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Willingness to pay for pollution prevention among Transylvanian Hungarians.:
A comparative sociological analysis based on EVS data

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Abstract

This study addresses whether Transylvanian ethnic Hungarians exhibit distinctive environmental attitudes compared to populations in Hungary and Romania, specifically examining what sociodemographic and attitudinal factors drive willingness to pay (WTP) for pollution prevention. We argue that minority status and regional context produce unique pathways to environmental engagement that reflect cultural identity rather than political motivations. Using binary logistic regression analysis on European Values Study 2017 data, we compare three samples: Transylvanian Hungarians (N=1,106), Hungarians (N=1,514), and Romanians (N=1,613). Results reveal that Transylvanian Hungarians demonstrate the highest WTP levels (64primarily by geographic concentration in ethnically Hungarian regions, education, altruism, and trust in environmental organizations. Unlike Hungary, where WTP correlates with urban residence, political interest, and income, Transylvanian Hungarian environmental concern operates as depoliticized philanthropy rooted in rural areas with strong ethnic identity. Romanian patterns show minimal predictive structure and negative political engagement effects. These findings suggest that environmental policy implementation in minority regions requires understanding culturally embedded rather than politically motivated environmental citizenship.

Keywords: *environmental concern, contingent valuation, ethnic Hungarians, European Values Study, survey*

1 Introduction

This study examines willingness to pay (WTP) for pollution prevention among Transylvanian ethnic Hungarians, a population largely absent from environmental attitude research. To carry out this analysis, we rely on the 5th 2017 wave of the European Values Study (EVS), which, in its related questionnaire, included the following item to assess the willingness to pay for the environment: 'I would give part of my income if I were certain that the money would be used to prevent environmental pollution.' The 2017 European Values Study (EVS) represents the first opportunity to systematically compare environmental attitudes of this minority population with their co-ethnics in Hungary and the majority population in Romania, using standardized measures across all three contexts.

We investigate whether Transylvanian Hungarians exhibit distinctive patterns of environmental WTP compared to populations in Hungary and Romania, and what sociodemographic and attitudinal factors drive these differences. Drawing on Social Identity Theory (Tajfel and Turner, 1979) the analysis asks whether minority status produces distinctive environmental

attitude patterns reflecting in-group distinctiveness seeking, or whether acculturation processes lead to convergence with majority population attitudes.

This research contributes to minority studies by examining how ethnic minorities navigate environmental concerns (Hoyos et al., 2009) within majority-dominated political systems, potentially revealing distinct pathways to environmental engagement that differ from both co-ethnic and majority populations. We investigate whether Transylvanian Hungarians exhibit distinct environmental WTP characteristics, potentially manifesting as altruistic rather than politically motivated engagement. This could reflect their bicultural positioning between Hungarian heritage frames emphasizing environmental values (Feischmidt, 2008) and Romanian institutional contexts.

The originality of this research lies in three key contributions. First, it provides the first exploratory systematic analysis of environmental attitudes among Transylvanian Hungarians using internationally comparable data. Second, it offers a unique three-way comparison that illuminates how minority status, national context, and ethnic identity shape environmental concern. Third, it extends contingent valuation research to an understudied population whose environmental attitudes may reflect distinct patterns due to their position as a national minority in a post-socialist context.

Following a review of Transylvanian Hungarian socio-cultural context, CV methodology, and established WTP determinants, we formulate and test hypotheses using EVS 2017 data from all three populations.

2 Literature review

2.1 Hungarians from the Transylvanian region of Romania

Transylvania is a historical province of Romania within the Carpathian Arc, comprising 107,000 km², with approximately 1.2 million Hungarians (19% of Transylvania's population, 6.5% of Romania's). Hungarians constitute Romania's largest ethnic minority (Culic, 2006) and the most numerous Hungarian group outside Hungary (Kiss, 2015), making them one of Europe's most significant native national minorities (Veres, 2012).

Hungarians in Transylvania maintain strong cultural, political, and familial ties with Hungary (Kiss et al., 2022) while functioning as an autonomous society through extensive institutional systems (educational, religious, political, cultural). This creates dual identity: Hungarian cultural-national attachment combined with Romanian civic belonging through citizenship ('Romanianness') (Veres, 2012).

Hungary's 2010 simplified naturalization law which enabled citizenship acquisition without residency requirements significantly reshaped relations with Transylvanian Hungarians (Moreh, 2019). This intervention did not trigger Romanian countermeasures, allowing Transylvanian Hungarians to maintain dual legal status (Csergő et al., 2025). Pogonyi (2019) demonstrates that the citizenship extension institutionally reinforced rather than created identities, formally acknowledging Hungarian belonging while preserving Romanian minority integration, i.e., what Veres (2012) termed 'dual identity'. Kiss and Toró (2021)'s survey confirms this stable dual positioning combines Hungarian ethnic attachment with pragmatic Romanian civic integration. Waterbury (2025) and Moreh (2019) argue that post-2010 policies politically restructured this relationship: while ethnic identity remained stable, Transylvanian Hungarians became increasingly embedded in Hungarian resource flows, loyalty expectations, and institutional dependencies, with identity progressively articulated through Hungary's nation-building project.

Despite this shared dual identity and transnational citizenship status, Transylvanian Hungarians are far from homogeneous, corresponding to diverse ethnolinguistic regions (Kiss, 2015). These regions vary significantly in ethnic concentration and socioeconomic development. Szeklerland forms the most compact Hungarian community with a traditional, rural character and strong regional identity; Partium/Crișana along the Hungarian border contains the second-largest group; Central Transylvania (Cluj-Napoca, Târgu Mureș) represents more urbanized communities; while Northern, Southern Transylvania and Banat contain dispersed populations (Figure 1).

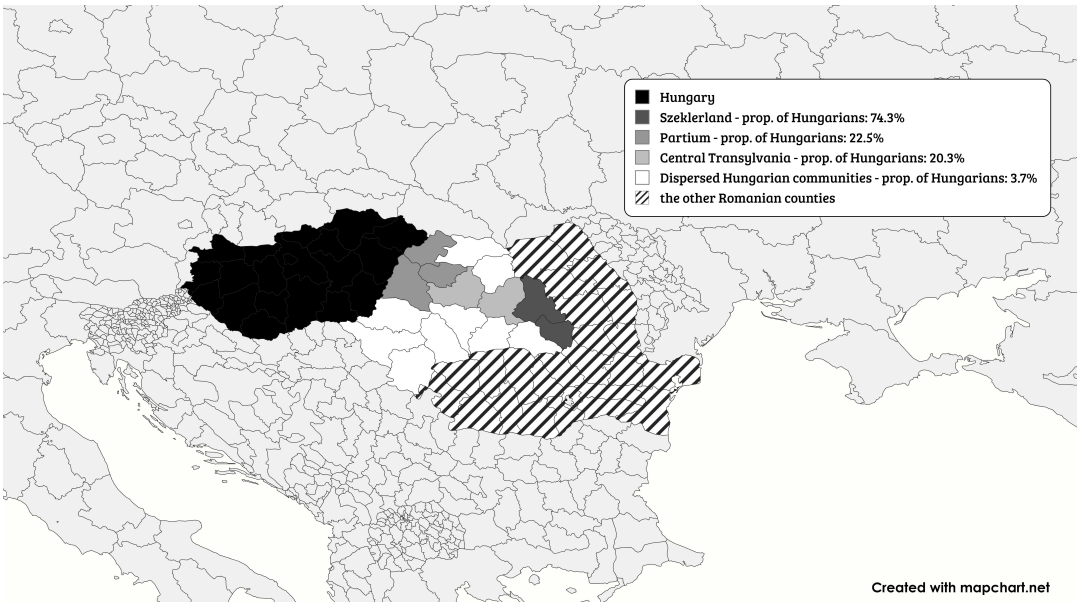

Figure 1 The researched regions and countries

Despite intra-regional differences, socioeconomic analyses show Hungarian minorities' less favorable position overall: lower wages, education levels, and urban middle-class representation compared to the Romanian majority (Kiss, 2015). Ethnic Hungarians' social capital is primarily bonding-type, enabled by dense institutional networks serving minority needs, creating pronounced ethnic parallelism between Hungarian and Romanian communities (Csata, 2015).

Scholarship on Hungarian-Romanian intergroup relations deepens this understanding. Kiss (2018) demonstrates that post-1989 developments reflect 'unequal accommodation': formal minority rights coexist with persistent ethnic stratification, marginalization, and asymmetric power relations, with ethnic parallelism enabling cultural reproduction while constraining economic integration. Brubaker et al. (2006) documented that everyday ethnicity operates through subtle mechanisms (language, institutions, residence) rather than overt conflict, creating a persistent gap between nationalist political rhetoric and daily pragmatic cooperation.

2.2 Social identity and environmental concern

The dual identity framework outlined above, wherein Transylvanian Hungarians simultaneously function as Romanian citizens and Hungarian transborder nationals, raises theoretical questions about how minority positioning shapes environmental attitudes.

Social Identity Theory (Tajfel and Turner, 1979) suggests individuals derive identity

from group memberships, adopting group norms and comparing in-groups favorably to out-groups. To maintain positive distinctiveness, minorities often emphasize superior group characteristics. Research shows that generosity, altruism, cleanliness, and tidiness constitute central elements of Transylvanian Hungarian collective self-representation (Papp, 2012). Within Hungarian discourse, Transylvania is portrayed as environmentally and culturally authentic, preserving traditional architecture, pristine nature, and social solidarity (Feischmidt, 2008). By directly linking environmental preservation with ethnic identity, this narrative establishes environmental stewardship as a potential positive distinctiveness marker. Social Identity Theory predicts that when environmental values become associated with in-group characteristics (Hoyos et al., 2009), minority members may exhibit stronger environmental attitudes as identity maintenance and expression. The positive distinctiveness mechanism suggests that when environmental stewardship becomes associated with valued in-group characteristics, minority members will exhibit stronger environmental attitudes to differentiate themselves favorably from the majority out-group (Tajfel and Turner, 1979). For Transylvanian Hungarians, environmental philanthropy may function as a marker of moral superiority, community altruism and responsibility contrasting with perceived Romanian pragmatism. Distinctiveness motivation should be strongest in ethnically concentrated areas where in-group identification is highest, while Hungarians in dispersed communities experiencing greater intergroup contact should adopt attitudes more similar to the Romanian majority. Alternative theoretical frameworks offer competing predictions for minority environmental attitudes. Acculturation theory suggests that environmental attitudes should vary based on cultural adaptation patterns, with more Romanian-acculturated Hungarians (typically urban, dispersed) showing environmental patterns closer to the Romanian majority, while less acculturated Hungarians (rural, concentrated) maintain distinctive environmental philanthropy (Berry, 1997). Minority group threat theory provides another lens, suggesting that environmental concern represents a safe form of civic engagement for minorities, allowing community values expression without directly challenging majority political control (Blumer, 1958).

The concept of cultural in-betweenness can be theoretically grounded in bicultural identity theory, which suggests that individuals with dual cultural memberships alternate between cultural frames depending on context (Hong et al., 2000). Transylvanian Hungarians may activate Hungarian cultural frames (emphasizing communal environmental responsibility) when expressing environmental philanthropy while simultaneously operating within Romanian institutional frames (characterized by political skepticism and economic pragmatism). This theoretical framework generates specific cross-group predictions: Hungary should exhibit standard Western civic engagement patterns in environmental WTP (income, political interest, urban residence) due to majority status and democratic consolidation; Romania should show weakly structured environmental WTP due to post-communist institutional distrust and economic prioritization; while Transylvanian Hungarians should display identity-maintenance patterns (education, ethnic concentration, altruism) reflecting their unique position as a cultural minority seeking positive distinctiveness through environmental stewardship.

2.3 The contingent valuation method and willingness to pay

Willingness to pay (WTP) questions employ the contingent valuation (CV) method, which estimates the economic value of nonmarket goods such as environmental quality (Hanemann, 1994). CV surveys present environmental scenarios and ask about monetary commitment to solutions, quantifying environmental concern through hypothetical market behavior (Liebe

et al., 2011). WTP questions tap moderate environmental activism requiring financial sacrifice without physical risk, making them suitable policy support indicators (Vicente et al., 2021) and interpretable as a specific component of general environmental concern (Franzen and Vogl, 2013). CV surveys vary from general WTP questions to detailed scenarios (Carson et al., 2001; Liebe et al., 2011).

WTP measures face several well-documented limitations. The primary concern is hypothetical bias: research shows that respondents overstate willingness to pay when no real payment is required, as the absence of financial consequences allows them to disregard budget constraints (Loomis, 2011; Penn and Hu, 2018). Related concerns include the 'warm glow' effect, whereby moral satisfaction from expressing pro-environmental attitudes inflates responses (Kahneman and Knetsch, 1992), and scope insensitivity, whereby WTP fails to increase proportionally with the magnitude of environmental improvement (Carson and Hanemann, 2005). The WTP-WTA (willingness to accept) disparity presents another challenge: respondents usually demand two to four times more compensation to accept environmental losses than to prevent them, reflecting loss aversion (Tunçel and Hammitt, 2014). Protest responses expressing ethical objections (Mitchell and Carson, 1989) and validity concerns requiring rigorous survey design (Jorgensen, 2023; Perni et al., 2021) present additional challenges.

Despite these limitations, WTP measures remain widely used in environmental sociology as indicators of environmental concern and policy support (Baumgärtner et al., 2017). Methodological recommendations include avoiding overly abstract formulations (Carson et al., 2001), using closed questions since respondents struggle with exact amounts (Hanemann, 1994), and interpreting responses through attitudes (Kotchen and Reiling, 2000).

The EVS 2017 WTP question, while lacking the scenario detail necessary for precise monetary valuation, can be used for comparative attitudinal research across diverse societal contexts (Carson et al., 2001). This design aligns with our analytical focus on relative differences in WTP determinants across groups rather than absolute payment amounts, substantially reducing concerns about hypothetical bias magnitude.

2.4 Determinants of the WTP

Liebe et al. (2011) identify five approaches: the economic model (income and environmental benefit), the public good theory (trust and reciprocity), the attitude-behavior paradigm (environmental attitudes), altruistic models (concern for others), and norm activation theory (moral responsibility). While income, trust, altruism, social norms, and environmental attitudes consistently emerge as key WTP factors, findings vary across contexts. The economic model emphasizes income (Ivanova and Tranter, 2008) as the primary WTP determinant, though correlations remain weak at individual (Combes et al., 2018) and societal (Gelissen, 2007) levels. Education often proves more influential than income, particularly in East-Central Europe (Lee and Norris, 2000). Age shows inconsistent relationships with WTP across studies, while women exhibit slightly higher WTP cross-culturally (Franzen and Vogl, 2013).

Urban residents may exhibit higher WTP due to greater environmental problem exposure (Franzen and Vogl, 2013), while place attachment and local environmental identity can strengthen rural residents' WTP when environmental issues directly affect their community (Brehm et al., 2013; Nielsen-Pincus et al., 2017). Social Identity Theory (Tajfel and Turner, 1979) suggests that place–based identities motivate environmental protection through feelings of belonging and shared responsibility, potentially increasing WTP. Left-wing political identification consistently predicts environmental concerns. Studies in the USA (Dupont and

Bateman, 2012) and cross-national analysis using EVS/WVS (Neumayer, 2004) and ISSP data (Ivanova and Tranter, 2008) consistently show that left-wing voters express greater WTP for environmental protection. This association appears weaker in Central and Eastern Europe, possibly reflecting lower environmental issue salience in post-communist political divides (Todor, 2018) or high non-response rates to political questions. Political interest may independently influence environmental WTP (Drews and van den Bergh, 2016), particularly for minority communities prioritizing competing policy concerns (Malin and Ryder, 2018). Some research suggests religious conservatives show higher environmental concern when controlling for political orientation (Hekmatpour, 2022; Lalot et al., 2022).

Research generally finds positive correlations between environmental attitudes and WTP (Kollmann and Reichl, 2015), although methodological differences across studies complicate direct comparisons (Meyer and Liebe, 2010).

Interpersonal and institutional trust (Liebe et al., 2011) significantly influences WTP, with high-quality governance contexts (Davidovic and Harring, 2020) fostering citizen trust and environmental policy support. Trust in state capacity emerges as particularly important for environmental tax acceptance (Todor, 2018). Charitable giving studies show that misuse of public money, corruption, and organizational distrust limit giving in general (Ferrara and Missios, 2020), dynamics likely to affect environmental WTP similarly.

Both pure altruism (concern for others' well-being) and impure altruism (personal satisfaction from doing good) positively influence environmental WTP (Duncan, 2004; Lundberg et al., 2019). This 'warm glow' effect suggests that stated WTP combines genuine environmental concern with moral satisfaction (Guagnano, 2001). While this complicates interpretation of absolute values, it does not undermine comparative analysis across populations.

This literature review reveals that WTP determinants vary across cultural and political contexts, suggesting Western findings may not directly apply to post-communist minority populations. Our comparative approach tests whether established WTP theories hold for Transylvanian Hungarians or whether their unique sociocultural position produces distinctive patterns.

3 Materials and methods

3.1 Hypotheses

Based on the literature review, we formulate hypotheses recognizing that minority status may produce different environmental attitude patterns than those found in majority populations. We expect income (H1) and education (H2) to positively predict WTP, with education particularly important in post-communist contexts and for minority identity maintenance. Reflecting place attachment and cultural authenticity narratives, we hypothesize rural residence and regional Hungarian concentration will positively predict WTP among Transylvanian Hungarians, contrasting with typical urban patterns (H3). Environmental attitudes (H4) should predict WTP across samples, potentially more strongly among Transylvanian Hungarians where environmental concern may reflect cultural identity. Altruism (H5) should predict WTP, especially among Transylvanian Hungarians, emphasizing community-oriented values. We expect institutional and interpersonal trust (H6) to influence WTP, with trust in environmental organizations potentially more important than political trust for Transylvanian Hungarians. Overall, we expect Transylvanian Hungarian WTP to be driven primarily by cultural and community factors (education, altruism, ethnic concentration) rather than political engagement, consistent with environmental concern serving as identity expression rather than political activism.

3.2 Data

This study analyses data from the 2017 European Values Study (EVS). Data collection occurred from 2017 to 2021, with delays due to COVID-19. EVS 2017 covers nationally representative samples of adults (18+) from 36 countries plus four minority regions, including the Hungarian minority in Transylvania, Romania. The analyses use the special Transylvanian Hungarian sample (N=1,106) (EVS, 2020) and two integrated datasets covering the Hungarian (N=1,514) and the Romanian (N=1,613) samples (EVS, 2022). Hungarian and Romanian samples used stratified random sampling based on electoral rolls and resident population data, respectively. The Transylvanian Hungarian sample was obtained through a three-stage design combining stratified random selection of settlements, random-route household selection, and quota-based respondent selection. While quota sampling for Transylvanian Hungarians differs from random sampling for Hungary and Romania, all samples achieve representativeness within target populations. The 2017-2021 collection period may introduce temporal variation, though unlikely to significantly affect environmental attitudes.

A methodological challenge arose from the dual database structure: data from Hungary and Romania are in the integrated EVS dataset. The Transylvanian Hungarian data form a separate dataset with different variable structures. We therefore constructed a merged dataset containing 360 common variables to enable three-way comparisons across samples. For Transylvanian Hungarian-specific analysis, we retained additional spatial variables (regional and administrative divisions) not present in the integrated dataset.

3.3 Variables and methods

In the EVS 2017, environmental attitudes were measured using six questions in the questionnaire (Q56 and Q57, V199-V204). Five of these items were assessed through a five-point Likert scale statement: 1. willingness to give up part of one's income for pollution prevention (WTP); 2. it is too difficult to do too much for the environment; 3. there are more important things in life than protecting the environment; 4. doing something for your environment is useless if others don't do the same and 5. claims about environmental threats are exaggerated. The sixth dichotomous question contrasts environmental protection with economic growth (EVS, 2022).

Out of these variables, the primary focus of our study is on the Likert variable that assesses willingness to pay: 'I would give part of my income if I were certain that the money would be used to prevent environmental pollution.' This dependent variable captures a behavioral intention rather than an abstract environmental opinion, requiring respondents to consider concrete personal sacrifice and thus represents a universal and comparable indicator of environmental commitment intensity.

Following the practice of previous studies (Carson et al., 2001; Liebe et al., 2011) we have transformed this variable into a binary variable: 1 = willing to pay, i.e., WTP (the agree and strongly agree responses) and 0 = not willing to pay (neither agree nor disagree, disagree and strongly disagree response categories). We conducted bivariate analyses to examine cross-regional differences in environmental concern, followed by binary logistic regression to model WTP determinants. Separate analyses for each population, rather than a pooled approach, enabled identification of group-specific predictive patterns. This analytical choice recognizes that WTP determinants may operate differently across the three contexts due to varying political systems, economic conditions, and cultural frameworks. Separate models allow all parameters (not just intercepts) to differ between populations, providing more nuanced insights into how factors like education, income, or trust function differently for

Transylvanian Hungarians compared to populations in Hungary and Romania.

The explanatory and control variables used in our studies are summarized in Table 1. There is a total of 20 variables, out of which 15 variables are common to all three regression models; four variables are only present in the Transylvanian Hungarians database (SD7-SD10); and one variable (SD5) is only present in the model comparing the three regions (in the absence of a city-county breakdown, we controlled for the size of the settlement). Thus, we used 19 explanatory variables in the model for Transylvanian Hungarians and 16 variables to compare the three regions/samples.

Table 1 The description of the explanatory variables

Explanatory variables	Measure	Min. and max. values/ Categories
Socio-demographic variables (SD, ten items)		
Age (SD1)	scale	Min. = 18 Max. = 82
Male (SD2)	binary	Female (0) Male (1)
Education (years): age of the respondent of completed formal education (SD3)	scale	Min. = 8 Max. = 70
High income (SD4)1	binary	Low or medium income (0) High income (1)
Bigger settlement (SD5)	binary	Below 20,000 inhabitants (0) 20,000 inhabitants and more (1)
Religiosity (SD6)	binary	Not religious or atheist (0) Religious (1)
Szeklerland (SD7)	binary	Not Szeklerland (0) Szeklerland (1)
Central Transylvania (SD8)	binary	Not Central Transylvania (0) Central Transylvania (1)
Partium2 (SD9)	binary	Not Partium (0) Partium (1)
Rural locality (SD10)	binary	Urban (0) Rural (1)
Social sensitivity (SS, five items)		
Trust in political institutions3 (SS1)	scale	Min. = -3.67866 Max. = 1.79322
Trust in cultural institutions4 (SS2)	scale	Min. = -2.55459 Max. = 3.09422
Trust in people (SS3)	binary	Can't be too careful (0) Most people can be trusted (1)
Altruism/empathy: level of empathy with the living conditions of people in 5 areas (neighborhood, region, country, Europe, and the whole world) (SS4)	scale	Min. = 0 Max. = 20
Connected to the city or region (SS5)	binary	Not connected (0) Connected (1)
Politics5 (P, two items)		
Political interest: frequency of following politics in 4 media types (TV, radio, newspapers, social media) (P1)	scale	Min. = 0 Max. = 16
Political activity: frequency of participation in elections at three levels (local, national, European) (P2)	scale	Min. = 0 Max. = 6
Attitudes towards the environment (E, three items)		

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Environment protection priority vs. economic growth and job creation (E1)	binary	Economic growth priority (0) Protecting the environment is a priority (1)
Attitudes towards the environment6 (E2)	scale	Min. = -2.98738 Max. = 2.18491
Trust in environmental organizations (E3)	binary	Can't be trusted (0) Can be trusted (1)

Note. [1] – measured as a household's total net income; [2] – for the Transylvanian regions, the reference category is the region "Dispersed Hungarian communities." The sample on the Transylvanian Hungarian minority operated with four categories of the regional background variables; [3] – factor variable for measuring the trust in 3 institutions: parliament, government, and political parties. For Hungary, the factor analysis grouped the variables measuring trust in all six institutions into one factor, while the cultural and political institutions dimension was well separated for the other two regions; [4] – factor variable for measuring trust in three institutions: the education system, the press, and the church. For Hungary, the factor analysis grouped the variables measuring the trust in all six institutions into 1 factor, while the cultural and political institutions dimension was well separated for the other two regions; [5] – One of the significant question of the environmental WTP studies – as outlined in the literature review section as well – is to investigate the role of left vs. right political identification on the WTP. Unfortunately, as previously mentioned, we were not able to include this variable in our model, due to the large percentage of non-responses on the question, i.e., missing values. We checked alternative regression models that included the left-right self-identification variable as well. Still, due to the high percentage (approx. one-third of the Transylvanian Hungarian and the Romanian sample) of non-responses the percentage of cases included in the analyses fell from 57.9% to 40.4% in the case of Transylvanian Hungarians; for Romania from 40.9% to only 28.6%; and for Hungary from 61.8% to 53.2%; [6] – factor variable for measuring the attitude towards the environment in the three regions, the value of Cronbach's alpha is higher than 0.65 in the case of each factor.

4 Results and discussion

4.1 A general view of the attitudes toward the environment in the three samples

Based on the relative frequencies of the original (five-point Likert scale) dependent variable (WTP) for the three regions, we see that Hungarians from Transylvania are the most likely to agree with the WTP statement, almost two-thirds of the respondents (64%) strongly agreeing, followed by Romanians (59%) and finally Hungarians from Hungary (42%) ($p=0.001$, $\chi^2=192.118$, $N=4{,}034$). (Figure 2).

We then investigated the other five variables of environmental attitudes. Significant differences emerged between samples ($p=0.001$, $\chi^2=152.120$, $N=3{,}810$) concerning the prioritization of environmental protection over economic growth and job creation: Hungarians from Transylvania are the most likely to think that environmental protection should be prioritized (71%) even if it slows down economic growth and causes some job losses, followed by Hungarians from Hungary (69%); Romanians are ambivalent since they split equally between the two options (Figure 3).

Factor analysis of the remaining four environmental attitude variables yielded a single-factor solution in each sample, suggesting that the EVS environmental concern battery taps three conceptually distinct facets: 1) beliefs regarding the individual responsibility/capacity in terms of environmental protection; 2) beliefs regarding the importance of environment vs. economic growth; and 3) the (monetary) valuation of a clean environment, i.e., WTP. Beyond the statement 'There are more important things to do in life than protect the environment,' significant regional differences emerged across the three remaining environmental attitude

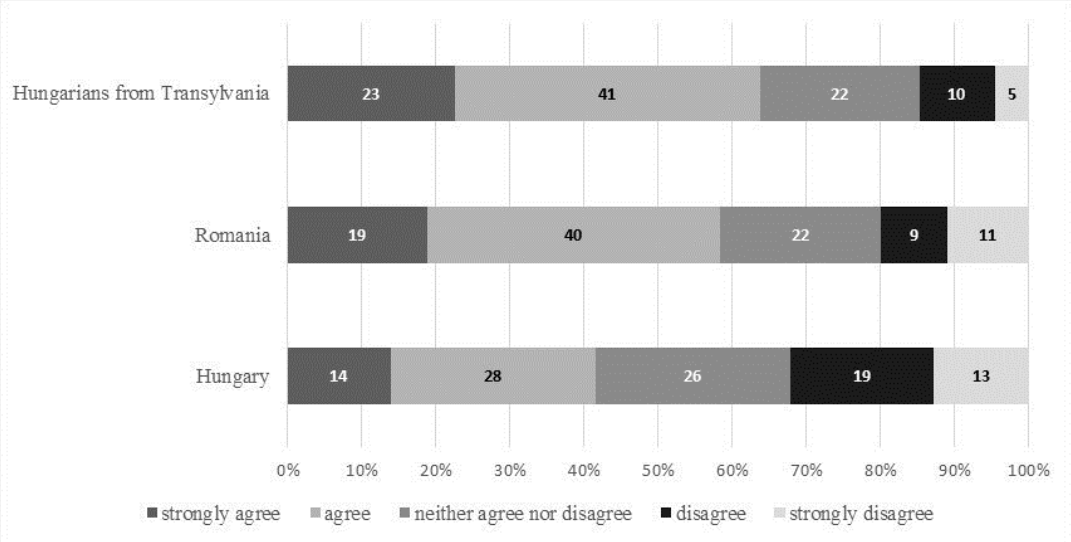

Figure 2 Responses on the item: 'I would give part of my income if I were certain that the money would be used to prevent environmental pollution' (%, N=4,034).

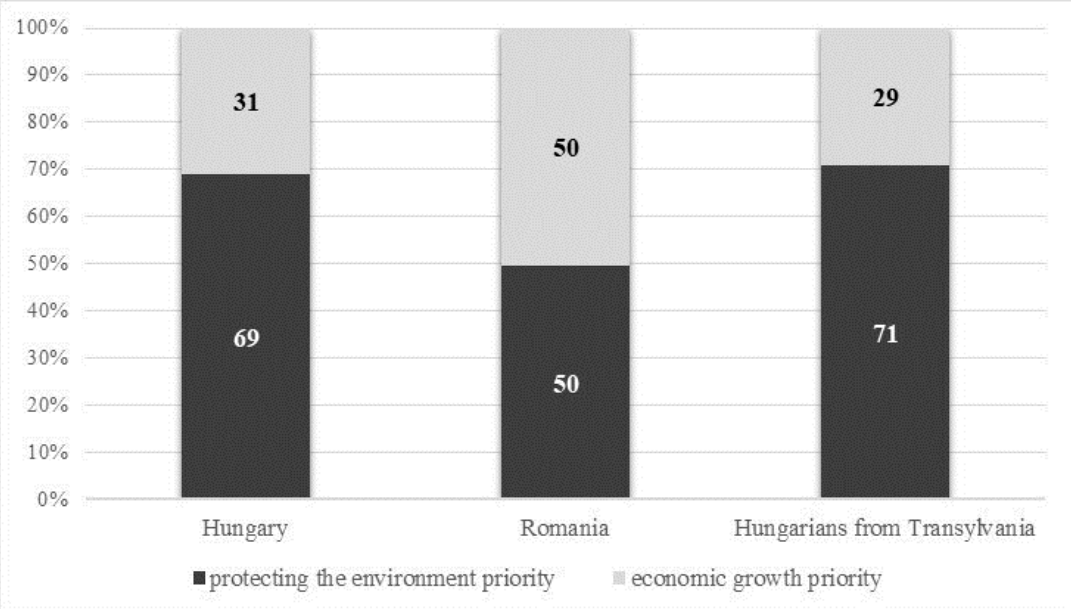

Figure 3 Responses on the item: 'Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs vs. Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent' (%, N=3,810)

items (p=0.001, F=8.029-125.21, N=3,909-4,047). Analysis of variance revealed that majority Hungarians expressed the highest environmental concern across all four attitudes (Figure 4).

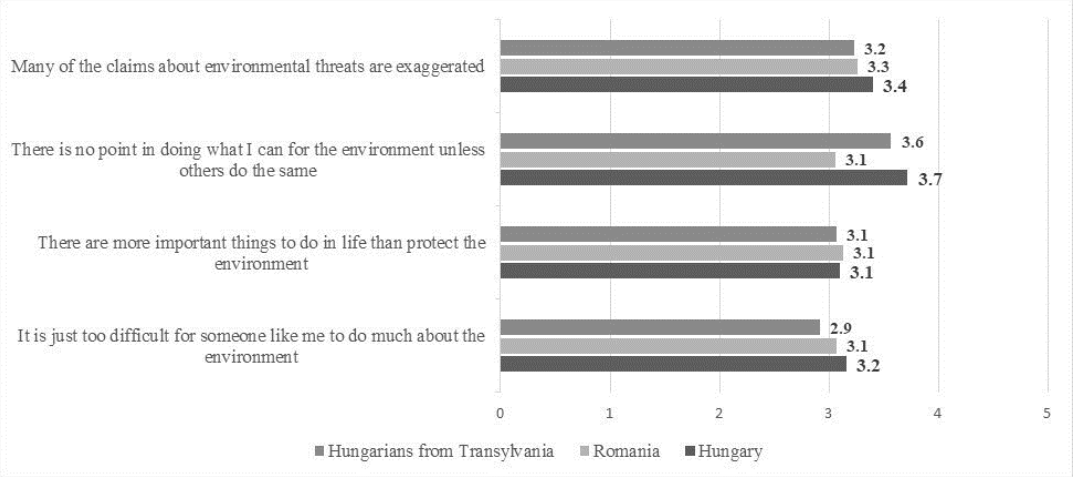

Figure 4 Agreement with attitudes toward environmental protection (Means, N=3,909 – 4,047)

These descriptive results reveal distinct group patterns. Transylvanian Hungarians may prioritize collective environmental action (WTP) over individual responsibility, viewing environmental issues as requiring institutional rather than personal solutions. This accounts for their lower individual responsibility scores, while their moderate WTP likely reflects competing priorities such as cultural preservation and economic security. This accounts for their lower individual responsibility scores, while their moderate WTP likely reflects competing priorities such as cultural preservation and economic security. Romanians display pragmatic environmental attitudes, with moderate WTP falling between the two Hungarian groups but marked ambivalence on environment-economy trade-offs. They divide equally on prioritizing environmental protection over economic growth, suggesting conflicted environmental-economic orientations.

4.2 The willingness of Hungarians in Transylvania to pay for pollution prevention

In the following steps of our analysis, we focused on the environmental WTP variable. We used binary logistic regression models to estimate the determinants of the dependent variable and test the hypotheses.

We tested multicollinearity (the highest correlation coefficient is r = −0.420 and VIF values range between 1.056 and 2.394, indicating no serious multicollinearity) for the 19 explanatory variables included in the analysis. Then, all variables were entered simultaneously into the model. Of the 19 variables, age, gender, and religiosity were included as control variables. Based on 640 observations (57.9%), the model is statistically significant according to both the Wald statistic and the Omnibus test ($p < 0.001$). The pseudo-R-squared measures (Nagelkerke $R^2 = 0.246$; Cox & Snell $R^2 = 0.177$) indicate moderate explanatory power, while the non-significant Hosmer–Lemeshow test ($\chi^2 = 7.530$, $p = 0.481$) confirms adequate model fit. The model improves correct classification by 5.2 percentage points relative to random categorization (see Table 2).

Table 2 Willingness to pay for pollution prevention—binary logistic regression model for Hungarians from Transylvania

	B	p-Value	Exp(B)
SD3 Education (years)	0.057	0.039	1.059
SD4 High income	-0.133	0.542	0.876
SS1 Trust in political institutions	-0.040	0.710	0.961
SS2 Trust in cultural institutions	-0.127	0.249	0.880
SS3 Trust in people	0.281	0.205	1.324
P1 Political interest	-0.009	0.715	0.991
P2 Political activity	0.047	0.410	1.048
SS5 Connectedness to Region	-1.389	0.001	0.249
SS4 Altruism/Empathy	0.054	0.024	1.056
E1 Economic growth priority vs. environmental protection	0.979	0.000	2.663
E2 Attitudes towards the environment	0.213	0.037	1.237
E3 Trust in environmental organizations	0.466	0.028	1.594
SD1 Age	0.005	0.450	1.005
SD2 Male	-0.013	0.945	0.987
SD10 Rural locality	0.448	0.034	1.566
SD6 Religiosity	-0.589	0.097	0.555
SD7 Szeklerland	1.455	0.000	4.286
SD8 Central Transylvania	1.598	0.000	4.945
SD9 Partium	0.676	0.022	1.967
Constant	-1.658	0.057	0.191
N	640 (57.9%)		
Wald-statistic	66.301***		
Omnibus test ($\chi 2$)	124.781***		
Nagelkerke R2	0.246		
Cox & Snell R Square	0.177		
Hosmer and Lemeshow Test	$\chi 2 = 7.530$, p = 0.481		
The model corr. for correct categorization	5.2%		

Note. The dependent variable was: "I would give part of my income if I were certain that the money would be used to prevent environmental pollution," where 1 = willing to pay (the agree and strongly agree responses) and 0 = not willing to pay (neither agree nor disagree, disagree and strongly disagree response categories); ***=p<0.01

Measuring combined effects of all variables, 11 of 19 remain significant, with nine improving categorization estimates. Geographic location within Transylvania is the strongest WTP predictor: Szeklerland and Central Transylvania residents show dramatically higher odds (Exp(B) > 4.28), followed by Partium (Exp(B) = 1.967). Environmental attitudes (B = 0.213, (Exp(B) = 1.237—H4 confirmed) and trust in environmental organizations (B = 0.466, (Exp(B) = 1.594—H6 partially confirmed) also emerge as significant predictors.

Hypothesis testing yields mixed results. H1 (income) exhibits inconsistent effects across samples. H2 (education) reveals meaningful patterns: education's significance specifically among Transylvanian Hungarians supports cultural capital explanations. H3 (place/regional identity) receives strong support through geographic effects. H4 (environmental attitudes) and H5 (altruism) are confirmed. H6 (trust) receives no support.

Ethnic geographic concentration as the strongest predictor aligns with Social Identity Theory (Tajfel and Turner, 1979): Hungarians in concentrated areas express environmental concern as in-group distinctiveness from Romanian majority attitudes, while those in dispersed areas adopt attitudes resembling the Romanian majority. This gradient supports acculturation theory (Berry, 1997), which predicts stronger cultural distinctiveness in concentrated ethnic communities versus majority convergence through intergroup contact in dispersed communities

Individual characteristics follow predictable patterns: education and altruism increase WTP; religiosity and local attachment decrease it. Education proves more influential than income, consistent with CEE findings (Lee and Norris, 2000), suggesting that environmental concern among Transylvanian Hungarians is culturally rather than economically driven. Only trust in environmental organizations—not interpersonal or political trust—significantly predicts WTP. This pattern, combined with strong altruism effects (Lundberg et al., 2019), suggests Transylvanian Hungarians view environmental WTP as targeted philanthropy rather than policy support. The finding that political variables fail to predict WTP suggests a depoliticized civic disposition, consistent with minority group threat theory (Blumer, 1958): i.e., environmental philanthropy represents 'safe' civic engagement without challenging majority control[1].

Two findings diverge from expectations. First, religiosity negatively predicts WTP, contradicting Western research (Hekmatpour, 2022). This pattern may reflect the secular character of environmental discourse in post-communist societies. Second, rural residence increases WTP despite local attachment decreasing it. This counterintuitive pattern likely reflects different interpretations of the broad WTP question: rural residents appear to interpret 'pollution prevention' as a general environmental value, while place-attached individuals prioritize targeted action in their specific community over abstract willingness to pay.

The absence of income effects alongside strong geographic and altruistic predictors suggests expressive rather than economic motivations, aligning with cultural narratives portraying Transylvanian Hungarians as environmentally conscious and community oriented. Environmental philanthropy thus functions as identity performance (Feischmidt, 2008), enabling individuals to enact valued group characteristics through willingness to contribute financially to environmental causes.

4.3 Transylvanian Hungarians' WTP compared to the Hungarian and Romanian samples

To examine cross-regional differences systematically, we constructed separate logistic regression models for each group using identical variable sets (across the three models with 16 predictors, the maximum Pearson correlation coefficient is r = 0.360, and VIF values range from 1.049 to 1.318, indicating negligible multicollinearity). All three models are statistically significant according to the Wald statistics and Omnibus tests ($p < 0.001$). The model estimated for Hungary, based on the largest sample (N = 935), demonstrates the strongest performance, with the highest explanatory power (Nagelkerke $R^2 = 0.173$; Cox & Snell $R^2 = 0.129$) and the greatest improvement in correct classification (9%). The Romania model (N = 660) shows comparatively weaker explanatory capacity (Nagelkerke $R^2 = 0.132$; Cox & Snell $R^2 = 0.097$) and the smallest gain in classification accuracy (2.8%). The model for Hungarians from Transylvania (N = 640) exhibits explanatory power comparable to that observed for Hungary (Nagelkerke $R^2 = 0.175$; Cox & Snell $R^2 = 0.127$), albeit with a more modest improvement in correct classification (3.4%). The non-significant Hosmer–Lemeshow tests in all cases indicate adequate model fit (Table 3).

[1] An alternative model not presented here (N=659) confirmed left-right self-identification also lacks predictive power, supporting CEE findings that political positioning poorly predicts environmental attitudes in post-communist contexts (Todor, 2018).

Table 3 Willingness to pay for pollution prevention—binary logistic regression model for Hungary, Romania, and Hungarians from Transylvania

	Hungary		Romania		Hungarians from Transylvania	
	B	Exp(B)	B	Exp(B)	B	Exp(B)
SD3 Education (years)	0.008	1.008	0.023	1.023	0.043*	1.044
SD4 High income	0.392**	1.481	0.219	1.245	-0.119	0.888
SS1 Trust in political institutions1	0.121	1.129	-0.033	0.967	-0.013	0.987
SS2 Trust in cultural institutions	-	-	0.130	1.138	-0.097	0.908
SS3 Trust in people	0.343**	1.410	0.31	1.364	0.179	1.196
P1 Political interest	0.036*	1.037	-0.046*	0.955	0.007	1.007
P2 Political activity	0.053	1.054	0.068	1.071	0.033	1.034
SS4 Altruism/empathy	0.075***	1.078	0.042**	1.043	0.057**	1.059
SS5 Connectedness to region	-0.237	0.789	0.022	1.022	-1.335***	0.263
E1 Economic growth priority vs. environmental protection	0.631***	1.880	0.685***	1.984	0.928***	2.530
E2 Attitudes towards the environment	0.220***	1.246	-0.019	0.981	0.267***	1.306
E3 Trust in environmental organizations	0.403***	1.497	0.744***	2.140	0.687***	1.987
SD1 Age	-0.017***	0.983	-0.01*	0.990	0.005	1.005
SD2 Male	0.149	1.161	-0.084	0.919	-0.01	0.990
SD5 Bigger settlement	0.275*	1.317	0.120	1.128	-0.632***	0.532
SD6 Religiosity	0.273*	1.314	0.221	1.247	-0.545	0.580
Constant	-1.825***	0.161	-0.856	0.425	-0.057	0.945
N	935 (61.8%)		660 (40.9%)		640 (57.9%)	
Wald-statistic	28.124***		31.758***		66.301***	
Omnibus test ($\chi 2$)	128.891***		67.325***		86.579***	
Nagelkerke R2	0.173		0.132		0.175	
Cox & Snell R Square	0.129		0.097		0.127	
Hosmer and Lemeshow Test	$\chi 2 = 10.669$, p = 0.221		$\chi 2 = 7.421$, p = 0.492		$\chi 2 = 7.528$, p = 0.481	
The model corr. for correct categorization	9%		2.8%		3.4%	

Note. The dependent variable was: "I would give part of my income if I were certain that the money would be used to prevent environmental pollution," where 1 = willing to pay (the agree and strongly agree responses) and 0 = not willing to pay (neither agree nor disagree, disagree and strongly disagree response categories); 1 Hungary's trust in political and cultural institutions (one factor); *=p<0.1, **=p<0.05 ***=p<0.01

Cross-regional analysis reveals both universal and region-specific predictors of environmental WTP. Three variables consistently predict WTP across all regions: environmental priority over economic growth emerges as the strongest universal predictor (B > 0.630, Exp(B) > 1.87, confirming H4), followed by trust in environmental organizations (Exp(B) > 1.49, partially confirming H6) and altruism (Exp(B) > 1.04, confirming H5). Four variables—trust in political and cultural institutions, political activity, and gender—show no significant effects in any region.

Regional variations reveal distinct WTP profiles beyond three universal predictors. Hungary shows significantly broader predictive power with ten significant variables, including income (B = 0.392, Exp(B) = 1.48—H1 confirmed), interpersonal trust (B = 0.343, Exp(B) = 1.41—H6 partially confirmed), and political interest (B = 0.036, Exp(B) = 1.037), absent in other regions. Religiosity and larger settlement size also positively predict WTP in Hungary, while age negatively affects it, consistent with earlier findings in the literature (Ivanova

and Tranter, 2008). Hungary's model suggests WTP stems from politically interested urban populations with better financial capacities, contrasting with Transylvania's philanthropic patterns.

Alternative model analysis confirmed that left-right political placement fails to predict WTP even in Hungary, where political divisions are sharper than in Romania or Transylvania (Neumayer, 2004). Moreover, including political placement worsens model fit, reducing explained variance from 61.8% to 53.2%, a pattern that contradicts Western literature linking left-wing political identity to environmental WTP. Romania shows severely constrained predictive power, with only five significant variables: the three universal predictors (environmental attitudes, organizational trust, altruism), age (B = −0.01, Exp(B) = 0.99), and political interest (B = −0.046, Exp(B) = 0.96), which notably reduces WTP. This weak structure suggests environmental disengagement reflecting Romania's post-communist trajectory and cultural inertia (Gavreliuc, 2012). Politically engaged Romanians appear to view environmental initiatives suspiciously or as competing with economic priorities. As already shown in Section 4.2, the Transylvanian Hungarian model is characterized by strong contextual effects: education is significant only in this group, while regional attachment and settlement size have marked negative effects, indicating higher WTP in smaller, more rural localities and a limited role of socio-economic predictors.

Overall, the comparative analysis confirms distinct environmental WTP profiles reflecting each group's socio-cultural position. Transylvanian Hungarians exhibit identity-embedded environmental philanthropy driven by cultural factors independent of political engagement. Majority Hungarians demonstrate standard civic engagement patterns connecting environmental WTP to political interest and economic capacity. Romanians show constrained post-communist institutional patterns. Transylvanian Hungarians' intermediary position reflects bicultural identity processes (Hong et al., 2000) through which minority members alternate between Hungarian cultural frames (environmental philanthropy, community responsibility) and Romanian institutional frames (political skepticism)

5 Conclusions

This study examined willingness to pay for pollution prevention among Transylvanian Hungarians, comparing them with Hungarian and Romanian samples from EVS 2017. While the EVS WTP variable is general compared to literature recommendations (Carson et al., 2001), it enables cross-national comparison using standardized measures. Our analysis provides the first systematic examination of Transylvanian Hungarians' environmental attitudes, contributing to the limited literature on minority environmental attitudes through a three-way comparative approach. Results reveal that Transylvanian Hungarians demonstrate highest willingness to pay, yet are surpassed by Hungarians from Hungary on other environmental attitudes, while Romanians show lowest environmental concern. Multivariate models confirm distinct WTP profiles: Romania shows straightforward environmental philanthropy driven by environmental concern, trust in NGOs, and altruism; Hungary reflects complex civic engagement tied to political awareness, urban residence, and economic resources; Transylvanian Hungarians exhibit culturally embedded philanthropy rooted in better-educated rural populations, particularly in ethnically concentrated regions like Szeklerland, with minimal political engagement.

Hypothesis testing yielded mixed results. Education and income showed inconsistent effects, though education was particularly important for Transylvanian Hungarians. Unlike Hungary's urban-centered WTP, Transylvanian Hungarian WTP was rural-based among ed-

ucated populations. Environmental attitudes and altruism strongly predicted WTP among Transylvanian Hungarians, while political engagement showed no influence, contrasting with Hungary. Political interest's absence among Transylvanian Hungarians suggests that minorities may conceptualize environmental issues separately from mainstream political processes. This 'depoliticization' may reflect strategic adaptation to limited political influence, pursuing ecological goals through civil society rather than electoral politics (Agyeman, 2005). Environmental WTP represents 'soft politics,' expressing civic values without challenging majority control.

Although the EVS's general WTP question limits precise policy prescriptions, our findings offer four policy-relevant insights. First, community-centered implementation: strong ethnic concentration and altruism effects, combined with absent political interest, suggest engaging ethnic community organizations, minority-language educational institutions, and local cultural leaders proves more effective than state channels. Second, education as intervention point: education's unique significance for Transylvanian Hungarians implies environmental programs embedded in minority-language institutional networks could enhance engagement beyond majority-language campaigns. Third, regional differentiation: ethnic concentration's strong effects require tailored approaches, emphasizing collective identity in concentrated areas like Szeklerland versus individual benefits in dispersed communities. Fourth, cultural framing: given WTP's independence from political engagement, framing environmental protection as collective community responsibility and cultural preservation rather than political advocacy may resonate more effectively, enabling safe civic expression without challenging majority control.

Future research should address several limitations. Context-specific WTP scenarios for concrete environmental goods would enable more actionable guidance. Longitudinal designs are needed to establish causality. Extending analysis to other minority-majority configurations would test whether our findings reflect universal minority dynamics or context-specific patterns. Qualitative research exploring how minorities conceptualize environmental responsibility could illuminate mechanisms underlying these quantitative patterns.

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