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The Interrelationship between Pro-Environmental Attitudes and Subjective Well-Being: The Case of Central and Eastern European Countries

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Abstract: Scientists and policy makers more often point out that pro-environmental attitudes and behaviour are related to subjective well-being, but there is a lack of deep scientific insights, as well as possible measure analysis, which would promote pro-environmental behaviour but, at the same time, lead to higher subjective well-being. The aim of this study is to investigate the relationship between pro-environmental attitudes, concerns about climate change, and subjective well-being in Central and Eastern European countries. This study employs descriptive statistics and multiple regression analysis to identify subjective well-being predictors in the case of Central and Eastern European countries. This study uses data from European Social Survey (ESS) rounds 4–10, and includes questions on pro-environmental attitudes, climate change cognition, orientation towards materialistic values, and households' total net income. The conducted research revealed that pro-environmental attitudes were related to higher levels of subjective well-being in different ESS rounds in many Central and Eastern European countries. In addition, there is some evidence that the relationship between pro-environmental attitudes and subjective well-being is weaker among individuals who are more oriented towards materialistic values. According to the results of this study, policy makers should develop policies that not only address environmental problems but also contribute to subjective well-being.

Keywords: subjective well-being; environmental cognition; pro-environmental attitudes; climate change cognition; Central and Eastern European countries

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1. Introduction

The change of environmental behaviour can be an important component in the formation of environmental policy. Environmental policy initiatives have so far paid too little attention to the potential synergies of the relationship between pro-environmental attitudes and subjective well-being. Underestimating the well-being benefits of pro-environmental behaviour, so far, has not led to the development of environmental policies aimed at convincing people to change their individual consumption patterns to the extent necessary to mitigate climate change and address other human-caused environmental problems [1]. Also, by understanding that pro-environmental attitudes and behaviour are related to subjective well-being, we can promote pro-environmental forms of behaviour in a way that increases individuals' subjective well-being—positive emotions, feelings of happiness, and a positive evaluation of their own life [2]. An increase in subjective well-being due to the implementation of an environmental action can motivate individuals to perform more pro-environmental actions [3]. Pro-environmental attitude is usually defined as the responsibility for the protection of the environment in its different areas, including sustainable production (e.g., applying circular economy principles) and consumption (e.g., overall reduction in consumption, water and energy saving, food waste avoidance, and reducing meat consumption), waste management, recycling, nature conservation, climate change mitigation (switching from fossil fuels to the use of alternative or renewable resources),

and supporting environmentally friendly products. In this article, we examine whether there is a relationship between pro-environmental attitude and well-being in Central and Eastern European countries using the data from the European Social Survey. The question this study aims to answer is as follows: does the link between pro-environmental attitudes and subjective well-being depend on personal materialistic values and on individual income levels?

There is a widespread assumption that increasing material wealth provides a greater sense of happiness and ensures higher subjective well-being. But once a certain level of income and consumption is reached, where people's needs are satisfied, this link becomes less clear [4,5]. Undoubtedly, subjective well-being is also determined by other factors such as health, safety, employment, leisure, natural environment, civil engagement, and involvement in community activities. Pro-social behaviour, including pro-ecological behaviour, is associated with a positive psychological state (intrinsic satisfaction by contributing to a public good) that determines subjective well-being [6]. Volunteering, acts of altruism, and caring about societal and environmental issues can also increase self-esteem and subjective well-being. If people recognize pro-environmental behaviour as beneficial to nature and/or its current and future inhabitants, people may feel good after performing a pro-environmental action [1]. People often consider "sustainable actions as moral choices and, therefore, as meaningful actions that can evoke positive emotions" [7].

Recently, there has been increasing evidence in the scientific literature that individuals with a pro-environmental attitude usually have higher levels of well-being [1,2,4,7–14]. As argued by Capstick et al. [4], it is important to recognize the broader range of pro-environmental attitudes and behaviour benefits for well-being, encompassing both the private sphere (e.g., saving energy at home) and the public sphere (e.g., immaterial benefits through civic engagement). Besides the personal satisfaction due to pro-environmental behaviour, it can also indirectly lead to an increase in well-being due to the positive effects of physical activity (e.g., walking and cycling instead of driving a car) and the joy of saving money. In this context, Krekel and Prati [10] perceive a win–win situation for the environment and individuals engaging in pro-environmental behaviour, and Ibáñez-Rueda and Wanden-Berghe [8] recognize the operation of theory of the double dividend. Welsch and Kühling [14] note that from the perspective of economic psychology, pro-ecological consumer choices are more beneficial to the individual because they are more in line with the principles of utility maximization than high-consumption lifestyles. It should be pointed out that in some cases, pro-environmental attitudes can lead to an increase not only in subjective well-being, but also in material welfare, for example, when sustainable consumption saves not only natural resources, but also personal assets.

From the consumer's perspective, the pro-environmental behaviour they engage in is theoretically expected to diminish well-being due to its entailing direct costs in terms of time, financial resources, and efforts; sometimes, it may even require an initial investment [1]. However, most research proves that despite all the costs, pro-environmental behaviour has a positive impact on well-being. The same is confirmed by Venhoeven et al. [7], stating that regardless of potential inconvenience, cost, or discomfort, individuals in most cases associate pro-environmental behaviour with positive feelings.

Looking from another viewpoint, negative feelings about climate change and other environmental issues affect our subjective well-being, so our pro-environmental involvement reduces this pressure, thereby increasing subjective well-being [1,15]. Schmitt et al. [1] emphasize that this engagement "counteracts the emotional harm posed by recognizing environmental crises". Therefore, it seems that in order to achieve high subjective well-being, one of the possibilities is to engage in pro-environmental actions [9], or to choose a green lifestyle [16].

As many researchers [10,14,17] point out, pro-environmental awareness and altruistic behaviour often create meaning in personal life, leading to greater feelings of happiness. Kittiprapas [18] in this context uses the definition "happiness derived from preserving their environment". Pro-environmental attitudes and behaviour are also related to the concept

of "sustainable happiness". Sustainable happiness, according to O'Brien [19], "contributes to individual, community and/or global well-being without exploiting other people, the environment or future generations" and is related to the development of "healthy and sustainable lifestyles and communities". Accordingly, the concept of sustainable happiness creates the basis not only for individual but also for global well-being [8].

Often, community support for a pro-environmental approach leads to a greater involvement of people in green initiatives and an increase in their well-being by feeling the recognition of the people around them. This is because such behaviour is recognized as morally right [7]. In pursuit of this recognition, people tend to report on social networks and other forms of communication about their contribution to waste recycling, resource saving, and environmentally friendly consumption. As Schmitt et al. [1] point out, participating in pro-environmental activities potentially promotes well-being due to a growing reputation, so pro-environmental behaviour that is easily noticed by others is more strongly associated with well-being.

Acting out of altruism and social responsibility in this way leads to the private (non-governmental) provision of public goods and gives a sense of satisfaction to those who provide them. Pro-environmental attitudes and behaviour often create a sense of higher well-being because people identify themselves as socially responsible and thus distinguish themselves from whole society [14]. Such a sense of social identity is directly related to life satisfaction. The results of the research conducted by Kerret et al. [20] revealed that students from green schools reported about more experiences of pro-environmental behaviour (sustainable consumption, protection of nature, recycling, resource conservation) and their school satisfaction was higher compared to the students from regular non-green schools. It can be concluded that the positive impact of pro-environmental attitudes and initiatives not only on the environment but also on the people themselves is becoming evident.

It should also be noted that the spread of pro-environmental attitudes leads to pro-environmental behaviour, which not only benefits the natural environment but is also reflected in the increase in subjective well-being due to positive changes in the natural environment. However, as Suárez-Varela et al. [13] state, a sense of concern for the environment does not always translate into personal actions towards its preservation. This is because some individuals believe that they cannot personally affect global environmental problems such as climate change or resource depletion.

If a pro-environmental attitude provides benefits, primarily through increased subjective well-being, people are more likely to engage in more pro-environmental behaviour and support for green policies [14]. They emphasize that the relationship between pro-environmental attitudes and well-being is stronger in countries where being green is a social norm, where society is less divided on environmental issues. They claim that "being green is psychological more beneficial in greener societies, because violation of the green social norm implies a psychological cost" [14]. In this case, subjective well-being comes through conformity. Binder et al. [16] also draw attention to "individuals' conformity with a general social greenness".

Conversely, increasing societal fragmentation over environmental issues (e.g., climate change) can undermine the welfare benefits of being green, reduce the spread of pro-environmental attitude, and ultimately negatively impact the natural environment [14].

Some researchers [6,14,18,21–23] examine the possibility of reverse causality: a greater life satisfaction could determine greener attitudes. This is confirmed by Coelho et al. [21], who state that positive mood can promote environmental concern (by promoting cognitive engagement) and pro-environmental behaviour. The research results of Wang and Kang [24] revealed that people's life satisfaction indeed promotes their interest in participating in environmental activities, and increasing subjective well-being can become a tool to solve potential conflicts between economic growth and environmental protection. Even more detailed conclusions about these interrelations were disclosed in the study of del Saz Salazar and Perez [23]. They stated that life satisfaction has a slightly stronger and more significant effect on high-cost pro-environmental behaviour than on low-cost

pro-environmental behaviour. Ouyang et al.'s [22] research showed that subjective well-being affects rural residents' social interaction, altruism, and pro-environmental behaviour. Also, a study revealed that the higher the level of environmental knowledge, the stronger the effect of subjective well-being on pro-environmental behaviour. Kittiprapas [18] also points out that inner happiness contributes significantly to improved environmental quality; a focus on happiness can promote environmental conservation and sustainable development. Zelenski and Desrochers [25] also disclosed that positive emotions can promote pro-environmental behaviour (especially those positive emotions that arise when being in nature). On the contrary, low well-being, depression, stress, and sleepiness negatively affect pro-ecological behaviour [6]. The same is confirmed by Nguyen et al. [26], stating that those individuals with lower subjective well-being are more likely to be concerned about their own problems and are therefore less likely to participate in issues of public concern, and therefore environmental problems are not as important for them. Prati et al. [27] summarize the confirmation of many scientists regarding the relationship between well-being and pro-environmental attitudes by the fact that pro-environmental actions are some of the forms of pro-social behaviour. So, it is natural that social well-being gives faith in the progress of society, leading to contributions to the commonwealth (including pro-environmental actions). The effect of subjective well-being on pro-environmental behaviour could be enhanced by exposure to environmental information in the media in countries with high levels of subjective well-being [26]. Reviewing the ideas expressed by other researchers, we can state that there are bidirectional relationships between pro-environmental behaviour and subjective well-being.

Some researchers argued that involvement in pro-environmental behaviour could depend on the personal material situation or the level of economic development of the country [4]. As Fischer and Boer [28] note, people who have more economic resources and better material conditions have greater options than others and can afford to make decisions based on personal values. Individuals living in poverty "have limited choices and do not clearly differentiate between the motivational orientations inherent in values" [28]. It should also be recognized that pro-environmental behaviour may require effort, personal time, and sometimes additional costs or investments, which only the wealthier people can afford. Capstick et al. [4] raise the following main question in their research: is the subjective well-being that comes from pro-environmental behaviour only the privilege of the people with higher incomes? Research by Capstick et al. [4] did not find any concrete evidence that the impact of pro-environmental attitude and behaviour on well-being is greater in the most economically developed countries than in less developed countries. It revealed that citizens' awareness of environmental issues and support for environmental action are not limited to rich countries. However, in some countries, the impact of pro-environmental attitude and behaviour on well-being was greater for individuals with higher individual income.

On the other hand, some psychological research shows that excessive materialism (when the possession of money and material goods is most important to a person) leads to lower levels of subjective well-being, while high pro-social attitudes increase well-being. This could justify the development of a pro-environmental approach [14].

It needs to be mentioned that materialistic self-interests are traditionally identified as causes of environmental problems. This is supported by Bethem [29], who argues that lifestyle choices have caused the existential threat associated with climate change. However, no claims should be made that such an approach cannot be associated with a positive impact on the environment. Individuals who are strongly oriented in self-interested values only engage in pro-environmental activities if the perceived benefit of the action exceeds the costs. However, a rational self-interested individual could also be involved in pro-environmental actions, because they realize that a good environment enhances their physical and mental well-being in the long run [9].

Psychological factors play an important role in creating a sustainable society and improving subjective well-being [9]. Various evidence also shows that personal values

are strong determinants of behaviour, seeking to benefit other people or the natural environment. Acting according to the personal values also associates with higher subjective well-being [4]. Personality traits (such as openness, conscientiousness, and extraversion) are also important determinants of pro-environmental behaviour [30]. A study by Kaida and Kaida [6] revealed that optimism also promotes pro-environmental behaviour. However, they emphasize that people who anticipate a pessimistic future scenario caused by climate change problems may encourage themselves to engage in pro-environmental behaviour.

Inappropriate environmental behaviour is mainly determined by habits, so people with a higher level of self-control are more easily attracted to pro-environmental behaviour. As a result of engaging in pro-environmental actions, their level of subjective well-being also increases [15]. Suárez-Varela et al. [13] argue that domestic water-saving habits in the household are not significant in explaining increases in subjective well-being, but are more evident in the use of devices that save water. Zawadzki et al. [2] developed this idea by stating that when pro-environmental actions are taken consciously (such as buying an energy-efficient device), the impact on subjective well-being is greater in comparison with decisions which are made automatically or out of habit (turning off the lights when you leave a room). They note that people are likely to consider actions such as purchasing a relatively expensive piece of equipment (an energy-saving device) personally meaningful and therefore feel satisfaction in doing them.

The methodological problem is that there may be a completely random connection between the phenomena under consideration. Some people for no apparent reason are pro-environmental and at the same time have a high level of life satisfaction [14].

Capstick et al. [4] state that "Policy interventions and campaigns designed to promote pro-environmental behaviour would do well to stress the value of action for both people and planet". The same is confirmed by Suárez-Varela et al. [13] who suggest that the interconnection between pro-environmental attitudes and behaviour with well-being should encourage policy makers to develop policies that not only address environmental problems but also contribute to subjective well-being. As Iriarte [31] states, the implementation of the UN Sustainable Development Goals creates prerequisites for not only solving social, economic, and environmental development issues, but also contributing to happiness and subjective well-being. However, if there is also an inverse relationship and subjective well-being promotes pro-environmental behaviour, it is the argument for policy makers to focus more on subjective well-being [10].

Bartolo et al. [32] suggest that the promotion of pro-environmental attitudes and behaviour should also be performed by enabling educational institutions to develop and implement programmes based on knowledge about the importance of pro-environmental behaviour, which should improve both personal and social well-being. The values and moral attitudes formed in childhood and adolescence, including a pro-environmental approach, lead to doing something good for themselves and for their own community, and this type of behaviour in the long term increases positive self-esteem, the level of life satisfaction, and well-being. Pro-environmental actions, once learned, can be activated automatically and out of habit with long-term benefits in terms of well-being [32].

Soni [12] emphasizes the importance of a pro-environmental approach to subjective well-being not only in national policy but also in corporate activities. She points out that in order to improve employee well-being in companies, pro-environmental attitudes and behaviours should also be promoted, fostering environmental awareness and helping to understand the necessity of sustainable development in the context of climate change.

Concluding, subjective well-being should not be the main motive for policies and actions promoting pro-environmental behaviour, but it provides additional arguments for the expediency of some environmental policy measures. Therefore, the aim of this article is to investigate the relationship between pro-environmental attitudes, concern about climate change, and subjective well-being in Central and Eastern European countries.

The structure of this paper is as follows: The data set, the study framework, and the research procedures are all described in Section 2. Section 3 contains the results of the implemented research. Sections 4 and 5 include a discussion and suggestions for future research.

2. Materials and Methods

2.1. Research Framework

This study analysed the relationship between pro-environmental attitudes and subjective well-being. Subjective well-being on an individual level was characterised by the subjective well-being index (SWI) using four questions from the European Social Survey (ESS). Pro-environmental attitudes excluding climate change cognitions were characterised by the environmental cognition index (ECI), whereas climate change cognitions were represented by three questions from the ESS and were characterized by the climate change cognition index (CCCI).

This research was divided into several steps: (1) descriptive statistics for all three indices were provided and analysed; (2) time series analysis using the environmental cognition index was performed; and (3) multiple regression analysis using the climate change cognition index was performed. Note that the environmental cognition index covers ESS rounds 4–10, whereas the climate change cognition index only uses rounds 8 and 10. Next, we provide this study's research framework (see Figure 1).

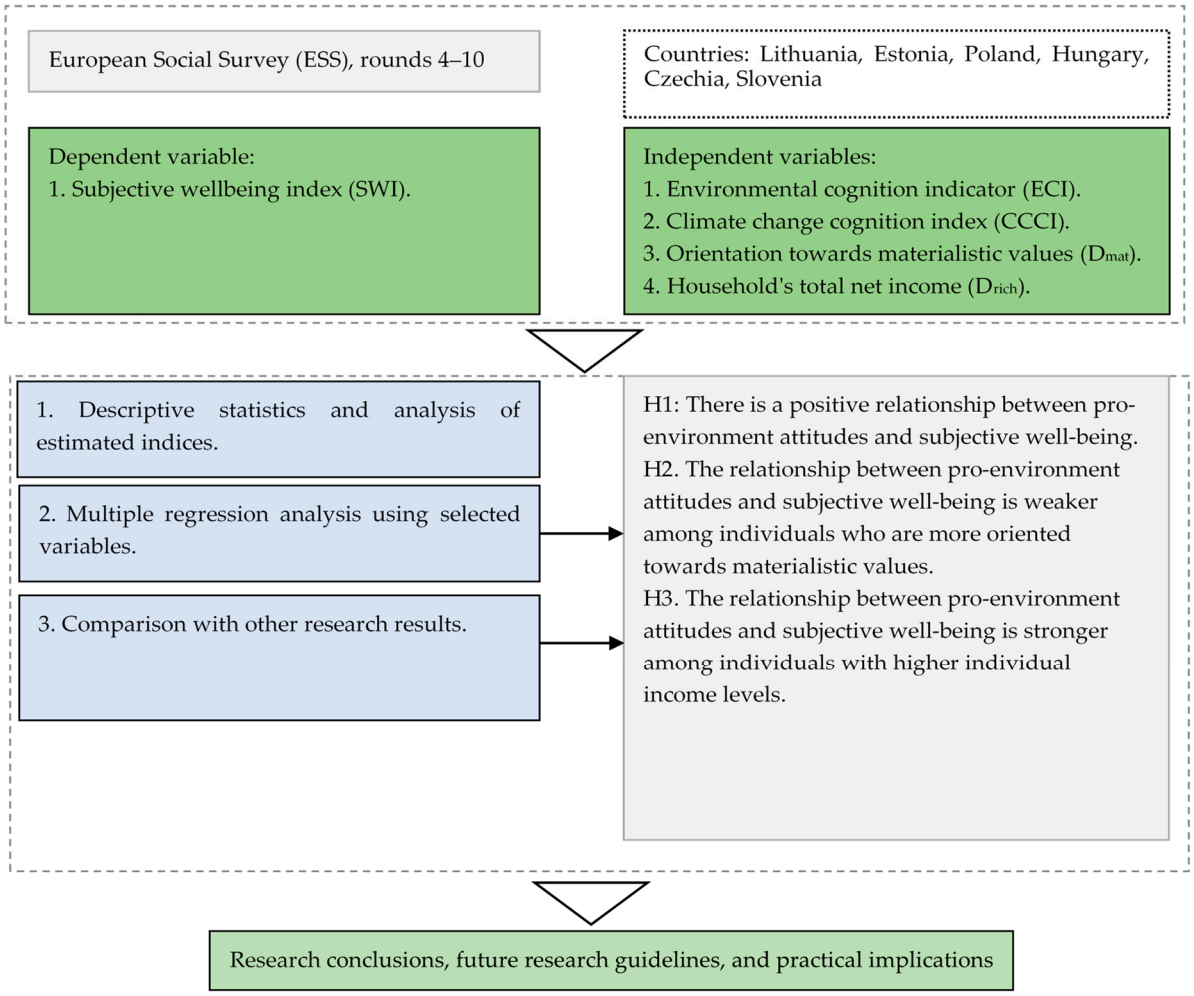


Figure 1. This study's research framework (prepared by authors).

This study used ESS data [33]. The ESS is continuous social scientific research which enables researchers to identify the attitudes, beliefs, and behavioural patterns of the various

European populations. Data from the ESS are publicly available and are used in this study. This study analysed data from six selected countries: Lithuania, Estonia, Poland, Hungary, the Czech Republic, and Slovenia. Countries that were assigned as Central and Eastern European countries and that participated in ESS rounds 4–10 are presented in Table A7 in Appendix B. All countries that were analysed participated in the ESS in all rounds continuously since ESS round 4 (2008). These countries are characterised by comparable economic structure and development; they are members of the EU and were countries under the influence of the Soviet Union until 1990. As we used subjective data from the ESS, we did not seek to compare them with objective data from selected countries. Our research does not aim to explore the situation of individual CEE countries, but aims to reflect the general trend of CEE countries.

The subjective well-being index (SWI) contains four ESS items. The domains on which this index focuses are (1) happiness and life satisfaction, (2) mental and physical health, and (3) financial and material stability, similarly to other authors [34]. The SWI is constructed using 4 items featured in all rounds of ESS research: (1) current happiness (code—happy) (from 0 = Extremely unhappy to 10 = Extremely happy scale on a 5-point scale), (2) current satisfaction with life (code—stflife) (from 0 = Extremely dissatisfied to 10 = Extremely satisfied scale on a 5-point scale), (3) general physical and mental health assessment (code—health) (from 1 = Very bad to 5 = Very good), and (4) feelings about current household income (code—hincfel) (from 1 = Very difficult on pre sent income to 4 = Living comfortably on present income scale). The theoretical range of results on this scale is from 4 to 19.

The environmental cognition indicator (ECI) contains one item from the ESS—Important to care for nature and the environment (code—impenv) (from 1 = Very much like me to 6 = Not like me at all). The theoretical range of results on this scale is from 1 to 6.

The climate change cognition index (CCCI) contains three items from the ESS: (1) Climate change is caused by natural processes, human activity, or both (code—ccnthum) (from 1 = Entirely by natural processes to 5 = Entirely by human activity), (2) To what extent do you feel personal responsibility to reduce climate change (code—ccrdprs) (from 0 = Not at all to 10 = A great deal scale on a 5-point scale), and (3) How worried are you about climate change (code—wrclmch) (from 1 = Not at all worried to 5 = Extremely worried). The theoretical range of results on this scale is from 3 to 15.

This study used two additional variables to further analyse the underlying relationships:

Household's total net income contains one item from the ESS: (1) household's total net income (code—hinctnta) (10 deciles).

Orientation towards materialistic values contains one item from the ESS: (1) Important to be rich and have money and expensive things (code—imprich) (from 1 = Very much like me to 6 = Not like me at all). Values of 1 and 2 amount to 1, and 0 otherwise.

2.2. Methods

In this study, generic statistical techniques were employed such as multiple regression analysis to identify SWI predictors and descriptive statistics (mean and standard deviation), as well as a parametric test (*t*-test) for comparing means.

In order to test the internal consistency of indices, we used Cronbach's alpha reliability coefficient. An internal consistency score of 0.7 or higher in a Cronbach's alpha analysis indicates that the scale is highly consistent. If the score is 0.5 or lower, the questions should be changed or rebuilt. This study used a multiple regression model to test the previously stated hypotheses H1, H2, and H3. The equation of the multiple regression model can be seen in Formula (1). In order to test hypothesis H1, we expect $\beta_1 > 0$ or $\beta_7 > 0$. To test hypothesis H2, we expect $\beta_3 < 0$ or $\beta_7 < 0$. To test hypothesis H3, we expect $\beta_5 > 0$ or $\beta_8 > 0$. Note that parameter β_2 indicates whether individuals oriented towards materialistic values experience a higher level of subjective well-being, and parameter β_4

indicates whether individuals belonging to the 10th decile according to net household income experience a higher level of subjective well-being.

$$SWI = \beta_0 + \beta_1 ECI + \beta_2 D_{Mat} + \beta_3 ECI \times D_{Mat} + \beta_4 D_{Rich} + \beta_5 ECI \times D_{Rich} + \beta_6 CCCI + \beta_7 CCCI \times D_{Mat} + \beta_8 CCCI \times D_{Rich} + \varepsilon \quad (1)$$

where SWI is the subjective well-being index; ECI is the environmental cognition indicator; D_{Mat} is a dummy variable (1 if the individual is oriented towards materialistic values, and 0 otherwise); D_{Rich} is a dummy variable (1 if the individual belongs to the 10th decile according to net household income, and 0 otherwise); $CCCI$ is the climate change cognition index; $\beta_{0...9}$ are model coefficients; and ε is the error.

After calculating model parameters, we omitted insignificant variables from the model (p-value < 0.05). In this manner, we provided only models with statistically significant variables from the multiple regression equation (Formula (1)). We then calculated the coefficient of determination (R^2) and the size of sample (n) for each provided model.

2.3. Data

Data from seven ESS rounds were used for the empirical investigation of subjective well-being and environmental and climate change cognition: ESS rounds 4 (2008), 5 (2010), 6 (2012), 7 (204), 8 (2016), 9 (2018), and 10 (2020). Only rounds 8 (2016) and 10 (2020) include inquiries about awareness of climate change. See the ESS 2008–2020 methodology overviews for more information on sampling, data collection, and other methodological considerations [28]. Selected Central and Eastern European countries, which participated in the ESS, were represented in this study: Lithuania, Estonia, Poland, Hungary, the Czech Republic, and Slovenia. All these countries are available in the ESS starting from ESS round 4 (see Table A7).

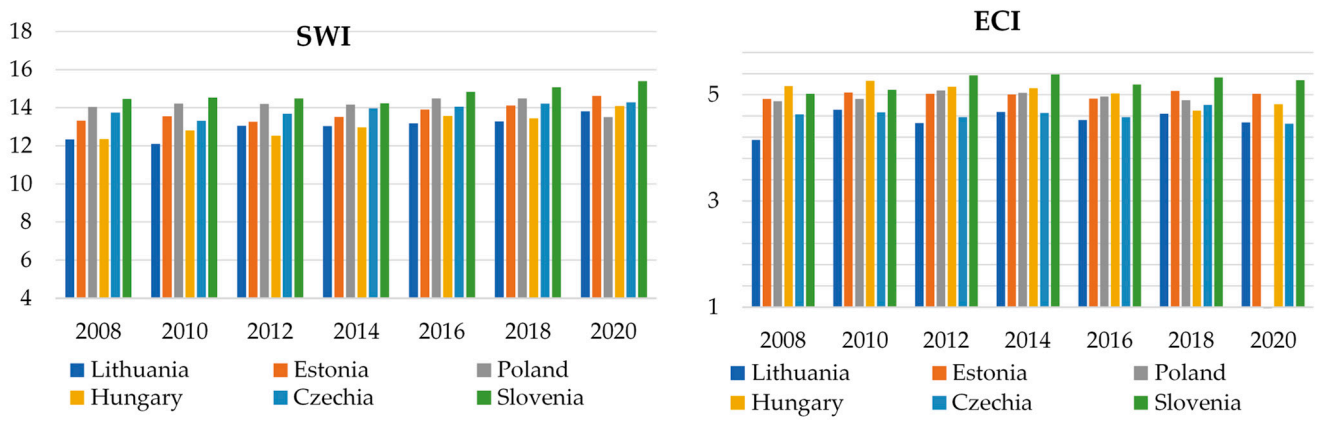
Gretl 2022c and Ms Excel 2403 software were used for calculations.

3. Results

This section is divided by subheadings. It provides a concise and precise description of the experimental results, including their interpretation as well as the experimental conclusions that can be drawn.

3.1. Subjective Well-Being and Environmental Cognition Indices

Figure 2 presents evaluations of the mean SWI and ECI in the 2008–2020 period.



(**a**) (**b**)

Figure 2. (**a**) Subjective well-being index (SWI) in six countries; (**b**) environmental cognition index (ECI) in six countries (own calculations). Note: no available data for Poland for calculating ECI in ESS round 10 (2020).

SWI assessment averages gradually increased during the analysed period for particular countries. The SWI was rated best in Slovenia and Poland throughout the period; however, in Poland, it decreased in 2020 as it was marked by the COVID-19 pandemic, so it could have affected SWI evaluations as well. At the beginning of the period in 2008–2020, the lowest SWI ratings were in Hungary and Lithuania, but in later years, the averages also had an increasing tendency. On the other hand, this index consists of several dimensions, the assessment of which may have also influenced the visible changes.

Focusing on ECI, it is obvious that in selected European countries, the averages were diverse and fluctuating. The highest average during the entire 2008–2020 period was in Hungary and Slovenia. The averages in Hungary were decreasing year by year, while in Slovenia, they were fluctuating. The lowest average assessments were in Lithuania and Czechia. As this index concerns how important it is to care for nature and the environment, it discloses that respondents' evaluations in the mentioned countries can be based on individual perceptions, attitudes, or experiences reflecting nature and the environment.

Further, Figure 3 shows averages of SWI and CCCI in years 2016 and 2020 when climate cognition index data were available just for ESS rounds 8 (2016) and 10 (2020). According to the parametric test (*t*-test) results, all estimated two-tailed *p*-values were below 0.05, showing that the null hypothesis (difference of means = 0) can be rejected for all counties and both indicators.

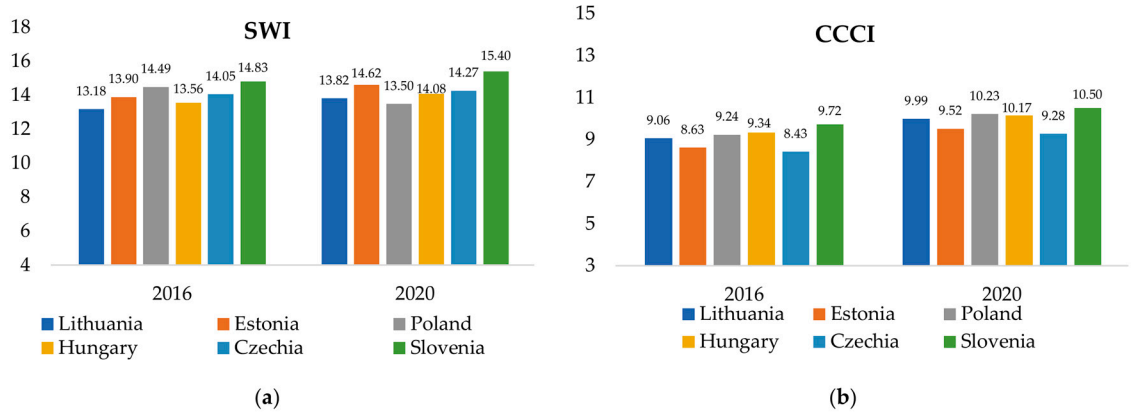


Figure 3. (**a**) Subjective well-being index (SWI) in six countries; (**b**) climate change cognition index (CCCI) in six countries (own calculations).

The SWI averages given above indicate that, comparing 2020 with 2016 years in all countries except Poland, the SWI averages increased. In both years, the highest SWI average was in Slovenia. However, the largest positive change was in Estonia, where the SWI average increased by 0.7, and only in Poland did the value of this index decrease.

According to CCCI evaluations, comparing 2020 with 2016 years, the average increased in all analysed countries, so positive changes were observed. It is noteworthy that in 2016, the lowest CCCI average was in Czechia (it was also lowest in 2020), and the highest in both years was in Slovenia. The smallest increase was in Slovenia (0.78) and the average rating increased most in Poland (0.99). It can be pointed out that the respondents' respective understanding of climate change and ongoing climate change also determined their current assessments.

Descriptive statistics of the subjective well-being index for selected countries are presented in Table 1.

Considering the descriptive statistics of individual countries, it is observed that in Lithuania, the SWI mean increased by ESS rounds. The standard deviation (St. Dev.) was observed as largest in ESS round 7 and smallest in round 5. As seen in the table, the size of the sample was fluctuating during ESS rounds 4–10 in all countries that, potentially, also affected particular evaluations of the SWI. In most rounds, Cronbach's alpha was suitable for all countries, as it was more than 0.6, except for Lithuania in round 5 where it was 0.561. In the case of Estonia, the SWI mean values were increasing, except in round 6.

The St. Dev. was largest in round 6 and smallest in round 10, also fluctuating from year to year. Cronbach's alpha scored above 0.7 and was considered good. Poland's situation reveals that the mean of SWI was higher than those in Lithuania and most Estonia rounds. The smallest St. Dev. was in round 8 and was largest in round 5. Cronbach's alpha scored above 0.6, so it was suitable for all ESS rounds. The mean of SWI in Hungary was smallest among all selected countries, with the largest St. Dev. in round 5 and the smallest in round 10. Cronbach's alpha was mostly above 0.7, except in last ESS rounds 9–10 where it above 0.6. The mean of SWI in Czechia had a tendency to increase round by round. The St. Dev. was smallest in ESS round 9 and the largest in round 5. Cronbach's alpha in most rounds scored above 0.6. The SWI mean in Slovenia was almost highest among all analysed countries. The St. Dev. varied from 2.3 to 2.6 in separate rounds. Cronbach's alpha was mostly above 0.7, and above 0.6 just in two ESS rounds.

Table 1. Descriptive statistics of subjective well-being index (own calculations).

Indicator	ESS Rounds	Mean	St. Dev	Size of Sample	Cronbach's Alpha	Mean	St. Dev	Size of Sample	Cronbach's Alpha
			Lithuania					**Estonia**	
SWI	4	12.339	2.472	1946	0.682	13.332	2.461	1623	0.740
SWI	5	12.094	2.413	1612	0.561	13.558	2.457	1787	0.724
SWI	6	13.053	2.596	2003	0.765	13.258	2.623	2355	0.748
SWI	7	13.038	2.748	2152	0.793	13.523	2.555	2041	0.758
SWI	8	13.183	2.490	2022	0.728	13.903	2.471	2014	0.748
SWI	9	13.271	2.560	1792	0.750	14.116	2.331	1902	0.740
SWI	10	13.819	2.593	1581	0.728	14.616	2.210	1540	0.716
			Poland					**Hungary**	
SWI	4	14.033	2.480	1581	0.725	12.348	2.763	1509	0.708
SWI	5	14.209	2.493	1651	0.736	12.810	2.800	1538	0.724
SWI	6	14.195	2.423	1849	0.712	12.540	2.770	1968	0.732
SWI	7	14.165	2.401	1578	0.706	12.971	2.617	1648	0.740
SWI	8	14.487	2.239	1627	0.687	13.561	2.532	1556	0.725
SWI	9	14.483	2.253	1442	0.683	13.441	2.468	1573	0.698
SWI	10	13.497	2.534	1274	0.723	14.082	2.321	1778	0.697
			Czechia					**Slovenia**	
SWI	4	13.750	2.438	1963	0.694	14.465	2.377	1262	0.698
SWI	5	13.305	2.589	2318	0.714	14.532	2.496	1370	0.728
SWI	6	13.687	2.538	1890	0.704	14.497	2.503	1234	0.690
SWI	7	13.973	2.336	2052	0.668	14.232	2.627	1207	0.732
SWI	8	14.052	2.345	2218	0.694	14.825	2.446	1292	0.710
SWI	9	14.214	2.239	2276	0.665	15.075	2.392	1299	0.723
SWI	10	14.272	2.354	2350	0.649	15.398	2.314	1228	0.724

Table 2 presents descriptive statistics of environmental cognition indicators within ESS rounds. It should be mentioned that data of given indicators are not available for all rounds, so they are separated. Moreover, when evaluating the sample size in all selected countries who answered the questions, it is seen that in all countries, the analysed questions are important to a large part of the respondents. Moreover, Cronbach's alpha was calculated just for CCCI, as ECI includes just one indicator.

Table 2. Descriptive statistics of ECI and CCCI (own calculations).

Indicator	ESS Rounds	Mean	St. Dev	Size of Sample	Cronbach's Alpha *	Mean	St. Dev	Size of Sample	Cronbach's Alpha *
			Lithuania				**Estonia**		
CCCI	8	9.065	2.132	1743	0.615	8.632	2.132	1926	0.574
CCCI	10	9.985	2.226	1536	0.628	9.524	2.183	1525	0.639
ECI	4	4.151	1.170	1992	-	4.920	1.110	1643	-
ECI	5	4.716	1.146	1627	-	5.041	0.871	1793	-
ECI	6	4.468	1.125	2107	-	5.021	0.896	2359	-
ECI	7	4.676	1.167	2239	-	5.007	0.925	2038	-
ECI	8	4.528	1.187	2086	-	4.928	0.926	2010	-
ECI	9	4.644	1.195	1725	-	5.074	0.855	1900	-
ECI	10	4.480	1.182	1624	-	5.018	0.915	1542	-
			Poland				**Hungary**		
CCCI	8	9.238	1.916	1495	0.551	9.340	1.887	1503	0.472
CCCI	10	10.229	2.172	1289	0.712	10.170	1.806	1758	0.548
ECI	4	4.880	0.951	1595	-	5.164	0.943	1432	-
ECI	5	4.923	0.929	1733	-	5.265	0.890	1472	-
ECI	6	5.086	0.868	1883	-	5.154	0.921	1969	-
ECI	7	5.038	0.884	1593	-	5.126	0.940	1520	-
ECI	8	4.967	0.893	1676	-	5.027	1.003	1459	-
ECI	9	4.896	1.013	1460	-	4.699	1.119	1647	-
ECI	10 **	-	-	-	-	4.822	0.962	1813	-
			Czechia				**Slovenia**		
CCCI	8	8.433	2.135	2070	0.564	9.724	1.913	1265	0.468
CCCI	10	9.283	2.254	2278	0.517	10.499	1.923	1232	0.517
ECI	4	4.633	1.106	1984	-	5.022	0.941	1264	-
ECI	5	4.669	1.044	2329	-	5.098	0.858	1372	-
ECI	6	4.578	1.078	1987	-	5.370	0.784	1250	-
ECI	7	4.661	1.098	1859	-	5.388	0.712	1198	-
ECI	8	4.577	1.058	2255	-	5.192	0.796	1298	-
ECI	9	4.812	1.075	2347	-	5.329	0.780	1309	-
ECI	10	4.457	1.244	2420	-	5.273	0.750	1235	-

*: Cronbach's alpha was not calculated for ECI, because it consists only of one item; ** there were no data for ECI in Poland in ESS round 10.

Lithuania's case reveals that the CCCI mean increased by 0.92 comparing ESS round 10 with 8. This shows that the respondents started to understand and appreciate the issues related to climate change more, while the ECI means were fluctuating in rounds 4–10 with the highest mean in round 5. The St. Dev. of CCCI was different in rounds 8 and 10. The St. Dev. of ECI varied in different rounds. The mean values for Estonia for CCCI also increased, but for ECI, the mean changed depending on the year. The St. Dev. for CCCI increased, but for all 4–10 rounds, the St. Dev. of ECI had a tendency to change. For Poland's case, the CCCI mean increased by 0.991, while the mean of ECI had a tendency to change. The St. Dev. was larger for CCCI than for ECI, and the St. Dev. for ECI varied. Hungary's situation revealed that the CCCI mean increased by 0.83 from round 8 to 10. The ECI mean changed in different rounds with the highest value in round 9. The St. Dev. for CCCI decreased and that for ECI was fluctuating. The CCCI mean in Czechia increased as in other countries, whereas the ECI mean had a tendency to increase/decrease in separate rounds. The St. Dev. for CCCI increased from round 8 to 10, but the St. Dev. of ECI was changing. The mean of the CCCI indicator for Slovenia increased (as in other countries) by 0.775. The St. Dev. of CCCI slightly increased and that for ECI was decreasing from round 4 to 7 and then slightly increased.

Generally, it was observed that the given data differed, changing means according to the analysed countries. As seen in most countries, the means of CCCI were increasing, which could mean that respondents' concern and interest in climate change are growing and gaining more and more attention. Meanwhile, the means of ECI were mostly changing

in separate rounds, which allows us to assume that environmental cognition depends on the various characteristics of respondents.

3.2. Multiple Regression Analysis

Next, multiple regression results are provided for Lithuania (see Table A1), Estonia (see Table A2), Poland (see Table A3), Hungary (see Table A4), Czechia (see Table A5), and Slovenia (see Table A6). Note that models are provided after omitting statistically insignificant variables (p-value < 0.05). A summary of the results showing only statistically significant coefficients is provided in Table 3.

Table 3. Statistically significant parameters of multiple regression models modelling relationships between SWI and selected independent variables in years 2008–2020 (own calculations).

Variable	ESS-04	ESS-05	ESS-06	ESS-07	ESS-08	ESS-09	ESS-10
ECI	−0.22 HU	0.24 HU		0.15 LT 0.24 HU	−0.14 EE 0.15 CZ	0.29 LT 0.37 PL 0.28 HU	0.21 HU 0.30 CZ −0.20 SI
D_{Mat}	2.50 LT 0.68 PL 0.84 CZ	0.80 CZ 0.84 SI	0.93 LT 0.34 PL 0.50 HU	0.69 LT 0.81 CZ	1.57 EE 3.26 SI	0.81 LT 0.52 PL −1.23 CZ	1.38 LT 2.77 EE 2.48 HU
ECI × D_{Mat}	−0.42 LT 0.10 HU		0.16 CZ	0.07 HU	0.26 LT 0.17 HU 0.11 CZ	0.16 HU 0.36 CZ	−0.29 LT 0.18 CZ
D_{Rich}	2.19 LT 1.94 EE 1.91 PL 2.70 HU	1.81 PL 2.29 HU	2.48 EE 2.11 PL 2.56 HU 2.17 CZ 1.99 SI	2.52 LT 1.80 PL 1.94 SI	1.83 LT 2.36 EE 1.69 HU 2.00 CZ 1.60 SI	2.46 LT 1.68 PL 2.37 HU 1.59 CZ	2.50 LT 1.73 EE 1.65 PL 1.81 HU 1.77 CZ 1.34 SI
ECI × D_{Rich}	0.37 SI	0.46 LT 0.42 EE 0.46 CZ 0.38 SI	0.44 LT	0.36 HU 0.44 CZ	0.34 PL	0.44 EE 0.29 SI	
CCCI					0.09 LT 0.15 EE 0.07 PL 0.11 HU		0.20 LT 0.22 EE 0.19 HU 0.10 SI
CCCI × D_{Mat}					−0.22 EE −0.29 SI		−0.28 EE −0.17 HU
CCCI × D_{Rich}							
R^2	0.03 LT 0.07 EE 0.08 PL 0.05 CZ 0.02 HU 0.03 SI	0.04 LT 0.07 EE 0.04 PL 0.05 CZ 0.05 HU 0.05 SI	0.15 LT 0.09 EE 0.05 PL 0.07 CZ 0.07 HU 0.03 SI	0.11 LT 0.00 EE 0.05 PL 0.11 CZ 0.05 HU 0.03 SI	0.14 LT 0.08 EE 0.05 PL 0.07 CZ 0.07 HU 0.03 SI	0.08 LT 0.06 EE 0.08 PL 0.10 CZ 0.06 HU 0.03 SI	0.16 LT 0.11 EE 0.05 PL 0.11 CZ 0.09 HU 0.03 SI

Note: abbreviations near coefficient values show the country for which the model is estimated: LT—Lithuania; EE—Estonia; PL—Poland; HU—Hungary; CZ—Chechia; SI—Slovenia.

Hypothesis H1. *There is a positive relationship between pro-environmental attitudes and subjective well-being. To accept this hypothesis, the relationship between ECI, CCCI, and SWI needs to be positive and statistically significant. According to the research results, H1 can be accepted for all countries in at least one ESS round. This is mostly observed in ESS rounds 8 and 10, where CCCI is used. In almost all statistically significant cases (except for Hungary ESS-04, Estonia ESS-08, and Slovenia ESS-10), ECI parameter estimates are positive. Another notable observation is that*

even though the average value of ECI for Hungary decreases over the years used in the research, the ECI parameter is positive and statistically significant in 4 out of 7 rounds and includes the latest ESS rounds.

Hypothesis H2. *The relationship between pro-environmental attitudes and subjective well-being is weaker among individuals who are more oriented towards materialistic values. To accept this hypothesis, we expect the parameters ECI* $\times$ D_{Mat} *or CCCI* $\times$ D_{Mat} *to be negative and statistically significant. Based on the research results, H2 can be accepted for half of the countries (Estonia, Chechia, and Hungary) in at least one round, but when using the climate change cognition index. Note that in all cases, the CCCI parameter is negative, whereas ECI provides mixed results. The ECI parameters have negative values for Lithuania in ESS-04 and ESS-10. Another important observation is that for Estonia and Slovenia, parameters were discovered to be negative in all cases where they were statistically significant.*

Hypothesis H3. *The relationship between pro-environmental attitudes and subjective well-being is stronger among individuals with higher individual income levels. To accept this hypothesis, we expect the parameters ECI* $\times$ D_{Rich} *or CCCI* $\times$ D_{Rich} *to be positive and statistically significant. According to the research results, H3 can be accepted for all countries in at least one ESS round, but only when using the environmental cognition indicator. None of the countries had statistically significant negative parameter values. Therefore, there are no contradictions: the parameter value is either positive or statistically insignificant. Another notable observation is that none of the countries had statistically significant parameter values in ESS-10.*

Summarizing the research results, hypotheses H1 and H3 can be accepted in at least one ESS round for each country, and almost no differences in sign have been observed, whereas hypothesis H2 provides mixed results (can only be accepted for Slovenia and Estonia). Another important observation is that D_{Mat} and D_{Rich} are positive and statistically significant, showing that individuals oriented towards materialistic values or belonging to the 10th decile of net household income experience higher subjective well-being.

4. Discussion

The conducted research revealed that pro-environmental attitude was related to a higher level of subjective well-being in different ESS rounds in many Central and Eastern European countries (except round 4). Hypothesis H1 was not only accepted by this research, but also discussed and confirmed in other studies (1, 2, 4, 8–12). The results of the conducted study are related to Venhoeven et al.'s [7] research showing that individuals in most cases associate pro-environmental behaviour with positive feelings. Analysing the relationship between ECI and SWI, it can be stated that in many Central and Eastern European countries, the concern for nature and environment has a direct relationship with happiness and life satisfaction and the mental and physical health of individuals.

Analysing the relationship between CCCI and SWI (these data were only collected in rounds 8 and 10 of the ESS), a significant relationship between perceived concern about the effects of climate change, responsibility for climate change mitigation, and subjective well-being was revealed. Analogous conclusions were also disclosed by Schmitt et al.'s [1] study, which explored relationships between pro-environmental behaviour, perceived ecological threats due to climate change, and life satisfaction.

The results of our research are related to the research findings of Kaida and Kaida [9] and Binder et al. [16], that engagement in pro-environmental actions and chosen green lifestyles can have an impact on high subjective well-being. Our research also supports Krekel and Prati [10] and Welsch et al. [21] stating that pro-environmental awareness and altruistic behaviour often create meaning in personal life, leading to greater feelings of happiness. In this context, Welsch and Kühling [14] emphasize the personal satisfaction that people feel when identifying themselves as moral and socially responsible and thus distinguish themselves from whole society.

The results of this study partially confirm hypothesis H2 (that the relationship between pro-environmental attitudes and subjective well-being is weaker among individuals who are more oriented towards materialistic values). This is especially evident when examining people seeking satisfaction in materialistic interests and their perceived concern about the effects of climate change, responsibility for climate change mitigation (CCCI), and the relationship with their subjective quality of life (SWI). Considering this relationship, it can be stated that simply the pursuit of material values (important to be rich and have money and expensive things) overshadows some people's other values, which is why their SWB decreases. This relates to some results of earlier studies. Welsch, and Kühling [14] claim that individuals holding a greener self-image display higher levels of life satisfaction, in contrast to materialistic-oriented individuals.

However, examining materialistic-oriented individuals and their pro-environmental awareness, as well the relationship between the concern for nature and the environment (ECI) and their subjective quality of life (SWI), hypothesis H2 is rejected according to the data of many ESS rounds. Perhaps this could be related to the research findings of Kaida and Kaida [9] that rational self-interested individuals could also be motivated in pro-environmental actions, because they realize that a good environment enhances their physical and mental well-being in the long run.

This study revealed that the relationship between pro-environmental attitudes and subjective well-being is stronger among individuals with higher individual income levels (confirming H3). This is evident when examining the relationship between ECI and SWI. If a person earns enough income, the relationship between their pro-environmental attitude and subjective well-being is usually higher. This is because wealth and income provide greater opportunities to choose a lifestyle and make decisions based on personal values. The situation of poorer people is the opposite: the lack of resources and choices in their life lead to the fact that the most important thing for them is ensuring the most basic needs, so they cannot devote effort, time, and money to pro-environmental actions. This supports the findings of Fischer and Boer [28], who state that people who have better material conditions have greater options than others and they can afford to make decisions based on personal values. Such conclusions are confirmed by Capstick et al.'s [4] research results, which state that in some countries, the impact of pro-environmental attitude and behaviour on well-being was greater for individuals with higher individual income.

Despite the significant results of this study, the following limitations of this study were identified: (1) this study used data starting from the fourth round of the ESS; (2) only two rounds of the survey (ESS8 and ESS10) included questions on attitudes towards climate change because they belong to rotating modules; the ESS was applied only in those two rounds, whereas the question of subjective well-being was constant in the ESS and included in all rounds of the ESS; (3) there were no data on households' total net income for Estonia in ESS7 and the environmental cognition for Poland in ESS10; (4) Cronbach's alpha was calculated just for the indexes SWI and CCCI, which include several indicators; and (5) since the authors of the article used ESS data, it was not possible to influence the sample or include other questions that could broaden or deepen this study.

In justifying the limitations, it should be noted that one of the limitations of using ESS data in the future is that environmental and climate change attitudes could not be analysed, compared, or observed if the recent modules would not be repeated in future rounds. This research did not include all Central and Eastern European countries, because not all of them participated in all the rounds where the data required for this study were available. This research used data starting from only ESS round 4 (Lithuania started participating in the ESS only from 2008).

This study does not apply methods to assess the causation of whether subjective well-being results in higher environmental cognitions or vice versa. Therefore, caution should be exercised in the interpretation of the empirical study's results, as there is a risk of inaccuracies due to the possible inverse relationship between subjective well-being and

pro-environmental attitudes. Moreover, our results intended not to disclose the situation of individual CEE countries but to reflect the general trend of CEE countries.

Potential directions for future research should focus not only on the interrelationship between pro-environmental attitudes and subjective well-being, but also on how concerns about environmental issues translate into pro-environmental behaviour, and how this conversion affects subjective well-being. It is also relevant to develop policy instruments promoting pro-environmental behaviour and examine possible reactions to them and the potential impact on subjective well-being.

Future research will enable this study to be applied, to analyse countries in Western Europe, and to compare their results. It seems that for the future, comparative analysis between the ESS and other (non-European) countries will be available, as a Memorandum of Understanding Between the European Social Survey (ESS) and the East Asian Social Survey (EASS) has already been signed, as mentioned officially by the ESS. Moreover, this means that most questions from the ESS can be adapted to other countries or regions depending on their socio-economic context. Separate studies would be needed to identify trends in specific countries. The future study can analyse subjective well-being and environmental context using more explanatory variables, such as gender, urban or rural inhabitants, and education, as estimated models have relatively low R-square values, showing that subjective well-being could be explained by additional factors.

5. Conclusions

The conducted research revealed that pro-environmental attitude is related to higher levels of subjective well-being in different ESS rounds in many Central and Eastern European countries. In most of the countries, the concern for nature, environment, and climate change has a direct relationship with happiness and life satisfaction and the mental and physical health of individuals.

The relationship between pro-environmental attitudes and subjective well-being is weaker among materialistic-oriented individuals. This is especially evident when examining their perceived concern about the effects of climate change and the responsibility for the relationship between climate change mitigation and their subjective quality of life.

This study revealed that the relationship between pro-environmental attitudes and subjective well-being is stronger among individuals with higher individual income levels. This is evident when examining the relationship between ECI and SWI. This can be explained by the fact that wealth and income provide greater opportunities to choose a lifestyle and make decisions based on personal values.

The novelty of this study is that the climate change cognition index was constructed and applied to assess the relationships between subjective well-being and environmental cognition using data from different ESS rounds.

In order to more deeply investigate the relationships between pro-environmental attitudes and subjective well-being in different Central and Eastern European countries, a more detailed analysis of social, economic, and political development indicators of individual countries would be required.

Subjective well-being should not be the main motive for policies and actions promoting pro-environmental behaviour, but it provides additional arguments for the expediency of some policy measures.

The interrelationship between pro-environmental attitudes and well-being should encourage policy makers to develop policies that not only address environmental problems but also contribute to subjective well-being.

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Data Availability Statement: The original data presented in the study are openly available in European Social Survey (ESS) Data Portal: https://ess.sikt.no/en/?tab=overview.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

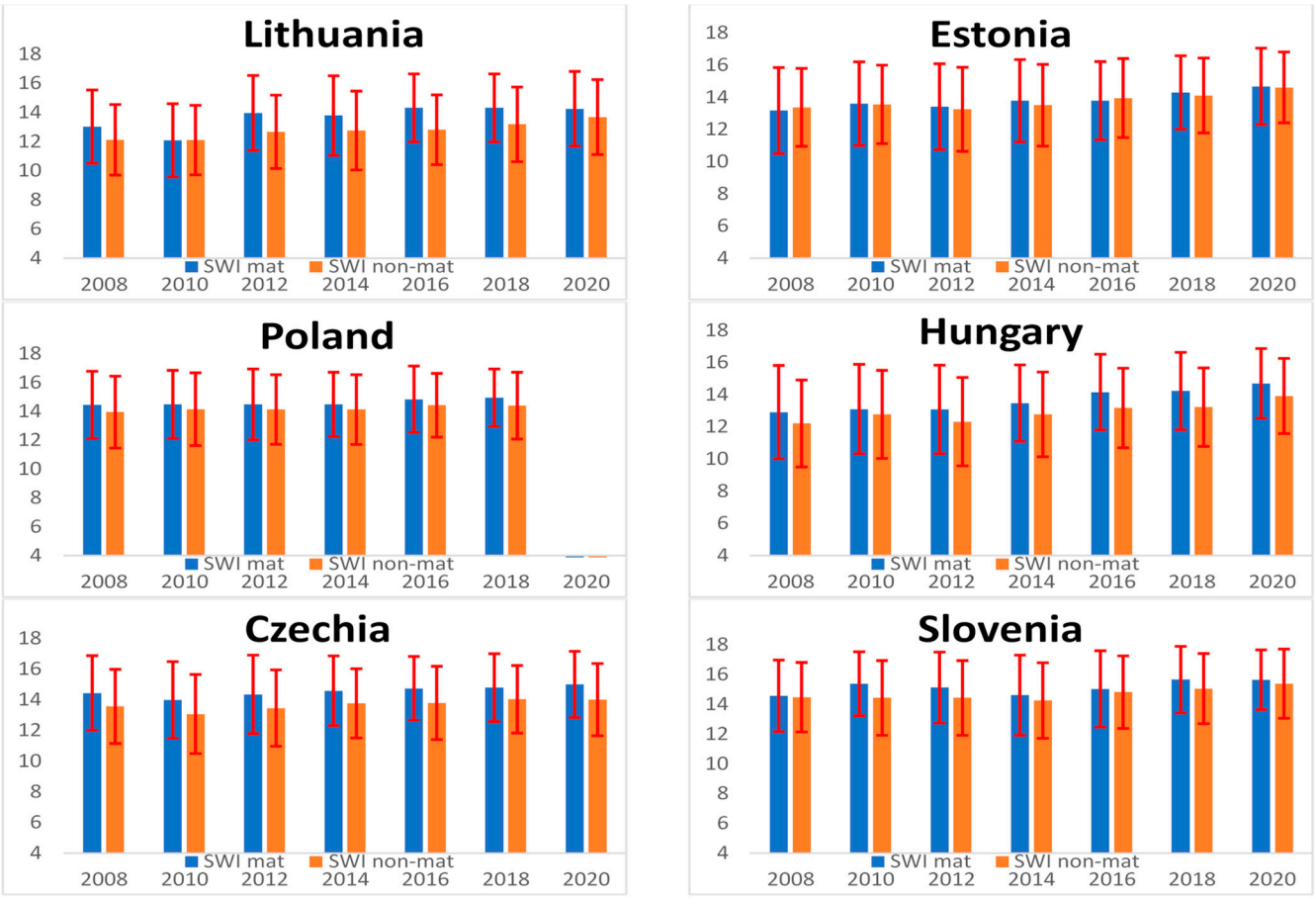

Figure A1. Mean SWI values of individuals oriented towards materialistic values and others (own calculations).

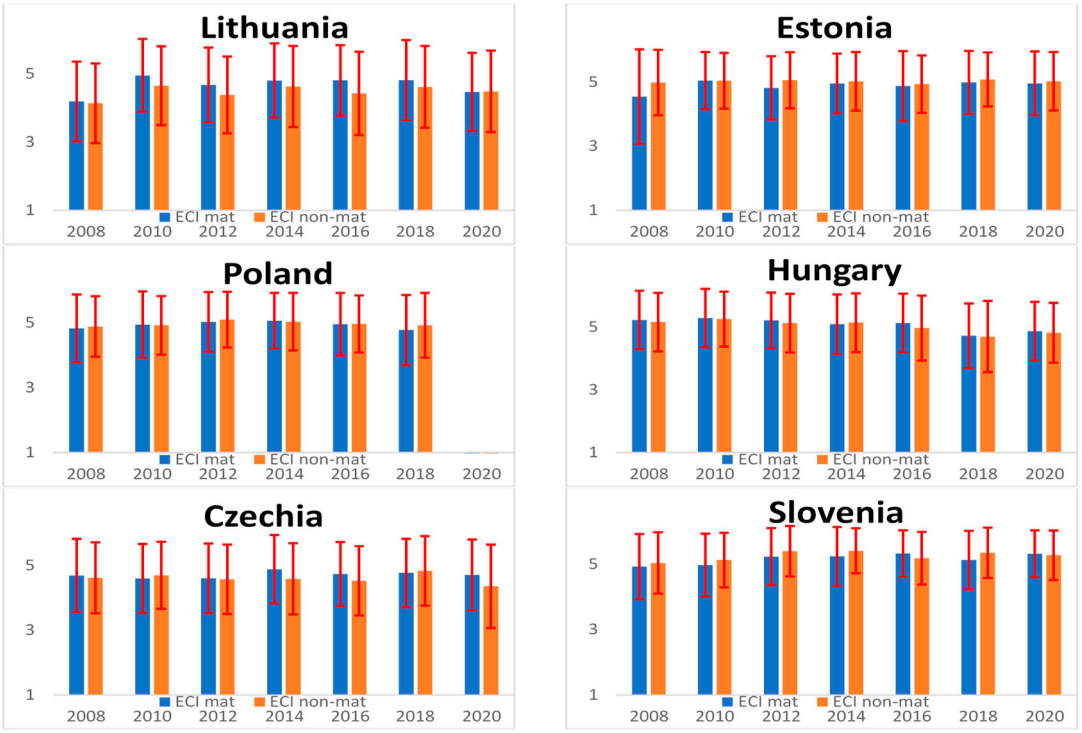

Figure A2. Mean ECI values of individuals oriented towards materialistic values and others (own calculations).

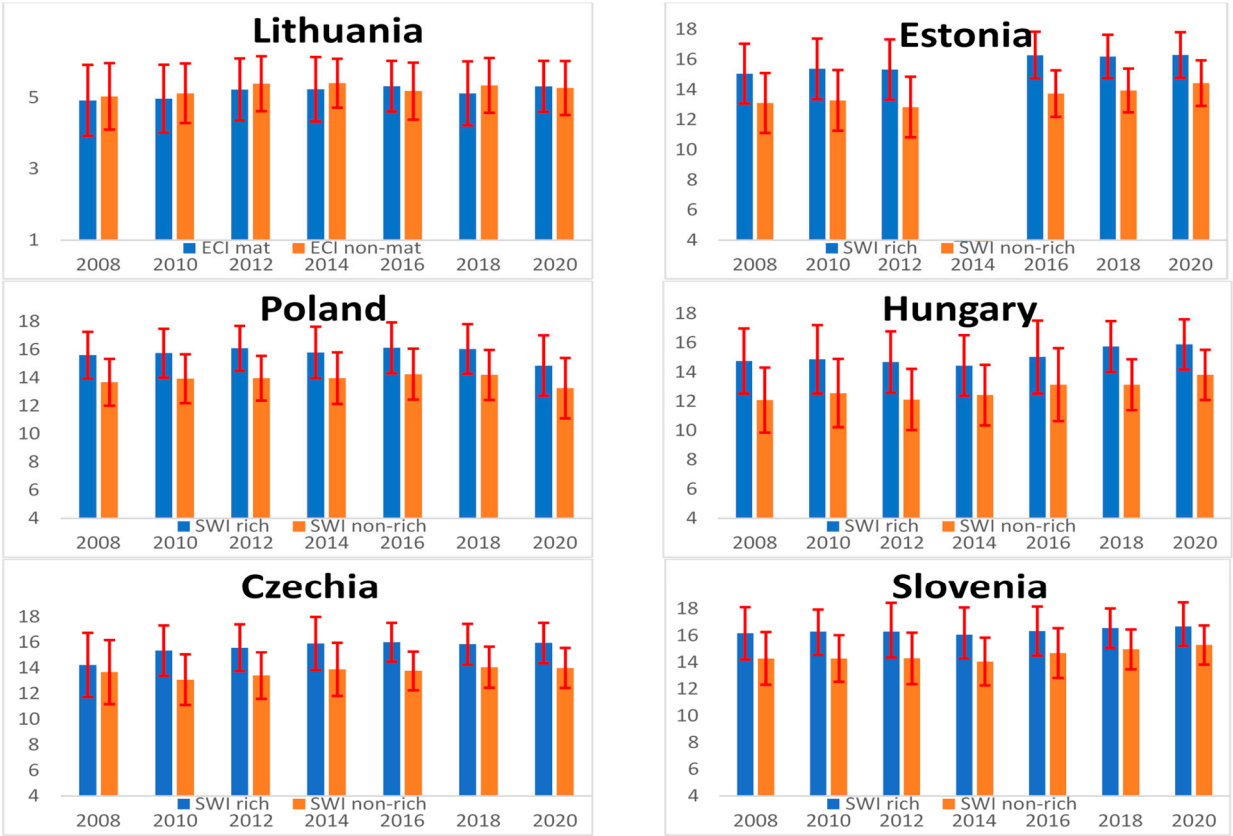

Figure A3. Mean SWI values of individuals belonging to 10th decile of net household income and others (own calculations).

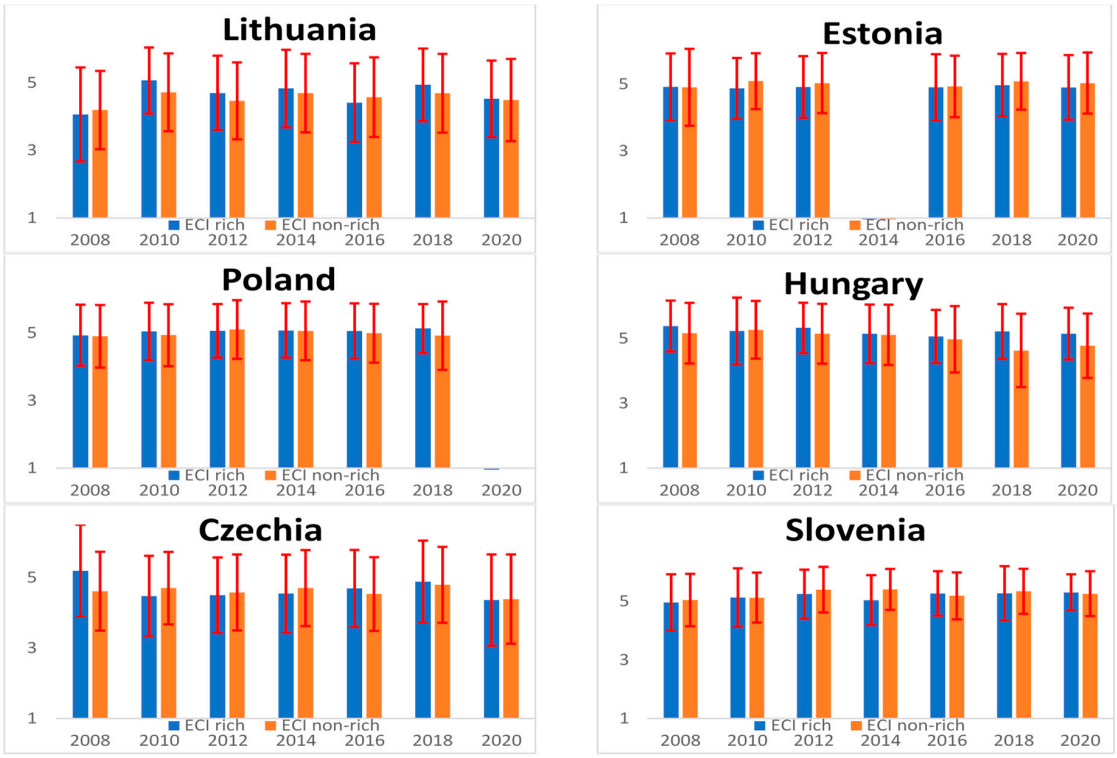

Figure A4. Mean ECI values of individuals belonging to 10th decile of net household income and others (own calculations).

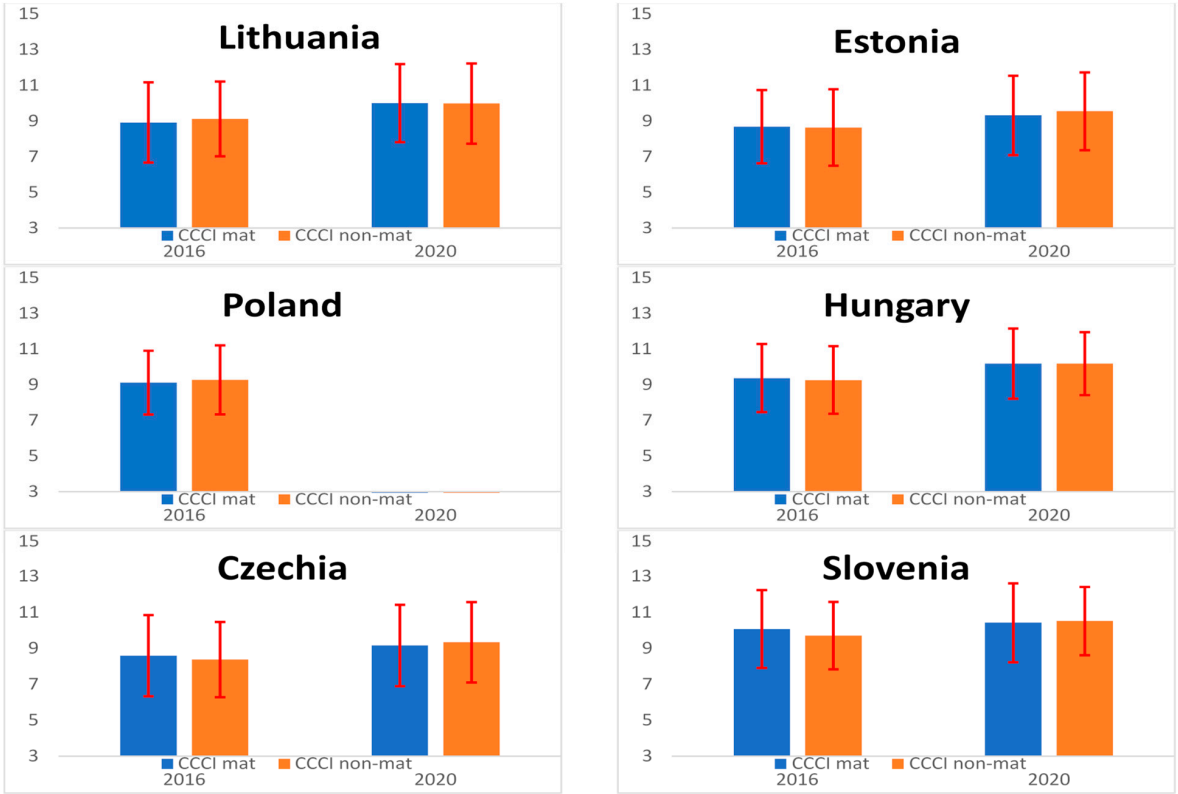

Figure A5. Mean CCCI values of individuals oriented towards materialistic values and others (own calculations).

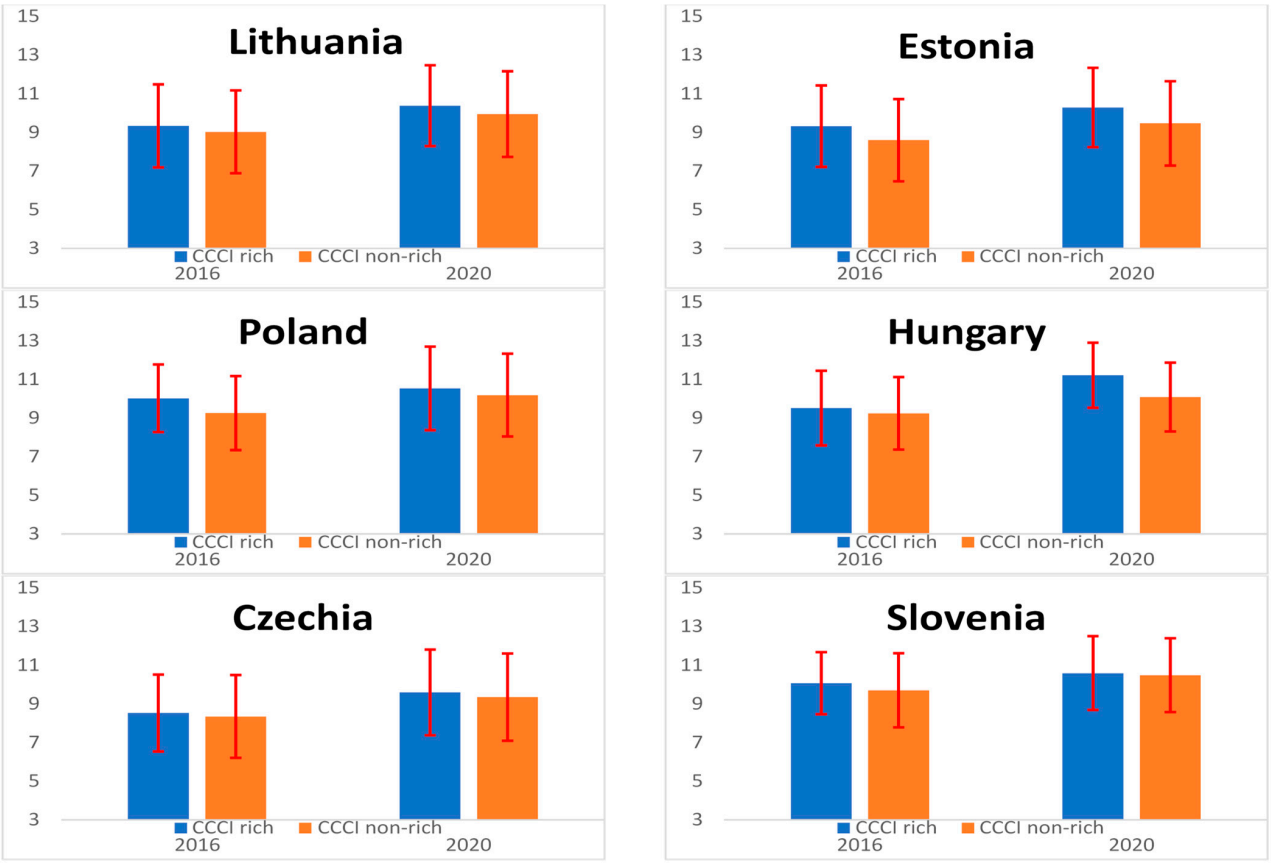

Figure A6. Mean CCCI values of individuals belonging to 10th decile of net household income and others (own calculations).

Table A1. Multiple regression results using Lithuania survey results (own calculations).

Name	β	Std. Error	t-Ratio	*p*-Value	Name	β	Std. Error	t-Ratio	*p*-Value
		ESS-04					ESS-05		
const	11.9611	0.0671	178.2000	0.0000	const	11.9714	0.0686	174.5000	0.0000
D_{Mat}	2.5026	0.4797	5.2170	0.0000	ECI × D_{Rich}	0.4647	0.0631	7.3610	0.0000
ECI × D_{Mat}	−0.422162	0.1072	−3.939	0.0001	R^2: 0.0420, n: 1239.				
D_{Rich}	2.1903	0.6075	3.6060	0.0003					
R^2: 0.0332, n: 1670.									
ESS-06							ESS-07		
const	12.3538	0.0712	173.4000	0.0000	const	11.7303	0.2571	45.6200	0.0000
D_{Mat}	0.9272	0.1303	7.1160	0.0000	ECI	0.1529	0.0530	2.8840	0.0040
ECI × D_{Rich}	0.4437	0.0322	13.7900	0.0000	D_{Mat}	0.6896	0.1433	4.8120	0.0000
R^2: 0.1499, n: 1680.					D_{Rich}	2.5172	0.2052	12.2700	0.0000
					R^2: 0.1070, n: 1762.				
		ESS-08					ESS-09		
const	11.8533	0.2556	46.3800	0.0000	const	11.7020	0.2619	44.6800	0.0000
ECI × D_{Mat}	0.2609	0.0269	9.7020	0.0000	ECI	0.2940	0.0543	5.4190	0.0000
D_{Rich}	1.8256	0.1936	9.4300	0.0000	D_{Mat}	0.8075	0.1984	4.0700	0.0000
CCCI	0.0927	0.0271	3.4240	0.0006	D_{Rich}	2.4639	0.3054	8.0680	0.0000
R^2: 0.1394, n: 1422.					R^2: 0.0766, n: 1471.				
		ESS-10							
const	11.5369	0.3143	36.7100	0.0000					
D_{Mat}	1.3829	0.5173	2.6730	0.0076					
ECI × D_{Mat}	−0.291169	0.1104	−2.637	0.0085					
D_{Rich}	2.4977	0.2008	12.4400	0.0000					
CCCI	0.2032	0.0305	6.6520	0.0000					
R^2: 0.1553, n: 1225.									

Table A2. Multiple regression results using Estonia survey results (own calculations).

Name	β	Std. Error	t-Ratio	*p*-Value	Name	β	Std. Error	t-Ratio	*p*-Value
		ESS-04					ESS-05		
const	13.1150	0.0685	191.5000	0.0000	const	13.2819	0.0635	209.1000	0.0000
D_{Rich}	1.9356	0.1948	9.9350	0.0000	ECI × D_{Rich}	0.4230	0.0398	10.6200	0.0000
R^2: 0.0671, n: 1375.					R^2: 0.0693, n: 1516.				
ESS-06							ESS-07		
const	12.8565	0.0610	210.8000	0.0000	const	13.5436	0.0565	239.7000	0.0000
D_{Rich}	2.4753	0.1770	13.9900	0.0000	R^2: 0.0000, n: 2019.				
R^2: 0.0923, n: 1927.									
		ESS-08					ESS-09		
const	13.2153	0.3397	38.9100	0.0000	const	13.9528	0.0542	257.4000	0.0000
ECI	−0.138556	0.0591	−2.344	0.0192	ECI × D_{Rich}	0.4446	0.0393	11.3200	0.0000
D_{Mat}	1.5747	0.6813	2.3110	0.0209	R^2: 0.0648, n: 1852.				
D_{Rich}	2.3644	0.2246	10.5300	0.0000					
CCCI	0.1545	0.0274	5.6410	0.0000					
CCCI × D_{Mat}	−0.217235	0.0764	−2.843	0.0045					
R^2: 0.0778, n: 1866.									
		ESS-10							
const	12.2911	0.2597	47.3200	0.0000					
D_{Mat}	2.7737	0.8136	3.4090	0.0007					
D_{Rich}	1.7305	0.1853	9.3380	0.0000					
CCCI	0.2238	0.0266	8.4180	0.0000					
CCCI × D_{Mat}	−0.284126	0.0846	−3.357	0.0008					
R^2: 0.1064, n: 1484.									

Table A3. Multiple regression results using Poland survey results (own calculations).

Name	β	Std. Error	t-Ratio	*p*-Value	Name	β	Std. Error	t-Ratio	*p*-Value
		ESS-04					ESS-05		
const	13.5868	0.0786	173.0000	0.0000	const	13.9450	0.0711	196.2000	0.0000
D_{Mat}	0.6777	0.1785	3.7960	0.0002	D_{Rich}	1.8104	0.2491	7.2670	0.0000
D_{Rich}	1.9053	0.1932	9.8610	0.0000	R^2: 0.0401, n: 1266.				
R^2: 0.0814, n: 1266.									
		ESS-06					ESS-07		
const	13.9172	0.0703	198.0000	0.0000	const	13.9931	0.0708	197.7000	0.0000
D_{Mat}	0.3442	0.1647	2.0910	0.0367	D_{Rich}	1.7958	0.2543	7.0610	0.0000
D_{Rich}	2.1117	0.2577	8.1950	0.0000	R^2: 0.0412, n: 1162.				
R^2: 0.0482, n: 1450.									
		ESS-08					ESS-09		
const	13.6295	0.3225	42.2600	0.0000	const	12.3181	0.3683	33.4400	0.0000
ECI × D_{Rich}	0.3379	0.0508	6.6480	0.0000	ECI	0.3691	0.0726	5.0870	0.0000
CCCI	0.0733	0.0340	2.1530	0.0316	D_{Mat}	0.5224	0.2040	2.5600	0.0106
R^2: 0.0455, n: 1105.					D_{Rich}	1.6819	0.2627	6.4020	0.0000
					R^2: 0.0827, n: 900.				
		ESS-10							
const	13.2656	0.0845	157.0000	0.0000					
D_{Rich}	1.6508	0.2390	6.9060	0.0000					
R^2: 0.0467, n: 976.									

Table A4. Multiple regression results using Hungary survey results (own calculations).

Name	β	Std. Error	t-Ratio	*p*-Value	Name	β	Std. Error	t-Ratio	*p*-Value
		ESS-04					ESS-05		
const	13.1563	0.4873	27.0000	0.0000	const	11.3606	0.4673	24.3100	0.0000
ECI	−0.224566	0.0933	−2.406	0.0163	ECI	0.2361	0.0873	2.7040	0.0070
ECI × D_{Mat}	0.1030	0.0412	2.5000	0.0126	D_{Rich}	2.2943	0.3203	7.1630	0.0000
D_{Rich}	2.6983	0.4254	6.3430	0.0000	R^2: 0.0488, n: 1137.				
R^2: 0.0473, n: 1049.									
		ESS-06					ESS-07		
const	11.9762	0.0853	140.3000	0.0000	const	11.1737	0.4241	26.3500	0.0000
D_{Mat}	0.5008	0.1515	3.3050	0.0010	ECI	0.2428	0.0820	2.9600	0.0031
D_{Rich}	2.5590	0.2569	9.9610	0.0000	ECI × D_{Mat}	0.0704	0.0321	2.1920	0.0286
R^2: 0.0742, n: 1386.					ECI × D_{Rich}	0.3601	0.0370	9.7270	0.0000
					R^2: 0.1078, n: 1099.				
		ESS-08					ESS-09		
const	11.7600	0.4140	28.4100	0.0000	const	11.6965	0.3260	35.8800	0.0000
ECI × D_{Mat}	0.1669	0.0336	4.9620	0.0000	ECI	0.2800	0.0685	4.0890	0.0000
D_{Rich}	1.6893	0.3233	5.2250	0.0000	ECI × D_{Mat}	0.1643	0.0406	4.0440	0.0001
CCCI	0.1132	0.0440	2.5730	0.0102	D_{Rich}	2.3688	0.3102	7.6350	0.0000
R^2: 0.0703, n: 855.					R^2: 0.1005, n: 980.				
		ESS-10							
const	10.8115	0.4543	23.8000	0.0000					
ECI	0.2114	0.0658	3.2120	0.0014					
D_{Mat}	2.4764	0.8403	2.9470	0.0033					
D_{Rich}	1.8098	0.2350	7.7020	0.0000					
CCCI	0.1872	0.0406	4.6120	0.0000					
CCCI × D_{Mat}	−0.171457	0.0805	−2.129	0.0334					
R^2: 0.1090, n: 1250.									

Table A5. Multiple regression results using Czechia survey results (own calculations).

Name	β	Std. Error	t-Ratio	*p*-Value	Name	β	Std. Error	t-Ratio	*p*-Value
		ESS-04					ESS-05		
const	13.5226	0.0722	187.3000	0.0000	const	12.9104	0.0716	180.2000	0.0000
D_{Mat}	0.8415	0.1590	5.2910	0.0000	D_{Mat}	0.8001	0.1470	5.4440	0.0000
R^2: 0.0195, n: 1407.					ECI × D_{Rich}	0.4562	0.0613	7.4470	0.0000
					R^2: 0.0530, n: 1637.				
		ESS-06					ESS-07		
const	13.2390	0.0780	169.8000	0.0000	const	13.6988	0.0690	198.6000	0.0000
ECI × D_{Mat}	0.1551	0.0318	4.8780	0.0000	D_{Mat}	0.8112	0.1354	5.9920	0.0000
D_{Rich}	2.1683	0.2417	8.9710	0.0000	ECI × D_{Rich}	0.4435	0.0739	6.0020	0.0000
R^2: 0.0733, n: 1351.					R^2: 0.0521, n: 1348.				
		ESS-08					ESS-09		
const	13.0193	0.2521	51.6500	0.0000	const	13.9737	0.0620	225.4000	0.0000
ECI	0.1531	0.0549	2.7900	0.0053	D_{Mat}	−1.22701	0.5003	−2.453	0.0143
ECI × D_{Mat}	0.1111	0.0269	4.1370	0.0000	ECI × D_{Mat}	0.3605	0.1023	3.5250	0.0004
D_{Rich}	1.9968	0.2283	8.7470	0.0000	D_{Rich}	1.5926	0.2217	7.1820	0.0000
R^2: 0.0735, n: 1576.					R^2: 0.0561, n: 1560.				
		ESS-10							
const	12.5707	0.2044	61.5000	0.0000					
ECI	0.2982	0.0455	6.5510	0.0000					
ECI × D_{Mat}	0.1821	0.0280	6.5130	0.0000					
D_{Rich}	1.7747	0.2651	6.6940	0.0000					
R^2: 0.0925, n: 1576.									

Table A6. Multiple regression results using Slovenia survey results (own calculations).

Name	β	Std. Error	t-Ratio	*p*-Value	Name	β	Std. Error	t-Ratio	*p*-Value
		ESS-04					ESS-05		
const	14.2967	0.0760	188.2000	0.0000	const	14.2122	0.0832	170.8000	0.0000
ECI × D_{Rich}	0.3738	0.0636	5.8810	0.0000	D_{Mat}	0.8351	0.2324	3.5930	0.0003
R^2: 0.0337, n: 995.					ECI × D_{Rich}	0.3783	0.0640	5.9150	0.0000
					R^2: 0.0473, n: 1045.				
		ESS-06					ESS-07		
const	14.3071	0.0847	168.9000	0.0000	const	14.1298	0.0836	169.0000	0.0000
D_{Rich}	1.9879	0.4075	4.8790	0.0000	D_{Rich}	1.9368	0.3869	5.0060	0.0000
R^2: 0.0251, n: 925.					R^2: 0.0254, n: 963.				
		ESS-08					ESS-09		
const	14.7085	0.0777	189.3000	0.0000	const	14.9940	0.0710	211.3000	0.0000
D_{Mat}	3.2574	1.2517	2.6020	0.0094	ECI × D_{Rich}	0.2947	0.0503	5.8640	0.0000
D_{Rich}	1.6016	0.3340	4.7950	0.0000	R^2: 0.0295, n: 1133.				
CCCI × D_{Mat}	−0.287783	0.1211	−2.376	0.0177					
R^2: 0.0278, n: 1074.									
		ESS-10							
const	15.3236	0.5400	28.3800	0.0000					
ECI	−0.200052	0.0923	−2.167	0.0305					
D_{Rich}	1.3438	0.2692	4.9910	0.0000					
CCCI	0.1028	0.0367	2.7970	0.0053					
R^2: 0.0318, n: 1063.									

Appendix B

Table A7. Central and Eastern European countries who participated in ESS * (source: [33]).

Countries	ESS Rounds (Years)									
	R1 2002/ 2003	R2 2004/ 2005	R3 2006/ 2007	R4 2008/ 2009	R5 2010/ 2011	R6 2012/ 2013	R7 2014/ 2015	R8 2016/ 2017	R9 2018/ 2019	R10 2020–2022
Bulgaria			•	•	•	•			•	•
Czechia	•	•		•	•	•	•	•	•	•
Estonia		•	•	•	•	•	•	•	•	•
Croatia				•	•				•	•
Latvia			•	•					•	•
Poland	•	•	•	•	•	•	•	•	•	•
Lithuania				•	•	•	•	•	•	•
Romania			•	•					•	
Slovakia		•	•	•	•	•			•	•
Slovenia	•	•	•	•	•	•	•	•	•	•
Ukraine		•	•	•	•	•				
Hungary	•	•	•	•	•	•	•	•	•	•

*: • means that the country took part in ESS; empty cell: did not participate.

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