

Is it Greener on the Right Side?

Evidence on the Relationship Between Political Preferences and Environmental Behavior from Hungary

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Abstract

Environmentalism and pro-environmental behavior are widely thought to correlate with political attitudes. In particular, both empirical and anecdotal evidence suggests that left-leaning individuals have more favorable dispositions toward environmentalism and practices that are regarded as environmentally friendly. We test this hypothesis using election data from Hungary. The main novelty of our result is that we study not stated but revealed preferences. We concentrate on one particular environmental practice: waste separation. Surprisingly, we find that districts with a higher left-wing vote share engage less in waste separation on average. This result, although surprising, is consistent with previous survey-based evidence. We provide intuition on how to interpret and explain our findings.

Keywords: environmentalism, political attitudes, waste separation, social environment

1. Introduction

Environmental issues are at the forefront of public discourse throughout the world, but especially in developed countries. Climate change and other environmental problems often dominate discussions in international organizations, but there is also increasing demand for „sustainable living” at the individual level. Among other countries and organizations, the European Union has set out a list of ambitious environmental goals. The EU’s goal is to become fully climate neutral by 2050, i.e. to ensure that its economic activities on net do not on net generate greenhouse gas emissions. This is part of the European Green Deal, the objectives of which include decarbonizing the energy sector, making buildings more sustainable and energy efficient, introducing cleaner, cheaper, healthier forms of transport, „greening” the industry, and increasing the share of recycled materials.

Achieving such goals, however, may be difficult for at least two reasons. First, pro-environmental behavior can be regarded as a luxury good and certainly as a normal good. There are therefore differences across income groups regarding attitudes toward environmental issues (Barnett and Morse, 1963; Hirsch, 1976; Inglehart, 1971; Krutilla and Fisher, 1975; Pearce and Atkinson, 1993; Gamba and Oskamp, 1994).

The logic behind this view is that the poor have much more pressing concerns than worrying about sustainability, a phenomenon often referred to in the literature as „too poor to be green” (Martinez-Alier, 1995; van Kempen et al., 2009). As income increases quality of life considerations come to the fore: the relative value of clean water, air and natural treasures (parks, canyons, coral reefs, wildlife, etc.) increases. Higher income also creates the opportunity to offset and correct the negative environmental impacts of production.

Attitudes and behavior toward the environment are also often divided across political lines. Typically, left-wing individuals and parties are thought to favor more environmental protection and to engage in a greater level of (allegedly) environmentally friendly practices. Much of the empirical literature corroborates this view (see for example Dunlap et al., 2001; Feygina et al., 2010; McCright and Dunlap, 2011), with one notable exception. McCright et al. (2015) find that the left-right division on environmentalism applies less in Central and Eastern Europe, where right-leaning individuals actually seem to have a more favorable attitude to environmentalism; specifically, the authors report a greater willingness to pay to fight climate change. This evidence, however, is based on survey data. Our paper, in contrast, contributes to the literature by examining revealed preferences, through observation of actual behavior. In particular, we connect the vote shares of left- and right-wing politicians in Budapest districts with a particular thought-to-be environmentally friendly practice: waste separation. Waste separation is the most common household level action that Europeans undertake to address climate change, according to the Eurobarometer surveys. Furthermore, waste generation habits strongly indicate environmental attitudes. The literature suggests that the amount of waste collected separately is a good measure of pro-environmental attitudes (see Aphale et al., 2015; Grazhdani, 2016). Consistent with the findings of McCright et al. (2015) and contrary to widespread beliefs, we do not find a positive link between left-wing politics and pro-environmental behaviour. In fact, we find just the opposite.

In the following, we first review the relevant literature. Next, in Section 3, we present our methodology and data. Then, in Section 4, we present our results and in Section 5, discuss the findings. Finally, in the last section, we conclude.

2. Literature review

A great number of studies have attempted to identify the sociocultural and demographic drivers of waste generation (see, e.g. Lebersorger and Beigl, 2011; Parizeau et al., 2015; Talalaj and Walery, 2015; Ghinea et al., 2016), and many studies have examined factors influencing the success of waste separation programmes (Ibáñez et al., 2011; Best and Kneip, 2011; Owusu et al., 2013; Bernstad et al., 2013; Mbiba, 2014; Xiao et al., 2017; Oyekale, 2018; Manomaivibool et al., 2018). Moreover, a few studies have analyzed the interaction between the two (see Aphale et al., 2015 or Grazhdani, 2016).

Several studies have aimed to identify the drivers of waste generation. According to Saphores et al. (2006), the most commonly studied sociodemographic variables that play a role in waste generation are gender, age, education and income. However, apart from the latter, there is no consensus regarding the effects of these variables. Numerous studies have come to completely opposite conclusions concerning the relationship between waste generation and age, gender or education (Vining and Ebreo, 1990; Schultz et al., 1995; Jakus et al., 1996; Werner and Makela, 1998; Meneses and Palacio, 2005; Ekere et al., 2009; Sidique et al., 2010; Matsumoto, 2011). Regarding income, a recent study by Romano et al. (2019) showed evidence that average taxable income per capita is a potential determinant of municipal waste production, while a Chinese research based on a panel data of 285 Chinese cities for the period of 2006-2015 (see Gui et al, 2019) found that regions with high income levels tend to produce more municipal solid waste. It appears that in the case of waste generation one of the most important and repeatedly identified drivers is the income level (see also Johnstone and Labonne, 2004; Talalaj and Walery, 2015).

The phenomenon of „too poor to be green” provides a good starting point for analyzing pro-environmental attitudes. Direct and indirect evidence of the phenomenon can be found in a number of studies on waste separation and waste management. For example, a study conducted in Ghana by Owusu et al. (2013) found that cash incentives had no statistically significant effect on waste separation among poor households. The economic reward offered was not enough to encourage the poor to collect waste separately, as their circumstances (lack of space) prevented them from doing so. In contrast, the financial incentive was effective for wealthier, more affluent households, as most had detached or semidetached houses with backyards and/or gardens with space for separate containers. Moreover, households with considerable extra space were more willing to collect waste separately even without additional rewards. These results are in line with the findings of Furedy and Lardinios (2000) that people living in crowded dwellings are unlikely to be interested in sorting at source even if they are provided with free bins. Similarly, Bennagen et al. (2002) showed that households with a backyard or garden are more likely to participate not only in waste separation but also in other recycling activities. It seems logical to assume that environmental awareness becomes a concern for people only beyond a certain income level, and that this level has a sociocultural aspect (Salkie et al., 2001;

Johnstone and Labonne, 2004; van Beukering et al., 2009 and Pampel, 2014). It is, however, important to emphasize again, that high-income is not necessarily associated with a lower environmental footprint; therefore, the relationship between income and environmentalism is ambiguous (Pampel, 2014).

In addition, several studies have demonstrated the relevance of political attitudes for pro-environmental behavior. In a highly comprehensive study Sánchez et al. (2016) investigated the attitudinal, sociodemographic and political factors that affect the environmental practices of Spanish households. The authors analyzed the relationship between certain factors, including age, gender, education and political affiliation, and environmentally conscious behavior, such as waste separation, water saving, and the purchase environmentally friendly products. The authors found that left-wing attitudes have a positive influence on both environmentally conscious consumption and environmentally conscious purchasing behavior. This is in line with a number of similar results, such as those by Witzke and Urfei (2001), Torgler and Garcia-Valinas (2007) and Vera-Toscano et al. (2008), who also concluded that people with a left-wing or liberal orientation are more sensitive to environmental issues.

Gromet et al. (2013) investigated how political preferences influence attitudes toward energy efficiency and energy-saving behavior. They conducted two studies in the United States. In the first study, the authors examined whether attitudes toward energy efficiency are polarized along political ideology. In the second study, they examined in a real-choice context how this polarization influences demand for energy-efficient products. The first study demonstrated that people with a more conservative or right-wing political ideology were less supportive of the development of more energy-efficient technologies. The second study showed that conservative individuals were willing to buy energy-efficient products (in this case, a more expensive light bulb) on financial grounds but that when energy efficiency was framed in a pro-environmental context (as indicated by a label), their willingness to buy was significantly reduced. In other words, more conservative consumers were less likely to buy the same energy-efficient light bulb at the same price if it had a label saying that the light bulb is environmentally friendly. Several studies have found similar results (Hu et al., 2017 or Fobissie, 2019). Caprara et al. (2006) argued that conservatives place more importance on stability and maintaining the status quo, while people with more liberal ideologies place more importance on civil rights and social issues. This suggests that the shift to sustainability is more unpopular among conservatives (Costa and Kahn, 2013; Unsworth and Fielding, 2014) because it threatens the functioning of the current system (Jost et al., 2003; Antonio and Brulle, 2011). On the other hand, Morrison and Miller (2008) suggested that liberals, and left-leaning individuals prioritize issues related to the environment and sustainability and Janoff-Bulman et al. (2009) and Kellstedt et al. (2008) claimed that they also place greater importance on solving environmental problems that will seriously affect future generations.

Political attitudes were also found to be important in a comprehensive European study. McCright et al. (2015) analyzed survey data from 14 Western European and 11 former communist Central and Eastern European countries and concluded that there is much greater support for fighting climate change among individuals with left-wing ideologies in Western Europe. Interestingly, however, the same is not true for postcommunists Central and Eastern European countries. The authors found that right-wing individuals in those countries were actually more likely to report a high willingness to pay to combat climate change. One reason

for this, the authors speculated, is that the definition of political left and right in postcommunist countries is different from than in Western Europe, and that climate change is not a pivotal issue in the former Eastern bloc. However, sustainability and the fight against climate change have since become central to the agenda of left-wing parties and movements, so it is worth reexamining the relevance of political ideology for environmental attitudes in Central and Eastern Europe.

3. Data and methodology

We examine the relationship between political preferences and sustainability-related behavior. To operationalize these concepts, one may conduct a survey and employ regression analysis as an analytical tool (see Caprara et al., 2006; Hu et al., 2017). However, surveys connected to political preferences are often not sufficiently accurate, most likely due to nonresponse bias and reporting of false preferences (Shaiko et al, 1991; Enns et al., 2017). Similar problems might arise with sustainability-related questions where social desirability bias may be present (see e.g. King and Bruner, 2000). To avoid these biases, we follow a different, revealed preference-based approach and use administrative data.

We measure political preferences using vote shares from municipal elections in Budapest. More specifically, we use the vote distributions of the mayoral candidates in municipal elections in 2014 and 2019. Naturally, there are many factors influencing the election of a mayor, and several of them are connected to the candidate itself and not to the party nominating him or her. However, since in Budapest voters can cast their votes only for nominees and not directly for parties, we cannot rely on parties' vote shares. However, in a large city, such as Budapest, there are no strong personal connections between district mayors and citizens, and party preferences seem to determine citizens' choices in elections. Hence, the vote shares of left- and right-wing candidates tend to mirror what would be party vote shares under a party vote system.

Pro-environmental attitudes can be measured by involvement in different activities. One possible such activity that can be measured at the district level and that might reveal environmental preferences is waste separation. Aphale et al. (2015) and Grazhdani (2016) suggested that environmentally conscious individuals are more likely to engage in waste separation. The amount of waste collected separately and the recycling rate (the proportion of the separated waste within the total amount of waste) can both be appropriate indicators of waste separation. Naturally, an increase in the volume of selective waste could reflect a general increase in waste production. Since, however, the volume of communal waste did not increase in the analyzed period (from 2013 to 2020), but the waste collected separately increased substantially (see Figure 1), we use the amount of waste collected separately as a proxy for pro-environmental behavior in our analysis.

The election-related data were obtained from the National Election Office. We used data only for the 2014 and 2019 municipal elections since curbside waste separation has been available in the entire area of Budapest only since 2013¹.

¹ The service is completely free of charge for the public, with no extra charge for either the collection bins or the collection of waste.

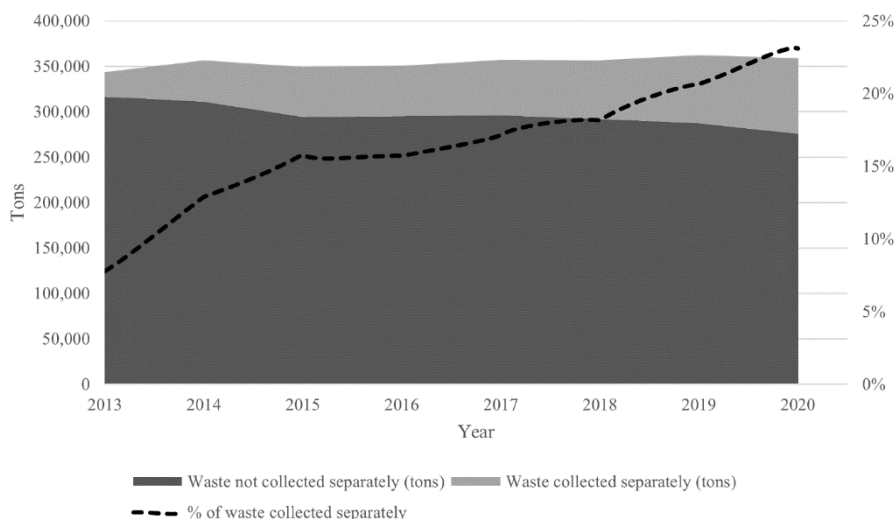


Figure 1: Amount of waste generated and collected separately in Budapest.
Source: Hungarian Central Statistical Office.

Municipal elections are held every five years. Data on waste collected separately were provided by the company responsible for waste collection and management in Budapest. The dataset includes the monthly amount of paper and plastic waste collected separately at the district level from April 2013 to August 2020. Since April 2013, the curbside collection system has been available throughout Budapest; thus, changes in volume can no longer be caused by the expansion of the collection system, only by the changing habits of the households. It is worth noting that data on voting aggregate individual choices while data on waste generation aggregate household-level behavior. However, it is well established that political preferences within households tend to be relatively homogeneous (Zuckerman et al., 2005; Alford et al., 2011; Hatemi, 2014). To make the waste generation data proportional to the population of the district, we calculated per capita values using population data published by the Hungarian Central Statistical Office. As waste generation is largely determined by income (see Johnstone and Labonne, 2004; Talalaj and Walery, 2015), it is necessary to control for the latter. District-level income data are not available; therefore, we used the average (real) rental price per square meter of residential units as a proxy variable in the analysis. This series of monthly data was obtained from the website Ingatlannet.hu. Unfortunately, other relevant data are not available on district-level; therefore, it is not possible to introduce other control variables to the model.

The time horizon of our analysis runs from 2013 to 2020. This time window is particularly relevant because sustainability as an issue became significantly more important to Hungarian citizens after 2015 as indicated by the Eurobarometer climate change surveys (see Figure 2). The descriptive statistics of the dataset used in this study are shown in Table.

Since in our panel dataset political attitudes are measured only twice (2014 and 2019), waste separation and rental prices are also aggregated to district-level averages for 2013-2014 and 2018-2019. We use two-year intervals instead of one month data, as the latter might be affected by one-time events. As a robustness check, we performed the same analysis using data only for 2014 and 2019.

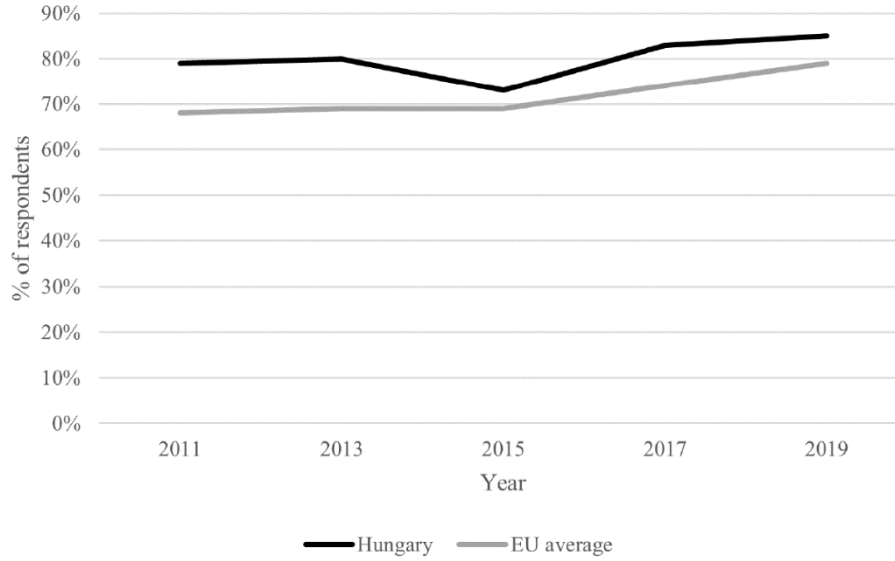


Figure 2: Share of respondents indicating climate change as a serious problem.
Source: Eurobarometer surveys on climate change. (<https://europa.eu/eurobarometer>)

In a panel dataset, one must consider the fact that the same data points (in our case districts) were observed for multiple periods. Since every district has time-independent characteristics, these have to be considered in the regression model. Since these characteristics (for example, level of education, household size) might be correlated with the explanatory variables, a fixed effect model that can filter out this type of endogeneity and provide consistent estimates is appropriate.

Variable	Obs.	Mean	St. dev.	Median	Min.	Max.
Vote share of the right-wing parties (%)	46	50.2	10.4	51.4	18.1	71.0
Vote share of the left-wing parties (%)	46	46.0	11.7	46.3	6.6	81.9
Waste collected separately (kg)	1,977	71,981	41,776	64,900	560	228,630
Population (capita)	2,047	76,221	33,323	76,182	21,894	152,620
Real rental prices (HUF/m ²)	1,973	2,779	867	2,782	212	5,582

Table 1: Descriptive statistics of the variables (district-level data)

The estimated equation is as follows:

$$Left_{it} = \beta_0 + \beta_1 Waste_{it} + \beta_2 RentalPrice_{it} + 2019_t + u_{it}$$

where $Left_{it}$ refers to the vote share of the left-wing candidates in election t in district i , $Waste_{it}$ is the per capita waste collected separately in district i around election t ,

$RentalPrice_{it}$ is the per-square-meter rental price in district i around election t , 2019_t is a dummy variable for the election of 2019 that is included to control for the overall changes in political preferences from 2014 to 2019, and u_{it} is the idiosyncratic error term. Finally, standard errors are clustered by district.

4. Results

When we compare the results of the two elections considered, it is evident that the left-wing parties have gained ground. While a left-leaning mayoral candidate won in only five districts (out of 23) in 2014, 14 districts were won by a left-wing candidate in 2019. At the same time, the issue of sustainability has become more important to citizens (see Figure 2).

This might suggest that pro-environmental behavior and political preferences are connected to each other, as is observed in most Western countries. However, Figure 3 tells a different story. Right-wing parties in Budapest generally lost a higher percentage of votes in districts where waste separation did not increase substantially, and their support declined less in districts where waste separation gained momentum. This picture is confirmed by the regression analysis (see Table 2).

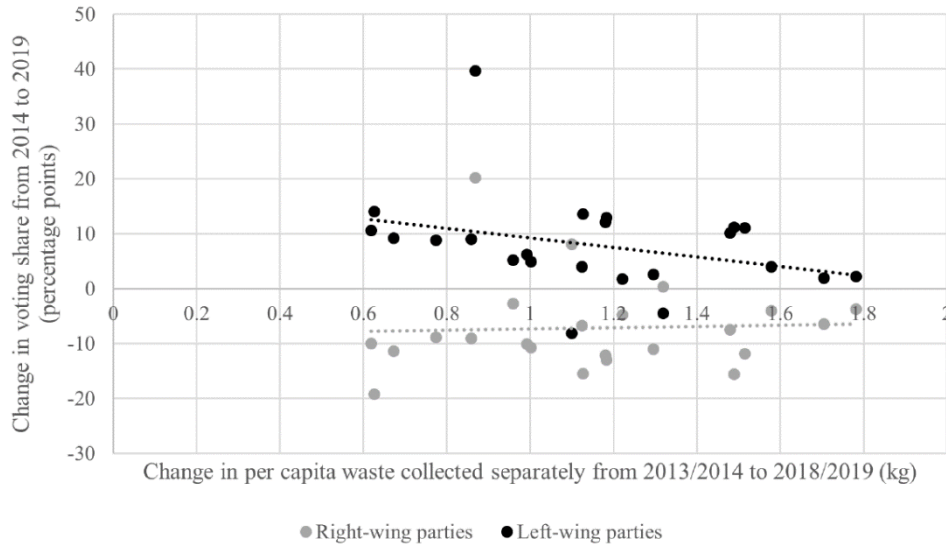


Figure 3: Change in vote shares and waste collected separately in the 23 districts of Budapest.

Explanatory variables	Original model (two-year data)		Robustness check (one-year data)	
	Estimated parameter	Standard error	Estimated parameter	Standard error
Waste separation	-8.709**	4.180	-6.790**	2.627
Real rental price	0.004	0.006	0.008	0.008
Year 2019	13.058	8.787	4.983	7.888
N	46		46	
Number of districts	23		23	
R^2	0.875		0.889	

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed test).

Table 2: Fixed effects regression results (dependent variable: vote share of left-wing parties). Standard errors are clustered by district.

Given that the original and robustness check models do not show substantial differences, we can conclude that the results presented are robust. Rental price does not correlate with vote share, as this variable proves to be insignificant in both regressions (the p -values are 0.461 and 0.341, respectively). Surprisingly, but in line with Figure 3, the positive shift in pro-environmental behavior seems to have favored right-wing parties. The estimated waste separation parameter is negative; i.e. in districts where waste separation increased more, the increase in the vote share of left-wing parties was lower.

5. Discussion

Our results can be interpreted in various ways. First, it could be that certain „environmentally conscious” practices are so uncontroversial in Budapest (or generally in Hungary) that it is hard to create political divisions along them. This in itself, however, in itself does not explain why right-leaning voters appear to be more environmentally conscious. Another possible explanation might be that Hungarians care *less* about the environment than citizens in Western Europe, and hence neither political side leverages the issue, resulting in the traditional left-right divide over this issue being irrelevant. However, according to the already mentioned Eurobarometer surveys, Hungarians seem to care *more* about the environment than the average EU citizen (Figure 2). Furthermore, even if this argument holds, it still does not explain the difference that we find in our study.

Apart from environmental attitudes, there may be other factors that drive our results. First, as research suggests, it is possible that right-leaning individuals are more obedient toward authority (see e.g. Graham et al., 2009), and since waste separation is compulsory they comply with it as much as possible.² Another possible explanation could be that peer pressure that might incentivize waste separation is stronger in low-density neighbourhoods (see Brueckner and Largey, 2008), which happen to be the more right-leaning areas in Budapest. Among others, Ari and Yilmaz (2016), Videras et al. (2012) and Welsch and K uhling (2016) provide evidence on social interaction effects in pro-environmental behavior. Individuals are more likely to collect waste separately or engage in other behavior that is regarded as environmentally friendly when their friends or neighbours do so. Likewise, individuals are less likely to display pro-social attitudes, including environmental consciousness, when others are less pro-social, or when others do not monitor their behavior. Thus, any initial difference in environmental attitudes between individuals of different political persuasions is likely to be magnified by social multiplier effects (see e.g. Glaeser et al., 2003). Even if left and right leaning voters are equally environmentally conscious, greater peer pressure in one group can lead to observed differences in pro-environmental behavior and attitudes.

A higher level of human capital, such as greater educational attainment, could also contribute to pro-environmental behavior. Although this could be due to selection effects, several studies (e.g. Mayer, 2015; Ponce et al., 2019, Hoffmann and Mutarak, 2020) found that

² It is important to note that although waste separation is compulsory, enforcing the rule is rather difficult, if not impossible.

there is likely a causal relationship: more education increases environmental consciousness. This could be due simply to more information being available to more highly educated individuals but also due to an attitude change in response to education. However, more highly educated individuals are more likely to be wealthier and live in wealthier neighbourhoods. By controlling for rental prices, we partially capture this effect.

Perhaps the most promising explanation for our results is that in postcommunist countries, being environmentally friendly is less connected, if at all, to left-wing politics. First, socialist regimes built up many „dirty industries”, which has limited the extent to which the connotations of left-wing politics and environmentalism could align. Second, according to the 2019 special Eurobarometer report on climate change, climate change is viewed as a more serious problem by younger respondents than by older respondents. The left-wing social environment, consisting of older left-wing voters and politicians socialized in the communist regime, has not constituted a fertile ground for environmentalist ideas. This reasoning is supported by the European Social Survey Round 9 data according to which there is a significant correlation between age and political attitudes. However the sign of the correlation is different for Western and Eastern Europe, with a coefficient of 0.085 for Western Europe and -0.078 for the postcommunist bloc, where the negative value indicates a more left-leaning orientation. That is, while younger people are more likely to have a left-leaning orientation in Western Europe, this age cohort is more likely to be right-leaning in Eastern Europe. On the other hand, right-wing political narratives, defined primarily by cultural identities, often harkened back to the period before the Second World War, where a reverence for nature has often been a key element of right-wing community organization (see e.g. Jehlicka and Jacobsson, 2021). This reasoning is consistent with the findings of McCright et al. (2015). They also suggested that left and right have different meanings in Western and Eastern Europe.

Our main contribution to the literature on political preferences and environmental attitudes is that we do not use survey data, unlike most studies in the literature. Answers to survey questions might not reflect actual behavior; hence, we have chosen to rely not on stated but on revealed preferences. It is important to note, however, that the simple observation that an individual collects waste separately does not necessarily mean that she is more environmentally conscious *in general*. It does mean, however, that it is important enough for her to act in a pro-environmental manner, at least in the case of waste collection. This may be due to internal motivation, social pressure or both. Whatever the explanation might be, it does seem that pro-environmental attitudes are associated less with left-wing politics in Hungary than in most Western countries.

One objection to our argument could be that while left-leaning voters engage less in waste separation, they may produce less waste in the first place. However, for this to be true, a substantial number of households in left-leaning districts would have to produce less waste for the difference to be measurable at the district level, and at the same time, a substantial number of households in right-leaning districts would have to produce more waste, because the total amount of waste has been mostly constant at the city level, as we have already pointed out earlier (Figure 1). This possibility is unlikely, as waste generation is driven mostly by income, and the trends in income do not show deviations across districts in the period considered. Furthermore, and even more importantly, if left-leaning individuals have cut their waste generation, they would have been more likely to decrease their nonrecyclable waste, which

could have led to an increase in not only the ratio but also the volume of selectively collected waste. Thus, on the whole, we consider the above scenario implausible.

An important, and perhaps obvious, limitation of our study is that elections are held only in every 4 or 5 years; therefore, it is not possible to construct a continuous dataset for political preferences. We could have added polling data to the dataset; however, polling data are often not aligned with true preferences. We could also have added the results of national elections from 2014 and 2018; however the constituency boundaries for municipal and national elections do not coincide. Furthermore, we used data only from 2013, as this was the year when curbside waste separation was extended to the whole territory of Budapest. We believe, however, that the revealed lack of connection between environmentalism and left-wing politics in Budapest can be generalized to the wider Hungarian context and perhaps to postcommunist Central and Eastern European countries, as can also be inferred from McCright et al. (2015).

Another limitation arises from the nature of the data used for this study. Since reliable individual-level election data are not available, we relied on district-level aggregates in our analysis. Therefore, our results reveal patterns of behavior for the majority of individuals within a district, not individuals. However, election data are arguably the most reliable measure one can have of political preferences.

Recently, left-wing parties in Hungary have taken up environmental causes, and there are signs that they may also converge in other areas to international left-wing trends; therefore, it is possible that in the future, we will see more stereotypically right-wing and left-wing attitudes regarding environmental issues in Hungary, just as we see in other Western countries. However, our study clearly shows that the social environment of the past casts a shadow on present attitudes and behavior.

6. Conclusion

In this paper we studied the relationship between political preferences and pro-environmental behavior. Political preferences were measured by vote shares of left-wing and right-wing parties in municipal elections in Budapest, Hungary, while we captured pro-environmentalism by the volume of curbside waste separation. Previous research suggests that the link between political and environmental attitudes might be different in postcommunist Central and Eastern European countries from those in other developed nations. Specifically, an analysis based on survey data (see McCright et al., 2015) suggested that environmentalism is less connected to left-wing politics in Central and Eastern Europe. Our analysis, based on revealed instead of stated preferences, confirms this result. Using a panel dataset and applying a fixed effects model, we found that waste separation is actually negatively correlated with the left-wing vote share; that is, in left-leaning districts individuals engage less in waste separation. We proposed several possible explanations to account for our results. As the left-right political landscape is changing across Central and Eastern Europe, the effect of political preferences on pro-environmentalism remains a fertile ground for future research.

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Conflict of interest statement

All authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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