Global Environmental Change 72 (2022) 102453

Contents lists available at ScienceDirect

Global Environmental Change

journal homepage: www.elsevier.com/locate/gloenvcha

Socioeconomic geography of climate change views in Europe

Mikko Weckroth [a,*], Sanna Ala-Mantila [b]

[a] Natural Resources Institute Finland (LUKE), Rural Studies, Land Use and Natural Resource Governance, Yliopistokatu 6, 80100 Joensuu, Finland
[b] Helsinki Institute of Sustainability Science (HELSUS), Ecosystems and Environment Research Programme, Faculty of Biological and Environmental Research, University of Helsinki, Yliopistonkatu 2, Helsinki 00014, Finland

ARTICLE INFO

Keywords:
Climate change
Climate change attitudes
Pro-environmental behaviour
Urban–rural differences
Social exclusion
Spatial justice

ABSTRACT

Climate change views have their socioeconomic foundations but also specific geographies. In merging these perspectives, this analysis uses ESS Round 8 data from 23 European countries to examine whether climate change scepticism and concern, pro-environmental personal norm and a willingness to engage in energy-saving behaviour exhibit, first, urban–rural and/or regional differences, and second, if these attitudes can be explained at individual level by socioeconomic position and wellbeing resources. We find that climate change scepticism and concern do exhibit urban–rural differences, where living in a country village is associated with greater climate scepticism and lower concern compared to living in a big city. Also, higher climate change concern and pro-environmental norms are associated with living in a region with constant population growth. These geographical differences are independent of individual-level socioeconomic attributes as well as one's political orientation. Additionally, the results show that both climate change attitudes and reporting energy-saving behaviour are strongly stratified by level of education and reveal that those in lower income deciles feel less pro-environmental norm but nonetheless report greater engagement with energy-saving behaviour. In sum, the results highlight that climate change mitigation is not a uniform project either spatially or within certain socioeconomic strata. Hence, our results suggest that socioeconomic disadvantage (belonging to the lowest education and income levels) and spatial marginalisation (living in more rural surroundings and declining regions) should be better acknowledged when reworking climate change and environmental policies in the EU.

1. Introduction

A classic text in environmental psychology by Barker (1968) proclaimed that if one wants to explain an action, he/she should go to the place where it occurs. A more analytical formulation of this thesis would be that, besides acknowledging the psychological determinants of human agency, it is important to understand that attitudes and behaviour are also spatially determined and expressed. In other words, it is essential to assess the extent to which different socio-spatial contexts and living environments attract, nurture and generate specific behavioural patterns that cannot be explained by focusing solely on individual-level factors. Recent works in economic geography have employed such concepts as 'spatially-bounded rationality' (Huggins et al., 2018; Huggins and Thompson, 2017) and explored the behavioural foundations of populations in cities and regions, with a focus on geographically-specific economic outcomes (Garretsen et al., 2018; Lee, 2017; Weckroth and Kemppainen, 2016).

This analysis applies these insights regarding the importance of geographic context to sustainability science to better understand the spatially-bounded human agency associated with climate change views. More specifically, using nationally representative survey data from 23 European countries we examine urban–rural differences and regional level contextual effects in four explicit concepts discussed in environmental psychology, each of which focus on individual-level perceptions of climate change: 1) climate change scepticism, 2) climate change concern, 3) foundations of pro-environmental personal norms and 4) a willingness to engage in low-carbon behaviour. We argue that the geography of these concepts is an especially timely subject for empirical evaluation, since recent decades have witnessed increasing inter-regional inequality and deepening urban–rural divisions within the EU (e.g. Ballas et al., 2017; Jones et al., 2018). Economic and political geographers have noted that this ongoing unbalancing of the spatial economy within the EU, together with increasing urbanisation, inevitably provokes anti-establishment attitudes in more peripheral and declining regions and nurtures the idea of getting even with the (urban) 'elites' (e.g. Essletzbichler et al., 2018; Rodríguez-Pose, 2018). Drawing

* Corresponding author.
E-mail addresses: mikko.weckroth@luke.fi (M. Weckroth), sanna.ala-mantila@helsinki.fi (S. Ala-Mantila).

https://doi.org/10.1016/j.gloenvcha.2021.102453
Received 5 January 2021; Received in revised form 17 December 2021; Accepted 21 December 2021
Available online 31 December 2021

from recent studies in environmental social psychology (Belanche et al., 2021; Fritsche et al., 2018), we approach geographical differences in climate change views as reflections of an intergroup conflict between the populations in growing and prosperous urban spaces and more peripheral and stagnating rural regions. Hence, in the context of outlining and implementing the salient EU policies, such as the European Green Deal, we ask whether the recent shifts in socioeconomic geography are also reflected in climate change views among EU citizens. It is often noted that climate change is impacting the (global) poor more than the rich (e.g. Marino and Ribot, 2012), but it is less frequently acknowledged that in addition to the spatially uneven effects of global warming, significant regional within-country differences also exist in terms of people's climate change views, and thus, their support for pro-environmental and climate change policies. Thus, this analysis examines relevant geographical differences not only through the lens of more generic urban–rural differences but also in a regional context. Moreover, a scrutiny of regional economies and demographics is not treated merely as a technical exercise but is embedded in assessing the 'revenge of the places that doesn't matter' thesis proposed by Rodríguez-Pose (2018).

In addition to emphasising this geographical dimension, we contribute to existing literature by scrutinising the individual-level determinants of climate change attitudes and efficacy and their relation to one's socioeconomic position. The already abundant psychology literature on climate change attitudes has tended to focus on cognitive processes and the role of personality traits, treating socio-demographic factors as simple control variables. This analysis, however, aligns more with a sociological approach (e.g. Marquart-Pyatt, 2008; 2012) and makes socioeconomic stratification the crucial factor for understanding the variation in climate change views within societies. Previous studies have suggested that climate change and environmental concern are stratified in such a way that groups with higher socioeconomic status are more likely to exhibit concern about environmental issues and climate change (e.g. Abrahamse and Steg, 2009). However, the socioeconomic background of subjects has been limited to rather few measures, with a primary focus on education, and the results are non-uniform in many cases (e.g. Milfont et al., 2015). Also, existing analyses have seldom examined the role of income in detail, and the findings of those studies that have focused on it have demonstrated little or no effect. Due to increasing socioeconomic inequalities in Europe (e.g. Ballas et al., 2017) and stringent climate related policies targeted at the household level, we believe this area to be of central importance for ensuring the legitimacy of climate change strategies and policies at the EU level.

By focusing on the role of wellbeing resources in shaping climate change attitudes, our analysis aligns with recent studies in sustainability science demonstrating that individual's cognitive resources play a central role in translating pro-environmental attitudes into concrete behaviour (Langenbach et al., 2020), and on a more general level, that people must circumvent existing cognitive barriers before engaging in more sustainable behaviour (Weber, 2017). Building on these findings, this analysis makes an assessment of the role of socioeconomic determinants in shaping climate change views in a European context.

In sum, this empirical analysis combines two important themes in behaviourally-oriented sustainability science: 1) the effect of geographical (urban–rural and regional) dimensions on a person's climate change attitudes and efficacy and 2) the importance of personal-level socioeconomic position and related wellbeing resources. We address these questions via high-quality survey data from the European Social Survey (ESS) Round 8 from 2016, which includes more than 40 000 responses from 23 European countries. The ESS Round 8 data includes a rotating module focusing on climate change attitudes (Poortinga et al., 2016), together with survey items on the self-reported living environment of respondents and relevant indicators of their socioeconomic position and perceptions of subjective economic hardship. Moreover, the ESS data also makes possible a geographical analysis at the regional level, as the data contains a location indicator for each respondent based on the European Union's NUTS (Nomenclature des unités territoriales statistiques) geocoding system. Therefore, we utilise Eurosta's data on regional macroeconomic performance and demographic change as potential contextual-level determinants. Hence, the analysis is aligned with studies that look at the contextual effects impacting climate change views using multilevel models (e.g. Marquart-Pyatt, 2012), but it focuses on investigating contextual effects at sub-national (i.e. regional) level. We inquire as to whether regional (NUTS) Gross domestic Product (GDP), GDP change from 2008 to 2016, and the proportion of those employed in the manufacturing sector as well as regional demographic indicators are associated with individual-level climate change attitudes and efficacy. Thereby, the hierarchical nature of the data makes it possible to examine the socioeconomic geography of climate change views at both micro (individual) and macro (regional) levels.

Thereby, the specific research questions addressed in this analysis are as follows:

1. Concerning geographical focus, and after accounting for individual level attributes, do the respondents' climate change views (*climate change scepticism, climate change concerns, pro-environmental personal norms* and *energy curtailment*) exhibit urban–rural differences based on their self-evaluated living environment, and second if they are associated with macroeconomic and demographic changes in a region?
2. To what extent do the socioeconomic position (household income, level of education and main activity) and wellbeing resources (subjective economic hardship) of the respondents affect their climate change views?

2. Theoretical background: From individual to collective drivers of environmental actions

Environmental psychologists have consistently investigated the process of how personal attitudes towards environmental threats, such as climate change, are formed and potentially translate into personal norms and ultimately action. One prominent model describing this process is the Value-Belief-Norm (VBN) model (Stern, 2000), which offers a general account of pro-environmental behaviour.

The VBN framework adopts the proposition that personal values, environmental worldview, awareness of adverse consequences, ascription of responsibility to self and personal norms for pro-environmental action all inform environmental behaviour. The VBN model assumes a causal order, wherein relatively stable personal-level values lead to certain focused beliefs, which in turn lead to believing that particular conditions threaten others and that actions can be taken to alleviate or avert such consequences. Finally, beliefs lead to norms that oblige people to take different types of pro-environmental actions. More recent studies have argued that worry about climate change, originating from threats to personal values, also initiates the VBN process, and that worry is likely to enhance those feelings of personal responsibility that motivate specific mitigating actions (e.g. Bouman et al., 2020). However, the VBN model does not claim to explain environmental behaviours on its own and acknowledges that such factors as personal capabilities and habits also influence behaviour and choices (Stern, 2000.) The value-action gap (sometimes called attitude-behaviour gap) is widely cited in literature on why environmental awareness does not necessarily translate into environmental actions, referring to the fact that people who claim to hold certain environmental values do not always act in accordance with them (Blake, 1999). In other words, the value-action gap refers to dissonance between expressed concerns and actual behaviour (e.g. Barr and Gilg, 2006; Flynn et al., 2009).

These models have attracted a fair share of criticism. Most of the criticism focuses on the fact that the causal order embedded in the models appears to rather straightforwardly ignore — or at least downplay — the role of the institutional and local context in which they

operate (Shove, 2010). However, Blake (1999) himself also points out that various individual, social and institutional contextual barriers contribute to the value-action gap. The role of context has also been emphasised by Manfredo et al. (2009), who note that environmental values at the group level are the result of people adapting to the socio-ecological system in which they live.

When shifting from the personal sphere to the collective sphere, scholars can draw on, for example, the social identity approach to recognise the influence of group membership on environmental attitudes and behavior (see, e.g. the review by Fielding and Hornsey, 2016). Stemming from same theoretical perspective, Fritsche et al. (2018) suggest a novel Social Identity Model of Pro-Environmental Action (SIMPEA), which explains an individual's private behaviour decisions by account for the ways in which collective self-definition affects one's environmental appraisals and responses. The model takes into account four groups of social identity variables and processes, namely ingroup identification, ingroup norms and goals, collective efficacy and emotions and motivations (Fritsche et al., 2018). The model can be applied to any relevant sub-group, for example to one's living environment, and it can help explain why some of the identity-based issues related to climate crisis responses may be a function of community. In line with this reasoning, Brieger (2019) also discusses the importance of contextual effects at the national level with respect to social identity and environmental concerns, and Babutsidze and Chai (2018) suggest that the value-action gap can be influenced by one's peers at the local level.

Hence, by making a geographical analogy to the theories presented above, we interpret the urban–rural differences in climate change attitudes as a potential reflection of intergroup conflict between two opposing opinion-based groups (e.g. climate change believers and critics) (for a similar reasoning, see Fielding and Hornsey, 2016). As SIMPEA suggests, members of one group (e.g. climate change critics) are unlikely to accept information perceived as originating from the out-group (e.g. information by scientists about human causes of climate change). We thus argue that spatial polarisation in contemporary Europe (Rodríguez-Pose, 2018) not only results from changes in geography of economic production and employment but also entails a social-psychological identity-based component.

To conclude, the present analysis aligns with claims that more emphasis should be placed on the contextual effects stemming from how environmental concerns are expressed and how they translate into individual norms and actions. Moreover, we suggest that one of the most important contexts affecting people's climate change views has to do with conditions in socioeconomic and political geography.

3. Geographies of discontent, political efficacy and urban–rural divisions in environmental attitudes

After the economic recession of 2008, socio-economic developments in Europe have been characterized by increasing regional divergence (Ballas et al., 2017; Martin, 2015). With rapid urbanisation and the further concentration of people and businesses in a fewer number of large cities, accompanied by changing industrial structures, urban–rural differences and spatial injustice have been on the rise (Jones et al., 2018). A seminal piece on contemporary economic geography has defined this spatial polarisation and its consequences as the 'revenge of places that don't matter' (Rodríguez-Pose, 2018). According to Rodríguez-Pose, the cuts in public investment in rural and more peripheral areas have led to a lack of opportunities and decreasing sense of agency in such areas. Consequently, the people living in those neglected areas have started to 'take the power back' via a type of revenge expressed through increasing support for political populism and anti-establishment attitudes.

The thesis put forward by Rodríguez-Pose implicitly proposes place-specific foundations underpinning people's attitudes, motivations and agency, which are related to — but not fully explained by — socioeconomic conditions in the regions. Hence, we draw on his thesis to ask whether general anti-establishment attitudes and frustrations with the (lack of) regional policy measures adopted by state governments might also be linked to attitudes and beliefs about collective environmental threats, such as climate change. Examples from the recent U.S. presidential elections show (see, e.g. Gimpel et al., 2020) that people living in the 'places that don't matter' might not even believe scientists about the supposedly politically neutral effects of human-induced global warming because of a suspicion that such views are being imposed by 'urban' elites.

Hence, our examination of urban–rural and regional differences in climate change attitudes and efficacy is theoretically framed as part of an emerging literature on the geography of discontent, political efficacy and anti-establishment (and, as such, anti-urban) attitudes (Dijkstra et al., 2020; Luukkonen et al., 2021; Rodríguez-Pose, 2018). Most importantly, recent analyses have shown that centralization and urbanization policies are also reflected in geographical differences in sentiments of political agency and efficacy, i.e. the feeling of not having a voice in political procedures (Luukkonen et al., 2021). These empirical observations echo recent theoretical formulations in political geography arguing that the currently dominant geopolitical narrative, based as it is on the valorisation of urban-based intellectuals and entrepreneurs, is an exclusive geopolitical imaginary leading to the marginalisation or exclusion of certain locations and actors that are not able to generate added value for the new urban-centred cognitive capitalism (Rossi, 2017; see also Moisio, 2018). Within this context, urbanisation should not be seen simply as a rural–urban migration pattern or agglomeration of economic resources and means of production, but as a selective and exclusive political process leading to the reconfiguration of the state as territorial-political community (Luukkonen et al., 2021).

We relate these theoretical debates in political geography to recent findings in environmental social psychology studies on the differences in place identity between residents of rural and urban communities (Belanche et al., 2021), which show that residents in rural communities have greater levels of affective and evaluative place identity than city dwellers. In parallel, other studies in environmental social psychology have noted that perceptions of environmental threats are constituted by collective worldviews, and hence, for example those with a more conservative identity tend to reject the existence of climate change, dismissing it as part of green and, as such, liberal ideology (Jacquet et al., 2014).

Several previous studies have already analysed geographical differences in environmental attitudes, beliefs and behaviours, but they mostly focus on general environmental attitudes rather than on climate attitudes per se. The first studies on environmental concerns among rural and urban citizens showed that urban residents exhibited greater environmental concern (e.g. Arcury and Christianson, 1993; Fortmann and Kusel, 1990; Lowe and Pinhey, 1982). In line with such studies, an early study by Tremblay and Dunlap (1978) found that place of residence is connected to environmental attitudes and concerns, leading to a situation where poor physical conditions of the environment lead to higher levels of concern.

More recently, Berenguer et al. (2005) found that those living in a large city (Madrid) exhibit stronger environmental beliefs and concerns, but that a sense of moral obligation and the number of pro-environmental behaviours was higher in the rural village context. In Canada, beliefs about climate change and how human activities contribute to it were somewhat lower in rural areas than in urban parts of the country (Mildenberger et al., 2016). However, Huddart-Kennedy et al. (2009) likewise found that people residing in urban areas throughout Canada participate less frequently in recycling and exhibit less stewardship behaviours than rural residents, yet they linked the differences in environmental behaviours to different opportunities and available infrastructures. A similar pattern was also discovered at the intra-urban scale by Árnadóttir et al. (2019), who found household energy-related behaviours to be more common among those living in car-dependent outer zones in the capital area of Finland compared to the

inner pedestrian zones. Controversially, Chung and Poon (2001) reported that in China, rural residents exhibit greater environmental concerns when measured using NEP indicators.

Thus, despite certain inconsistencies in the literature, there seems to be some consensus among scholars that urban dwellers are more concerned with environmental issues but less willing or able to act on such concerns, at least in the Western context (see also the multi-country analysis by Marquart-Pyatt, 2008). In sum, the results of existing analyses on geographical differences in environmental attitudes are based on relatively small and non-representative national samples, and as a result, descriptions of more generalised urban–rural, or core-periphery, differences remain absent. Also, the previous analyses have typically limited their focus to a single dimension of people's more general attitudes about climate or environmental change (e.g. climate change concern/worry or pro-environmental action) and have operated with rather crude individual level geographical measures (e.g. a simple urban–rural binary, such as Huddart-Kennedy et al., 2009), and as such, they have been unable to distinguish individual-level determinants from contextual ones. Despite these limitations, Huddart-Kennedy et al. (2009 p. 329) concludes that rural–urban differences may (due to increased urban–rural mobility and cultural convergence) in fact be diminishing. However, within the context of emerging interregional inequalities and urban–rural polarisation reviewed earlier, our analysis assumes just the opposite.

Hence, a general hypothesis (H1) concerning geographical variations in climate change attitudes and efficacy is that we expect to find signs of an urban–rural and/or core-periphery gradient where a more rural and/or peripheral context is associated with higher levels of scepticism and lower levels of concern and general norms regarding how to address climate change.

4. The objective and subjective socioeconomic dimensions of the psychology informing climate change attitudes, norms and efficacy

In addition to geography, it is possible to distinguish another context highly relevant to climate change attitudes: individual socioeconomic position and the more profound and underlying wellbeing resources possessed by individuals.

The existing literature has provided evidence that gender, education and age play a role in determining people's perceptions of climate change (e.g. Poortinga et al., 2012; Poortinga et al., 2019; Marquart-Pyatt et al., 2019), even though there is some variation between countries (Poortinga et al., 2019) as well as inconsistencies in the results (for a review, see Milfont et al., 2015). The findings thus far suggest that men, older people and less educated persons are more sceptical and less concerned about climate change (Milfont et al., 2015; Poortinga et al., 2012; Marquart-Pyatt, 2008; McCright et al., 2016), but these general statements hide some details about the complexity of such interrelationships (see, e.g. the review by Blankenberg and Alhusen, 2018). Interestingly, neither income nor employment have always been included in the models explaining people's attitudes about climate change (e.g. Berenguer et al., 2005) or else scholars have found that their effects are rather insignificant (McCright et al., 2016; McCright and Dunlap, 2011). However, for example Brieger (2019) found that those with higher levels of education and income and who rank themselves as members of a higher social class are reportedly more willing to give up money for greater environmental protection measures. Likewise, Marquart-Pyatt (2012) found that income has a positive relationship with environmental efficacy and a willingness to pay, but not with threat awareness. Scholars have also found that unemployment and retirement can predict certain pro-environmental behaviours (Binder and Blankenberg, 2017). However, the range of measured environmental attitudes and behaviours vary greatly, and it is still difficult to draw any overarching conclusions about the role of socioeconomic factors.

Instead of relying only on objective socioeconomic indicators, we also inquired into whether certain cognitive barriers exist with respect to the disadvantaged position of individuals that may cause psychological strain and lower their capacity to develop pro-environmental norms or efficacy. This approach also builds on Self-determination Theory (SDT), first proposed by Ryan and Deci (2000) as an approach to understanding human motivation based on our fundamental needs of autonomy, social relations and competence. SDT focuses primarily on people's immediate social contexts and the degree to which their fundamental needs are being met or have been thwarted in those contexts.

Elsewhere in the broader field of the social sciences, the relationship between poverty and diminished cognitive capacity has been well documented, for example in a seminal study by Mani et al. (2013), who showed that experiences with poverty strongly impede cognitive function. These insights have been applied recently in research on the relationship between the environment and behaviour by, for example, Langenbach et al. (2020), who demonstrated that cognitive resources serve as a crucial moderator in the process whereby people's pro-environmental attitudes translate into corresponding behaviour. Additionally, the satisfaction of basic psychological needs has been linked with a greater likeliness to engage in pro-environmental actions (for an overview, see Wullenkord et al., 2021), a finding in line with the SDT approach. This line of inquiry has recently also been touched upon in applied sustainability research by, for example, Poruschi and Ambrey (2016), who studied people's energy attitudes and direct residential energy consumption patterns, finding that vulnerable groups (e.g. renters) have a significantly lower adaptive capacity, which they speculated could be traced to differences in ontological security and greater psychological burden.

However, the question of wellbeing resources and sense of agency has already appeared in sustainability studies when framed as part of a 'post-materialistic' thesis (Inglehart, 1990; Inglehart and Welzel, 2005). However, this question has been examined at the national level by asking whether a nation's overall level of affluence would explain the environmental values and attitudes of its people (Givens and Jorgenson, 2011). We, in contrast, examine the 'post-materialistic' thesis via individual framing, by focusing on objective measures of socioeconomic position (income, education and labour market position) as well perceptions of subjective economic hardship.

Hence, we approach the role of socioeconomic position and wellbeing resources with the general hypothesis (H2) that climate change views are socioeconomically stratified in a pattern where those in the lower strata exhibit greater scepticism and less concern with norms regarding or actions taken in response to climate change.

5. Data

5.1. Data

The data used in this analysis comes from the ESS Round 8 conducted in 2016. We used the second edition of the data, which includes post-stratification weights (PSPWGHT) for all 23 countries included in the study. The sampling data is based on a strict random probability method in all participating countries, and the data is representative of all persons aged 15 and over residing in private households in each country, regardless of their nationality, citizenship or language (ESS, 2020a). In addition to its rigorous sampling strategy, the published ESS data includes sophisticated post-stratification weights to reduce the sampling error and potential non-response bias in the data (ESS, 2020b). All the models included in this analysis applied the post-stratification weighting (PSPWGHT) procedure.

5.2. Dependent variables

5.2.1. Climate change scepticism

Our measure for *climate change scepticism* was based on the ESS

survey item *clmchng*, which asked respondents about their beliefs regarding the reality of climate change, that is, whether people think the world's climate is changing or not, irrespective of the possible perceived causes or consequences. The respondents were asked to answer the following question: *You may have heard the idea that the world's climate is changing due to increases in temperature over the past 100 years. What is your personal opinion on this? Do you think the world's climate is changing?* They chose from a range of four options: *1) definitely changing, 2) probably changing, 3) probably not changing and 4) definitely not changing*.

5.2.2. Climate change concern

The *climate change concern* measure is defined in the ESS climate change module as a personal evaluation of the seriousness of the impacts of climate change, as reflected in personal feelings about the issue. People's level of concern was measured with a single item, *wrclmch*, with participants being asked to respond to the following question: *How worried are you about climate change?* They aligned their responses on a six-point scale: *1 = Not at all worried / 6 = extremely worried*. However, it should be noted that concern and worry are in fact two different things (Verplanken and Roy, 2013), but in accordance with the conceptual framing of the ESS module (Poortinga et al., 2016, p. 24) the single-item climate concern measure in this instance reflects the personal relevance, preoccupation and/or feelings of more generic worry regarding the seriousness of climate change.

5.2.3. Pro-environment personal norm

The *pro-environmental personal norms* measure in the ESS climate change module refers to feelings of moral obligation or a sense of responsibility to either perform or refrain from taking any specific actions that would help solve a perceived collective problem, in this case climate change. The wording of the question for this survey item, *ccrdprs*, was as follows: *To what extent do you feel a personal responsibility to try to reduce climate change*? An 11-point response scale was applied ranging from *0 = Not at all* to *10 = A great deal.*

5.2.4. Energy curtailment

The *energy curtailment* measure in the ESS climate change module refers to a willingness to curtail one's behaviour to save on household energy use through cutting down on energy-related activities or services. The question for this survey item, *rdcenr*, asked respondents to choose from possible options for how to reduce their energy consumption: *There are some things that can be done to reduce energy use, such as switching off appliances that are not being used, walking for short journeys, or only using the heating or air conditioning when really needed. In your daily life, how often do you do things to reduce your energy use*? Participants chose from a range of responses on a six-point scale: *1 = Never* to *6 = Always.* However, for his question the respondents were also given the option *Cannot reduce energy use*. As it is not possible to position this response on an ordinal scale, they (N = 250) were recoded as missing variables in the data.

5.3. Independent variables

5.3.1. Country-level variance

To account for county-specific effects, country dummies were created and included in the analysis as control variables. A total of 22 country-level dummies were included in the models, with Austria being treated as a reference category.

5.3.2. Domicile

The location indicator in the ESS data is based on a person's self-evaluated living environment, measured using the following question (*domicile*): *Which phrase on this card best describes the area where you live*? Respondents were given five options: 1) *A big city, 2) The suburbs or outskirts of a big city, 3) A town or a small city, 4) A country village* or *5) A farm or home in the countryside*. This item was included in the regression analyses as a categorical variable, and as our theoretical framing was premised on the role of peripherality and rural living, *big city* residence was defined as the reference category.

5.3.3. Regional-level (NUTS) variables

The regional-level variables were downloaded from the Eurostat regional data base and combined with the ESS data according to the common NUTS indicators. The selected regional-level variables represent the standard indicators employed in the existing literature on the geography of discontent and political efficacy (Luukkonen et al., 2021). The time span for evaluating the temporal development of population and changes in GDP was set between the years 2008 and 2016 to capture relative changes since the recent economic recession.

First, the indicator on *mean annual population change* was calculated as an average based on annual total population change between the years 2008 and 2016. Here, total population change is considered a key indicator of regions in decline, reflecting a process of considerable and constant population loss. As indicators on macroeconomic performance, we used *Regional GDP* as well as *GDP change from 2008 to 2016*. These measures were included as an index to the EU average to better reflect the relative change in lagging and growing regions. Additionally, we included the measure *Share (%) of manufacturing employment,* which has been considered in previous analyses to reflect insecurity in labour markets due to economic structural change (e.g. Essletzbichler et al., 2018; Luukkonen et al., 2021) as well as a more conservative value orientation, and therefore, it serves as a complimentary indicator of rurality and peripherality. Finally, we also included a measure on *Population density (inhabitants / km^2)* as a more objective indicator of urbanity compared to the subjectively evaluated domicile indicator. All the regional level variables were included in the models in a centralised format (as mean-centred variables).

5.3.4. Socioeconomic indicators

For a measure education level, we used the ESS's The International Standard Classification of Education (ISCED) categorisation, which includes seven stages ranging from less than lower secondary (ISCED I) to higher tertiary education (ISCED V2). As our focus was on persons in the lower socioeconomic strata, we used ISCED V2 as a reference category. Additionally, we included a measure of household income (*hinctnta*) in deciles to account for income distribution in each national context. Here, we defined the 6th decile as the reference in order to reflect both ends of income distribution in relation to the economic middle class.

To measure perceived wellbeing resources, we relied on people's perceived subjective level of economic hardship. Hence, we utilised the ESS survey item *hincfel*, which asked how the respondents would evaluate the sufficiency of their current household income based on a four-point response scale: 1 = *Living comfortably on present income* / 4 = *Finding it very difficult on present income*. *Living comfortably on present income* was defined as the reference category.

Regarding the labour market position of respondents, the ESS collects rather detailed information on their main activities in the last seven days, distinguishing also between active (looking for a job) and passive (not looking for a job) unemployment. The largest group, *Paid work*, was used as the reference category.

Additionally, we included age, gender and cohabiting status (whether respondents live with a husband, wife or partner) as socio-demographic control variables for all the models. Since previous studies have shown (e.g. McCright et al., 2016) that political ideology conditions one's perceptions of climate change, we also included a measure of where respondents place themselves on the political spectrum based on a 10-point scale (0 = left / 10 = right) as an additional control variable.

6. Method

Since our study design and dataset was hierarchical, we defined a two-level random intercept model with individuals nested in regions to

obtain the correct standard error estimates for the regression coefficients. Moreover, we utilised country-level fixed effects (country dummies) to control for all national variations and ran four separate regression models for each dependent variable in our analysis: *climate change scepticism*, *climate change concern*, *pro-environmental personal norms* and *energy curtailment*.

All independent variables (domicile, regional variables and socioeconomic indicators) were included in the model to distinguish the main effects of each predictor when disassociated from the other independent variables. The estimations were conducted using Stata version 16.1 and the *meglm* procedure, which has been designed for fitting multilevel mixed-effects generalised linear models into hierarchical datasets. Additionally, we applied the *svy* prefix command in Stata, which makes it possible to run statistical models for complex survey data and assign a weight specification for all levels in the hierarchical analysis. Individual post-stratification weights in ESS were applied in all models to correctly account for the effects of non-random missing data on the sampling procedure. The higher level weights were constructed by dividing the population in a NUTS region by the corresponding number of respondents in the ESS data, and we scaled the mean of the regional weight variable to one.

In technical terms, our dependent variables were ordinal rather than continuous measures and all the models were also run as an ordered logistic regression model during the robustness checks of the analysis. Finally, none of the four models showed multicollinearity between the predictors in the models, as no VIF values above three were present.

7. Results

The descriptive statistics for continuous variables used in the analysis are presented in Table 1 and the categorical variables in Table 2 below.

As a first stage in the empirical analysis, we fitted empty (e.g. null) models with no explanatory variables to each of the four dependent variables in this study to define the variance attributed to each level. As a result, the intraclass correlations coefficients (ICC) indicate that 3.8% of the total variance in *climate change scepticism*, 8.9% in *climate change concern*, 11.5% in *pro-environmental personal norms* and 3.4% in *energy curtailment* can be attributed to inter-regional differences. As expected, the regional-level variance is modest compared to individual-level variance, but the roughly 10% variance at the regional level in terms of *climate change concern* and *pro-environmental personal norms*, together with the strong theoretical reasons for assessing regional differences, justify using multilevel modelling as an empirical strategy.

Table 1
Descriptive statistics of continuous variables.

	Mean	Std Dev.	Min.	Max.
Dependent variables				
Climate change sceptism	1.52	0.69	1	4
Climate change concern	3.01	0.93	1	5
Pro-environmental personal norm	5.59	2.71	0	10
Energy curtailment	4.15	1.20	1	6
Individual level independent variables				
Age	47.0	18.6	15	100
Political orientation (left–right scale)	5.1	2.2	0	10
Regional (NUTS) level independent variables				
Share (%) of manufacturing employment in 2016	15.0	7.3	0.7	38.8
Mean annual population change from 2008 to 2016	9932	17,958	−15400	115,990
Population density (inhabitants / km^2)	393	926	2	7454
Regional GDP in 2016 (EU = 100)	106.1	56.0	18.0	289.0
GDP change from 2008 to 2016 (EU = 100)	1.2	11.5	−44.0	50.0

The results from the hierarchical linear regression models for the four dependent variables in this study are presented in Table 3 below.

Concerning the first dependent variable, *climate change scepticism*, the first column in Table 2 show signs of a gradient-like pattern where living in a more rural environment (country village: B 0.047, p-value 0.012; or farm or home in countryside: B 0.051, p-value 0.054) is associated with greater climate change scepticism compared to living in a larger city. Interestingly, higher population density is also related to higher levels of scepticism. Concerning the socioeconomic position of respondents, level of education shows a rather clear gradient where scepticism increases with lower levels of education.

The second column in Table 2, which reports the estimates for *climate change concern*, shows a similar yet inverse pattern with respect to level of education. Concerning geographical variables, living in a country village is associated with lower climate change concern (B 0.056, p-value 0.045) compared to those living in a larger city, and in parallel stronger *climate change concern* is related to living in a region with positive population change, i.e. a growing region. Additionally, being a student, permanently ill or disabled or having difficulties in coping with one's present income are associated with higher levels of concern. Household income, however, does not show any consistent socioeconomic pattern or gradient.

With respect to the *pro-environmental personal norms* in the third column of Table 2, the results show the strongest loadings in relation to both geographical and socioeconomic predictors (regional and individual variance components). Again, pro-environmental personal norms are stratified most distinctively by level of education, where especially having less than a lower secondary education is a strong negative predictor (B −1.120, p-value 0.000) of feeling a moral obligation or personal responsibility to take actions that might slow or prevent climate change. Concerning regional-level determinants, here also living in a region that has experienced a constant population gain is associated with higher pro-environmental personal norms. The income dimension likewise shows signs of a pattern where being in the lowest (1st and 2nd) income deciles is associated with lower pro-environmental personal norms.

Finally, the *energy curtailment* measure in the fourth column of Table 2 does not show an urban–rural difference or any regional effects, but the gradient for level of education is similar to that at previous stages. Interesting, the objective income variable plays a role here, where the lower income deciles (1st decile B 0.165, p 0.004; and 3rd decile B 0.100, p-value 0.034) report greater *energy curtailment* than the top two deciles (9th decile B 0.124p-value 0.002; and 10th decile B −0.098, p-value 0.046).

In sum, the results provides empirical support our hypotheses with certain specifications. Concerning the potential urban–rural differences (H1), climate change scepticism shows signs of an urban–rural gradient, whereas such a pattern in not evident in pro-environmental norms or energy curtailment. Concerning, the contextual effects at regional level, living in a growing region in terms of population change is associated with higher *pro-environmental norms* and greater *climate change concern*. Related to the second hypothesis (H2), the results also show that climate change attitudes and efficacy are socioeconomically stratified, with level of education being the strongest stratifying factor in all dimensions of people's climate change views and actions. However, while objective socioeconomic variables and one's political orientation are controlled for, the results show only limited support for the importance of subjective wellbeing resource since only where being permanently sick or disabled and having difficulties to cope with present income are associated with higher climate change concern.

7.1. Robustness checks

As our dependent variables are, in technical terms, of an ordinal nature, we employed ordered logistic regression models as a robustness check. All the results presented in Table 3 were robust concerning the

Table 2
Descriptive statistics of categorical variables.

	Freq.	Percent	Cum.		Freq.	Percent	Cum.
Domicile				**Country**			
A big city	7172	19.4	19.4	Austria	2010	5.4	5.4
Suburbs or outskirts of big city	3780	10.2	29.6	Belgium	1766	4.8	10.2
Town or small city	11,886	32.2	61.8	Checz	2269	6.1	16.3
Country village	11,511	31.2	93.0	Germany	2852	7.7	24.1
Farm or home in countryside	2606	7.1	100	Estonia	2019	5.5	29.5
Total	36,955	100.0		Spain	1958	5.3	34.8
Gender				Finland	1925	5.2	40.0
Male	17,540	47.4	47.4	France	2070	5.6	45.6
Female	19,451	52.6	100	Great-Britain	1959	5.3	50.9
Total	36,991	100.00		Hungary	1614	4.4	55.3
Household income (decile)				Ireland	2757	7.5	62.7
1st	3031	9.9	9.9	Italy	2626	7.1	69.8
2nd	3213	10.5	20.4	Lithuania	2122	5.7	75.5
3rd	3383	11.1	31.5	Netherlands	1681	4.5	80.1
4th	3419	11.2	42.7	Norway	1544	4.2	84.3
5th	3364	11.0	53.7	Poland	1694	4.6	88.8
6th	3223	10.5	64.2	Portugal	1270	3.4	92.3
7th	3243	10.6	74.8	Sweden	1551	4.2	96.5
8th	3113	10.2	85.0	Slovenia	1307	3.5	100.0
9th	2378	7.8	92.8	Total	36,994	100	
10th	2211	7.2	100.0	**Subjective economic hardship**			
Total	30,578	100		Living comfortably	11,849	32.4	32.4
Main activity				Coping	17,663	48.2	80.6
Paid work	19,063	51.7	51.7	Difficult	5477	15.0	95.5
Education	2903	7.9	59.6	Very difficult	1644	4.5	100.0
Unemployed, looking for job	1380	3.7	63.3	Total	36,633	100	
Unemployed, not looking for job	548	1.5	64.8	**Education level**			
Permanently sick or disabled	954	2.6	67.4	ISCED I , less than lower secondary	3569	9.7	9.7
Retired	9353	25.4	92.7	ES-ISCED II, lower secondary	6514	17.7	27.3
Community or military service	34	0.1	92.8	ISCED IIIb, lower tier upper secondary	5993	16.3	43.6
Housework, looking after children, othe	2260	6.1	98.9	ISCED IIIa, upper tier upper secondary	7427	20.1	63.7
Other	393	1.1	100.0	ISCED IV, advanced vocational, sub-degree	4755	12.9	76.6
Total	36,888	100		ISCED V1, lower tertiary education, BA level	3915	10.6	87.2
Cohabiting				ISCED V2, higher tertiary education, => MA level	4631	12.6	99.8
With husband/wife/partner	21,561	58.5	58.5	Other	77	0.2	100.0
Alone	15,282	41.5	100.0		36,881	100	
Total	36,843	100					

use of either linear or ordered logistic regression.

8. Discussion

The aim of this analysis was to focus on two areas that have not been sufficiently addressed in the existing literature on behaviourally-oriented sustainability science: 1) geographical (urban–rural and regional) variations in climate change attitudes and efficacy and 2) the extent to which socioeconomic position potentially affects people's cognitive capacity and wellbeing resources. In other words, this analysis focused on distinguishing between sources of both geographical and socioeconomic variance affecting various climate change views at the individual level.

First and foremost, the results of this analysis have demonstrated that the beliefs, concern, norm and actions taken to mitigate climate change are not uniform with respect to people's spatial or socioeconomic position. Instead, the concern, norm, and efforts at mitigating climate change are driven by more privileged segments of a society, i.e. those with a tertiary education and who are economically better off. Most importantly, all four specific climate change attitudes examined here, *climate change scepticism, climate change concern, pro-environmental personal norms and energy curtailment,* are stratified most apparently by education level. Additionally, reporting lower *pro-environmental personal norms* is associated with belonging to the lowest (1st and 2nd) income deciles. These results reflect the socioeconomically stratified levels of self-determination and efficacy, and they confirm earlier findings about the importance of education level. However, the role of household income in pro-environmental norms and energy curtailment is somewhat surprising compared to some earlier results. In fact, our results contradict those recently provided by Brieger (2019), as they call attention to the fact that those who rank themselves as members of a higher social class are reportedly more willing to give up money for the sake of stronger environmental protection measures. Our results show that belonging to the lowest income deciles (1st and 3rd) is associated with reports of greater *energy curtailment,* whereas belonging to the top two deciles has the opposite effect. This finding can be seen as a social position-related example of the value-action (or attitude-behaviour) gap, highlighting a dissonance between expressed concerns and actual behaviour.

In addition to being socioeconomically stratified, our results show that climate change attitudes and efficacy vary geographically mainly at the regional (macro) level. Concerning perceived (micro) urban–rural differences, climate change scepticism exhibits signs of an urban–rural gradient, with more scepticism among those living in a rural context. These results are also independent from one's political orientation. In parallel, higher levels of climate change concern and stronger personal norms for reducing climate change are also positively associated with living in a growing region experiencing positive population change since 2008. These results align with the SIMPEA framework, which suggests that responses to climate crises are a function of community (Fritsche et al., 2018), as well as Ryan and Deci's (2000) idea that our fundamental needs for autonomy, social relations and competence are context-dependent, as these building blocks of human functioning differ in, for example, urban versus rural and growing versus stagnating regions.

In our interpretation, these results reflect the increasing differences between urban versus rural, core versus periphery, and growing versus shrinking regions in contemporary Europe. We link the spatial divisions

Table 3
Estimates from hierarchical linear regression models.

Dependent variable	Climate change sceptism		Climate change concern		Pro-Environmental Personal Norms		Energy Curtailment	
Independent variables	B	p	B	p	B	p	B	p
Regional variables								
Share (%) of manufacturing employment in 2016	−0.005	0.851	−0.001	−0.001	0.121	0.382	0.045	0.316
Mean annual population change from 2008 to 2016	−0.001	0.781	**0.015**	0.015	**0.072**	0.000	0.003	0.731
Population density (inhabitants / km^2)	**0.007**	0.010	−0.009	−0.009	−0.021	0.210	0.003	0.662
Regional GDP in 2016 (EU = 100)	−0.048	0.149	0.051	0.051	−0.096	0.614	−0.031	0.603
GDP change from 2008 to 2016 (EU = 100)	0.001	0.441	0.003	0.003	−0.003	0.666	0.002	0.423
Domicile								
Big city	ref		ref		ref		ref	
Suburbs or outskirts of big city	−0.012	0.584	0.011	0.751	−0.075	0.297	−0.028	0.503
Town or small city	0.021	0.316	−0.044	0.156	−0.094	0.096	−0.011	0.725
Country village	**0.047**	0.012	**−0.056**	0.045	−0.076	0.226	−0.059	0.088
Farm or home in countryside	0.051	0.054	−0.055	0.175	−0.144	0.160	0.049	0.371
Education level								
ISCED I , less than lower secondary	**0.145**	0.000	**−0.286**	0.000	**−1.120**	0.000	**−0.398**	0.000
ES-ISCED II, lower secondary	**0.076**	0.001	**−0.218**	0.000	**−0.694**	0.000	**−0.281**	0.000
ISCED IIIb, lower tier upper secondary	**0.063**	0.002	**−0.127**	0.000	**−0.453**	0.000	**−0.183**	0.000
ISCED IIIa, upper tier upper secondary	**0.039**	0.029	**−0.089**	0.003	**−0.353**	0.000	**−0.186**	0.000
ISCED IV, advanced vocational, sub-degree	0.014	0.458	**−0.080**	0.008	**−0.145**	0.046	0.011	0.801
ISCED V1, lower tertiary education, BA level	−0.005	0.802	0.000	0.995	−0.085	0.159	−0.021	0.555
ISCED V2, higher tertiary education, => MA level	ref		ref		ref		ref	
Other	−0.022	0.881	−0.102	0.631	−0.720	0.066	−0.031	0.903
Main activity								
Paid work	ref		ref		ref		ref	
Education	−0.035	0.209	**0.140**	0.000	**0.202**	0.050	−0.076	0.094
Unemployed, looking for job	−0.011	0.716	0.055	0.218	0.103	0.358	0.121	0.063
Unemployed, not looking for job	0.000	0.997	0.061	0.448	0.072	0.683	0.021	0.791
Permanently sick or disabled	−0.064	0.085	**0.193**	0.000	0.245	0.139	0.038	0.572
Retired	0.030	0.098	**−0.064**	0.019	**−0.361**	0.000	**−0.099**	0.007
Community or military service	**−0.233**	0.003	0.120	0.366	−0.455	0.450	0.104	0.710
Housework, looking after children, others	−0.007	0.763	−0.014	0.662	0.081	0.407	−0.055	0.281
Other	−0.082	0.062	−0.022	0.763	−0.187	0.282	−0.075	0.410
Subjective economic hardship								
Living comfortably	ref		ref		ref		ref	
Coping	−0.002	0.900	0.002	0.918	−0.075	0.103	−0.013	0.592
Difficult	−0.011	0.521	**0.087**	0.011	−0.010	0.901	0.045	0.202
Very difficult	−0.060	0.055	0.074	0.243	−0.263	0.125	0.056	0.507
Household income (decile)								
1st	0.047	0.057	−0.065	0.103	**−0.342**	0.005	**0.165**	0.004
2nd	0.036	0.198	−0.062	0.107	**−0.279**	0.006	0.071	0.167
3rd	0.019	0.508	−0.040	0.265	−0.094	0.397	**0.100**	0.034
4th	0.033	0.290	−0.050	0.149	−0.116	0.203	0.005	0.908
5th	**0.056**	0.026	−0.020	0.613	−0.050	0.622	0.015	0.740
6th	ref		ref		ref		ref	
7th	0.041	0.172	**−0.075**	0.032	−0.010	0.918	−0.074	0.088
8th	0.048	0.064	−0.059	0.071	−0.067	0.397	−0.046	0.309
9th	−0.026	0.370	−0.038	0.274	0.006	0.951	**−0.124**	0.002
10th	0.020	0.429	−0.054	0.113	0.140	0.099	**−0.098**	0.046
Political identification								
Left-right scale	**0.028**	0.000	**−0.045**	0.000	**−0.090**	0.000	**−0.023**	0.000
Variance components: region	0.004		0.011		0.116		0.018	
Variance components: individual	0.374		0.736		5.332		1.232	
Observations	27,085		26,695		26,458		27,152	

Note 1, Country specific effects and sociodemographic controls (age, gender and cohabiting status) included to all models.
Note 2, P-values < 0,05 appear bolded.

in climate change attitudes to theoretical literature on the geography of discontent, political efficacy and anti-establishment attitudes (Rodríguez-Pose, 2018). Such discussions generally perceive the global urbanisation and the rural–urban migration patterns as not just a simple demographic process but also a powerful political-spatial imaginary that is both spatially and socioeconomically selective and exclusive (Luukkonen et al., 2021). Hence, viewed from the perspective of rural and peripheral populations, current climate change policies (and the dominance of highly elusive policy concepts and buzzwords such as 'sustainable urban development') can be seen primarily as urban projects driven by and concerning only the financially well off and educated population, who are 'urban' not only in terms of location but also culturally, reflecting the ideal model of citizenship in a knowledge-intensive (urban) society (e.g. Rossi, 2017; Moisio, 2018).

In empirical terms, the cross-sectional setting of this survey analysis is however subject to certain limitations when defining the structure of the variables and, as such, the causal order between attitudes and actions. In other words, the focus on attitudes and efficacy does not necessarily correlate with actual environmental impacts, which can also correlate strongly with place of residence. For example, empirical analyses have also shown that wealthier urbanites have larger carbon footprints, especially because of their greater consumption of products and services (e.g. Ala-Mantila et al., 2014). Additionally, income level – also when controlling for environmental identity or consciousness – is particularly predictive of a larger environmental impact (Moser and Kleinhückelkotten, 2018). However, it should be mentioned that local context and living environment might erect certain barriers toward engaging in environmental behaviours, barriers related to, e.g. physical or institutional factors. For example, the possibility to reduce one's carbon footprint or energy consumption is not equally distributed in

space; rather, it is facilitated or promoted by the built environment and neighbourhood characteristics (e.g. Graziano and Gillingham, 2014).

Additionally, the polarised patterns in objective (household) income needs further research. This analysis revealed a pattern where those in lower income deciles reported weaker pro-environmental norms but stronger engagement with energy curtailment behaviour. The mismatch between norms and actual behaviour is an important socio-economic detail, as a disconnect between climate change views and actions contribute to a sense of injustice regarding who is / ought to be contributing more to climate change mitigation efforts. In other words, this asymmetry reflects a tension regarding which socioeconomic groups are obliged to take pro-environmental actions and which groups have the recourses to act voluntarily. However, this polarization in the income/energy curtailment relationship could also be reflecting the fact that lower income groups receive more relative economic benefits from reduced energy use than more affluent groups. In any case, the results serve as a reminder that focusing simply on individual-level psychological determinants to account for pro-environmental actions is not enough; socioeconomic and geographical context define a person's capabilities to act according to her/his values and attitudes.

Finally, it needs to be noted that one potential reason for the existence of the observed urban–rural action gap (stronger norms not reflected in actions) could be partly due to self-selection, meaning that those with stronger environmental values have chosen to live in cities due to the better possibilities for, e.g. public transportation use (Kahn and Morris, 2009). This could further imply that those with stronger environmental values gather in cities, but at the same time they for various reasons have fewer possibilities to affect their energy use. If this is the case, then the increasing pace of urbanisation necessitates the fact that multiple solutions (ranging from urban planning to technological innovations and tracking and controlling one's energy use) are needed to enable and encourage further reductions in the actual environmental impacts of urban lifestyles.

9. Conclusion

This analysis has set out to contextualise the SIMPEA (Fritsche et al., 2018) framework along urban–rural gradient and has proposed a geographical analogy to the thesis by arguing that one source of collective identity and ingroup association is place of residence. As such, the cross-sectional associations based on individual and contextual level main effects serve as important groundwork and a guide to future research. More explicitly, future analysis aiming to contextualise the processes of where climate change attitudes emerge should do well to examine the moderating role of socio-spatial context. For example, future analysis based on hierarchical designs could focus on cross-level interactions where the level of, e.g. education, or the value climate in various regions would moderate the relationship between individual-level attributes and pro-environmental norms. Also, using high-quality panel data instead of a cross-sectional design would make it possible to draw causal conclusions about the aforementioned relationships.

To conclude, this analysis has provided a detailed description of general trends in urban–rural differences as well as the socioeconomic determinants of climate change attitudes in contemporary Europe. These findings should be used to frame future studies focusing on country-specific contexts and comparisons by also applying qualitative and mixed methods approaches. For example, the indicator regarding an individual's living environment used in this analysis could be considered as a proxy measure reflecting one's perceived 'place' in society in a more profound and multidimensional manner requiring more nuanced operationalisations and methodological plurality. As we have argued the dominant narrative of urbanisation as an inevitable 'global megatrend' paired with city-regional notes claiming all 'thorny problems' (e.g. climate change) at a global scale will be solved by and within cities and city regions (see, e.g. Kythreotis et al., 2020), as well as the appraisals of 'urban entrepreneurs' as the saviours of the knowledge-intensive economy (Moisio, 2018), are all likely to produce sentiments of both socioeconomic and spatial exclusion. Moreover, political geographers would suggest that urban–rural (or core-periphery) differences in levels of climate change scepticism, concern and efficacy discussed in this analysis are not just a simple consequence of socioeconomic deprivation and/or physical location but also reflect more profound sentiments of fear and concern about potential futures and socio-spatial imaginaries in which certain segments of society are becoming economically, culturally and politically irrelevant (Lizotte, 2019).

As such, these results have certain important policy implications. Both the framework and results of this analysis highlight the fact that environmental (including climate change) policies need to be better connected and aligned with social as well as regional policy (see Rodríguez-Pose, 2018). This is essential for making the urgently needed climate policies more acceptable in the eyes of everyone. Indeed, we already have evidence of weakening public support for decarbonisation policies, visible in such protest movements as the Gillet Jaune in France, which originated from a demand for more just fuel tax policies.

A recent EU-level step towards acting on the uneven consequences of climate policies is the Just Transition Mechanism, part of the European Green Deal, which aims to support those most impacted by the transition to a climate-neutral Europe. However, it is yet to be seen how the implications of marginalisation will materialise in the ways in which climate-related policies are implemented across the EU. To conclude, the effects of climate change and increasing social inequality between and within societies are the two most important threats to planetary well-being in the future, and integrating these perspectives is a crucial task for future analyses and policies.

Acknowledgments

The authors would like to thank three anonymous reviewers, the editorial team of Global Environmental Change and Aino Santavuori from the University of Helsinki for providing valuable comments on the earlier versions of the manuscript. Authors also acknowledge funding by the University of Helsinki (PROFI3 profiling grant) and by The Ella and Georg Ehrnrooth Foundation grant.

CRediT authorship contribution statement

Mikko Weckroth: Conceptualization, Methodology, Software, Formal analysis, Writing – original draft, Writing – review & editing. **Sanna Ala-Mantila:** Methodology, Writing – original draft, Writing – review & editing, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Abrahamse, W., Steg, L., 2009. How do socio-demographic and psychological factors relate to households' direct and indirect energy use and savings? J. Econ. Psychol. 30 (5), 711–720.

Ala-Mantila, S., Heinonen, J., Junnila, S., 2014. Relationship between urbanization, direct and indirect greenhouse gas emissions, and expenditures: A multivariate analysis. Ecol. Econ. 104, 129–139.

Arcury, T., Christianson, E.H., 1993. Rural-urban differences in environmental knowledge and actions. J. Environ. Educ. 25 (1), 19–25.

Árnadóttir, Á., Czepkiewicz, M., Heinonen, J., 2019. The Geographical Distribution and Correlates of Pro-Environmental Attitudes and Behaviors in an Urban Region. Energies 12 (8).

Babutsidze, Z., Chai, A., 2018. Look at me Saving the Planet! The Imitation of Visible Green Behavior and its Impact on the Climate Value-Action Gap. Ecol. Econ. 146, 290–303.

Ballas, D., Dorling, D., Hennig, B., 2017. Analysing the regional geography of poverty, austerity and inequality in Europe: A human cartographic perspective. Regional Stud. 51 (1), 174–185.

Barker, R., 1968. Ecological psychology: Concepts and methods for studying the environment of human behavior. Stanford University Press, Stanford, U.S.
Barr, S., Gilg, A., 2006. Sustainable lifestyles: framing environmental action in and around the home. Geoforum 37 (6), 906–920.
Belanche, D., Casaló, L.V., Rubio, M.Á., 2021. Local place identity: A comparison between residents of rural and urban communities. J. Rural Stud. 82, 242–252.
Berenguer, J., Corraliza, J.A., Martín, R., 2005. Rural-urban differences in environmental concern, attitudes, and actions. Eur. J. Psychol. Assessment 21 (2), 128–138.
Binder, M., Blankenberg, A.-K., 2017. Green lifestyles and subjective well-being: More about self-image than actual behavior? J. Econ. Behav. Organ. 137, 304–323.
Blake, J., 1999. Overcoming the 'value-action gap' in environmental policy: Tensions between national policy and local experience. Local Environ. 4 (3), 257–278.
Blankenberg, A.-K., Alhusen, H., 2018. On the determinants of pro-environmental behavior: a literature review and guide for the empirical economist. CEGE Discussion Papers No. 350.
Bouman, T., Verschoor, M., Albers, C.J., Böhm, G., Fisher, S.D., Poortinga, W., Whitmarsh, L., Steg, L., 2020. When worry about climate change leads to climate action: How values, worry and personal responsibility relate to various climate actions. Global Environ. Change 62, 102061. https://doi.org/10.1016/j.gloenvcha.2020.102061.
Brieger, S.A., 2019. Social identity and environmental concern: the importance of contextual effects. Environ. Behav. 51 (7), 828–855.
Chung, S.-S., Poon, C.-S., 2001. Characterisation of municipal solid waste and its recyclable contents of Guangzhou. Waste Manage. Res. 19 (6), 473–485.
Dijkstra, L., Poelman, H., Rodríguez-Pose, A., 2020. The geography of EU discontent. Regional Stud. 54 (6), 737–753.
European Social Survey ESS, 2020a. Sampling. Online source (Accessed 20.11.2020). Available at: https://www.europeansocialsurvey.org/methodology/ess_methodology/sampling.html.
European Social Survey ESS, 2020b. Guide to Using Weights and Sample Design Indicators with ESS Data. Online source (Accessed 20.11.2020). Available at: https://www.europeansocialsurvey.org/docs/methodology/ESS_weighting_data_1_1.pdf.
Essletzbichler, J., Disslbacher, F., Moser, M., 2018. The victims of neoliberal globalisation and the rise of the populist vote: A comparative analysis of three recent electoral decisions. Cambridge J. Regions Econ Soc. 11, 73–94.
Fielding, S., Hornsey, M., 2016. Social identity analysis of climate change and environmental attitudes and behaviors: insights and opportunities. Front. Psychol. 7, 1–13.
Flynn, R., Bellaby, P., Ricci, M., 2009. The 'Value-Action Gap' in Public Attitudes towards Sustainable Energy: The Case of Hydrogen Energy. Sociol. Rev. 57 (2_suppl), 159–180.
Fortmann, L., Kusel, J., 1990. New Voices, Old Beliefs: Forest Environmentalism Among New and Long-Standing Rural Residents. Rural Sociol. 55, 214–232.
Fritsche, I., Barth, M., Jugert, P., Masson, T., Reese, G., 2018. A Social Identity Model of Pro-Environmental Action (SIMPEA). Psychol. Rev. 125 (2), 245–269.
Garretsen, H., Stoker, J., Soudis, D., Martin, R., Rentfrow, P.J., 2018. The relevance of personality traits for urban economic growth: Making space for psychological factors. J. Econ. Geogr. Online first. doi: doi.org/10.1093/jeg/lby025.
Gimpel, J.G., Lovin, N., Moy, B., Reeves, A., 2020. The urban-rural gulf in american political behavior. Political Behav. 42 (4), 1343–1368.
Givens, J.E., Jorgenson, A.K., 2011. The effects of affluence, economic development, and environmental degradation on environmental concern: A multilevel analysis. Organ. Environ. 24 (1), 74–91.
Graziano, M., Gillingham, K., 2014. Spatial patterns of solar photovoltaic system adoption: the influence of neighbors and the built environment. J. Econ. Geogr. 15, 815–839.
Huddart-Kennedy, E., Beckley, T.M., McFarlane, B.L., Nadeau, S., 2009. Rural-urban differences in environmental concern in Canada. Rural Sociol. 74, 309–329.
Huggins, R., Thompson, P., 2017. The behavioural foundations of urban and regional development: Culture, psychology and agency. J. Econ. Geogr. 19, 1–26.
Huggins, R., Thompson, P., Obschonka, M., 2018. Human behaviour and economic growth: a psychocultural perspective on local and regional development. Environ. Plann. A 50 (6), 1269–1289.
Inglehart, R. (Ed.), 1990. Culture Shift in Advanced Industrial Society. Princeton University Press.
Inglehart, R., Welzel, C., 2005. Modernization, cultural change, and democracy: The human development sequence. Cambridge University Press, New York NY.
Jacquet, J., Dietrich, M., Jost, J., 2014. The ideological divide and climate change opinion: "top-down" and "bottom-up" approaches. Front. Psychol. 5.
Jones, R., Moisio, S., Weckroth, M., Woods, M., Luukkonen, J., Meyer, F., 2018. Re-conceptualising territorial cohesion through the prism of spatial justice: Critical perspectives on academic and policy discourses. In T. Lang (Ed.), "Local and regional development in times of polarisation. Re-thinking spatial policies in Europe", Brussels, Palgrave Macmillan.
Kahn, M., Morris, E., 2009. Walking the Walk: The Association Between Community Environmentalism and Green Travel Behavior. J. Am. Plann. Assoc. 75 (4), 389–405.
Kythreotis, A.P., Jonas, A.E.G., Howarth, C., 2020. Locating climate adaptation in urban and regional studies. Regional Stud. 54 (4), 576–588.
Langenbach, B.P., Berger, S., Baumgartner, T., Knoch, D., 2020. Cognitive resources moderate the relationship between pro-environmental attitudes and green behavior. Environ. Behav. Online first. 52 (9), 979–995. https://doi.org/10.1177/0013916519843127.
Lee, N., 2017. Psychology and the geography of innovation. Econ. Geogr. 93 (2), 106–130.
Lizotte, C., 2019. Where are the people? Refocusing political geography on populism. Political Geogr. 71, 139–141.
Lowe, G., Pinhey, T.K., 1982. Rural-urban differences in support for environmental protection. Rural Sociol. 47, 423–445.
Luukkonen, J., Weckroth, M., Kemppainen, T., Sirviö, H., Makkonen, T., 2021. Urbanization and the shifting conditions of the state as territorial-political community – study on the geographies of political efficacy. Transactions of the Institute of British Geographers, Online first https://rgs-ibg.onlinelibrary.wiley.com/doi/abs/10.1111/tran.12503.
Martin, R., 2015. Rebalancing the Spatial Economy: The Challenge for Regional Theory. Territory Politics Governance 3 (3), 235–272.
Manfredo, M., Teel, T., Henry, K., 2009. Linking Society and Environment: A Multilevel Model of Shifting Wildlife Value Orientations in the Western United States. Social Sci. Quart. 90, 407–427.
Mani, A., Mullainathan, S., Shafir, E., Zhao, J., 2013. Poverty impedes cognitive function. Science 341 (6149), 976–980.
Marino, E., Ribot, J., 2012. Special Issue Introduction: Adding insult to injury: Climate change and the inequities of climate intervention. Global Environ. Change, 22, 323–328.
Marquart-Pyatt, S.T., 2012. Contextual influences on environmental concerns cross-nationally: A multilevel investigation. Soc. Sci. Res. 41 (5), 1085–1099.
Marquart-Pyatt, S.T., 2008. Are there similar sources of environmental concern? Comparing industrialized countries. Social Sci. Quart. 89 (5), 1312–1335.
Marquart-Pyatt, S.T., Qian, H., Houser, M.K., McCright, A.M., 2019. Climate change views, energy policy preferences, and intended actions across welfare state regimes: Evidence from the European Social Survey. Int. J. Sociol. 49 (1), 1–26.
McCright, A.M., Dunlap, R.E., Marquart-Pyatt, S.T., 2016. Political ideology and views about climate change in the European Union. Environ. Politics 25 (2), 338–358.
McCright, A.M., Dunlap, R.E., 2011. Cool dudes: The denial of climate change among conservative white males in the United States. Global Environ. Change 21 (4), 1163–1172.
Mildenberger, M., Howe, P., Lachapelle, E., Stokes, L., Marlon, J., Gravelle, T., Österblom, H., 2016. The distribution of climate change public opinion in Canada. PLoS ONE 11 (8), e0159774. https://doi.org/10.1371/journal.pone.015977410.1371/journal.pone.0159774.g00110.1371/journal.pone.0159774.g00210.1371/journal.pone.0159774.g00310.1371/journal.pone.0159774.g00410.1371/journal.pone.0159774.g00510.1371/journal.pone.0159774.t00110.1371/journal.pone.0159774.t00210.1371/journal.pone.0159774.s001.
Milfont, T.L., Milojev, P., Greaves, L.M., Sibley, C.G., 2015. Socio-structural and psychological foundations of climate change beliefs. New Zealand J. Psychol. 44, 17–30.
Moser, S., Kleinhückelkotten, S., 2018. Good intents, but low impacts: diverging importance of motivational and socioeconomic determinants explaining pro-environmental behavior, energy use, and carbon footprint. Environ. Behav. 50 (6), 626–656.
Moisio, S., 2018. Geopolitics of the Knowledge-Based Economy. Routledge, London.
Poortinga, W., Whitmarsh, L., Böhm, G., Steg, L., Fisher, S., 2016. ESS round 8 question module design template: Public attitudes to climate change, energy security, and energy preferences. NSD - Norwegian Centre for Research Data for ESS ERIC, Bergen, Norway.
Poortinga, W., Spence, A., Demski, C., Pidgeon, N., F., 2012. Individual-motivational factors in the acceptability of demand-side and supply-side measures to reduce carbon emissions. 48, 812-819.
Poortinga, W., Whitmarsh, L., Steg, L., Böhm, G., Fisher, S., 2019. Climate change perceptions and their individual-level determinants: A cross-European analysis. Global Environ. Change 55, 25–35.
Poruschi, L., Ambrey, C.L., 2016. On the confluence of city living, energy saving behaviours and direct residential energy consumption. Environ. Sci. Policy 66, 334–343.
Rossi, U., 2017. Cities in Global Capitalism. Polity Press, Cambridge.
Rodríguez-Pose, A., 2018. The revenge of the places that don't matter (and what to do about it). Cambridge J. Regions Econ. Soc. 11, 189–209.
Ryan, R.M., Deci, E.L., 2000. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. Am. Psychol. 55 (1), 68–78.
Shove, E., 2010. Beyond the ABC: Climate change policy and theories of social change. Environ. Plann. A 42 (6), 1273–1285. https://doi.org/10.1068/a42282.
Stern, P.C., 2000. Toward a coherent theory of environmentally significant behavior. J. Social Issues 56, 407–424. https://doi.org/10.1111/0022-4537.00175.
Tremblay, K.R., Dunlap, R.E., 1978. Rural-Urban Residence and Concern with Environmental Quality: A Replication and Extension. Rural Sociol. 43 (3), 474–491.
Verplanken, B., Roy, D., 2013. "My Worries Are Rational, Climate Change Is Not": Habitual Ecological Worrying Is an Adaptive Response. PLOS ONE 8 (9).
Weber, E., 2017. Breaking cognitive barriers to a sustainable future. Nat. Human Behav. 1, 1–18.
Weckroth, M., Kemppainen, T., 2016. Human capital, cultural values and economic performance in European regions. Regional Stud. Regional Sci. 3 (1), 239–257. https://doi.org/10.1080/21681376.2016.1177467.
Wullenkord, M., Tröger, J., Hamann, K.R.S., Loy, L., Reese, G., 2021. Anxiety and Climate Change: A Validation of the Climate Anxiety Scale in a German-Speaking Quota Sample and an Investigation of Psychological Correlates. Online first: https://psyarxiv.com/76ez2/.