

Issue 26(4), 2026
ISSN: 1567-7141
DOI: 10.59490/ejtir.2026.26.4.8420

TU Delft | OPEN Publishing

Research Article

Conflict or shared concerns? Rural–urban differences in attitudes towards restricting car use in Belgium and Finland

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Keywords
car use
rural-urban divides
rural mobility
transport attitudes
environmental attitudes
survey experiments

Publishing history
Submitted: 17 October 2025
Revised date(s): 22 May 2026
Accepted: 28 May 2026
Published: 19 November 2026

Cite as
Mustikkamaa, S., & Gugushvili, D. (2026). Conflict or shared concerns? Rural–urban differences in attitudes towards restricting car use in Belgium and Finland. European Journal of Transport and Infrastructure Research, 26(4). *https://doi.org/10.59490/ejtir.2026.26.4.8420*

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Abstract

Reducing car use is essential for mitigating global warming. While several studies suggest that opposition from rural areas can hinder progress towards this goal, urban–rural differences in attitudes regarding transport policies remain insufficiently understood. In this article, we argue that attitudes towards car use across rural and urban areas are better characterized as shared concerns about rural mobility, rather than as a simple rural–urban conflict. We demonstrate this by analysing data from a survey experiment embedded in the European Social Survey Cross-National Online Probability Panel (CRONOS-2) in Finland and Belgium. Our research design enables us to assess the role of domicile in relation to policy framing, population density, political ideology, political trust and environmental values in shaping attitudes towards restricting car use. The results suggest that while reducing car use in rural areas remains contentious, restrictions in urban areas are more widely accepted. Moreover, attitudes regarding the restriction of car use appear to be more strongly associated with ideational factors than with rural–urban differences or spatial dispersion.

1 Introduction

Reducing emissions from private means of transport is a key component of climate change mitigation. Passenger road transport accounts for about a tenth of global emissions (Ritchie, 2020), and emissions from the transport sector are particularly large in Europe and North America (IPCC, 2023, p. 238). For passenger cars in the EU, emissions per kilometre of travel were around double that of buses in 2018, and more than four times the amount of emissions from rail travel (European Environment Agency, 2021). As car ownership is predicted to rise, so will emissions if no action is taken to reduce them. A shift from internal combustion engine cars to electric vehicles (EVs) can help offset some of the emissions, but as EVs also have climate and material footprints, choosing other travel modes and reducing kilometres driven remain key policy goals as well.

Many policies, including increased fuel taxes and congestion charges, have been proposed to reduce emissions from transport. However, potential opposition from rural areas has been put forward as a major hindrance to the successful implementation of these policies. In suburban and rural areas, reducing car use is particularly problematic since long-distance commuting by car is part of the normal daily routine. Studies show that compared with urban residents, people living in rural and suburban areas are less supportive of climate policies, especially fuel taxes (Arndt et al., 2023; Rhodes et al., 2017). They are also more likely to hold climate-sceptic views (Weckroth & Ala-Mantila, 2022) and more conservative socio-cultural values (De Vries, 2018). Each of these factors, if strong enough, could lead to a similar backlash against new transportation policies, as in the Gilets Jaunes protests in France in 2018.

Yet overall, there is no clear understanding of attitudes towards car use restriction policies, and whether attitudes towards them differ between rural and urban residents—or why. Some studies find that rural and urban residents in fact have relatively similar views on many key climate policies (Sivonen, 2023; Umit & Schaffer, 2020). Moreover, much of the earlier research has relied on cross-sectional regression methods which, although informative, may not fully capture the underlying causal mechanisms, or how policy framing affects attitudes. We argue that further insights are needed into whether people view reducing car use a legitimate policy objective, whether rural–urban differences exist in these attitudes, and if so, how significant these differences are compared with other, ideational cleavages.

In this article, we argue that the significance of rural–urban issues in climate attitudes is better described as shared concerns over rural mobility, than as rural–urban conflicts. We explore this proposition in three ways. First, we examine if support for reducing car use differs depending on whether it is framed as targeting urban or rural areas. Second, we test the effects of population density on attitudes towards car use. Third, we investigate the extent of rural–urban differences and how they compare with other standard sources of attitudinal cleavage, such as political ideology, environmental attitudes and political trust. We explore these questions by using comparative survey data from the CRONOS-2 dataset, a follow-up study to the European Social Survey (ESS) round 10. The CRONOS-2 data contains a survey experiment exploring support for reducing car use, fielded in Belgium and Finland, that has certain advantages over typical survey measurements. In particular, the randomly assigned experimental treatments specifically asked about reducing car use in cities and in the countryside, as well as without specifying the location. Moreover, the dataset facilitates a Most Similar Systems Design (MSSD), which allows us to compare an extremely population-dense country (Belgium) with one of the most sparsely populated countries in Europe (Finland), while in other respects these countries are very similar.

The paper is organized as follows. In the next section we review the literature on climate policy support and rural–urban divides, focusing particularly on policies that relate to transportation and personal vehicle use. We explain the theoretical and empirical gaps that our research can address and outline our general argument and three hypotheses. We then describe our methods, present

the empirical findings and summarize our main findings supporting the argument on shared concerns over rural mobility.

2 Reducing emissions from traffic: the role of public opinion

Many policy options exist to reduce CO2 emissions related to car travel. According to economists, fuel taxes provide a cost-effective way of reducing driving and related emissions. Taxes can speed up the transition to EVs, push people towards alternative modes of travel and adjust trip generation, destination and road choices (Jaccard, 2020; Stern, 2007). Road tolls have a successful track record in reducing congestion and traffic-related emissions in cities (Kuss & Nicholas, 2022; Odeck & Bråthen, 2002). The effectiveness of both taxes and road tolls can be enhanced by expanding options for public transport and improving cycling and pedestrian infrastructure, thereby providing people with more options to actually change their behaviour instead of simply paying the increased fees and taxes and sticking to their usual patterns of transportation. However, most of these options are of limited use for the countryside, as the low population density and longer distances make public transport and cycling less viable alternatives.

Putting these policies into action may involve confronting strong constituents of 'car-dependent transport systems', as outlined in a recent critical review by Mattioli et al. (2020). The review lists 'cultures of car consumption' as one of five such constituents, with cultures referring to 'habits, practices and routines', as well as beliefs, including perceptions of the 'good life', and political decisions related to personal car use. Cars not only enable a greater degree of personal mobility, but also ultimately lead to lifestyles, preferences and societal developments that require mobility, to a greater extent than can be provided by other modes of transport. Car use has also signified 'personal freedom' and autonomy, and links with broader cultural factors such as gender norms, both for men as a perceived necessity and as enabling stronger personal autonomy for women. For these reasons, many consider car use as a personal necessity, especially in advanced Western economies.

Against this backdrop, it is not surprising that attempts to reduce car use have often failed. In particular, increasing taxes on fossil fuels has provoked hostile reactions from the public in France, Australia and the US state of Washington (Crowley, 2017; Karceski, 2022; Mehling, 2018)—hostile enough to force politicians to backtrack on their policy plans or scrap existing tax schemes. Concerns about rural mobility and long commutes have been an important component in sparking such reactions from the public. In rural areas, it may be more difficult to reduce both the number of trips driven or to choose routes that consume less fuel (given the lack of alternative mode choices and routes), implying a stronger degree of car dependency. Issues of rural mobility and rural discontent can also feed into broader patterns of public protest and populist movements. The 'Revenge of the places that don't matter' thesis (Rodríguez-Pose, 2018) implies that persistent poverty and other regional economic issues in rural areas foster support for populist parties and opposition towards mainstream politicians. Right-wing populists in particular tend to see climate change as an issue of interest to the perceived global or urban 'elite', as opposed to the interests of rural people or 'the common man' (Aasen & Sælen, 2022; Schaller & Carius, 2019; Vihma et al., 2020). Thus, rural discontent often aligns with the views of right-wing populist parties and can contribute to their electoral successes.

In order to understand public opposition towards climate policies and reducing car reliance, researchers have examined attitudes towards fuel taxes (Fairbrother et al., 2019; Kallbekken & Sælen, 2011; Maestre-Andrés et al., 2019; Sælen & Kallbekken, 2011), congestion charges (Odeck & Bråthen, 2002; Schuitema et al., 2010), or a mix of taxes and other policies, such as low-carbon fuel standards and fuel efficiency requirements (Rhodes et al., 2017). These studies conclude that perceived unfairness, concerns over regressive effects (Maestre-Andrés et al., 2019), a lack of trust in politicians (Fairbrother et al., 2019; Hammar & Jagers, 2006; Rhodes et al., 2017) and a lack of

perceived environmental benefits (Kallbekken & Sælen, 2011) are some of the key factors that trigger opposition to increases in fuel taxes. On a positive note, some of these policies may become popular over time (van Wee et al., 2023). For example, a study by Schuitema et al. (2010) shows that public acceptance of the congestion tax in Stockholm rose after the implementation of the policy. Respondents were initially critical due to the high perceived financial costs of the policy, but reductions in congestion and decreased parking problems won many over. Similar results have been found for a congestion tax in Gothenburg (Börjesson et al., 2016; Nilsson et al., 2016), although support did not increase in the city of Bergen in Norway (Tvinnereim et al., 2020).

Given that mobility options differ so much between rural and urban areas, researchers have also examined rural–urban differences in attitudes towards transport policies (as well as towards climate and other environmental policies more broadly). In Western Europe, individuals living in rural and suburban areas are less supportive of climate policies, especially fuel taxes (Arndt et al., 2023). In Germany, attitudes towards the phasing-out of fossil-fuel powered cars became more positive in urban areas from 2017 to 2021, but residents in rural areas remain critical (Levi et al., 2023). Similarly, results from Canada show that people living in rural areas and those who rely on personal vehicles are more opposed to carbon taxes, probably due to the higher salience of transport costs and the lack of public transport options (Rhodes et al., 2017). In general, concentrated local costs can trigger strong opposition to policies, while broadly diffused, but less-salient benefits are less likely to generate policy support (Stokes, 2015).

Nevertheless, socioeconomic aspects are hardly the only factor producing rural–urban differences in climate policy support. Research has shown that place and rural (or urban) identities are also relevant, and are linked to attitudes towards climate policies. In the Netherlands, people living in rural areas tend to hold more conservative socio-cultural values than those in urban areas, independent of left-right political orientation, and this gap may be increasing over time (De Vries, 2018). Weckroth & Ala-Mantila (2022) show similar results across Europe, demonstrating that people residing in the countryside hold more climate-sceptic views and are less concerned about climate change, independent of their socioeconomic status or their political left-right orientation. Examining attitudes in Canada, Beck et al. (2016) argue that carbon taxes are perceived as overtly unfair towards rural areas up to the point that it becomes a myth, distinct from the actual economic effects of the tax.

Yet another set of studies show that in many instances, rural–urban differences are absent. This is the case for attitudes towards fuel taxes in Finland (Sivonen, 2023) and Sweden (Hammar & Jagers, 2006). Similarly, Umit & Schaffer (2020) find that even though support for carbon tax is lower in rural areas across Europe, the difference is small. Clearly, there are also matters on which both rural and urban residents agree. Moreover, research on road tolls suggests that self-interest—in terms of distances driven or frequency of having to pay the toll—matters for supporting road tolls, but much less than broader social norms, environmental attitudes or the perceived effectiveness of policies (Eliasson, 2014; Eliasson & Jonsson, 2011; Schade & Schlag, 2003). Broadly interpreted, such findings imply that rural residence, insofar as it links to self-interest via car use, may not be as consequential to support for transport policy as are broader values and perceptions of fairness and efficiency.

The uncertainty about the role of urban–rural domicile in forming attitudes towards reducing car use may originate from both the theoretical and the methodological limitations of existing studies. Theoretically, many studies expect rural–urban differences in transport policy preferences to reflect a wider rural–urban conflict, for example, in terms of rural political discontent with the 'urban elite' (Beck et al., 2016; Rodríguez-Pose, 2018) or in terms of conflicts rooted in self-interest (Umit & Schaffer, 2020). In this regard, people living in cities and in the countryside are seen as—or expected to be—in conflict or opposed to each other in terms of attitudes, without any shared views or concerns. Potentially, existing research may therefore overlook the possibility that urban respondents are also concerned about lives and livelihoods in rural areas. In addition, the urban–

rural dichotomy in car use appears less sharp once we take into account that urban residents are not confined only to their cities, as many of them actively use cars to travel both within and across countries. Therefore, their rational self-interest may not differ much from that of rural residents.

Methodologically, typical survey approaches involve asking respondents to express their agreement with or opposition to simple statements or policies, and answers are then compared across rural and urban respondents (see e.g., Umit & Schaffer, 2020; Weckroth & Ala-Mantila, 2022, that use data from the ESS). With such an approach, it may be difficult to explain why rural–urban differences do or do not arise. By contrast, survey experiments allow causal inference regarding how policy framing—such as whether policies target rural or urban areas—shapes support for a given policy (Mutz, 2011). Moreover, in a typical survey setting, it can be difficult to disentangle the effects of longer distances and low population density (spatial dispersion) from those of socioeconomic factors, political values and climate change perceptions. This is particularly the case if a survey is fielded in a single country. We argue that a carefully applied comparative framework—in our case, a Most Similar Systems Design (MSSD) (Anckar, 2008)—can overcome some of these challenges.

There are a few other avenues through which to expand the existing research. While the above research cites many reasons for rural–urban differences in attitudes towards climate change mitigation, there are several limitations to these studies when applied to transport policy and car use. Many of them measure more general climate attitudes or concerns, rather than attitudes towards policies that directly relate to traffic. Further, even when measuring policy support, the results could be explained by factors other than perceptions or attitudes towards car use as such. For instance, qualitative interviews on fuel taxes have shown that much of the opposition towards fuel taxes is motivated by the perception of tax being ineffective in actually reducing car use (Kallbekken & Aasen, 2010). This is a substantially different issue from, for instance, the cultural perception of a car as a personal necessity or a provider of personal freedom (see Mattioli et al., 2020). Asking what respondents feel about restricting car use—regardless of whether it is done via fossil-fuel taxes, road tolls or other policies—adds another angle to the subject.

Our study attempts to overcome some of these limitations, as well as connect the literature on fuel taxes, tolls and other transport policies with that on rural–urban differences in climate attitudes, as this is not always explicitly linked to transport issues. Overall, we argue that rural–urban attitudes regarding car use are better described as shared concerns over rural mobility, rather than a rural–urban conflict. In contrast to rural and urban residents forming their opinions from a narrow self-interest perspective, leading to conflicting views, we argue that these residents primarily agree on several aspects. Both rural and urban residents—not only rural residents themselves—may find that it is difficult to reduce car use in the countryside. By a similar logic, even urban residents (rather than only rural residents) may admit that it is possible to reduce car use in cities. We expect that these shared concerns will be particularly pronounced in countries with long distances and sparsely populated areas. Moreover, we acknowledge that attitudes may still differ between rural and urban areas, as a result of either self-interest, different perceptions and salience of issues between rural and urban residents, or different patterns of ideology, trust and values in cities and the countryside. While our empirical focus is on personal vehicle use, we suggest that the logic of shared concerns may also explain rural–urban attitudinal cleavages (or lack of them) in environmental politics more broadly.

To test this general argument – that rural-urban attitudes regarding car use are better described as shared concerns rather than rural-urban conflict –, we formulate three hypotheses. First, we examine whether policy support changes depending on whether it is framed as targeting rural or urban areas. We hypothesize that opposition to restricting car use will be the strongest if it is framed as targeting rural areas, the weakest if framed as targeting cities and in between if framed in general terms without specifying either urban or rural settings (Hypothesis 1). Second, we hypothesize that greater spatial dispersion (at the national level) will be associated with stronger

opposition to car restrictions in rural areas and when the location is not specified, but not in urban areas (Hypothesis 2). In other words, we expect that the issues of rural mobility are more salient in countries with greater spatial dispersion (in our case Finland) than in countries with high population density (in our case Belgium). Third, we expect that urban–rural domicile will be a weaker determinant of car use restrictions compared with ideational factors that previous research has shown to influence attitudes towards mobility/transport policies, including left-right political ideology (Syrda, 2025), biospheric values (Harring et al., 2017), awareness of the human cause of climate change (Brouwer et al, 2008) and political trust (Fairbrother et al, 2019; Hammar and Jagers, 2006) (Hypothesis 3). If this hypothesis is confirmed, we infer that there is not much conflict between rural and urban residents, and that attitudinal differences are likely due to other factors, supporting our claim of "shared concerns".

3 Data and methods

We use cross-sectional, nationally representative survey data from Finland and Belgium in the analysis. CRONOS-2 is a cross-national online panel survey conducted by the European Social Survey (ESS) consortium in 12 European countries. The respondents of the survey were people who participated in the tenth round of the ESS and agreed to be interviewed in follow-up studies. Accordingly, CRONOS-2 has an additional value through the ability to link it with the ESS data, thus allowing us to integrate multiple variables from the ESS.

In total, six rounds of CRONOS-2 were conducted at intervals of several weeks between November 2021 and March 2023. Four of these rounds used uniform questionnaires across all participating countries, whereas country-specific questionnaires were used in two rounds. Our dependent variables were fielded in the country-specific rounds in Finland and Belgium only (N=716 for Belgium, N=982 for Finland). The respondents in the ESS are recruited using a random probability selection method, which does not apply to CRONOS-2, as the opt-out from follow-up studies is not randomly distributed. To take account of this, we use a weight variable generated by the CRONOS-2 team that adjusts for the unequal probability of different categories of ESS respondents not participating in the follow-up studies. Thus, the results can be generalized at the national level in both countries.

Table 1 provides socio-demographic composition of the samples in the two countries. The most pronounced difference concerns the domicile of respondents; less than one in four Belgians (23%) lives in big cities or suburbs, whereas this proportion is considerably higher in Finland at 39%. While this may seem counter-intuitive, it reflects the fact that a large proportion of Belgians chooses to live in rural locations that are closely connected to bigger cities, thus enjoying the benefits of both having a house with a garden in a quiet location and a relatively short commute to work in a city. Belgian "country villages", as worded in ESS, are therefore likely reflecting locations that are relatively close to bigger cities. This is in contrast to Finland where rural residences and villages are much more isolated from bigger cities.

3.1 Dependent variable

The country-specific rounds of Belgian and Finnish surveys included an experiment that involved randomly dividing the respondents into three groups and presenting them with different formulations of a question about restricting car use:

- Car use should be reduced even if it limits people's mobility;
- Car use in the cities should be reduced even if it limits people's mobility;
- Car use in the countryside should be reduced even if it limits people's mobility.

These items form a population-based survey experiment (Mutz, 2011), allowing us to draw causal conclusions on the effect of framing (rural, urban, unspecified) on support for car restrictions. In

all versions, the answers were measured on a 5-point Likert scale, with 1 being 'strongly agree' and 5 being 'strongly disagree'. To make the interpretation more intuitive, we reversed the scores so that higher values imply stronger support for the policy proposals. Our primary dependent variable—general support for reducing car use—takes the value marked by a respondent irrespective of which treatment group she/he was ascribed to. However, to take account of the differences in question formulation, in each model where we use this dependent variable we simultaneously include two variables to control for experimental treatment group membership.

Table 1. Socio-demographic characteristics of Belgian and Finnish sample (%)

Socio-demographic characteristic	Belgium	Finland
Female	49.2	54.2
Male	50.8	45.8
Primary education or less	20.9	17.5
Secondary education	39	46.5
Tertiary education	40.1	36
Big city	13.1	27
Suburbs or outskirts of big city	9.6	12
Town or small city	24.3	29.6
Country village	47.5	14
Farm or home in countryside	5.5	17.5
Urban	22.7	39
Rural	77.3	61
Age (average)	48.6	50.2

3.2 Independent variables

Political ideology is measured on a standard left-right scale, where 0 corresponds to left and 10 to right. Biospheric values are measured through a Schwartz scale item, which asks to what extent the respondent resembles a person for whom 'it is important to care for nature and the environment'. Answer categories range from 1 (very much like me) to 6 (not like me at all) (Schwartz, 2012). We reversed the scores so that higher values indicate being more environment-friendly. To construct an index of political trust, we used five questions that asked to what extent the respondents trust the parliament, the legal system, police, politicians and political parties. Responses to these questions were measured on a scale from 0 (no trust at all) to 10 (a great deal of trust). The Cronbach's alpha score for these five items is 0.91, indicating a strong internal consistency and thus suitability for aggregation. The index represents the average of respondents' answers to the five questions. Perceived cause of climate change is a 5-point continuum, with answers ranging from climate change being caused 'entirely by natural causes' to 'entirely by human activity'.

Domicile is measured using a survey item indicating whether respondents lives in large cities or in the suburbs or outskirts of large cities (coded as urban), whereas respondents living in towns or small cities, as well as in country villages and farms, are coded as rural. For robustness tests, we also used the original five categories of domicile and an alternative three-fold classification (large cities, suburbs, and all other areas). The results are identical to those reported here and can be provided upon request. Education categories are coded low, middle, and high, based on ISCED education levels. Age is measured in years. our gender variables has two categories - female and male. The independent variables are generally associated with support for climate and transport policies, even if the effects of gender and age is not always large or consistent (Bergquist et al., 2022).

3.3 Analytical strategy

We employ several statistical techniques in the analysis, including t-tests, OLS regression models and dominance analysis. To compare attitudes in Finland and Belgium, we follow the logic of MSSD (Anckar, 2008) and use t-tests. Our reasoning is that among other similarities, both countries have a high GDP per capita (40,630 Euros in Belgium; 40,620 Euros in Finland in 2024 (Eurostat, 2026), a proportionally representative electoral system representing similar Western European political party families, high levels of education (see Table 1) and low levels of climate scepticism (e.g., in our sample, the share of people not at all worried or not very worried about climate change is 16% in Belgium and 12% in Finland). Even car ownership is similar: roughly 72% of households in Belgium owned at least one personal vehicle in 2023 (Statbel, 2025), whereas the figure was 74% for Finland in 2016 (OSF, 2020). However, the countries differ in one key respect: population density. Despite the majority of its resident reporting living outside big cities and suburbs, Belgium is one of the most densely populated countries in mainland Europe, with a population of 384 inhabitants per km² in 2022 when the data was collected (Eurostat, 2024). By contrast, Finland is the third-least population dense country in Europe, after Norway and Iceland, with a population density of only 18.3 people per km² in 2022. In line with the logic of MSSD, we argue that the differences in attitudes towards car reduction between the two countries will be primarily driven by differences in population density, and that other country-level factors are similar enough to not confound the analysis substantially.

Dominance analysis is not to cofound a statistical method used to assess how much each predictor contributes to the overall fit of a model, helping to rank predictors by importance (Budescu, 1993; Budescu & Azen, 2004; Luchman, 2021). It works by comparing predictors in pairs and evaluating how each one increases the explained variance when added to different subsets of the model. If one predictor consistently adds more explanatory power than another across all subsets, it is said to completely dominate the other; if it adds more on average, it shows general dominance. This technique allows researchers to build an importance ranking and determine each predictor's contribution to a model, both in absolute and relative terms.

4 Results

To test our first hypothesis, we fitted a model, with experimental treatments and the country variable being the only predictors (Table 2). The model explains 16% of the variance of the dependent variable (R2). In line with our expectations, we find that compared with the scenario where location is not specified, support for restricting car use drops substantively—by 0.7 points on a five-point scale—when the measure is presented as targeted specifically at rural areas. Conversely, support for restricting car use increases by 0.4 points if it is restricted to urban areas only. Therefore, support for the policy is indeed the lowest when aimed at rural areas, the greatest when targeting urban areas and in between if the location is not specified. Importantly, this pattern holds in both urban and rural areas (Figure 1). Moreover, on average, urban residents are more in favour of restricting car use in urban areas than in the countryside, providing clear evidence in favour of our argument on shared concern. So, even if urban residents are a little more supportive of restrictions in rural areas than rural residents, urban residents are even more in favour of restricting car use in cities.

Table 2. Effects of experimental treatment on support for car restriction, OLS regression

Dependent variable	Model 1 Car use restriction
Treatment urban	0.42***
Treatment rural	-0.70***
Belgium (ref: Finland)	0.16*
Cons.	2.78***

R2	0.16
N of observations	1311
RMSE	1.09

Notes: *** p < 0.001; ** p < 0.01; * p < 0.05

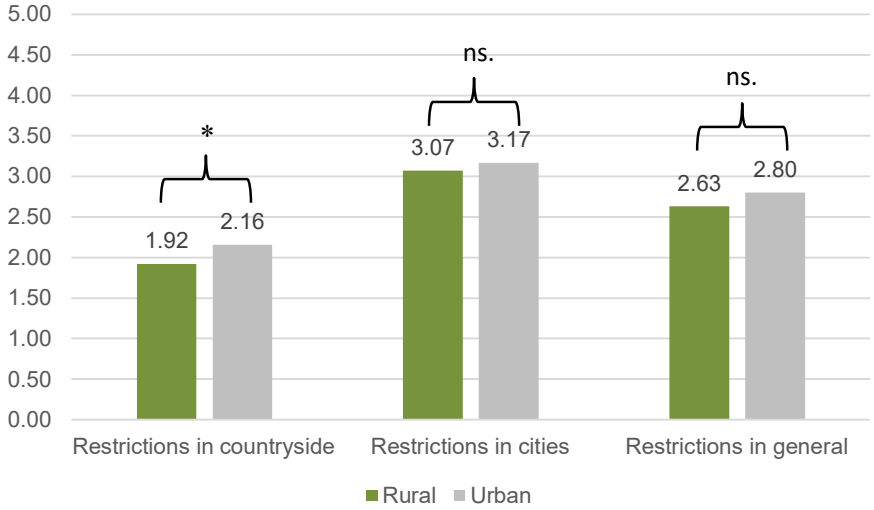


*Figure 1. Support for restricting car use in rural and urban areas. Notes: Two-tailed t-test. *p < .05, ns = non-significant.*

Our second hypothesis predicts that car restrictions in general (without specifying the location), and in rural areas, will be less popular in Finland due to the lower population density than in Belgium, but equally popular in both countries when the measure targets urban areas. The findings also confirm this hypothesis. The difference between Finns and Belgians in terms of support for car restrictions in urban areas is statistically non-significant (Figure 2). At the same time, framing restrictions as either targeting only rural areas or not specifying their geographical focus, shows important differences between the countries. In both cases, Finns are more opposed than Belgians, and this difference is statistically significant. Interestingly, the country difference is greater in the case of not specifying the location than in the case of rural location framing. For Belgian respondents, there also appears to be no difference between framing restrictions towards urban areas or as a general restriction (diff = 0.1; p = 0.45). However, Finns react much more positively to the urban framing than to the general framing (diff = 0.64; p < 0.001). One possible explanation is that Finns are more likely than Belgians to consider rural residents when responding, even if the location is not specified. In line with our MSSD logic, we can attribute these differences primarily to differences in population density between the two countries.

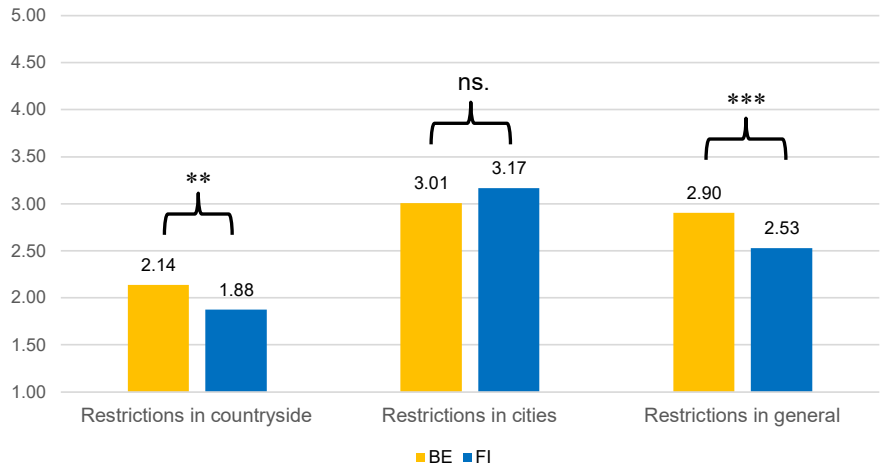


*Figure 2. Support for restricting car use in Belgium and Finland. Notes: Two-tailed t-test. *** p < .001, **p < .01, ns = non-significant.*

Our third hypothesis posited that domicile (representing mobility-related self-interest) is less important in forming opposition to restricting car use than ideational factors investigated in previous research. To test this, we fitted several regression models (Table 3). In model 2 we enter only the domicile variable together with the treatment and country variables, while in each of the models M3 to M6, we also add an ideational predictor. In the final model, M7, we enter all variables simultaneously, including the control variables. Compared with model M1, each model increases the explained variance of the dependent variable, though to a small extent; nevertheless, the final model, M7 increases the explained variance substantively, from 16% to 24%. Most importantly, the effect of urban–rural residence is small, but it retains statistical significance in all models except the final one, in which all predictors are entered simultaneously. This implies that the small difference in car restriction preferences between urban and rural dwellers cannot be explained by a single factor, such as rural residents being more right-wing or having lower political trust. Instead, it is a combination of multiple ideational differences between rural and urban residents that generate the small difference in support for reducing car use. It is also important to note that the effects of all the ideational predictors are in the expected direction: support for restricting car use is higher among those who are left-wing, have greater trust in public institutions, have stronger biospheric values and are more inclined to ascribe responsibility for climate change to human actions. Unlike these, socio-demographic factors – age, gender and education – appear to have no influence over people's support for restricting car use.

Table 3. Effects of urban–rural location, ideational factors and basic socio-demographic factors on support for restricting car use, OLS models

Independent variables	M2	M3	M4	M5	M6	M7
Treatment urban	0.42***	0.42***	0.42***	0.42***	0.45***	0.43***
Treatment rural	-0.69***	-0.71***	-0.71***	-0.71***	-0.71***	-0.74***
Urban (ref: rural)	0.21**	0.21**	0.16*	0.20*	0.18*	0.15
Biospheric values		0.23***				0.16***
Climate change belief			0.26***			0.19**
Left-right scale				-0.07***		-0.06**
Political trust					0.09***	0.08***
Belgium (ref: Finland)	0.20**	0.22**	0.21**	0.16*	0.36***	0.37***
Female (ref: male)						0.13
Secondary education (ref: primary)						0.14
Tertiary education						0.11
Age						0.00
Cons.	2.73***	1.58***	1.82***	3.10***	2.33***	0.77*

Independent variables	M2	M3	M4	M5	M6	M7
R2	0.16	0.19	0.19	0.18	0.18	0.24
N of observations	1311	1310	1310	1281	1311	1275
RMSE	1.09	1.07	1.07	1.08	1.08	1.04

Notes: *** p < 0.001; ** p < 0.01; * p < 0.05

To further explore the importance of urban–rural residence vis-à-vis the rest of the predictors, we conducted dominance analysis using the variables from Model M7. Table 4 shows the general dominance analysis results. The complete dominance analysis results are provided in Table 6 in the Appendix. The first column of Table 4 shows the absolute contribution of each predictor to the overall model fit statistic (R2), the second column transforms these into relative contributions by dividing them by the overall model fit statistic so that the sum of all predictors' contributions is 100%, and the last column provides the rank order. The results highlight the paramount importance of policy framing, as experimental treatment accounts for two-thirds of the total variation explained by the model. It also completely dominates every other predictor in the model (see Table 6 in the Appendix). The next strongest predictors, all of which are ideational (biospheric values, left-right scale, perceived cause of climate change and political trust) together account for only a quarter of the total explained variance. Urban–rural location is the third weakest predictor, contributing only two per cent to the total explained variance of the model. This is a strong proof that domicile has no direct substantive effect whatsoever on people's preferences regarding the restriction of car use.

Table 4. Dominance analysis of predictors of reduction in car use

Predictor	Dominance stat	Standardized dominance stat	Ranking
Left-right scale	0.01	0.06	4
Biospheric values	0.02	0.08	2
Political trust	0.01	0.03	6
Cause of climate change	0.02	0.07	3
Age	0.00	0.01	10
Urban-rural residence	0.00	0.02	8
Country	0.01	0.04	5
Experimental treatment	0.16	0.65	1
Gender	0.00	0.02	9
Education	0.00	0.02	7
Overall fit statistic = 0.24			

For a robustness test, we replicated dominance analysis for car restriction in urban, rural and unspecified locations (Table 5). Again, we find that domicile is a weak predictor of opinions about reducing car use, especially in urban areas and when the location of restrictions is not specified. It performs relatively better in relation to support for reductions in rural areas, being the third strongest predictor. However, in this case too, in relative terms it only accounts for 14 per cent of the total explained variation, further confirming its limited effect on the formation of opinions about car use restriction.

5 Conclusion

In this paper, we sought to explore whether a substantive urban–rural divide exists with regard to opinions about restricting car use, and if so, how this cleavage compares with other sources of controversy on the issue. Robust analysis of data from an original survey experiment allows us to draw a number of conclusions that have both theoretical and practical implications, and help to advance general knowledge about public support for reducing car use. Our results clearly indicate that the extent of urban–rural divides in this regard is marginal, and primarily driven by simultaneous differences in multiple ideational factors in the two types of domiciles, rather than self-interest. We do find that population density matters, but largely due to the fact that even those

residing in urban areas seem to be aware of car use and the realities of personal mobility in the countryside. These findings support our main argument that urban and rural attitudes towards policies to reduce car use (as well as climate policies in general) are not bound to be conflictual, but can also reflect shared concerns about the social effects. This echoes the findings of Bergquist et al. (2022), showing that general opposition to an environmental policy increases when it is perceived to have unfair implications for specific social groups. Importantly, shared concerns about rural mobility are more pronounced in more sparsely populated settings.

From a practical point of view, our findings offer a mixed message for environmental activists and policymakers. On the one hand, the findings highlight the importance of policy framing. This also implies that opponents can easily mobilize public opinion against general car use reduction policies—for example, fuel taxes or other distance-based charges—if they manage to frame them as particularly damaging for rural populations. On the other hand, the public appears more open to the idea of reducing car use in cities, irrespective of how densely populated the country is. Therefore, policies that specifically target urban areas—such as congestion charges or low emissions zones—have reasonable chances of gaining support from the general public in various national settings. Based on earlier research, this should especially be the case if their positive effects are easily visible, as in the cases of Stockholm and Gothenburg (Börjesson et al., 2016; Nilsson et al., 2016; Schuitema et al., 2010).

Table 5. Dominance analysis of predictors of reducing car use in urban and rural areas, and in unspecified locations

Predictor	Car restrictions in urban areas			Car restrictions in rural areas			Car restrictions in unspecified location		
	Dominance stat.	Standardized dominance stat.	Ranking	Dominance stat.	Standardized dominance stat.	Ranking	Dominance stat.	Standardized dominance stat.	Ranking
Left-right scale	0.01	0.12	4	0.01	0.11	5	0.03	0.20	3
Biospheric values	0.03	0.29	1	0.02	0.20	2	0.02	0.12	4
Political trust	0.02	0.19	3	0.01	0.11	4	0.01	0.04	7
Cause of climate change	0.02	0.20	2	0.01	0.08	6	0.04	0.25	2
Age	0.01	0.07	6	0.00	0.00	9	0.01	0.04	6
Urban–rural location	0.00	0.00	9	0.01	0.14	3	0.01	0.04	8
Country	0.00	0.02	8	0.03	0.27	1	0.04	0.25	1
Gender	0.01	0.08	5	0.01	0.07	7	0.00	0.01	9
Education	0.00	0.03	7	0.00	0.01	8	0.01	0.05	5
Observations	433			431			411		
Overall fit statistic	0.12			0.10			0.17		

Before concluding, we would like to acknowledge some limitations of our study that should be addressed by future research. A more fine-grained analysis will require datasets and additional variables that directly measure reliance on car use, for example, the frequency of car use, the distance covered on a regular basis and the ease of access to public transport. Similarly, experiments can be made more complex, with vignettes manipulating not only the targeted location, but also other dimensions of policies, such as their type and coerciveness. The wording used in our dataset also implies a reduction in mobility ('even if it limits people's mobility'), whereas more robust public transport and infrastructure should allow personal mobility to be maintained, even with reductions in car use. Given that the wording reminds respondents of mobility reductions, our item is more likely to underestimate, rather than overestimate, support for reducing car use.

Overall, our results suggest that the greater difficulties facing rural residents in reducing car use and finding alternative means of transport do not necessarily lead to rural–urban conflicts. Instead, even people residing in cities appear to be sensitive to the mobility needs of the rural population. Accounting for these concerns is key to building transport policies that garner enough popular support to be politically viable.

Funding

This work was supported by EU Horizon 2020 grant No. 871063 and Flemish Research Council (FWO) grant No. I000623N.

Data Access Statement

The European Social Survey CRONOS-2 country-specific rounds for Finland and Belgium are freely and publicly available from the European Social Survey Data Portal: https://europeansocialsurvey.org/data-portal (see 10.21338/cron2w6_be_e01 and 10.21338/cron2w3_fi_e01).

Contributor Statement

Conceptualization: Sami Mustikkamaa, Dimitri Gugushvili, Christoph Arndt; Data Curation: Dimitri Gugushvili; Formal Analysis: Dimitri Gugushvili; Investigation: Sami Mustikkamaa, Dimitri Gugushvili; Methodology: Dimitri Gugushvili, Sami Mustikkamaa; Visualization: Dimitri Gugushvili, Sami Mustikkamaa; Writing – Original Draft: Sami Mustikkamaa, Dimitri Gugushvili; Writing – Review & Editing: Sami Mustikkamaa, Dimitri Gugushvili.

Use of AI

During the preparation of this work, the authors did not use AI.

Acknowledgements

In the memory of Professor Christoph Arndt whose untimely passing has left us deeply saddened.
We are grateful to the participants of YHYS Colloquium 2024, Lappeenranta, Finland, and of Nordic ESPAnet 2025, Helsinki, for their useful feedback.

Conflict Of Interest (COI)

There is no conflict of interest.

References

Aasen, M., & Sælen, H. (2022). Right-wing populism and climate policies: Explaining opposition to road tolls in Norway. *Transportation Research Part D: Transport and Environment*, *105*. https://doi.org/10.1016/j.trd.2022.103222

Anckar, C. (2008). On the Applicability of the Most Similar Systems Design and the Most Different Systems Design in Comparative Research. *International Journal of Social Research Methodology, 11*(5), 389–401. https://doi.org/10.1080/13645570701401552

Arndt, C., Halikiopoulou, D., & Vrakopoulos, C. (2023). The centre-periphery divide and attitudes towards climate change measures among Western Europeans. *Environmental Politics*, *32*(3), 381–406. https://doi.org/10.1080/09644016.2022.2075155

Beck, M., Rivers, N., & Yonezawa, H. (2016). A rural myth? Sources and implications of the perceived unfairness of carbon taxes in rural communities. *Ecological Economics, 124*, 124–134. https://doi.org/10.1016/j.ecolecon.2016.01.017

Bergquist, M., Nilsson, A., Harring, N., & Jagers, S. C. (2022). Meta-analyses of fifteen determinants of public opinion about climate change taxes and laws. *Nature Climate Change, 12*(3), 235–240. https://doi.org/10.1038/s41558-022-01297-6

Brouwer, R., Brander, L., & Van Beukering, P. (2008). "A convenient truth": Air passengers' willingness to pay to offset their CO2 emissions. *Climatic Change, 90*, 299–313. https://doi.org/10.1007/s10584-008-9414-0

Budescu, D. V. (1993). Dominance analysis: A new approach to the problem of relative importance of predictors in multiple regression. *Psychological Bulletin*, *114*(3), 542–551. https://doi.org/10.1037/0033-2909.114.3.542

Budescu, D. V., & Azen, R. (2004). Beyond global measures of relative importance: Some insights from dominance analysis. *Organizational Research Methods, 7*(3), 341-350. https://doi.org/10.1177/1094428104267049

Börjesson, M., Eliasson, J., & Hamilton, C. (2016). Why experience changes attitudes to congestion pricing: The case of Gothenburg. *Transportation Research Part A: Policy and Practice, 85*, 1–16. https://doi.org/10.1016/j.tra.2015.12.002

Crowley, K. (2017). Up and down with climate politics 2013–2016: the repeal of carbon pricing in Australia. *WIREs Climate Change, 8*(3). https://doi.org/10.1002/WCC.458

De Vries, C. E. (2018). The cosmopolitan-parochial divide: Changing patterns of party and electoral competition in the Netherlands and beyond. *Journal of European Public Policy, 25*(11), 1541–1565. https://doi.org/10.1080/13501763.2017.1339730

Eliasson, J. (2014). The role of attitude structures, direct experience and reframing for the success of congestion pricing. *Transportation Research Part A: Policy and Practice, 67*, 81–95. https://doi.org/10.1016/j.tra.2014.06.007

Eliasson, J., & Jonsson, L. (2011). The unexpected "yes": Explanatory factors behind the positive attitudes to congestion charges in Stockholm. *Transport Policy, 18*(4), 636–647. https://doi.org/10.1016/J.TRANPOL.2011.03.006

European Environment Agency. (2021). *Rail and waterborne: Best for low-carbon motorised transport*. Publications Office of the European Union. https://doi.org/10.2800/817894

Eurostat. (2024). *Population density* [dataset]. Retrieved February 27, 2025, from https://doi.org/10.2908/TPS00003

Eurostat. (2026). *Real GDP per capita* [dataset]. Retrieved May 22, 2026, from https://doi.org/10.2908/SDG_08_10

Fairbrother, M., Johansson Sevä, I., & Kulin, J. (2019). Political trust and the relationship between climate change beliefs and support for fossil fuel taxes: Evidence from a survey of 23 European countries. *Global Environmental Change, 59*, 102003. https://doi.org/10.1016/j.gloenvcha.2019.102003

Hammar, H., & Jagers, S. C. (2006). Can trust in politicians explain individuals' support for climate policy? The case of CO2 tax. *Climate Policy, 5*(6), 613–625. https://doi.org/10.1080/14693062.2006.9685582

Harring, N., Jagers, S. C., & Matti, S. (2017). Public support for pro-environmental policy measures: Examining the impact of personal values and ideology. *Sustainability, 9*(5), 679. https://doi.org/10.3390/su9050679

Intergovernmental Panel on Climate Change (IPCC) (Ed.). (2023). *Climate Change 2022 - Mitigation of Climate Change: Working Group III Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press. https://doi.org/10.1017/9781009157926

Jaccard, M. (2020). *The Citizen's Guide to Climate Success: Overcoming Myths that Hinder Progress* (1st ed.). Cambridge University Press. https://doi.org/10.1017/9781108783453

Kallbekken, S., & Aasen, M. (2010). The demand for earmarking: Results from a focus group study. *Ecological Economics, 69*(11), 2183–2190. https://doi.org/10.1016/j.ecolecon.2010.06.003

Kallbekken, S., & Sælen, H. (2011). Public acceptance for environmental taxes: Self-interest, environmental and distributional concerns. *Energy Policy, 39*(5), 2966–2973. https://doi.org/10.1016/j.enpol.2011.03.006

Karceski, S. M. (2022). Efforts to tax carbon in Washington State. *PLOS Climate*, *1*(10), e0000076. https://doi.org/10.1371/JOURNAL.PCLM.0000076

Kuss, P., & Nicholas, K. A. (2022). A dozen effective interventions to reduce car use in European cities: Lessons learned from a meta-analysis and transition management. *Case Studies on Transport Policy, 10*(3), 1494-1513. https://doi.org/10.1016/J.CSTP.2022.02.001

Levi, S., Wolf, I., Sommer, S., & Howe, P. D. (2023). Local support of climate change policies in Germany over time. *Environmental Research Letters, 18*(6). https://doi.org/10.1088/1748-9326/acd406

Luchman, J. N. (2021). Determining relative importance in Stata using dominance analysis: domin and domme. *The Stata Journal: Promoting Communications on Statistics and Stata, 21*(2), 510-538. https://doi.org/10.1177/1536867X211025837

Maestre-Andrés, S., Drews, S., & van den Bergh, J. (2019). Perceived fairness and public acceptability of carbon pricing: A review of the literature. *Climate Policy, 19*(9), 1186–1204. https://doi.org/10.1080/14693062.2019.1639490

Mattioli, G., Roberts, C., Steinberger, J. K., & Brown, A. (2020). The political economy of car dependence: A systems of provision approach. *Energy Research & Social Science, 66*, 101486. https://doi.org/10.1016/J.ERSS.2020.101486

Mehling, M. (2018, December 10). *Emmanuel Macron's carbon tax sparked gilets jaunes protests, but popular climate policy is possible*. The Conversation. https://doi.org/10.64628/AB.c5vkuaugh

Mutz, D. C. (2011). *Population-Based Survey Experiments*. Princeton University Press.

Nilsson, A., Schuitema, G., Jakobsson Bergstad, C., Martinsson, J., & Thorson, M. (2016). The road to acceptance: Attitude change before and after the implementation of a congestion tax. *Journal of Environmental Psychology, 46*, 1–9. https://doi.org/10.1016/J.JENVP.2016.01.011

Odeck, J., & Bråthen, S. (2002). Toll financing in Norway: The success, the failures and perspectives for the future. *Transport Policy, 9*(3), 253–260. https://doi.org/10.1016/S0967-070X(02)00030-6

Official Statistics of Finland (OSF). (2020). *Households' consumption 2016*. http://stat.fi/til/ktutk/2016/ktutk_2016_2016-11-03_tie_001_en.html

Rhodes, E., Axsen, J., & Jaccard, M. (2017). Exploring Citizen Support for Different Types of Climate Policy. *Ecological Economics, 137*, 56–69. https://doi.org/10.1016/j.ecolecon.2017.02.027

Ritchie, H. (2020). *Cars, planes, trains: where do CO_2 emissions from transport come from?* Our World in Data. https://archive.ourworldindata.org/20251125-173858/co2-emissions-from-transport.html

Rodríguez-Pose, A. (2018). The revenge of the places that don't matter (and what to do about it). *Cambridge Journal of Regions, Economy and Society, 11*(1), 189–209. https://doi.org/10.1093/CJRES/RSX024

Sælen, H., & Kallbekken, S. (2011). A choice experiment on fuel taxation and earmarking in Norway. *Ecological Economics, 70*(11), 2181–2190. https://doi.org/10.1016/j.ecolecon.2011.06.024

Schade, J., & Schlag, B. (2003). Acceptability of urban transport pricing strategies. *Transportation Research Part F: Traffic Psychology and Behaviour, 6*(1), 45–61. https://doi.org/10.1016/S1369-8478(02)00046-3

Schaller, S., & Carius, A. (2019). *Convenient Truths - Mapping climate agendas of right-wing populist parties in Europe*. adelphi. https://adelphi.de/publications/convenient-truths

Schuitema, G., Steg, L., & Forward, S. (2010). Explaining differences in acceptability before and acceptance after the implementation of a congestion charge in Stockholm. *Transportation Research Part A: Policy and Practice, 44*(2), 99–109. https://doi.org/10.1016/j.tra.2009.11.005

Sivonen, J. (2023). Attitudes toward global and national climate policies in Finland – The significance of climate change risk perception and urban/rural-domicile. *GeoJournal, 88*, 2247–2262. https://doi.org/10.1007/s10708-022-10750-0

Statbel (2025). *Vehicles per household*. Retrieved June 26, 2025, from https://statbel.fgov.be/en/themes/mobility/traffic/vehicles-household

Stern, N. (2007). *The Economics of Climate Change: The Stern Review* (1st ed.). Cambridge University Press. https://doi.org/10.1017/CBO9780511817434

Stokes, L. C. (2015). Electoral Backlash against Climate Policy: A Natural Experiment on Retrospective Voting and Local Resistance to Public Policy. *American Journal of Political Science, 60*(4), 958–974. https://doi.org/10.1111/AJPS.12220

Syrda, J. (2025). Sharing the road: Political ideologies and political party preference as drivers of public transport infrastructure support. *Global Environmental Change, 92*. https://doi.org/10.1016/j.gloenvcha.2025.103012

Tvinnereim, E., Haarstad, H., Rødeseike, A., & Bugnion, V. (2020). Explaining public acceptance of congestion charging: The role of geographical variation in the Bergen case. *Case Studies on Transport Policy, 8*(3), 992–1001. https://doi.org/10.1016/J.CSTP.2020.04.007

Umit, R., & Schaffer, L. M. (2020). Attitudes towards carbon taxes across Europe: The role of perceived uncertainty and self-interest. *Energy Policy, 140,* 111385. https://doi.org/10.1016/j.enpol.2020.111385

Van Wee, B., Annema, J. A., & Van Barneveld, S. (2023). Controversial policies: Growing support after implementation. A discussion paper. *Transport Policy*, *139*, 79–86. https://doi.org/10.1016/j.tranpol.2023.05.010

Vihma, A., Reischl, G., Andersen, A. N., & Berglund, S. (2020). *Climate Change and Populism: Comparing the populist parties' climate policies in Denmark, Finland and Sweden*. Finnish Institute of International Affairs.

Weckroth, M., & Ala-Mantila, S. (2022). Socioeconomic geography of climate change views in Europe. *Global Environmental Change, 72*, 102453. https://doi.org/10.1016/J.GLOENVCHA.2021.102453

Appendix

Table 6. Complete dominance analysis

		Is dominated									
		Left-right scale	Biospheric values	Political trust	CC belief	Age	Urban-rural	Country	Experimental treatment	Gender	Education
Dominates	Left-right scale		0	0	0	1	1	0	-1	1	0
	Biospheric values	0		0	0	1	1	0	-1	1	1
	Political trust	0	0		0	0	0	0	-1	0	0
	Climate change belief	0	0	0		1	1	0	-1	1	1
	Age	-1	-1	0	-1		0	0	-1	0	0
	Urban-rural	-1	-1	0	-1	0		0	-1	0	0
	Country	0	0	0	0	0	0		-1	0	0
	Experimental treatment	1	1	1	1	1	1	1		1	1
	Gender	-1	-1	0	-1	0	0	0	-1		0
	Education	0	-1	0	-1	0	0	0	-1	0	