



Original article

Views of Central European high school students on environmental issues and policies

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ABSTRACT

Community uptake of knowledge about the environment, perception of the environment, and environmental awareness are of pivotal importance. Secondary school students represent an emerging young generation that will become actively involved in shaping the discourse of our societies, as they face major issues such as climate change and biodiversity loss. The aim of the study was to explore environmental awareness and attitudes in relation to environmental policies on the national and European level. The study was conducted on the secondary school students from the Czech Republic and the Slovak Republic and differences between the two countries and gender were investigated. Based on a questionnaire, the acquired data suggest that secondary school students exhibit environmental awareness and display environmentally friendly behaviour, by which they aim to reduce their negative burden on the environment. The study group identified environmental pollution and climate change as the most relevant contributors to this global crisis, while excessive construction, biodiversity loss, and insufficient protection were identified to a lesser degree. The environment as a whole was perceived as endangered, among which soil was singularly the least pronounced environmental category. The results show a strong negative perception of national actions to protect the environment, and the secondary school students in the study supported the idea that countries should be doing more to protect the environment. The European Union's ambitious plans to reach carbon neutrality in 2050 were also met with a degree of pessimism and uncertainty.

KEY WORDS: environmental awareness, carbon neutrality, climate change, environmental pollution, European Union, biodiversity loss

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1. Introduction

Humankind has entered a new geological era characterised by an unprecedented impact on the environment – the Anthropocene (LEWIS & MASLIN, 2015). The wasteful exploitation of Earth's resources

and destruction of habitats, together with emissions of greenhouse gases, have unleashed mass extinctions and population declines in nature's biodiversity and warmed the planet by over 1.5 °C compared to the pre-industrial era (RIPPLE ET AL., 2023). Human civilisation has exceeded the safe operating zones

of our planet (ROCKSTRÖM ET AL., 2023) and now faces new challenges in sustaining societal development and the need to live sustainably. To achieve these sustainability goals, environmentally aware policy-making, strong governance, and decision-making are urgently needed, along with a resilient, environmentally conscious, educated, and determined society. Otherwise, civilisation as we know it may face major economic depression, emerging diseases, and the eventual collapse of societies in many regions of the planet.

The Slovak and Czech general public is thought to be pro-environmentally oriented and to profess an ecocentric environmental attitude but lags in some respects when compared to Western European countries (ČÁBELKOVÁ ET AL., 2022; URBAN & KAISER, 2022). The Slovak general public mostly perceives humans to be an equally important part of nature and cares strongly about the quality of the environment, which suggests an inclination towards environmentally friendly behaviour and sustainability approaches (MARCINEKOVÁ ET AL., 2024), although strong environmental impulses are lacking within society. On the other hand, the general public lacks knowledge when tested on more specific environmental issues (LIPTÁK ET AL., 2024), and non-scientifically based theories may disrupt science-based knowledge. Research on students' perceptions of environmental concerns and problems is generally scarce, although some surveys from the Central European region exist (e.g., ALFOLDI & ALFOLDI, 2019; CINCERA ET AL., 2022). Nevertheless, this landscape remains largely unexplored in both the Slovak Republic and the Czech Republic. While research regarding the environment tends to address questions to the general public (in the broader society), it loses some of its specificity. From this point of view, it is important to address stakeholders or specific groups such as students or communities (ALFOLDI & ALFOLDI, 2019), and pupils (WASILEWSKA, 2023; SVOBODOVÁ & CHVÁL, 2024). Furthermore, it is important to obtain information related to the perception of the environment, as well as on issues such as policies in action. Secondary school students represent a generation with a strong educational focus on environmental issues and can be considered an indicator of the uptake of pro-environmental attitudes and values. These aim to establish a new pillar in the decision-making of the generation to come, an area that has been partially unsuccessful and difficult to promote in the general discourse in Central Europe over the course of time (DURDOVIC ET AL., 2025).

This study focuses on secondary school students in the Slovak Republic and the Czech Republic and evaluates their attitudes toward environmental issues. Within its scope, the study presents the results of a questionnaire survey (both physical and online) of secondary school students from both countries. The two countries and, indeed, all of the countries of the Visegrád Group (Poland, the Czech Republic, the Slovak Republic, and Hungary) are characterised by increasing pressure to enhance their environmental policies. They also represent a significant component of the European Green Deal. These countries are expected to align their policies with the principles of sustainable development. The success of these efforts may substantially influence the implementation of broader European environmental objectives, including those associated with the European Green Deal.

This study aimed to investigate whether students' perception of environmental issues differs between secondary school students from the two countries and between the genders. It also explores knowledge uptake in relation to environmental issues by identifying the most prominent factors endangering the environment and the environments being endangered. It also seeks to explore whether students with pro-environmental attitudes are more likely to have a more positive belief regarding European environmental policies and whether they tend to have a more pessimistic perspective on domestic environmental actions. The core of this investigation offers insights into how students perceive the current state of environmental endangerment and provides valuable information regarding the mindset of students engaging with environmental issues within the context of public discourse.

1.1. Literature review

Interest in the environmental problems of contemporary society is determined by various factors and is shaped by predominant discourses. Emerging global issues such as climate change and the overexploitation of resources are overshadowed by the discourse set by the mass media and prominent figures, often opposing current scientific evidence, the need for sustainable development and environmental education, and diverting attention to more local affairs (MEDVECKY & LERSMÖLLMANN, 2026). It is somewhat expected that interest in nature and, overall, in environmental issues decreases over time in young individuals and adolescents alike

(NEUROHR ET AL., 2024), revealing the foundations of the rift between human society and the natural environment. Furthermore, ČÁBELKOVÁ ET AL. (2022) found in their study that older people showed little interest in climate, were less aware of sustainable development and climate change, and showed decreased willingness to take action, compared to their younger counterparts. Adult females, on the other hand, tended to be more concerned with climate change compared to adult males (ČÁBELKOVÁ ET AL., 2022). BALDWIN ET AL. (2023), in their research conducted on young individuals in secondary school in Australia, indicated low expectations that society will take action regarding climate change, pointing attention to pessimistic attitudes among young individuals in this regard.

Community building, environmental awareness, and pro-environmental behaviour are of critical importance and have substantial potential to influence regional and national progress toward sustainability (DAMERELL ET AL., 2013; OTTO & PENSINI, 2017; VAN DE WETERING ET AL., 2022). Constructive climate change engagement in an after-school programme using participatory methods could be an effective means for growing climate change awareness and taking action to reduce harm in relation to climate (TROTT, 2020). However, environmental education and awareness lack a systematic approach and coordination in many regions, including Central Europe (PISCOVÁ ET AL., 2023). SVOBODOVÁ (2020) and SVOBODOVÁ & CHVÁL (2024) investigated pupils' attitudes toward the environment, but there is a paucity of studies investigating the environmental awareness of young secondary school pupils.

The environmental attitudes of teenagers in Hungary are published by ALFOLDI & ALFOLDI (2019), and focus mainly on the conservation of animals and plants. CYNK (2017) investigated broader environmental aspects focusing on university students in the Central European context. His results showed a higher environmental consciousness in students from Slovakia compared to their counterparts from Poland and Ukraine. Another study (JANKOWSKI & ŚWISŁOCKI, 2025) focused on Polish youth (Gen Z), investigating attitudes regarding the natural world and specifically urban forestry. While the findings revealed relatively high proportions of students with a caring attitude toward the environment and nature, the study did not reach a conclusive finding when asked about attitudes towards sustainable urban greenery and its practices (JANKOWSKI & ŚWISŁOCKI, 2025).

A specific focus on students at the University of Prešov in Slovakia, and their attitudes towards the environment was published in the study by NOVOTNÝ ET AL. (2021). The authors concluded that the students exerted a relatively high environmental awareness, although some variation was recorded when comparing the results from students of different faculties and fields. Positive environmental attitudes and attitudes towards recycling were also investigated in the general public of Slovakia, with the most pronounced correlation being education and gender (LORINCOVÁ & OSVALDOVÁ, 2025). Differences in gender were also recorded in the study by SVOBODOVÁ & CHVÁL (2024), indicating that lower secondary school girls in the Czech Republic demonstrate higher scores regarding environmental attitudes, sensitivity, behaviour, and outdoor activities, when compared with boys.

Environmental education and knowledge play a significant role in shaping the environmental attitudes of youth. Special emphasis on this subject has been researched by SVOBODOVÁ (2020), which focused on the environmental literacy of pupils in the Czech Republic. CYNK (2017b) focused on the environmental knowledge of university students from four European countries and found a rather shallow display of knowledge regarding environmental issues, with the highest level of environmental awareness among the participants from the Czech Republic. This is in line with URBAN & KAISER (2022), pointing to relatively low scores from Central European countries compared to Western nations.

2. Materials and methods

2.1. Ethics statement

All procedures performed in this study involved human participants and therefore complied with the 1964 Declaration of Helsinki (WORLD MEDICAL ASSOCIATION, 1964) and its later amendments. The survey respected the dignity of the respondents through a standardised approach. The responses were not backed by a respondents consent form (informed consent); however, the respondents were informed about the handling and management of data by the researchers, and the data were treated anonymously. Participants were assured of the confidentiality of the data obtained. Instructions for the survey were available to the respondents and provided all the necessary information explaining the aim of the research, with guarantees to the respondents about data management. Personal

information requested in the survey prevented any potential identification of specific respondents, and the questions asked did not pose ethical dilemmas regarding the answers. The questionnaire survey was in agreement with the standard ethical procedures used in research in the social sciences and related disciplines. The survey was inclusive and objective, avoiding all subjective evaluations during the assessment and evaluation of the research results.

2.2. Procedure

The data were collected in person and used a printed questionnaire that was distributed among attendees at the TalentEXPO Science and Technology 2024 event held in Banská Bystrica from April 25th to 27th, 2024. The event was organised by the National Institute of Education and Youth in the Slovak Republic and took place at Matej Bel University. The event was held alongside the nationwide competition in science and technology. The questionnaire was distributed to the students from registered secondary schools attending the event and to the attendees of the competitions in natural sciences. The interviewees were asked to complete the distributed questionnaire on the first day of the competition during the exhibition of partner organisations of the event, where all the attendees were gathered together.

In addition to this method of data collection, the same questionnaire was also distributed online via

social networks and through teachers' involvement in both countries, namely the Slovak Republic and the Czech Republic. In the Slovak Republic, the online questionnaire was proposed to students in the second half of 2024, while in the Czech Republic, the investigation was performed in the first half of 2025. The investigation was anonymous and designed to cover a variety of regions in both countries and thereby obtain data from a broad cross-section of secondary school students. The subjective perceptions and feelings of the participants were of interest when answering questions in the presented questionnaire.

2.3. Questionnaire

The anonymous questionnaire consisted of ten short questions formulated to be as clear as possible and to minimise the time required to complete it. The entire questionnaire was designed to fit on a single A4 page. The list of questions is presented in Table 1.

The first question (Q1) concerned the gender of the respondents, and the second (Q2) focused on their ages. Questions 3, 4, 5, 7, 8, and 10 were designed according to the 7-point Likert scale principle (where 1 indicated *definitely not*, and 7 *absolutely yes*), while questions 6 and 9 were multiple-choice questions, with an option to provide additional input if desired (Q6). The respondents had the possibility to select multiple indicated categories in the list.

Table 1. Questions incorporated in the questionnaire

7-point Likert scale questions	Likert scale	Multiple choices
Q3 Are you interested in themes regarding the environment?	1-definitely not/7- absolutely yes	
Q4 Is the environment endangered?	1-definitely not/7- absolutely yes	
Q5 Is the state doing all it can to reduce the negative effects on the environment?	1-definitely not/7- absolutely yes	
Q7 Are you doing all you can to reduce your own negative effects on the environment?	1-definitely not/7- absolutely yes	
Q8 Should the state be doing more to protect the environment?	1-definitely not/7- absolutely yes	
Q10 Will the European Union reach carbon neutrality by 2050?	1-definitely not/7- absolutely yes	
Multiple-choice selection questions		
Q6 What endangers the environment the most?		a. Climate change, b. Biodiversity loss, c. Environmental pollution, d. Excessive construction, e. Insufficient environmental protection, and f. Other
Q9 Which part of the environment is endangered the most?		a. Soil, b. Water, c. Air, d. Biodiversity, and e. All the indicated categories

2.4. Research hypothesis

The research hypothesis of this study was designed to confirm, or deny, the following assumptions: a. interest in the environment will vary in the two countries, and that the interest will be greater in females than males; b. perception of the endangerment of the environment will be greater in females than males and will not be determined by country; c. differences in attitudes towards the state efforts in relation to environmental protection will be determined by country, while age and gender will contribute to a lesser extent; d. self-perceived efforts to protect the environment will be perceived more strongly by females than males with a lesser effect of age and country; e. in relation to states' efforts regarding to environmental protection, Czech responders were expected to endorse state efforts, scoring higher than their Slovak counterparts; f. carbon neutrality by 2050 was expected to be met with scores in the lower half of the scale with effects based on country (Czech counterparts scoring higher than Slovak counterparts), age (younger individuals will show greater optimism than older respondents) and gender (females displaying greater optimism than males); g. differences in the selection of environmental threats will be determined based on the respondents' country while gender will contribute to a lesser extent; h. significant differences will be identified within the environmental categories with effects based on the respondents' country and gender.

2.5. Statistical analysis

All data were standardly processed using the Microsoft Office 2016 software package (Microsoft Corporation, 2015, <https://office.microsoft.com>). All numbers are presented as means with standard deviation and/or summaries with standard error of the mean, where applicable. Regarding the comparison of Czech and Slovak participants (categorical), gender (categorical), and age (continuous predictor) in relation to Likert scores, ordinal logistic regression models were fitted using the proportional odds assumption using a logit link function. Parameter estimation was performed using maximum likelihood using the Broyden-Fletcher-Goldfarb-Shanno (BFGS) algorithm. Statistical significance was assessed using Wald tests, with p-values calculated from the standard normal distribution. Model fit was evaluated using the Akaike Information Criterion (AIC) and the

Bayesian Information Criterion (BIC). Statistical analyses were conducted using Python 3.11 (Python Software Foundation, 2016) and the statsmodels package (version 0.14.0) for ordinal logistic regression. The OrderedModel class was employed to fit proportional odds models with maximum likelihood estimation and BFGS optimisation.

Responses to the item "What endangers the environment most?" were recoded using predefined mutually exclusive decision rules. The questionnaire contained five principal environmental threats: environmental pollution, climate change, loss of biodiversity, excessive construction, and insufficient environmental protection. Responses containing only one of these threats were retained as the corresponding single factor category. Responses containing exactly two predefined threats were classified as "Two factors," whereas responses containing three or more predefined threats were classified as "Multiple factors." Write-in responses that did not correspond to the five predefined threats were grouped as "Other/rare responses" because their individual frequencies were too low for a separate statistical analysis. Obvious spelling variants were standardised before classification. This procedure reduced the 46 unique response strings to eight categories: pollution, climate change, biodiversity loss, excessive construction, insufficient environmental protection, two factors, multiple factors, and other/rare responses.

Responses to the item "Which part of the environment is endangered the most?" comprised 16 unique response strings. Responses identifying only one environmental component were assigned to the corresponding category: air, water, soil, or biodiversity. The response "All the indicated categories" was classified as "All categories," while responses identifying two or more, but not all, environmental components were classified as "Multiple categories." This produced six mutually exclusive categories: air, water, soil, biodiversity, all categories, and multiple categories.

Age was grouped into meaningful brackets (17 years and younger, 18-19 years, 20 years and older) based on data distribution. The group 17- consisted of 251 respondents, while the later had 181 and 13 respondents, respectively. The Pearson chi-square test was used to assess the significant association between demographic variables and environmental perceptions. Cramér's V was used to determine effect sizes (< 0.1: negligible effect, 0.1-0.3: small effect, 0.3-0.5: medium effect, 0.5: large effect).

Significance categories were used as follows: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, $p < 0.1$, ns $p \geq 0.1$.

Republic were represented by 156 females and 101 males, with an average age of 17.2 ± 1.3 years.

3. Results

Altogether, 445 respondents completed the questionnaire. Of these, 188 respondents were from the Slovak Republic, while 257 respondents were from the Czech Republic. Of the 188 respondents from the Slovak Republic, 123 were female and 65 male, with an average age of 17.1 ± 1.6 years. The respondents from the Czech

3.1. Comparison of Czech and Slovak participants

Are you interested in themes regarding the environment? There were no significant differences in responses to this question concerning country, gender, or age (Table 2). This null finding was likely due to a ceiling effect, as the median score on this item was 5, with most responses clustering around 4–5 and relatively few extremely low scores (Fig. 1 and 2).

Table 2. Regression analysis

Model	Dependent Variable	Predictor	Coefficient	Std_Error	Z_Value	P	CI_Lower	CI_Upper	Log Likelihood	AIC	BIC
Env. Interest	Are you interested in themes regarding the environment?	State (Slovakia vs Czech Rep)	0.033	0.1713	0.1926	0.8473	-0.3028	0.3688	-780.94	1579.88	1616.77
Env. Interest	Are you interested in themes regarding the environment?	Sex (Male vs Female)	-0.3408	0.1759	-1.9379	0.0526	-0.6855	0.0039	-780.94	1579.88	1616.77
Env. Interest	Are you interested in themes regarding the environment?	Age	-0.0566	0.0577	-0.9812	0.3265	-0.1696	0.0564	-780.94	1579.88	1616.77
Env. Endangered	Is the environment endangered?	State (Slovakia vs Czech Rep)	0.247	0.1838	1.3436	0.1791	-0.1133	0.6073	-533.28	1084.56	1121.44
Env. Endangered	Is the environment endangered?	Sex (Male vs Female)	-0.5931	0.1881	-3.1534	0.0016	-0.9617	-0.2245	-533.28	1084.56	1121.44
Env. Endangered	Is the environment endangered?	Age	0.0745	0.0625	1.1918	0.2334	-0.048	0.1971	-533.28	1084.56	1121.44
State Efforts	Is the state doing all it can to reduce the negative effects on the environment?	State (Slovakia vs Czech Rep)	-1.0633	0.179	-5.9406	< 0.0001	-1.4141	-0.7125	-690.78	1399.57	1436.45
State Efforts	Is the state doing all it can to reduce the negative effects on the environment?	Sex (Male vs Female)	0.368	0.1801	2.0427	0.0411	0.0149	0.721	-690.78	1399.57	1436.45
State Efforts	Is the state doing all it can to reduce the negative effects on the environment?	Age	-0.0641	0.0587	-1.0926	0.2746	-0.1792	0.0509	-690.78	1399.57	1436.45
Personal Efforts	Are you doing all you can to reduce your own negative effects on the environment?	State (Slovakia vs Czech Rep)	-0.0103	0.174	-0.0591	0.9529	-0.3512	0.3307	-714.65	1447.3	1484.18
Personal Efforts	Are you doing all you can to reduce your own negative effects on the environment?	Sex (Male vs Female)	-0.2917	0.178	-1.6388	0.1013	-0.6406	0.0572	-714.65	1447.3	1484.18
Personal Efforts	Are you doing all you can to reduce your own negative effects on the environment?	Age	0.0665	0.0582	1.1422	0.2534	-0.0476	0.1805	-714.65	1447.3	1484.18

	effects on the environment?										
State Should Do More	Should the state be doing more to protect the environment?	State (Slovakia vs Czech Rep)	0.7512	0.1853	4.0533	0.0001	0.3879	1.1144	-586.16	1190.33	1227.21
State Should Do More	Should the state be doing more to protect the environment?	Sex (Male vs Female)	-0.6831	0.1857	-3.679	0.0002	-1.047	-0.3192	-586.16	1190.33	1227.21
State Should Do More	Should the state be doing more to protect the environment?	Age	0.0667	0.0621	1.0756	0.2821	-0.0549	0.1884	-586.16	1190.33	1227.21
Eu Carbon Neutral	Will the European Union reach carbon neutrality by 2050?	State (Slovakia vs Czech Rep)	0.2642	0.1698	1.5565	0.1196	-0.0685	0.597	-755.7	1529.4	1566.28
Eu Carbon Neutral	Will the European Union reach carbon neutrality by 2050?	Sex (Male vs Female)	-0.4866	0.1822	-2.6708	0.0076	-0.8437	-0.1295	-755.7	1529.4	1566.28
Eu Carbon Neutral	Will the European Union reach carbon neutrality by 2050?	Age	-0.1122	0.0587	-1.9102	0.0561	-0.2273	0.0029	-755.7	1529.4	1566.28

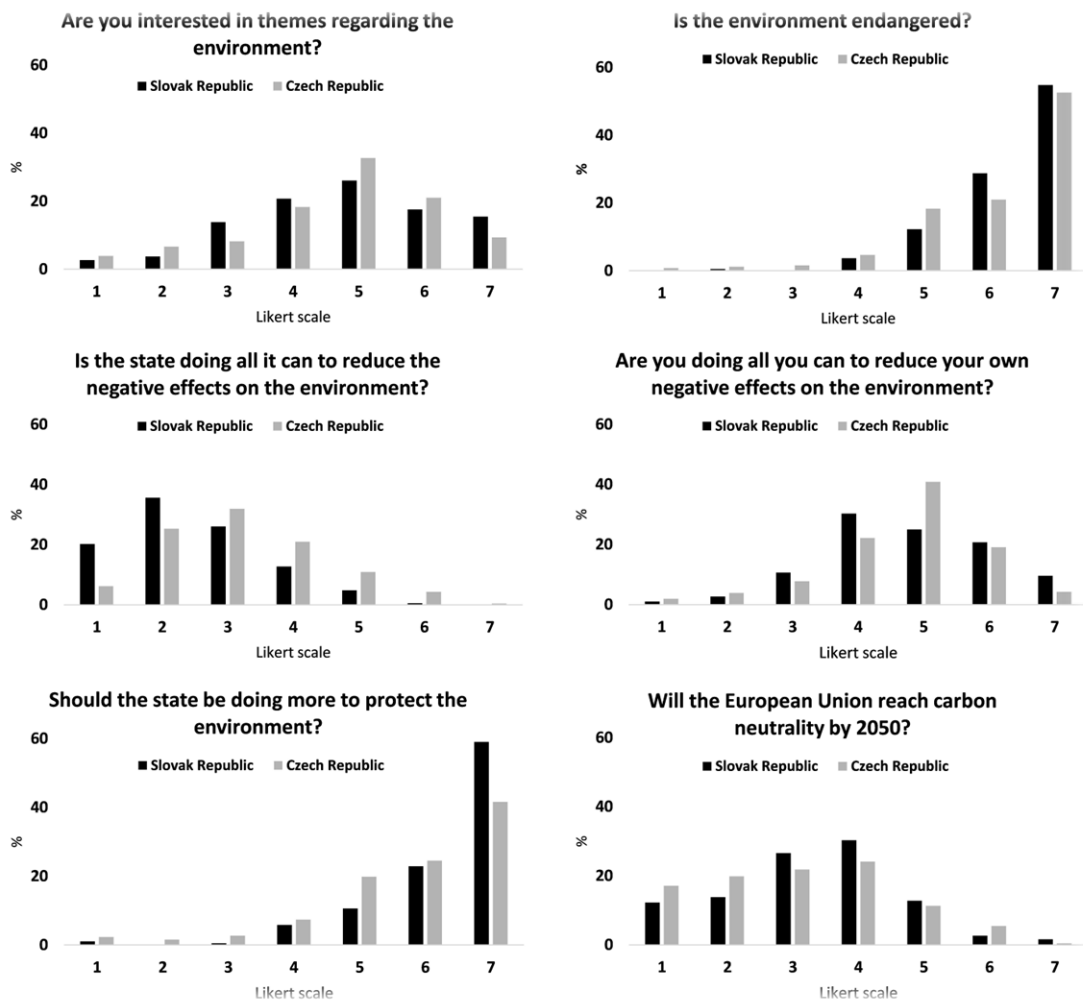


Fig. 1. Answers of the respondents to Questions 3, 4, 5, 7, 8, and 10, based on a 7-point Likert scale. (1 = definitely not, 7 = absolutely yes) by country

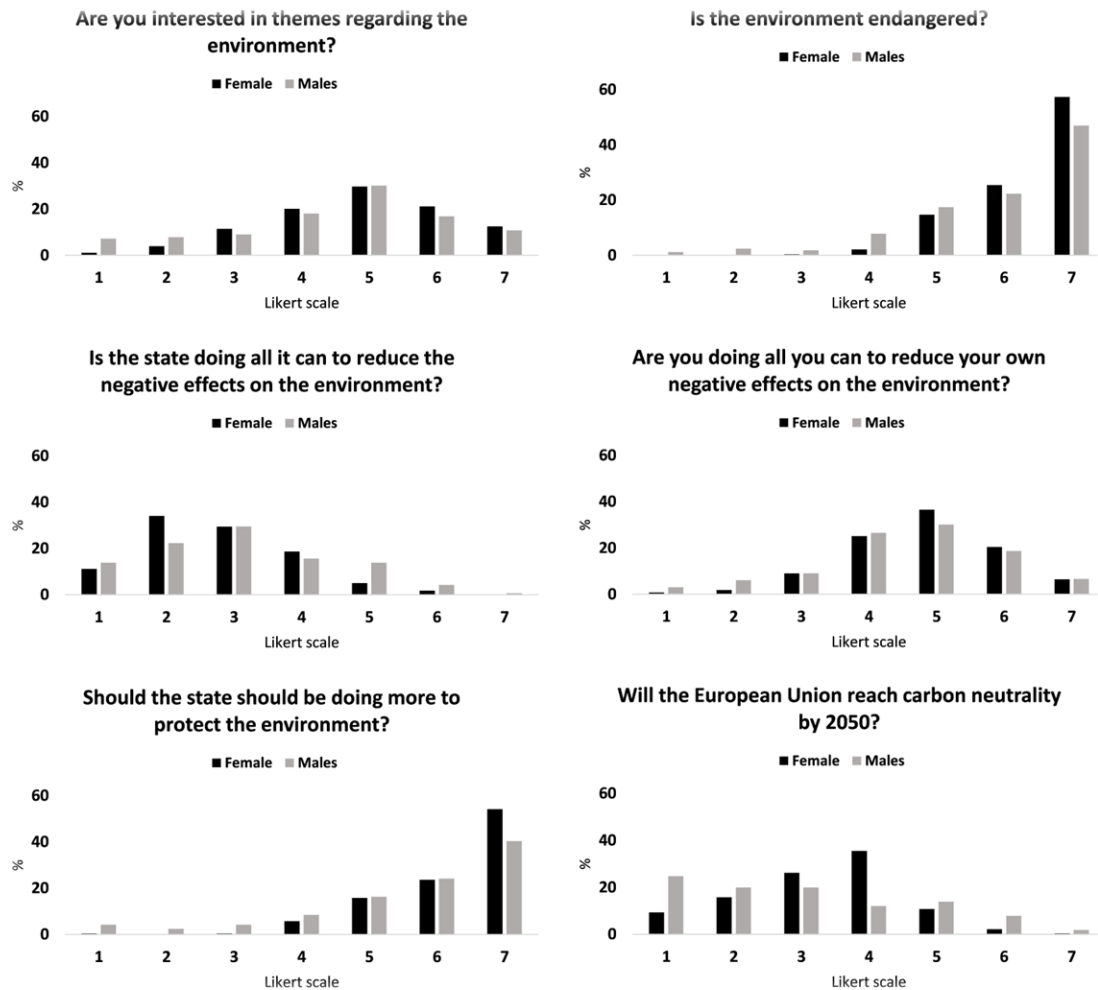


Fig. 2. Answers of the respondents to Questions 3, 4, 5, 7, 8, and 10, based on a 7-point Likert scale. (1 = definitely not, 7 = absolutely yes) by gender

Is the environment endangered? This item received extremely high scores from participants (median = 7). This item showed the strongest ceiling effect of all questions, with 77.8% of responses at the high end (6–7), with 53.5% being the maximum (7). A significant effect was found for gender, with females perceiving greater environmental endangerment than males ($\beta = -0.593$, $p = 0.002$; Fig. 1 and 2). No significant differences were found between the country or age of the respondents (Table 2).

Is the state doing all it can to reduce the negative effects on the environment? The median score in participant responses was 3 (Fig. 1, Fig. 2). Significant effects were found both for country and gender: Czech participants rated government environmental efforts significantly higher than Slovak participants ($\beta = -1.063$, $p < 0.001$), and males rated government efforts higher than females, when pooled together from both countries ($\beta = 0.368$, $p = 0.041$). Age showed

no significant association with responses to this question (Table 2).

Are you doing all you can to reduce your own negative effects on the environment? There were no significant differences in responses to this question concerning country, gender, and age of the respondents (Table 2). This null finding was likely due to a ceiling effect, as the median score on this item was 5, with most responses clustering around 4–5 and relatively few extremely low scores (Fig. 1, Fig. 2).

Should the state be doing more to protect the environment? This variable shows the strong ceiling effect of all environmental questions, with nearly three-quarters (72.8%) of participants responding at the high end (6–7, median = 6), including 49.0% at the maximum score (7) (Fig. 1, Fig. 2). Slovak participants more strongly endorsed increased government environmental action than their Czech counterparts ($\beta = 0.751$, $p < 0.001$), and females

more strongly endorsed increased government action than males ($\beta = -0.683$, $p < 0.001$) (Table 2).

Will the European Union reach carbon neutrality by 2050? Participants from both countries scored a mean of 3.3 (Slovak Republic) and 3.1 (Czech Republic) points on the 7-point Likert scale. The majority (83%) of the participants scored between 1 and 4 points (Fig. 1, Fig. 2). Significant effects were found comparing the genders, where females displayed a more optimistic view than males ($\beta = -0.486$, $p < 0.008$). Younger individuals tended to score higher in comparison to older counterparts ($\beta = -0.112$, $p < 0.056$).

3.2. Categorical variables

Country was significantly associated with responses to both categorical items: “What endangers the environment most?” (Pearson’s $\chi^2(7) = 209.111$, $p < 0.001$, Cramér’s $V = 0.686$) and “Which part of the environment is endangered the most?” (Pearson’s

$\chi^2(5) = 69.711$, $p < 0.001$, Cramér’s $V = 0.396$; Fig. 3). The association was stronger for the first item.

Czech respondents more frequently identified single environmental threats. Pollution was identified by 48.2% of Czech respondents, compared with 17.0% of Slovak respondents, while climate change was identified by 28.8% and 6.9%, respectively. In contrast, Slovak respondents more frequently selected combinations of environmental threats. Multiple factors were identified by 47.3% of Slovak respondents, compared with 3.5% of Czech respondents, while exactly two factors were identified by 19.1% of Slovak respondents and none of the Czech respondents.

Regarding the parts of the environment considered endangered, 51.8% of Czech respondents and 42.0% of Slovak respondents selected all specified environmental components. Combinations of two or more, but not all, components were identified by 23.9% of Slovak respondents, whereas no Czech respondents selected such a combination.

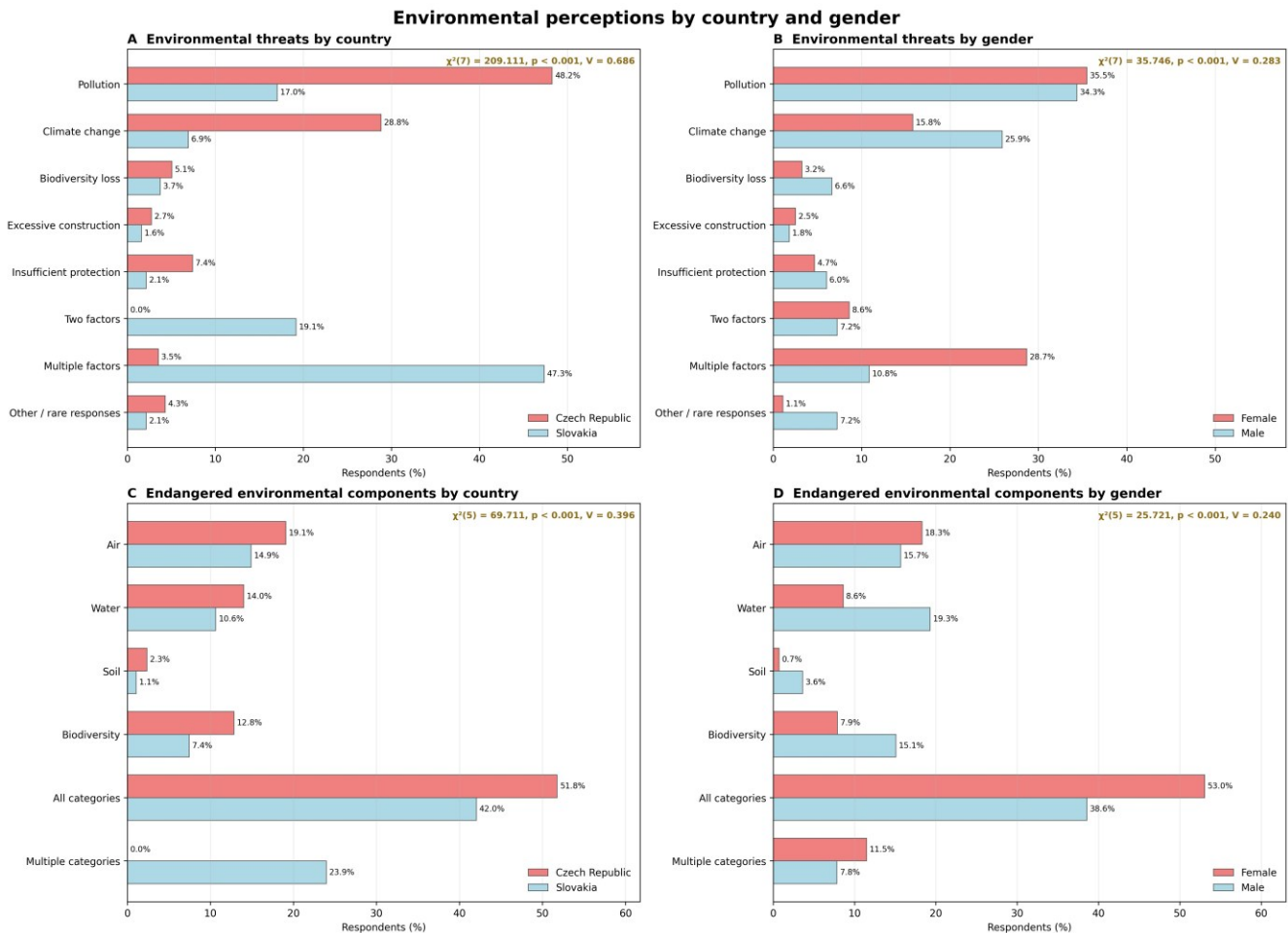


Fig. 3. Differences in categorical variables based on respondents

Gender was also significantly associated with responses to both categorical items: “What endangers the environment most?” (Pearson’s $\chi^2(7) = 35.746$, $p < 0.001$, Cramér’s $V = 0.283$) and “Which part of the environment is endangered the most?” (Pearson’s $\chi^2(5) = 25.721$, $p < 0.001$, Cramér’s $V = 0.240$). Both associations were small.

Male respondents more frequently identified climate change as the principal threat than female respondents (25.9% vs. 15.8%). Female respondents more frequently identified multiple threats than male respondents (28.7% vs. 10.8%; Fig. 3). Regarding endangered environmental components, female respondents more frequently selected all the indicated components than male respondents (53.0% vs. 38.6%). Male respondents more frequently selected biodiversity (15.1% vs 7.9%) and water (19.3% vs. 8.6%) as individual components.

Age group was not significantly associated with responses to either “What endangers the environment most?” (Pearson’s $\chi^2(14) = 8.440$, $p = 0.865$, Cramér’s $V = 0.099$) or “Which part of the environment is endangered the most?” (Pearson’s $\chi^2(10) = 6.338$, $p = 0.786$, Cramér’s $V = 0.086$).

Additional write-in responses concerning environmental threats included humans, excessive consumerism, overpopulation, obesity, capitalism, excessive production, fast fashion, waste, transport, the human mindset, loss of respect for nature, nature itself, and responses indicating that nothing endangers the environment. With the exception of overpopulation, which was mentioned by one respondent in each country, each write-in concept occurred only once in the results.

4. Discussion

As humankind approaches a critical period in its history (KEMP ET AL., 2022; RIPPLE ET AL., 2023; RICHARDSON ET AL., 2023; ROCKSTRÖM ET AL., 2023), having exceeded the safe operating zones of our planet (ROCKSTRÖM ET AL., 2009), it is crucial that students participating in this survey acknowledge that the environment is endangered. This aligns with the results of the 2024 Eurobarometer survey conducted by the European Commission (ATTITUDES OF EUROPEANS TOWARDS THE ENVIRONMENT, 2024). This study presents generally positive responses, reflecting the latest environmental assessments (EEA, 2019; TURVEY & CREES, 2019; IPBES, 2019; WWF, 2022), and may indicate a promising shift in societal discourse among the emerging younger generation.

Despite the generally low environmental attitude ranking of the Slovak Republic and the Czech Republic among 28 countries in the study by URBAN & KAISER (2022), where both countries were placed towards the lower end of the spectrum, the findings of this study, although represented on a relatively small sample of respondents, demonstrate a relatively strong awareness of current environmental issues and a high self-reported engagement to take actions to reduce personal negative impact on the environment.

The results demonstrate a relatively strong engagement with environmental themes among the current group of secondary school students, and encouragingly, this sentiment is consistently observed across both countries and likely reflects a broader trend among secondary students in general. This highlights an important aspect of societal uptake of environmental discourse within this demographic, regardless of age, gender, or national/regional differences. Such a positive orientation toward environmental issues is particularly important, as previous research has shown that positive environmental connections formed during adolescence often persist into adulthood (SOGA ET AL., 2016; SOGA & GASTON, 2016). Students also reported taking action to reduce their negative environmental impact. Female respondents selected combinations of environmental threats more frequently than male respondents. This may indicate a difference in how threats were conceptualised or reported, but the selection of multiple factors cannot by itself be interpreted as evidence of greater knowledge or a more complex understanding. In line with these findings, the results also correlate with students’ self-reported actions to reduce their negative environmental impact. While these self-assessments are inherently subjective, the strength of this finding provides evidence of an environmentally conscious youth actively engaging in behaviours aligned with sustainability principles, although a degree of uncertainty in responses was noted. Moreover, females in this study tended to lean towards multiple-factor explanations, leaning towards a more complex understanding of the environmental threats, rather than selecting a single category.

Responses regarding whether the government of the Slovak Republic and the Czech Republic are doing all that is within their power to reduce the negative impacts on the environment reflected a rather pessimistic perception among students. The country effect was particularly strong, with a large effect size, indicating that Czech participants rated

their government's environmental efforts substantially more positively than Slovak participants. This view is furthermore strengthened by the strong consensus that the country should intensify its efforts to protect the environment. The dissatisfaction expressed by this young group of individuals comes at a time when both countries are midway through implementing ambitious environmental plans, which are perceived not to have met with expectations. These perceptions among secondary school students may indicate a perceived need for stronger environmental action and highlight expectations regarding future policy development. Global megatrends closely relate to the assessment of the planet's safe operating zones, with most categories already exceeding critical thresholds (Richardson et al., 2023). In line with this perception is also the EU Green Deal's ambition to achieve carbon neutrality by 2050. The students' responses reveal a rather pessimistic attitude towards the likelihood of this goal being met, reflecting mixed feelings about the EU's commitment and effectiveness. This sentiment is unsurprising, given current political and geopolitical tensions, ongoing conflicts, and instability both in Europe and globally. Nonetheless, this case study provides an indication of how EU actions are perceived by the younger generation, whose voices are crucial as potential implementers of the Sustainable Development Goals. The strength of these attitudes should not be taken for granted, as they are closely linked to the hopes and aspirations of young individuals and may influence whether they will pursue an environmentally-friendly and sustainable lifestyle, contributing at local, regional, or even national levels. Young individuals who are set to live in a hotter climate, in a world of uncertainty, while also bearing many other consequences of climate change, may experience a rise in depression-like behaviour and anxiety, as well as increased fear within this vulnerable population (HICKMAN ET AL., 2021). HICKMAN ET AL. (2021) state in their study that climate anxiety and distress were correlated with perceived inadequate government response and associated feelings of betrayal. These findings highlight the importance of effective communication and engagement strategies that may help strengthen confidence in environmental policies and sustainability goals among young people.

The Slovak Republic has missed the opportunity to establish a systematic and coordinated approach to environmental education at the elementary school level, leaving this responsibility largely to several

non-governmental organisations and the Slovak Environment Agency. Despite the urgency of addressing climate change and global environmental issues, education has not yet reached its full potential in this area. In most cases, environmental and climate change education remains insufficiently integrated into school curricula (ROUSELL & CUTTER-MACKENZIE-KNOWLES, 2019; EILAM, 2022). The consequences of failing to embed these important subjects in education, particularly in ways that actively engage young people with environmental and climate-related topics, may result in misconceptions and broader environmental illiteracy across the population. Such outcomes must be urgently avoided, as public attitudes strongly influence both individual behaviours and the commitments of key stakeholders. These, in turn, have direct and indirect impacts on efforts to achieve Sustainable Development Goals and actions aligned with the scientific ambition of current environmental and sustainable development policies. Consequently, the quality and scope of environmental education may vary significantly, depending on the region, school, or individual teachers involved (PISCOVÁ ET AL., 2023). Since 2007, environmental education has been a mandatory component of the school curriculum in the Czech Republic, as set out in the national school law (SVOBODOVÁ, 2020). The topic is included in the current Framework Education Plan as a cross-curricular theme, under the title 'Environmental Education'. It is divided into four thematic parts, which aim to contribute to the understanding of the relationship between human relations to the environment, to raise awareness of the fundamental conditions of life, and to promote a sense of responsibility for the future life of the planet. In 2024, a new Framework Curriculum was developed, which will be released and be valid from September 2026 (NATIONAL PEDAGOGICAL INSTITUTE OF THE CZECH REPUBLIC, 2026). This updated curriculum replaces the previously defined "Environmental Education" theme with a comprehensive concept titled "Sustainable Environment". The new framework aims to integrate environmental education with the social, economic, and cultural dimensions of sustainability, offering a broader and more inter-connected perspective. This shift represents a modern and promising approach; however, its success will largely depend on the willingness and motivation of educators to convey this knowledge in an integrated and meaningful way.

The results of this current investigation do not take into account students' backgrounds, cognitive

abilities, or prior education which may be perceived as a limitation of the current research. The selected respondents do not represent the broader societal average in terms of environmental knowledge, as the relatively small group of respondents consists exclusively of young individuals, approximately 17 years of age. On the other hand, it captures an important insight into how this current age group perceives environmental issues, demonstrating its stance towards government environmental management and views in relation to reaching the goals of the EU Green Deal. At the same time, this prevailing attitude appears to be tinged with uncertainty, which may contribute to feelings of hopelessness and a potential loss of belief in a more sustainable future. This underscores the need for further research and supportive frameworks and emotional reinforcement to help this generation maintain and/or build pro-environmental attitudes. Furthermore, empowering young people to engage in environmental action, innovation, and sustainability research is critically important in order to advance the transition to a more sustainable society. Additionally, it is strongly recommended that further research be conducted in other nations, and based on those results, to set and develop a future package of policy recommendations to meet the demands of the emerging active community. Actions that overlook the perspectives of young people may reduce their engagement with environmental decision-making and sustainability initiatives.

Most respondents in this study considered all the indicated environmental components (soil, air, water, and biodiversity) to be endangered. Among respondents selecting a single component, air and water were identified more frequently than soil or biodiversity. The major threat to the environment was identified as environmental pollution and climate change, although the drivers behind these phenomena are human actions fostering habitat destruction and overexploitation (CARO ET AL., 2022). In this regard, our study shows that females expressed significantly higher concern about environmental endangerment compared to males, which can be explained by greater investment/care in relation to reproduction and offspring, and/or greater degree of reasoning and empathy display, where women identify danger or negative notions with a higher rate of success (CHRISTOV-MOORE ET AL., 2014). Czech respondents predominantly selected individual threats, whereas Slovak respondents more frequently selected combinations of threats. This country

difference was large, but it may reflect not only differences in environmental perceptions but also differences in response-selection behaviour or interpretation of the multiple-response format. The present study cannot distinguish among these explanations. Additional write-in responses included humans, excessive consumerism, overpopulation, obesity, capitalism, excessive production, fast fashion, waste, transport, the human mindset, loss of respect for nature, nature itself, and responses indicating that nothing endangered the environment. With the exception of overpopulation, which was mentioned once in each country, each write-in concept occurred only once and was therefore not interpreted separately in more detail. Female respondents reported greater concern about environmental endangerment and selected combinations of threats more frequently than male respondents (cf. PROKOP AND KUBIATKO, 2014).

The focus on young individuals, such as secondary school students, presents a significant field of interest. Failing to address the needs of this segment of the population by neglecting education that promotes environmentally friendly behaviour, and not raising awareness based on scientific evidence will not only lead to detrimental consequences marked by inaction on climate change but will also place responsibility in the wrong hands. Hope plays a crucial role in shaping environmental engagement among teenagers and young adults (OJALA, 2012) and has meaningful implications for education relating to sustainability and innovations introducing environmentally friendly solutions. Despite relatively high interest in environmental themes and personal subjective engagement, scepticism or pessimism regarding the achievement of carbon neutrality and a sustainable future remains high. This confirms the earlier assumption of OJALA (2015), who found that scepticism is common among adolescents. These worrying trends shape the overall quality of life and expectations of individuals and raise several important questions that the scientific community must address, communicate, and investigate further. The obtained results of this case study provide insight into the perception of environmentally related issues, call for greater engagement in this field, and focus on preparing these young individuals for the environmental challenges of the future.

5. Conclusions

Secondary school students represent an important group in society because they will increasingly participate in future environmental decision-making and sustainability initiatives. The present findings suggest relatively high levels of environmental concern and self-reported environmental engagement among respondents, together with scepticism regarding the sufficiency of current environmental actions. These results provide insight into environmental perceptions among young people in the Czech Republic and Slovakia and may inform future research and educational initiatives.

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