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Veröffentlichungsversion / Published Version

Zeitschriftenartikel / journal article

Empfohlene Zitierung / Suggested Citation:

Orru, K., & Lilleoja, L. (2015). Contextual drivers of environmental values cross-culturally: evidence from Europe between 2004 and 2012. *Studies of Transition States and Societies*, 7(3), 38-51. <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-464461>

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Contextual Drivers of Environmental Values Cross-Culturally: Evidence from Europe Between 2004 and 2012

Kati Orru* & Laur Lilleoja

Abstract

Environmental issues continue to grow in international prominence, owing to the importance of environmental conditions to human wellbeing globally. This paper focuses on why people's values toward care for nature and environmental protection change – one of the antecedents to pro-environmental norms and behaviour. We aimed to clarify how individual and country-level contextual factors affect environmental values in Europe. Our cross-national study used data on individual environmental values from the 2004 and 2012 rounds of the European Social Survey, in combination with macro-level data on socio-economic security, countries' environmental performance and educational levels. Country-level results revealed that throughout the studied years, nature held more importance to people in countries with increased levels of unemployment and exacerbated income disparities, including in transitional, post-socialist economies. Care for environment is less prominent in countries already performing well in terms of socio-economic and environmental performance, i.e. in states that may have higher resilience capacity towards adverse environmental impacts. Besides a state's science education, which functions as an effective socialiser of caring for nature, practical experiences with adverse environmental impacts (e.g. health impairment) could be used to predict an increase in the mean value of the natural environment in a country.

Keywords: value change, environment, cross-cultural analysis, Europe.

Introduction

Transitioning towards socially and ecologically more sustainable ways of life is a major challenge for modern societies and policies. Promoting this transition is more effective when we have a better understanding of the factors that cause environmentally adverse behaviour and when we apply well-tuned interventions to adjust the antecedents of this behaviour (Geller, 2002). According to standard social or environmental psychology models, such as the theory of planned behaviour (Ajzen, 1991) or the Value-Belief-Norm model (Stern, 2000), human values together with beliefs regarding environmental problems drive personal preferences and environmental behaviour. These models set the focus on individuals, whose behavioural choices make the difference in responses to environmental issues. Criticism towards individual-centred behavioural models suggests that besides personal attitudes and choices, societal context with its many institutions makes some courses of action more likely than others (Spaargaren, 2000; Shove, 2010; Urry, 2010). State measures, systems of provision and available infrastructures enable or limit certain ways of life, ingrain routine ways of behaviour and normalise ways of thinking about the inputs (energy, water) and externalities related to practices. Some authors (e.g. Elzen, Geels & Green, 2004) take this line of thought even further, suggesting that institutions, conventions and markets create the needs and desires of societies and individuals in a co-evolutionary

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process. This paper contributes to the debate on how environmentally problematic ways of life are reproduced and how they change by providing new evidence on the temporal dynamics of a variety of contextual factors that may underlie changes in people's level of care for the natural environment.

In the existing literature, several drivers of change in people's care for nature have been proposed. Cross-national comparisons have mostly used Inglehart's (1997) or Schwartz's (1992) theoretical frameworks to relate the shift in prevailing value orientations to democratisation, modernisation and secularisation. Some others relate changes in attitudes to the increasing understanding of environmental processes, including knowledge stemming from real life events and experiences (Dunlap, Xiao, & McCright, 2002; Hansla, 2011). The analysis in this paper takes an in-depth look at the interaction of environmental values with broader socio-institutional and material contexts over time. By looking at changes in socio-economic security, level of education and environmental conditions, we aimed to elucidate their interaction with the general value people give to nature and environmental protection. We used data on individuals' environmental values from the 2004 and 2012 rounds of the European Social Survey and combined these with macro-level data on socio-economic security levels and state efforts in environmental governance and education in 22 European countries.

Drivers of care for the environment

Values are "concepts or beliefs about desirable end states or behaviours that transcend specific situations, guide selection or evaluation of behaviour and events, and are ordered by relative importance" (Schwartz & Bilsky, 1987, p. 551). They are also interpreted as cultural devices aimed at control and social regulation and form certain patterns in macro-social contexts (Raudsepp, Tart, & Heinla, 2014). Schwartz's (2004) model distinguishes ten value types that can be organised into two higher order dimensions: 1) from Self-transcendence (embracing the welfare of others) to Self-enhancement (emphasising one's own interests); 2) from Openness to change (accepting change, risk and unpredictability) to Conservation (preservation of the status quo). The self-transcendence value orientations are of particular importance for our present article, since previous studies have linked these value orientations to pro-environmental attitudes and behaviours (e.g. Stern, Dietz, & Guagnano, 1998; Nordlund, Eriksson, & Garvill, 2010). In our analysis, we used the significance given to care for nature and environmental protection by respondents to a Schwartz (2005) Portrait Value questionnaire during the European Social Survey. In this paper, we conceptualised care for the environment as more of an attitude than as a motivational disposition (as implied in Schwartz's theory).

In the existing literature, several drivers of change of care for nature have been proposed. Schwartz has shown how certain macro-social contexts of control and social regulation drive the prevalence of certain value structures. According to Schwarz (2007), *laissez-faire* types of approaches to state regulation and the economy promote a high level of achievement, conformity and power values combined with the low importance of universalism, including the value attributed to the welfare of the environment. For example, the post-Soviet, early capitalist societies favoured the prioritisation of individualistic values such as success, replacing the universal solidarity values that prevailed in the Soviet system. Interestingly, Eastern European countries such as Estonia also show important value gaps between different income segments: self-assertion values are important for the wealthy and universalistic values are more important for the poor (Vihalemm & Kalmus, 2008). Most recent studies, however, show that universalistic values, including regard for the environment, only occur in the young and wealthy segments of the population (Raudsepp et al., 2014).

According to Inglehart's (1995, 1997) post-materialism hypothesis, environmental awareness is part of a general change in fundamental values that occurs as societies evolve. With growing affluence, societies are less concerned with economic security and may pursue post-materialistic goals such as

self-actualisation and environmental protection. For example, in the context of Eastern Europe, the post-socialist transition has been related to relatively low post-materialism values and high scores for scarcity values (Inglehart & Welzel, 2005).

In a similar vein, the national prosperity explanation asserts that citizens of a country are more likely to express greater care towards the environment when a certain baseline level of economic security has been acquired (Franzen, 2003). The prosperity explanation (Diekmann & Franzen, 1999) considers environmental quality as a public good, the demand for which rises with income. Increase in income allows an increase in consumption, but also higher investment in environmental quality. Empirical research of this thesis is, however, currently inconclusive. Recent work (e.g. Dunlap & York, 2008; Franzen & Meyer, 2010) has found the effect of affluence on people's care for the environment as positive, negative or no relationship.

Another explanation for the emergence of care for nature has been related to human experiences: citizens' concern about the harmful effects of industrialisation, urbanisation and economic development in their surrounding biophysical environment. Brechin (1999) demonstrates higher levels of environmental concern related to perceived environmental threats for citizens in less affluent nations, including transitional post-socialist countries, compared with those in richer countries. Greater expressed concern for the environment was shown for multiple measures of local environmental conditions related to environmental quality, health and pollution (Brechin, 1999).

It is also argued that some environmental processes are too complex for the layperson to understand and they form attitudes and beliefs through their direct experience and familiarity with often uncertain phenomena such as biodiversity loss or climate change (Swim, Clayton, Doherty, Gifford, Howard, Reser, Stern, & Weber, 2010). Indeed, based on an example of climate change, Spence, Poortinga, Butler and Pidgeon (2011) showed how individuals who have direct experience of a phenomenon that may be linked to climate change are more likely to be concerned by the issue. Thus, we can expect that the citizens of countries with poorer environmental quality are more concerned with the state of the environment.

In addition to practical experiences with a degraded environment, some environmental problems, such as resource overuse or energy consumption, cannot be directly perceived. Concern over such environmental processes depends on our beliefs about the adverse effects. A series of studies (e.g. Steg, Dreijerink, & Abrahamse, 2005; Thøgersen, 2005; Nordlund, Erikson, & Gavrill, 2010) have confirmed that values are fundamentally related to awareness and beliefs about environmental issues. Education may foster environmental values through instilling norms or through psychological effects (e.g. Dietz, Stern, & Guagnano, 1998; Dunlap, Van Liere, Mertig, & Jones, 2002). One rationale is that a value orientation biases individuals to believe in specific consequences of environmental problems that are congruent with their prioritised value type (e.g. Stern, Dietz, Kalof, & Guagnano, 1995). Awareness of consequences has also been proposed to mediate the relationships between value orientation and environmental concerns: care for consequences would presuppose awareness of or belief in the occurrence of these consequences (Hansla, 2011). Although existing cross-national comparisons in Europe (e.g. Marquart-Pyatt, 2012a) show that awareness of environmental threats is higher in Central Europe than Western Europe, it still needs to be established to what extent this can be linked to the value given to the environment.

In addition to macro-level effects, there are also individual level factors that shape environmental concerns. Socio-demographic characteristics (age, gender, level of education) have commonly been used to explain individual variance in the importance attributed to the environment (Dietz, Kalof, & Stern, 2002). The relationship to age has been negative in some studies (e.g. Dunlap et al., 2000) and in some cases environmental friendliness increases with advancing age (e.g. Raudsepp (2001) found environmental friendliness peaks from 40–54). However, these are based on cross-sectional data and, therefore, we cannot distinguish between age effect, cohort effect, or life-cycle effect. Empirical studies indicate that women attribute more importance than men to environmental concerns

(Raudsepp, 2001; Dietz et al., 2002). Minority groups show higher care for the environment (Dietz et al., 1998). As for political preferences, liberal attitudes and left-wing values predict higher concern for the environment (Piurko, Schwartz, & Davidov, 2011). In practical everyday activities, care for nature has been linked with boycotting certain products (Saris, Knoppen, & Schwartz, 2013). Care for nature and other self-transcendence values are substantially higher among those with higher levels of education (Dietz, Stern, & Guagnano, 1998; Schwartz & Rubel, 2005). Individual wealth and environmental concern are also positively associated (e.g. Diekmann & Franzen, 1999; Franzen, 2003).

Data and methods

In this study, we used survey data collected during the European Social Survey (ESS) in 2004 (ESS Round 2 Data, 2004) and 2012 (ESS Round 6 Data, 2012). The ESS is a biennial, cross-sectional and multi-country survey covering over 30 European nations. The ESS includes a random sample of all persons aged 15 and over (no upper age limit), residing in private households, regardless of their nationality, citizenship, or language. The survey is conducted through face-to-face interviews.

The ESS dataset used included 82352 observations (40652 from 2004 and 41700 from 2012) from 22 countries – Belgium, Switzerland, Czech Republic, Germany, Denmark, Estonia, Spain, Finland, France, United Kingdom, Hungary, Ireland, Iceland, Italy, Netherlands, Norway, Poland, Portugal, Sweden, Slovenia, Slovakia and Ukraine. We chose those European countries that participated in the ESS in both 2004 and 2012.

Among cultural, political and economic aspects of social life, the ESS pays specific attention to indicators of human values. The Portrait Value questionnaire (Schwartz, 2005) in the ESS gives a portrait of a person's goals, aspirations that point implicitly to the importance of a value. For each portrait a respondent answered, *How much this person is or is not like you?* Respondents selected an answer on a scale ranging from 1 (Very much like me) to 6 (Not like me at all). We used the answer for the portrait *He strongly believes that people should care for nature. Looking after the environment is important to him* to ascertain people's value for nature. To deal with the effect of different response styles (e.g. tendencies of under or over scoring), we computed a centred score for each individual by following a procedure suggested by Schwartz (2004).

In the individual level analyses, we expected the care for environment to depend on age, gender, level of education and income, as well as belonging to a minority group. We also analysed information collected on political attitudes using the question 'Placement on left-right scale?' and everyday practices of a self-transcendent nature with the question 'Boycotted certain products last 12 months?'

We used correlation analyses to study the effect of different country-level contextual factors, which helped us to avoid excluding countries from regression analyses when they lacked values for certain indicators. According to Schwartz's theory, basic values are ordered by their relative importance (Schwartz, 1992), which means that besides a comparison of mean value scores, the importance of value for the environment can also be analysed by looking at its rank compared to the other 20 value indicators. We used this approach when looking for macro-level correlations with parameters of socio-economic security, environmental, educational conditions prevailing in countries. For each country, we computed the rank of environmental value in the hierarchy of all 21 values and correlated it with the indexes of country-level conditions, using Spearman's rho. The full table with country-level mean scores and ranks of environmental value can be found in appendix 1.

We tested the assumptions about the effect of several macro-level variables on environmental concern. Appendix 2 provides descriptive statistics and correlations of the country-level variables used in our empirical analysis. Since we presumed that environmental concern might depend on wealth, we used the Gross Domestic Product (GDP) and a broader aggregate of social security and sustainability – the Human Development Index. The Human Development Index (HDI) is a summary measure of

average achievement in key dimensions of human development: 1) a long and healthy life, 2) being knowledgeable and 3) having a decent standard of living. The HDI is the geometric mean of normalised indices for each of the three dimensions. Gross domestic product (GDP) is an aggregate measure of production equal to the sum of the gross values added by all resident institutional units engaged in production. GDP per capita (per person) is calculated by dividing total GDP by the resident population on a given date. We assumed environmental care might also depend on the distribution of wealth in the country and used indicators compiled by the Organisation for Economic Co-operation and Development (OECD) – unemployment for all ages in a country and the Gini coefficient of equivalised disposable income – to test this assumption. The Gini coefficient is a measure of the inequality of a distribution (0 = total equality; 1 = maximal inequality): the relationship of cumulative shares of the population, arranged according to the level of equivalised disposable income, to the cumulative share of the equivalised total disposable income received by individuals. Furthermore, we assumed that the transitional societies are less inclined to care for the environment. Therefore, we took the historical background into consideration and we differentiated post-communist and other countries.

Knowledge from practical experiences with adverse environmental conditions may drive the concern of environmental impacts. We used data on exposure to climate-related impacts and associated vulnerabilities, one of the most salient environmental problems over recent years (Eurobarometer, 2011, 2014). For climate-related impact data, we used the Germanwatch (Kreft & Eckstein, 2014) Climate Risk Index, which is considered to provide reliable data on the direct impacts (fatalities) of extreme weather events and the associated socio-economic data. To be exact, we applied Germanwatch's data on cumulative climate death toll for the period of 1993-2012 per 100,000 inhabitants. In addition to the direct experiences with adverse health effects, education may sensitise individuals to environmental problems as well. We used the OECD Programme for International Student Assessment (PISA) data on proficiency levels in Science subjects as a proxy measure of people's understanding of environmental processes in the case study countries. PISA aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students. The 2006 and 2012 PISA rounds required knowledge of fundamental scientific concepts in core scientific spheres, e.g. 'Living systems' and 'Earth and space systems'.

We assume that in democracies, a higher level of caring for the environment should drive into more pro-environmental governmental measures. We operationalised the effectiveness of environmental governance and the ecological sustainability of systems of provision and consumption using the Environmental Performance Index (EPI) in each country. The EPI has been computed by the Yale Centre for Environmental Law and Policy (YCELP) and the Centre for International Earth Science Information Network (CIESIN) since 2001. The EPI considers 20 parameters, such as use of environmental resources, governance and acceptance of environmental measures by private enterprises (Hsu, Emerson, Levy, de Sherbinin, Johnson, Malik, Schwartz, Allison, Coplin, Guy, Lujan, Hawkins, Lipstein, Miao, Mala, & Jaiteh, 2014).

Results

Regression analysis was used to describe the effect of individual level factors on people's level of care for nature (Table 1). Model 1 tested the impact of an individual's socio-demographic placement on care for nature. Being female, having higher education or earning more all predicted higher levels of care for nature. Belonging to a minority ethnic group predicted a lower care for nature. The most important factor predicting care for nature was age, but in this case the relationship was not totally linear – younger persons cared less for nature, but the value given to the natural environment was higher among older generations. However, the trend reverses at about 84 years, when significance given to care for nature starts to decrease. As we are not using the panel data, we cannot confirm if it is purely the age effect or if there is also a life-cycle or cohort effect shaping the care for nature.

Table 1: Individual level predictors of people's care for nature (standardised regression coefficients)

	Model 1	Model 2
Age	.688**	.640**
Age square	-.438**	-.387**
Gender (1–Male/ 2–Female)	.056**	.051**
Education (1–Primary/ 2–Secondary/ 3–Tertiary)	.057**	.041**
Belonging to a minority ethnic group (1–yes/ 2–no)	.018**	.020**
Household income per person	-.033**	-.037**
Placement on left right scale (0–left/ 10–right)		-.079**
Boycotted certain products in the last 12 months (1–yes/ 2–no)		-.109**
Adjusted R Square	.077	.096

*correlation is significant at the 0.05 level; **correlation is significant at the 0.01 level

Source: authors' compilation based on European Social Survey 2004 and 2012

Table 2: Country-level Spearman correlations (correlation coefficients with significance levels) between care for nature value and contextual indexes in 2004 and 2012

	2004	2012
Human development index (HDI) (2005/2012)	-.28*	-.48**
GDP per capita at current prices (2004/ 2012)	-.25*	-.46**
Gini coefficient of equivalised disposable income (2004/ 2012)	.09	.023*
Unemployment by all ages (2004/ 2012)	.07	.27*
Environmental Performance Index (2004/ 2012)	-.44**	-.49**
Cumulative climate death toll 1993-2012 per 100,000 inhabitants	.04	.31*
PISA Science mean score (2004/ 2012)	.23*	.25*
Post-communist country	.35*	.41*

*correlation is significant at the 0.05 level; **correlation is significant at the 0.01 level

Source: Source: authors' compilation based on OSCD data, European Social Survey Multilevel Data, Germanwatch Data and The Environmental Performance Index by Yale University

Model 2 included individual practices and attitudes in predicting environmental values. An individual's placement towards the left on the 11-point left/right political orientation scale correlated positively with care for nature to a significant extent. Boycotting certain products also correlated positively with care for nature.

We also tested for the importance of country-level indicators of socio-economic security, levels of science education and the effectiveness of environmental governance to predict value orientations of care for nature. Table 2 includes correlations between country-level means of care for nature and different contextual indexes. We also explored the change over time (2004-2012) in values attributed to care for nature. We saw a statistically significant increase in care for the natural environment in Spain, Italy, Portugal, Iceland and Slovenia; and a decline in Hungary, Ireland, Czech Republic, Norway, Ukraine and Switzerland. We tested the selected contextual variables of socio-economic security, education and environmental governance as possible drivers of value change.

Relation of care for nature to socio-economic security

Table 2 shows significant correlation between the mean care for nature and the selected indicators of socio-economic security. The Human Development Index was negatively correlated with care for nature: higher levels of HDI correlated with lower levels of care for nature. The Gini coefficient

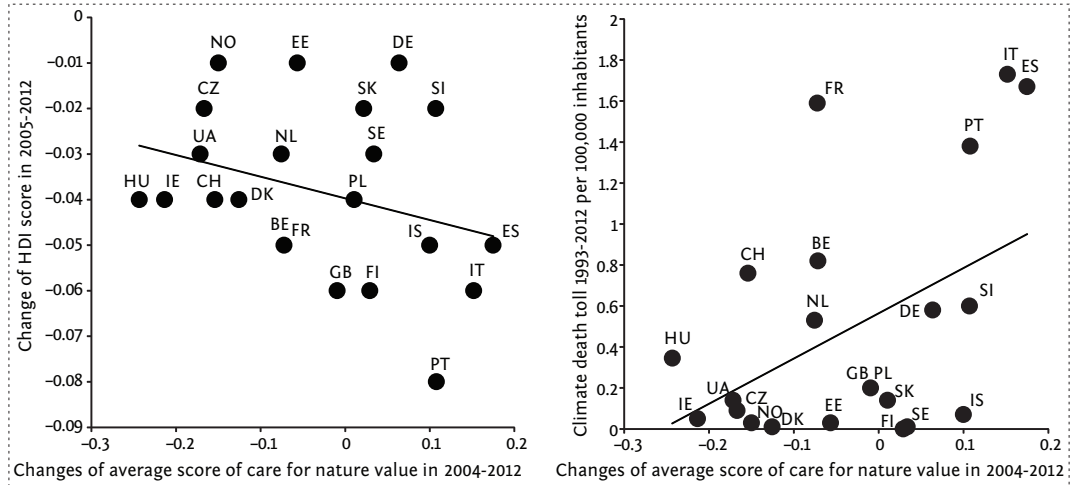


Figure 1: Human development index change between 2005 and 2012 in relation to the change in mean values attributed to care for nature between 2004 and 2012 (Pearson correlation 0.4; full names of abbreviations for countries are given in Appendix 1)

Source: authors' illustration based on data from the European Social Survey (2004 and 2012)

Figure 2: Cumulative climate death toll between 1993 and 2012 per 100,000 inhabitants and the change in values attributed to care for nature between 2004 and 2012 (Pearson correlation 0.45*)

Source: authors' illustration based on data from the European Social Survey (2004 and 2012) and Germanwatch

of equalised disposable income and the rate of unemployment in a country correlated positively with care for nature to a significant degree. An increase in income disparity and unemployment was positively related to higher care for nature.

Furthermore, we found a significant correlation (-.4) between change over time in the Human Development Index (2005-2012) and care for the natural environment (2004-2012). Figure 1 shows that in countries that underwent a larger decrease in Human Development, the importance ascribed to care for the environment increased (such as Portugal, Italy and Spain), while in countries where the decrease was smaller (e.g. Norway), the average importance given to care for nature decreased.

Relation of care for nature to environmental performance

Table 2 indicates a significantly negative correlation between the mean care for nature and the indicators of environmental performance of the economies under study. A higher overall Environmental Performance Index predicted lower levels of care for nature.

A change in value for the natural environment was positively correlated to the extent to which a country experienced casualties related to extreme weather events in 2004 and in 2012 (Table 2). A statistically significant correlation did appear when analysing value change over the years (Figure 2).

In the countries where the climate death toll per 100,000 inhabitants was greater between 1993 and 2012 (Italy, Spain and Portugal), the natural environment had become more highly valued. By contrast, in countries where the number of climate related deaths was close to zero (Hungary, Estonia and Sweden), a relatively small change in the mean care for environment between 2004 and 2012 occurred.

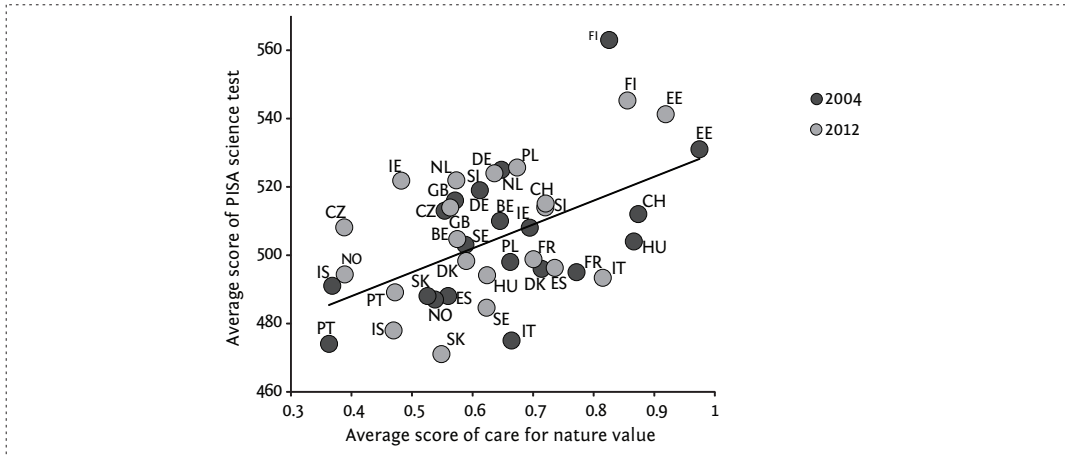


Figure 3: PISA Science mean scores in relation to the values attributed to care for nature in 2004 and 2012 (Pearson correlation .50)

Source: authors' illustration based on data from the European Social Survey (2004 and 2012) and the OECD

Relation of care for nature to environmental education

The PISA Science mean score had a positive and statistically significant correlation with care for nature (0.54 and 0.48 in 2004 and 2012, respectively). Figure 3 indicates PISA scores from two rounds of Science proficiency testing in relation to the mean values attributed to care for nature in each country. The change in the value attributed to the natural environment was less significantly correlated with the change in PISA Science test results between 2006 and 2012.

Discussion

The findings of this paper indicate important relationships between individual and country-level variables vis-a-vis the significance given to care for the natural environment. Using data from 22 European countries, this paper demonstrates the influence of important individual-level factors on care for nature cross-nationally. Education and being female positively influenced care for the environment, whereas a curvilinear relationship with age was established. While relationships with gender and educational level were as predicted and match the results from previous studies (Dietz et al., 1998; Dietz et al., 2002; Raudsepp, 2001; Schwartz & Rubel, 2005), the decrease in the importance of care for nature among elderly people is a relatively new finding. While Raudsepp (2001) has shown that people's regard for the environment reaches a peak when they are in their 50s, it is somewhat expectable that at a much greater age people will start to emphasise less with environmental and social issues, as they have to deal with more immediate problems such as their health. The result also fits with recent studies that showed that in most of European countries the importance of self-transcendence values (where care for nature belongs) decreases in people up to their 80s and then levels off (Dobewall, 2013).

Belonging to a minority ethnic group indicated significantly lower levels of care for nature, which contradicts earlier findings (Dietz et al., 1998). The less secure positions of minority groups in European societies may contribute to their caring less for the environment in comparison to majority groups. The negative correlation between care for nature and left-right political placement fits with earlier results (Puurko et al., 2011) and confirms that environmental attitudes are directly linked with political

attitudes. The relationship of care for the environment with the practice of boycotting products proves that environmental care may be expressed in some daily activities. Our analyses revealed a negative relationship between income and care for nature, which contradicts with some but not all recent studies (Dunlap & York, 2008; Franzen & Meyer, 2010). However, this finding resonates well with the country-level analysis that also showed negative relationships between levels of socio-economic security and environmental concern.

In the country-level analysis, the established negative relationships between affluence and care for nature contrasts with the post-materialism thesis and partially confirms previous research (Dunlap & York, 2008; Marquart-Pyatt, 2012b) that showed national wealth does not always translate into greater care for the environment. The negative relationship between socio-material security and care for nature is supported by the fact that in both 2004 and 2012 care for nature was held as more important in post-communist transitional economies with poorer standards of living (as also demonstrated by Brechin, 1999), but also in Southern European countries that were severely affected by economic crises over the turn of the past decade. Furthermore, our findings showed that a worsening economic situation over time, i.e. increased levels of unemployment and exacerbated income disparities in years of economic recession, may have reinforced the association between relatively low levels of socio-economic security and care for nature.

These findings do not offer support for Schwartz's conceptualisation on how transition from socialism to capitalism has favoured the pursuit of self-interest, competitiveness and material values and undervalued concern for universalist values such as caring for the environment. The post-socialist transition has not driven a devaluing of the care for the environment in Eastern European countries. By large, the countries whose socio-economic indexes reflect a greater struggle in the economic recession have experienced a greater increase in caring for the environment. One explanation for this may lie in the tendency that care for the environment is not only a luxury of the wealthy and successful, but it is also a concern for the less well-off groups for maintaining their environment-related livelihoods and traditions as well as health, which are endangered by global processes such as climate change.

Following the standard psychological models, such as the value-belief-norm theory (Stern, 2000), higher levels of environmental care predict higher support/demand for more environmentally friendly government measures, with the pro-environmental regulations that may constrain individual choices more accepted. Our study, however, showed that lower levels of care for nature correlated significantly with effective environmental governance as defined by a high environmental performance index. The analyses uncovered important institutional factors in effecting care for the environment, and our findings partially oppose the effects of environmental conditions shown in previous research (Haller & Hadler, 2008; Franzen & Meyer, 2010). The lower value people ascribed to the environment in countries that performed well with regards to the environment may be related to citizens having been less exposed to environmental problems thanks to more successful state mitigation. As the better-performing countries are also more affluent, their citizens may also have better means to secure themselves from the negative impacts of a poor state of the environment and do not have to ponder about environmental issues.

Existing empirical research has shown that higher awareness of environmental problems is related to a higher level of caring for nature (Thøgersen, 2005; Nordlund et al., 2010). Our analysis agreed with earlier findings (e.g. Swim et al., 2010; Spence et al., 2011), regarding the positive effect of empirical knowledge of adverse environmental effects on environmental values. Climate change related health effects have gained prominence in Mediterranean countries in particular, since these states have also experienced a greater increase in environmental values than other European countries. If such drastic events do have a causal effect on values, it might be worth further investigating the extent to which these value changes are maintained longer-term.

A positive correlation between science proficiency levels and a mean level of care for nature in a country was also found in this study. A prominent framework in research on environmental care addresses the socialising potential of educational systems to promote norms and values supportive of environmental awareness (Dietz et al., 1998; Dunlap et al., 2002). State education on living and Earth systems may contribute to awareness of environmental issues and an increased concern regarding potentially adverse environmental effects on humans as well as the biosphere, socialising the public towards caring for the environment to help mitigate impacts. This finding supports the information-centred model of environmental care: awareness raising programmes and school curricula may shape our concerns for the environment. However, the relatively lower scores for environmental performance in high-care countries show that these attitudes may not materialise in the absence of supportive structures. To put it into another way, high care does not necessarily affect state and private investment in environmentally friendly infrastructures. More information and concern regarding environmental problems does not grant sustainability when there is a lack of resources or willingness to change the conditions and structures people are operating in and/or the existing structures do not facilitate lowering the environmental impacts of production and consumption.

The value of this study lies in our consideration of the temporal dynamics of a variety of contextual factors that may underlie changes in people's level of care for the natural environment. Addressing a broad range of factors enabled an assessment of the relative strength and direction of these factors, which may influence care for nature. The use of country-level indicators allowed us to study the general development of value given for care for nature in a socio-cultural context. The downside of such an approach is that by using macro-level indicators we could not explain individual level tendencies. It is known, however, that value diversity is much larger within than between countries (Magun, Rudnev, & Schmidt, 2012). Due to the limited data available, we used attitudes towards the environment and PISA results only as country-level variables, but in future studies it would be interesting to study what factors affect care for the environment at multiple levels of analysis (including individual, regional or state level).

Conclusions

Explaining the emergence and salience of care for the environment, one of the antecedents of pro-environmental norms and behaviour, is an internationally prominent issue. Our analysis of data from 22 European countries confirmed earlier findings that the individual level factors, which include being female, having higher education, having a political orientation towards left, positively correlate with care for nature cross-nationally. The decrease in the importance of care for nature among elderly people is a relatively new finding and may be related to a resignation from environmental and social concerns when more immediate concerns such as health become more prominent. Our country-level analysis allows us to draw the following conclusions:

First, studies following the Schwartz approach to values have indicated how the transition from socialism to capitalism has favoured the search of competitiveness and material values and undervalued concern for universalist values, including caring for nature. Our analysis, however, indicates that the post-socialist transition and economic ruptures related to increases in social instability and inequality have instead reinforced the value attributed to the environment. This suggests that caring for the environment is not exclusive to the well-off groups, but has remained a concern for the less fortunate groups in terms of sustaining their environment-dependent livelihoods, and in terms of the increasing need for mitigating health threats from global environmental changes (such as climate deaths in the Mediterranean region).

Second, the results offer insights into the tensions between the ecological, social and economic dimensions of sustainability. Our study showed that lower levels of care for nature correlated significantly with effective environmental governance, as defined by a high environmental performance index. Ecological sustainability is more desired in societies that struggle with socio-economic stability as well as with the environmental performance of the country. Reversely, ecological sustainability goals seem to be less at stake in countries already performing well in terms of socio-economic and ecological sustainability, i.e. in states that may have higher resilience capacity towards adverse environmental impacts.

Third, the results of this study draw attention to the many barriers involved in turning sustainable ways of thinking into action. On the one hand, the findings confirm the information-centred model of environmental care: empirical knowledge from environmental impacts as well as proficiency of state education on living and Earth systems may function as socialisers and incline the public towards a care for nature. On the other hand, the relatively lower scores for environmental performance in high-care countries show that these pro-environmental attitudes may not materialise in the absence of supportive structural conditions.

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Appendix 1: Country-level mean scores and ranks of environmental value in 2004 and 2012

		Average scores (with lower and upper 95% confidence intervals)			Rank among 21 values		
		2004	2012	change 2004–2012	2004	2012	change 2004–2012
BE	Belgium	.65 (.61;.69)	.57 (.53;.61)	-.08	3	4	-1
CH	Switzerland	.87 (.84;.9)	.72 (.68;.76)	-.15	3	3	0
CZ	Czech Republic	.55 (.51;.59)	.39 (.35;.43)	-.16	4	6	-2
DE	Germany	.57 (.53;.61)	.64 (.6;.67)	+.07	5	5	0
DK	Denmark	.71 (.66;.76)	.59 (.54;.64)	-.12	2	5	-3
EE	Estonia	.97 (.93;1.01)	.92 (.88;.95)	-.05	1	1	0
ES	Spain	.56 (.51;.61)	.73 (.69;.77)	+.17	4	4	0
FI	Finland	.83 (.79;.87)	.85 (.82;.89)	+.02	3	2	+1
FR	France	.77 (.72;.82)	.7 (.65;.75)	-.07	3	3	0
GB	United Kingdom	.57 (.52;.62)	.56 (.52;.6)	-.01	5	5	0
HU	Hungary	.87 (.83;.91)	.62 (.59;.66)	-.25	1	2	-1
IE	Ireland	.69 (.64;.74)	.48 (.45;.52)	-.21	3	7	-4
IS	Iceland	.37 (.27;.47)	.47 (.39;.55)	+.1	8	7	+1
IT	Italy	.66 (.62;.7)	.81 (.76;.87)	+.15	2	1	+1
NL	Netherlands	.65 (.61;.69)	.57 (.53;.61)	-.08	4	5	-1
NO	Norway	.54 (.49;.59)	.39 (.33;.44)	-.15	4	8	-4
PL	Poland	.66 (.62;.7)	.67 (.64;.71)	+.01	4	3	+1
PT	Portugal	.36 (.32;.4)	.47 (.44;.5)	+.11	6	5	+1
SE	Sweden	.59 (.54;.64)	.62 (.57;.67)	+.03	5	5	0
SI	Slovenia	.61 (.57;.65)	.72 (.68;.76)	+.11	2	1	+1
SK	Slovakia	.53 (.48;.58)	.55 (.51;.59)	+.02	4	4	0
UA	Ukraine	.78 (.74;.82)	.6 (.56;.65)	-.18	2	3	-1

Source: authors' compilation based on data from the European Social Survey (2004 and 2012)

Appendix 2: Descriptive statistics and correlations of analysed country-level factors (cumulative data from 2004 and 2012)

	Mean	Std. dev.	Min.	Max.	Correlations									
					1	2	3	4	5	6	7	8		
(1) Human development index (HDI)	.9	.05	.74	.97	1									
(2) GDP per capita at current prices	32923	19953	1367	100056	.63	1								
(3) Gini coefficient of equalised disposable income	28.43	4.09	22.6	37.8	-.32	-.34	1							
(4) Unemployment by all ages	8.59	4.71	0	25	-.56	-.5	.39	1						
(5) Environmental Performance Index	73.83	7.41	46.64	87.67	.24	.47	-.18	-.2	1					
(6) Climate death toll 1993–2012 per 10000 inh.	.49	.58	0	1.73	.02	-.11	.42	.25	-.05	1				
(7) PISA Science mean score	506	20	471	563	-.01	-.01	-.02	-.11	.04	-.34	1			
(8) Post-communist country	.33	.48	0	1	-.66	-.7	-.03	.27	-.26	-.32	.13	1		

Source: authors' compilation based on OSCD data, European Social Survey Multilevel Data, Germanwatch Data and The Environmental Performance Index by Yale University