424***	0.1603***	0.2906***	0.2384***
Age					
15-20	0.0571	0.0993	-0.0818	0.0956	-0.1456
31-40	0.0607	0.0145	0.0802	0.1044	-0.0034
41-50	-0.0224	0.0212	0.1288*	0.0283	0.1129
51-60	-0.0107	0.0594	0.2211***	0.0373	0.0652
61-70	-0.1466*	0.1555*	0.2149***	-0.0564	0.1341
71-80	-0.1846**	0.0115	0.1047	-0.1924**	0.1101
81-90	-0.2232*	-0.0261	-0.156	-0.2650**	0.0244
Activity					
Education	0.18	0.1049	0.0183	0.2168**	0.0793
Un. looking for job	0.2586***	0.0789	-0.058	0.2205*	0.2105**
Un. not looking for job	0.0223	0.2834*	0.0858	0.0768	0.0822
Permanent sick or dis.	-0.044	0.0474	0.0577	0.1308	0.1133
Retired	0.0651	-0.0534	-0.0875	0.1169**	0.116
Housework	0.0632	0.0128	-0.0093	0.0563	0.068
Other	-0.2731	0.0985	0.0189	-0.3501*	
Country					
Belgium	0.0033	0.0017	0.0391	0.0988	-0.1226**
Spain	0.3654***	0.1706***	0.3683***	0.1102*	
the UK	0.3554***	0.0315	0.4235***	0.6364***	-0.1171*
Greece	-0.1255*	-0.1664***	-0.3683***	-0.3319***	-0.4321***
Norway	0.1823*	-0.3833***	0.0905	0.04	-0.7555***
Poland	-0.2107***	-0.131	0.2315*	-0.6376***	
Switzerland	0.3465***	-0.046	0.4103***	0.2168**	-0.1495*
the Netherlands	0.3426***	-0.0872	0.1734**	-0.058	-0.3414***
_cons	0.0213	0.2231	0.2479	0.0165	0.5348
N	5408	5408	5408	5408	4484
adj. R-sq	0.0936	0.059	0.1002	0.1222	0.0692
AIC	1.48E+04	1.50E+04	1.47E+04	1.46E+04	1.26E+04
BIC	1.50E+04	1.52E+04	1.49E+04	1.49E+04	1.28E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-,Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.25: Models with only Energy prices lagged by 3 months

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Energy price (log - lag3)	-0.0980**	-0.0557	-0.0366	-0.0953**	-0.0548
Big City	0.1534***	0.0841**	0.0092	0.1580***	0.0581
Female	0.1832***	0.1997***	0.2101***	0.2253***	0.1316***
Income Perceived					
Difficult	0.1361*	0.0314	-0.2200**	0.1458*	-0.1675
Coping	0.1017	-0.097	-0.2849***	0.0507	-0.2158**
Living comfortably	0.1465*	-0.0843	-0.2622***	0.0476	-0.1663
Education					
Less than lower sec.	0.0438	-0.0079	-0.0411	0.0176	-0.1949**
Lower secondary	-0.1216**	-0.0399	-0.1316**	-0.1481**	-0.0348

Lower upper sec.	-0.2250***	-0.0372	-0.0293	-0.1660**	0.0154
Adv. Vocational	-0.0545	-0.0041	0.0309	-0.0522	0.068
Lower tertiary	0.1183**	0.2589***	0.1776***	0.1159**	0.1438**
Higher tertiary	0.2729***	0.3427***	0.1599***	0.2923***	0.2395***
Age					
15-20	0.0542	0.0984	-0.0814	0.092	-0.146
31-40	0.0624	0.0154	0.0807	0.1062	-0.0015
41-50	-0.0214	0.0215	0.1287*	0.0295	0.1137
51-60	-0.0089	0.0603	0.2215***	0.0391	0.0673
61-70	-0.1447*	0.1561*	0.2148***	-0.054	0.1363
71-80	-0.1831**	0.012	0.1046	-0.1906**	0.1119
81-90	-0.2198*	-0.0251	-0.1564	-0.2607**	0.0278
Activity					
Education	0.1809*	0.1047	0.0174	0.2183**	0.0804
Un. looking for job	0.2619***	0.0816	-0.0553	0.2229*	0.2122**
Un. not looking for job	0.0253	0.2847*	0.0862	0.0801	0.0851
Permanent sick or dis.	-0.0458	0.0469	0.058	0.1286	0.1132
Retired	0.0644	-0.0529	-0.0862	0.1154**	0.1162
Housework	0.0618	0.0121	-0.0096	0.0548	0.0674
Other	-0.2725	0.0992	0.0198	-0.3499*	
Country					
Belgium	-0.014	-0.0036	0.0411	0.0776	-0.1299**
Spain	0.3630***	0.1685***	0.3661***	0.1085*	
the UK	0.3504***	0.0328	0.4293***	0.6276***	-0.1179*
Greece	-0.1320*	-0.1711***	-0.3725***	-0.3374***	-0.4360***
Norway	0.1889**	-0.3563***	0.1360*	0.0242	-0.7399***
Poland	-0.2178***	-0.1275	0.2428*	-0.6517***	
Switzerland	0.3475***	-0.0368	0.4266***	0.2096**	-0.1445*
the Netherlands	0.3425***	-0.0817	0.1837***	-0.0635	-0.3386***
_cons	0.0208	0.1098	0.0382	0.1242	0.4768
N	5408	5408	5408	5408	4484
adj. R-sq	0.0943	0.059	0.0999	0.1232	0.0693
AIC	1.48E+04	1.50E+04	1.47E+04	1.46E+04	1.26E+04
BIC	1.50E+04	1.52E+04	1.49E+04	1.49E+04	1.28E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

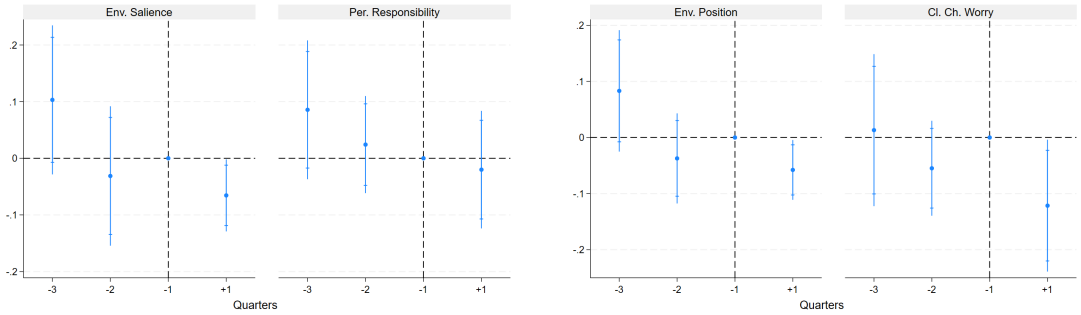
Table C.26: Models with only Energy prices not lagged

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Energy price (log)	-0.092	-0.0829	-0.0659	-0.0872	-0.1108*
Big City	0.1531***	0.0839**	0.0091	0.1577***	0.0582
Female	0.1850***	0.2008***	0.2108***	0.2270***	0.1328***
Income Perceived					
Difficult	0.134	0.0302	-0.2207**	0.1437*	-0.1686
Coping	0.1013	-0.0971	-0.2849***	0.0503	-0.2152**
Living comfortably	0.1460*	-0.0843	-0.2622***	0.0471	-0.1658
Education					
Less than lower sec.	0.042	-0.0092	-0.0422	0.0158	-0.1968**
Lower secondary	-0.1233**	-0.0408	-0.1322**	-0.1498**	-0.0359
Lower upper sec.	-0.2266***	-0.0379	-0.0297	-0.1675**	0.0158
Adv. Vocational	-0.0526	-0.0035	0.0312	-0.0503	0.069
Lower tertiary	0.1165**	0.2573***	0.1763***	0.1143**	0.1419**
Higher tertiary	0.2710***	0.3422***	0.1598***	0.2905***	0.2406***
Age					

15-20	0.0586	0.1002	-0.0805	0.0963	-0.1434
31-40	0.0609	0.0147	0.0803	0.1047	-0.0023
41-50	-0.0227	0.021	0.1285*	0.0282	0.1134
51-60	-0.0097	0.0603	0.2217***	0.0383	0.0684
61-70	-0.1490*	0.1536*	0.2131***	-0.0583	0.1339
71-80	-0.1858**	0.0106	0.1038	-0.1932**	0.1113
81-90	-0.2249*	-0.0271	-0.1574	-0.2657**	0.0279
Activity					
Education	0.178	0.1033	0.0166	0.2154**	0.079
Un. looking for job	0.2605***	0.0802	-0.0564	0.2215*	0.2105**
Un. not looking for job	0.0201	0.2816*	0.0841	0.075	0.082
Permanent sick or dis.	-0.045	0.0462	0.0572	0.1294	0.1114
Retired	0.068	-0.0511	-0.0852	0.1190**	0.1175
Housework	0.0637	0.0131	-0.009	0.0567	0.0687
Other	-0.2735	0.0979	0.0187	-0.3509*	
Country					
Belgium	0.0191	0.0135	0.0517	0.1099	-0.1148*
Spain	0.3547***	0.1613***	0.3605***	0.1007	
the UK	0.3692***	0.0418	0.4345***	0.6460***	-0.1108*
Greece	-0.1294*	-0.1695***	-0.3714***	-0.3349***	-0.4342***
Norway	0.2008**	-0.3789***	0.1102	0.0379	-0.7905***
Poland	-0.2339***	-0.1558	0.2169	-0.6659***	
Switzerland	0.3562***	-0.0418	0.4196***	0.2187**	-0.1592*
the Netherlands	0.3559***	-0.0782	0.1844***	-0.0502	-0.3395***
_cons	0.0063	0.2694	0.2063	0.0982	0.7936**
N	5408	5408	5408	5408	4484
adj. R-sq	0.0934	0.059	0.1	0.1224	0.0698
AIC	1.48E+04	1.50E+04	1.47E+04	1.46E+04	1.26E+04
BIC	1.50E+04	1.52E+04	1.49E+04	1.49E+04	1.28E+04

*** p<0.01, ** p<0.05, * p<0.10
Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Figure C.1: Event Study including additional controls



Event graphs come from OLS regressions on 4967 observations on standardized variables over closeness to parties with a strong focus on the environment, personal responsibility towards climate change, closeness to pro-environmental parties and concern about climate change. Controls include gender, living in a big city, income, education, age-groups, main activity, left-right scale, political interest, a control for monthly trends a and country fixed effects. Independent variables of interest are quarters with 24th November - 23rd February 2022 (-1) as the benchmark. Confidence intervals are at 90% and 95%.

Table C.27: Benchmark models without Belgium

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.1018***	-0.0955***	-0.0325	-0.0833**	-0.067
Big City	0.1419***	0.0978***	0.0102	0.1462***	0.0618
Female	0.1872***	0.2198***	0.2081***	0.2281***	0.1270***
Income Perceived					
Difficult	0.1353	0.0711	-0.1667*	0.1655**	-0.1243
Coping	0.1168	-0.0775	-0.2686***	0.0745	-0.1971*
Living comfortably	0.1482*	-0.0729	-0.2422**	0.0717	-0.1495
Education					
Less than lower sec.	0.0295	-0.0565	-0.0717	-0.0118	-0.2419**
Lower secondary	-0.1418**	-0.0598	-0.1457**	-0.1740***	-0.0664
Lower upper sec.	-0.2668***	-0.075	-0.0495	-0.2004***	-0.0083
Adv. Vocational	-0.0611	-0.0561	0.0343	-0.0727	0.0573
Lower tertiary	0.0977*	0.2170***	0.1848***	0.1138**	0.1147
Higher tertiary	0.1909***	0.2865***	0.1250**	0.2262***	0.2348***
Age					
15-20	0.0015	0.0731	-0.1366	0.0362	-0.1268
31-40	0.0198	-0.0322	0.0753	0.0722	-0.0629
41-50	-0.0692	-0.0116	0.1254*	0.0005	0.0724
51-60	-0.0426	0.0057	0.2438***	0.0255	0.0284
61-70	-0.2230***	0.0572	0.2194***	-0.0976	0.089
71-80	-0.2147**	-0.0964	0.1019	-0.1930**	0.0818
81-90	-0.2565*	-0.1056	-0.1593	-0.2757**	0.0086
Activity					
Education	0.1841	0.0702	0.0421	0.2447**	0.0723
Un. looking for job	0.2553**	0.1106	-0.0326	0.2283*	0.2103**
Un. not looking for job	0.0104	0.3838**	0.1335	0.0675	0.0465
Permanent sick or dis.	0.0526	0.0682	0.0108	0.168	0.0231
Retired	0.0882	0.0224	-0.0582	0.1322**	0.1242
Housework	0.0791	0.0417	0.0206	0.0867	0.0823
Other	-0.2869	0.119	0.0397	-0.3536*	
Country					
the UK	0.3849***	0.061	0.4428***	0.6601***	-0.0957
Spain	0.3849***	0.1787***	0.3743***	0.1243*	
Norway	0.3037***	-0.2851***	0.1827***	0.1297*	-0.6630***
Poland	-0.1639**	-0.1087	0.2600**	-0.6083***	
Switzerland	0.4267***	0.0083	0.4504***	0.2748***	-0.1189
the Netherlands	0.3932***	-0.0461	0.2054***	-0.0272	-0.3138***
Greece	-0.1352*	-0.1845***	-0.3918***	-0.3422***	-0.4326***
_cons	-0.4306***	-0.1023	-0.1818	-0.3296***	0.2686*
N	4844	4844	4844	4844	3921
adj. R-sq	0.095	0.0643	0.1087	0.1303	0.0686
AIC	1.32E+04	1.33E+04	1.31E+04	1.31E+04	1.10E+04
BIC	1.34E+04	1.35E+04	1.33E+04	1.33E+04	1.12E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.28: Benchmark models without Switzerland

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.0717**	-0.0751**	-0.0249	-0.0696**	-0.0663
Big City	0.1519***	0.0949***	0.0257	0.1664***	0.0965**
Female	0.1717***	0.1619***	0.1810***	0.2041***	0.1106**

Income Perceived					
Difficult	0.1017	0.0427	-0.2270**	0.0984	-0.1951*
Coping	0.0951	-0.0791	-0.2743***	0.0284	-0.1843
Living comfortably	0.0894	-0.0573	-0.2491**	-0.015	-0.1329
Education	0.0338	0.0221	-0.0196	0.0073	-0.1665*
Less than lower sec.	-0.0804	-0.0222	-0.1324**	-0.1202**	-0.0365
Lower secondary	-0.1588**	-0.0265	0.0057	-0.1052	0.0704
Lower upper sec.					
Adv. Vocational	-0.0928	-0.0021	0.0164	-0.0891	0.0065
Lower tertiary	0.0865	0.2837***	0.1932***	0.0943*	0.1562**
Higher tertiary	0.2263***	0.3415***	0.1581***	0.2515***	0.2033***
Age					
15-20	0.1139	0.0635	-0.1471	0.1529	-0.2661
31-40	0.0463	0.0141	0.0859	0.1031	0.036
41-50	-0.0568	0.0105	0.0951	0.0039	0.1075
51-60	-0.0502	0.0476	0.1782**	0.0112	0.0786
61-70	-0.1288*	0.1580*	0.1983**	-0.025	0.1602
71-80	-0.1764**	-0.0074	0.0573	-0.1743*	0.0819
81-90	-0.2730**	-0.046	-0.2621**	-0.3026**	-0.0132
Activity					
Education	0.1193	0.0785	-0.0176	0.1462	0.0781
Un. looking for job	0.2259**	0.0086	-0.1093	0.1521	0.1604*
Un. not looking for job	-0.0154	0.2713*	0.0674	0.033	0.0904
Permanent sick or dis.	-0.0893	0.0475	0.0707	0.1077	0.1138
Retired	0.0098	-0.0643	-0.069	0.0646	0.1138
Housework	0.0497	0.0089	-0.0259	0.0282	0.053
Other	-0.3309*	0.0929	0.0231	-0.4057**	
Country					
the UK	0.4276***	0.0404	0.4287***	0.6977***	-0.1067
Belgium	0.0449	0.0123	0.0474	0.1322*	-0.1056*
Spain	0.4013***	0.1672***	0.3615***	0.1231*	
Norway	0.3281***	-0.3045***	0.1601***	0.1383**	-0.6890***
Poland	-0.1892**	-0.1104	0.2435*	-0.6426***	
the Netherlands	0.4039***	-0.0761	0.1782***	-0.0367	-0.3357***
Greece	-0.1314*	-0.1713***	-0.3726***	-0.3497***	-0.4340***
_cons	-0.3802***	-0.1407	-0.0719	-0.2487**	0.2219
N	4766	4766	4766	4766	3842
adj. R-sq	0.09	0.0605	0.0971	0.1263	0.0721
AIC	1.30E+04	1.32E+04	1.29E+04	1.29E+04	1.08E+04
BIC	1.33E+04	1.34E+04	1.32E+04	1.31E+04	1.10E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.29: Benchmark models without Spain

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.0926**	-0.0921**	-0.049	-0.0823**	-0.0528
Big City	0.1634***	0.0918**	0.0052	0.1664***	0.0579
Female	0.1865***	0.2076***	0.2027***	0.2340***	0.1316***
Income Perceived					
Difficult	0.0969	0.0401	-0.2510**	0.07	-0.1704
Coping	0.0753	-0.0992	-0.3198***	-0.0186	-0.2088**
Living comfortably	0.0978	-0.0788	-0.2816***	-0.049	-0.1608
Education					
Less than lower sec.	0.0362	-0.0657	-0.0877	0.016	-0.1946**

Lower secondary	-0.1696**	-0.0635	-0.1631**	-0.1933***	-0.0338
Lower upper sec.	-0.2241***	-0.0002	-0.0193	-0.1500**	0.0219
Adv. Vocational	-0.0647	0.0161	0.0471	-0.0539	0.0755
Lower tertiary	0.1310**	0.2925***	0.2055***	0.1211**	0.1472**
Higher tertiary	0.3376***	0.4260***	0.2109***	0.3640***	0.2389***
Age					
15-20	0.1397	0.1292	-0.0986	0.2336	-0.1517
31-40	0.047	-0.007	0.0526	0.1069	-0.0037
41-50	-0.0569	-0.0104	0.0739	0.0114	0.1092
51-60	-0.0348	0.0249	0.1581**	0.0256	0.0638
61-70	-0.1623*	0.1339	0.1701*	-0.0688	0.1334
71-80	-0.1823*	-0.003	0.0495	-0.1826*	0.1102
81-90	-0.2309*	-0.041	-0.1482	-0.2698**	0.0208
Activity					
Education	0.2059	0.154	0.0973	0.2441*	0.0763
Un. looking for job	0.2163*	0.1644	0.0085	0.1639	0.2308**
Un. not looking for job	-0.0556	0.2413	0.0635	-0.0215	0.0899
Permanent sick or dis.	-0.036	0.0201	0.0765	0.1273	0.1258
Retired	0.0617	-0.0439	-0.0812	0.1206*	0.1168
Housework	0.0786	0.0202	0.0108	0.0821	0.0707
Country					
the UK	0.3579***	0.0441	0.4428***	0.6426***	-0.1028
Belgium	0.0069	0.0066	0.043	0.1005	-0.1105*
Norway	0.2724***	-0.3226***	0.1531**	0.1102*	-0.6938***
Poland	-0.2124***	-0.1386	0.2443*	-0.6480***	
Switzerland	0.3631***	-0.0361	0.4383***	0.2280**	-0.1219
the Netherlands	0.3415***	-0.0939	0.1758**	-0.059	-0.3289***
Greece	-0.1350*	-0.1610**	-0.3687***	-0.3456***	-0.4282***
_cons	-0.3730***	-0.1096	-0.0406	-0.2575**	0.2067
N	4653	4653	4653	4653	4484
adj. R-sq	0.105	0.0643	0.1064	0.1459	0.0709
AIC	1.27E+04	1.28E+04	1.26E+04	1.25E+04	1.26E+04
BIC	1.29E+04	1.30E+04	1.28E+04	1.27E+04	1.28E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.30: Benchmark models without the UK

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.1161***	-0.1134***	-0.0651*	-0.1113***	-0.0831*
Big City	0.1430***	0.0779**	0.0032	0.1463***	0.0616
Female	0.2002***	0.1944***	0.2241***	0.2508***	0.1307***
Income Perceived					
Difficult	0.1316	-0.0051	-0.2249**	0.1436*	-0.2178*
Coping	0.0938	-0.1163	-0.2820***	0.0379	-0.2571**
Living comfortably	0.1634*	-0.1023	-0.2653***	0.0596	-0.2014*
Education					
Less than lower sec.	0.0668	0.0451	-0.0137	0.0341	-0.1278
Lower secondary	-0.1376**	-0.0243	-0.1248**	-0.1660***	-0.0262
Lower upper sec.	-0.2391***	-0.0559	-0.0387	-0.1865**	0.0239
Adv. Vocational	-0.0536	-0.0346	0.0199	-0.0459	0.0439
Lower tertiary	0.0950*	0.2361***	0.1780***	0.0932*	0.1416**
Higher tertiary	0.2497***	0.3224***	0.1522***	0.2728***	0.2335***
Age					
15-20	0.0259	0.0706	-0.1046	0.0773	-0.1681

31-40	0.0627	0.0209	0.0782	0.1068	0.0232
41-50	-0.0039	0.0299	0.1480**	0.0484	0.1318
51-60	0.024	0.0928	0.2545***	0.0693	0.0772
61-70	-0.1072	0.1823**	0.2330***	-0.0172	0.1416
71-80	-0.143	-0.0245	0.0829	-0.1628	0.0988
81-90	-0.1866	-0.0667	-0.2043	-0.2422*	0.0175
Activity					
Education	0.2015*	0.1308	0.0391	0.2374**	0.092
Un. looking for job	0.2707***	0.0968	-0.0549	0.2315*	0.2055*
Un. not looking for job	0.067	0.2595	0.1054	0.1189	0.0808
Permanent sick or dis.	-0.0996	0.0899	0.0502	0.0937	0.1821
Retired	0.0636	-0.0396	-0.0726	0.1239*	0.1615**
Housework	0.0399	0.0227	-0.0349	0.0368	0.0721
Other	-0.2596	0.095	0.0231	-0.3369*	
Country					
Belgium	0.035	0.028	0.0577	0.1217*	-0.1061*
Spain	0.3634***	0.1746***	0.3641***	0.1155*	
Norway	0.2916***	-0.2909***	0.1781***	0.1290**	-0.6841***
Poland	-0.1526**	-0.0852	0.2576**	-0.5866***	
Switzerland	0.3785***	0.0012	0.4476***	0.2498***	-0.1115
the Netherlands	0.3709***	-0.058	0.2010***	-0.0287	-0.3258***
Greece	-0.1166*	-0.1645**	-0.3728***	-0.3233***	-0.4412***
_cons	-0.4514***	-0.1157	-0.114	-0.2973**	0.2608*
N	4891	4891	4891	4891	3969
adj. R-sq	0.0944	0.0628	0.1019	0.0933	0.0731
AIC	1.33E+04	1.35E+04	1.33E+04	1.34E+04	1.11E+04
BIC	1.36E+04	1.37E+04	1.35E+04	1.36E+04	1.13E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.31: Benchmark models without Greece

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.1155***	-0.0657*	-0.0333	-0.1065***	-0.0402
Big City	0.1895***	0.1099***	0.038	0.1847***	0.0709
Female	0.2177***	0.2025***	0.2251***	0.2516***	0.1441***
Income Perceived					
Difficult	0.17	0.0355	-0.2033	0.2564**	-0.1349
Coping	0.1379	-0.1372	-0.3327**	0.1695	-0.216
Living comfortably	0.1945*	-0.1192	-0.2890**	0.1789	-0.1648
Education					
Less than lower sec.	0.0496	-0.0191	-0.02	0.0348	-0.2144*
Lower secondary	-0.1015	-0.075	-0.1548**	-0.1374**	-0.0489
Lower upper sec.	-0.1991***	-0.0532	-0.0312	-0.1509**	0.0446
Adv. Vocational	-0.0137	-0.0161	0.0073	-0.0334	0.0738
Lower tertiary	0.1826***	0.2535***	0.1309**	0.1535**	0.1713**
Higher tertiary	0.2931***	0.3332***	0.1381**	0.2906***	0.2572***
Age					
15-20	0.0748	0.1228	-0.0796	0.0918	-0.094
31-40	0.0862	0.0388	0.0888	0.1375*	-0.0092
41-50	0.011	0.03	0.1694**	0.0663	0.1087
51-60	-0.0045	0.1094	0.2836***	0.0576	0.0982
61-70	-0.1405*	0.2038**	0.2506***	-0.0517	0.1662
71-80	-0.2170**	0.078	0.1832*	-0.2173**	0.1726
81-90	-0.2109	0.0848	-0.1199	-0.2673**	0.0795

Activity					
Education	0.1814	0.0876	-0.0149	0.2229**	0.0173
Un. looking for job	0.2658**	0.032	-0.1054	0.2147	0.1831
Un. not looking for job	-0.0835	0.2823*	0.181	0.0351	0.3075**
Permanent sick or dis.	-0.0245	0.0459	0.0477	0.1511*	0.1301
Retired	0.1212*	-0.0662	-0.0799	0.1713***	0.1337
Housework	0.0737	0.039	0.101	0.0943	0.1245
Other	-0.2488	0.1026	0.0114	-0.3216*	
Country					
the UK	0.3504***	0.0337	0.4443***	0.6129***	-0.1175*
Belgium	0.0121	0.0203	0.0747	0.1057	-0.1078*
Spain	0.3421***	0.1730***	0.3856***	0.0952	
Norway	0.2626***	-0.2985***	0.1942***	0.1007	-0.6885***
Poland	-0.1904***	-0.0982	0.2981**	-0.5935***	
Switzerland	0.3687***	-0.0167	0.4602***	0.2326***	-0.1272*
the Netherlands	0.3465***	-0.0631	0.2055***	-0.047	-0.3313***
_cons	-0.5987***	-0.161	-0.2448	-0.5613***	0.1285
N	4668	4668	4668	4668	3745
adj. R-sq	0.0937	0.0641	0.0692	0.1143	0.08
AIC	1.28E+04	1.29E+04	1.28E+04	1.27E+04	1.05E+04
BIC	1.30E+04	1.31E+04	1.30E+04	1.29E+04	1.07E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.32: Benchmark models without Italy

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.1040***	-0.0976***	-0.0408	-0.1026***	-0.052
Big City	0.1696***	0.1020***	0.0269	0.1757***	0.0619
Female	0.2148***	0.2110***	0.2398***	0.2619***	0.1375***
Income Perceived					
Difficult	0.1520*	0.0187	-0.2588***	0.1638**	-0.1588
Coping	0.1016	-0.0928	-0.2965***	0.0537	-0.2131*
Living comfortably	0.1625*	-0.0831	-0.2608***	0.0675	-0.1541
Education	0	0	0	0	0
Less than lower sec.	0.0017	-0.0409	-0.0768	-0.0206	-0.1712*
Lower secondary	-0.1323**	-0.0565	-0.1437**	-0.1676**	-0.0084
Lower upper sec.	-0.2105***	-0.0429	-0.0331	-0.1423*	0.0316
Adv. Vocational	-0.0352	-0.0142	0.0234	-0.0398	0.0966
Lower tertiary	0.1202**	0.2522***	0.1556***	0.1177**	0.1604**
Higher tertiary	0.3048***	0.3483***	0.1559***	0.3233***	0.2631***
Age					
15-20	0.06	0.1105	-0.0964	0.0975	-0.1166
31-40	0.0803	0.0403	0.1162	0.127	0.051
41-50	-0.0085	0.0213	0.1576**	0.0478	0.1492
51-60	0.0231	0.073	0.2291***	0.0739	0.0911
61-70	-0.1358*	0.1953**	0.2311***	-0.022	0.2073**
71-80	-0.2078**	0.0804	0.1451	-0.2002**	0.2034*
81-90	-0.2227*	0.0659	-0.0957	-0.2490*	0.101
Activity	0	0	0	0	0
Education	0.2115*	0.1312	0.016	0.2522**	0.1028
Un. looking for job	0.3181***	0.0866	-0.0512	0.2343*	0.2759**
Un. not looking for job	0.0596	0.3143*	0.1708	0.0922	0.0849
Permanent sick or dis.	-0.0181	0.055	0.0508	0.1572*	0.1503
Retired	0.0725	-0.0831	-0.0895	0.1287**	0.1011

Housework	0.0722	-0.0033	-0.0241	0.0458	0.0529
Other	-0.2717	0.1058	0.0201	-0.3401*	
Country					
Belgium	-0.3688***	-0.0285	-0.3777***	-0.5460***	0.0042
Spain	-0.0234	0.1255**	-0.0667	-0.5539***	
Norway	-0.1036**	-0.3415***	-0.2630***	-0.5449***	-0.5646***
Poland	-0.5797***	-0.1584*	-0.1857	-1.2839***	
Switzerland	-0.0074	-0.0591	-0.0003	-0.4229***	-0.0131
the Netherlands	-0.0209	-0.1152	-0.2487***	-0.7089***	-0.2145***
Greece	-0.5210***	-0.2143***	-0.8016***	-0.9944***	-0.3138***
_cons	-0.146	0.2548*	-0.1256	0.2481**	0.0495
N	4896	4896	4896	4896	3974
adj. R-sq	0.1072	0.1053	0.0657	0.1435	0.0675
AIC	1.33E+04	1.33E+04	1.35E+04	1.31E+04	1.11E+04
BIC	1.35E+04	1.35E+04	1.37E+04	1.34E+04	1.13E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country - England-

Table C.33: Benchmark models without the Netherlands

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.0967***	-0.0975***	-0.0422	-0.1019***	-0.0429
Big City	0.1292***	0.0661*	-0.0064	0.1266***	0.029
Female	0.1341***	0.2165***	0.2046***	0.1793***	0.1046**
Income Perceived					
Difficult	0.1438*	-0.0239	-0.2726***	0.1143	-0.2196**
Coping	0.0816	-0.1383	-0.3242***	0.011	-0.2725**
Living comfortably	0.1617*	-0.1308	-0.3266***	0.0346	-0.2358**
Education					
Less than lower sec.	0.0929	0.0594	-0.0087	0.0765	-0.2159**
Lower secondary	-0.0805	0.0038	-0.1022*	-0.1054*	-0.0232
Lower upper sec.	-0.2226***	0.0093	-0.0193	-0.1571**	0.0127
Adv. Vocational	-0.0422	0.0318	0.0534	-0.0198	0.0942
Lower tertiary	0.1235**	0.2720***	0.1874***	0.1188**	0.1848***
Higher tertiary	0.2814***	0.3440***	0.1661***	0.3018***	0.2775***
Age					
15-20	0.0678	0.1511	0.0486	0.0829	0.0103
31-40	0.0725	0.0082	0.0911	0.0898	0.017
41-50	-0.0003	0.0132	0.1361*	0.0192	0.123
51-60	-0.0281	0.0117	0.2211***	-0.0198	0.0281
61-70	-0.1429*	0.1253	0.2179***	-0.0972	0.0819
71-80	-0.2116**	-0.0478	0.087	-0.2716***	0.063
81-90	-0.2579**	-0.1235	-0.1312	-0.3802***	-0.0263
Activity					
Education	0.1474	0.0522	0.0149	0.1356	0.0448
Un. looking for job	0.2499**	0.062	-0.0825	0.2058*	0.1741
Un. not looking for job	0.0221	0.2915*	0.0741	0.0838	0.0548
Permanent sick or dis.	-0.0281	0.0508	0.0915	0.1741*	0.1259
Retired	0.0585	-0.0806	-0.1103*	0.0982	0.1353*
Housework	0.0243	0.001	-0.0302	0.0172	0.0777
Other	-0.2956	0.0702	-0.0053	-0.3885**	
Country					
the UK	0.3806***	0.0541	0.4343***	0.6712***	-0.1023
Belgium	0.0253	0.0239	0.0531	0.1181	-0.1245**
Spain	0.3622***	0.1598***	0.3489***	0.1063	

Norway	0.2929***	-0.3016***	0.1686***	0.1227*	-0.6846***
Poland	-0.1691**	-0.1074	0.2476*	-0.6187***	
Switzerland	0.3752***	-0.0248	0.4276***	0.2361**	-0.1376*
Greece	-0.1148	-0.1610**	-0.3661***	-0.3197***	-0.4326***
_cons	-0.4038***	-0.0822	-0.0792	-0.2616**	0.2930*
N	4770	4770	4770	4770	3848
adj. R-sq	0.0901	0.0627	0.1032	0.1264	0.0744
AIC	1.31E+04	1.32E+04	1.29E+04	1.29E+04	1.07E+04
BIC	1.33E+04	1.34E+04	1.31E+04	1.31E+04	1.09E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.34: Benchmark models without Norway

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.0948***	-0.0641*	-0.0318	-0.0864**	-0.0137
Big City	0.1490***	0.0358	-0.0284	0.1662***	0.0272
Female	0.1707***	0.1933***	0.2129***	0.2091***	0.1823***
Income Perceived					
Difficult	0.1361*	0.0297	-0.2046**	0.1468*	-0.1252
Coping	0.1026	-0.1033	-0.2664***	0.0597	-0.1907*
Living comfortably	0.1366*	-0.0954	-0.2591***	0.0407	-0.1476
Education					
Less than lower sec.	0.0271	-0.0249	-0.0591	-0.0057	-0.2081**
Lower secondary	-0.1377**	-0.0374	-0.1162*	-0.1489**	-0.0479
Lower upper sec.	-0.2651***	-0.0502	-0.0702	-0.2246***	-0.0938
Adv. Vocational	-0.0478	0.0654	0.0251	-0.0288	0.1292
Lower tertiary	0.1186**	0.2637***	0.1663***	0.1074**	0.0663
Higher tertiary	0.2752***	0.3336***	0.1377**	0.2883***	0.1835***
Age					
15-20	0.0157	0.0588	-0.0432	0.017	-0.2949
31-40	0.0411	-0.0129	-0.0024	0.0498	-0.0978
41-50	-0.0337	0.0447	0.0978	-0.0164	0.0841
51-60	0.0019	0.0796	0.1816**	0.0231	0.0636
61-70	-0.1497*	0.1602*	0.1890**	-0.0821	0.09
71-80	-0.1528	0.0826	0.1088	-0.1672*	0.0557
81-90	-0.1743	0.013	-0.1266	-0.1661	-0.0039
Activity					
Education	0.132	0.1013	-0.0487	0.2040*	0.178
Un. looking for job	0.2560**	0.0831	-0.0416	0.2366*	0.2305**
Un. not looking for job	0.1494	0.1634	-0.1614	0.1667	-0.082
Permanent sick or dis.	-0.14	0.0065	0.0579	0.041	0.0551
Retired	0.0464	-0.0648	-0.1345*	0.0831	0.0548
Housework	0.0761	-0.0224	-0.0792	0.0493	0.0208
Other	-0.2478	0.0858	-0.0042	-0.3190*	
Country					
the UK	0.3542***	0.0449	0.4413***	0.6211***	-0.0829
Belgium	0.025	0.018	0.0571	0.1127	-0.0955
Spain	0.3461***	0.1712***	0.3669***	0.1047*	
Poland	-0.1704**	-0.0876	0.2588**	-0.5903***	
Switzerland	0.3753***	-0.0185	0.4446***	0.2493***	-0.1078
the Netherlands	0.3597***	-0.0544	0.2112***	-0.0259	-0.2933***
Greece	-0.1335*	-0.1557**	-0.3512***	-0.3316***	-0.4387***
_cons	-0.3979***	-0.1787	-0.0791	-0.2813**	0.1572
N	4527	4527	4527	4527	3605

adj. R-sq	0.0923	0.0422	0.1043	0.1246	0.0441
AIC	1.24E+04	1.26E+04	1.23E+04	1.22E+04	1.02E+04
BIC	1.26E+04	1.28E+04	1.26E+04	1.25E+04	1.03E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-

Table C.35: Benchmark models without Poland

	Env. Sal.	**Worry**	**Resp.**	**Env. Pos.**	**Sens.**
Post	-0.0972***	-0.0927***	-0.0424	-0.0897***	-0.0528
Big City	0.1540***	0.0802**	0.0061	0.1515***	0.058
Female	0.1823***	0.1962***	0.2008***	0.2202***	0.1310***
Income Perceived					
Difficult	0.1408*	0.0436	-0.1961**	0.1579**	-0.1635
Coping	0.1082	-0.0694	-0.2398***	0.0545	-0.2115**
Living comfortably	0.1493*	-0.0614	-0.2268**	0.0425	-0.1665
Education					
Less than lower sec.	0.0481	-0.0093	-0.0251	0.02	-0.1950**
Lower secondary	-0.1204*	-0.0479	-0.1240**	-0.1375**	-0.034
Lower upper sec.	-0.2301***	-0.0549	-0.0242	-0.1729**	0.015
Adv. Vocational	-0.0498	-0.0118	0.0458	-0.0549	0.0706
Lower tertiary	0.1228**	0.2429***	0.1839***	0.1323***	0.1443**
Higher tertiary	0.2772***	0.3272***	0.1758***	0.2935***	0.2397***
Age					
15-20	0.0655	0.1263	-0.0539	0.1028	-0.1345
31-40	0.0687	0.0457	0.1207	0.1274	-0.0006
41-50	-0.0151	0.0464	0.1452**	0.047	0.1132
51-60	-0.0079	0.0808	0.2338***	0.0523	0.069
61-70	-0.1516*	0.1715**	0.2152***	-0.0622	0.1361
71-80	-0.1842**	0.0271	0.1165	-0.1834**	0.1126
81-90	-0.2266*	-0.0249	-0.1789	-0.2553**	0.0278
Activity					
Education	0.1749	0.1043	0.0214	0.2230**	0.0801
Un. looking for job	0.3082***	0.0901	-0.0356	0.3350***	0.2209**
Un. not looking for job	0.0312	0.2960*	0.1026	0.1025	0.0783
Permanent sick or dis.	-0.0419	0.0443	0.0728	0.1298	0.1131
Retired	0.0734	-0.0553	-0.078	0.1323**	0.1181
Housework	0.0651	0.0082	-0.0024	0.0641	0.0693
Other	-0.2767	0.1109	0.0205	-0.3534*	
Country					
the UK	0.3702***	0.0507	0.4390***	0.6584***	-0.1041
Belgium	0.023	0.0235	0.0545	0.1169	-0.1065*
Spain	0.3574***	0.1717***	0.3653***	0.1084*	
Norway	0.2874***	-0.2917***	0.1727***	0.1300**	-0.6820***
Switzerland	0.3847***	-0.0104	0.4398***	0.2569***	-0.1236
the Netherlands	0.3663***	-0.0593	0.1950***	-0.0316	-0.3204***
Greece	-0.1302*	-0.1602**	-0.3637***	-0.3422***	-0.4358***
_cons	-0.4714***	-0.1747	-0.1904	-0.3776***	0.2063
N	5247	5247	5247	5247	4484
adj. R-sq	0.0942	0.0599	0.102	0.1169	0.0691
AIC	1.43E+04	1.45E+04	1.42E+04	1.42E+04	1.26E+04
BIC	1.46E+04	1.48E+04	1.45E+04	1.45E+04	1.28E+04

*** p<0.01, ** p<0.05, * p<0.10

Category reference classes: Income Perceived -Very Difficult-, Education -Upper secondary-, Age -21-30-, Activity -Paid Work- and Country -Italy-