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The Relationship Between Selected Socioeconomic Factors and Students' Environmental Values and Attitudes

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Abstract

Socioeconomic status (SES) significantly affects students' environmental awareness, with those from disadvantaged backgrounds showing lower environmental literacy. This aligns with broader trends, where lower SES is linked to reduced literacy levels across various domains, including health and environmental contexts. These disparities may lead to unequal participation in environmental decision-making and advocacy, reinforcing socio-environmental injustice. Our research not only focuses on students from lower SES backgrounds but also considers other disadvantaged groups, such as those facing health challenges, cultural differences, or difficult living conditions.

This study examines the relationship between socioeconomic factors and the environmental values and attitudes of 11- to 15-year-old students in primary schools engaged in social innovation action research on environmental education. Data were collected using a standardized Pupil Environmental Literacy Questionnaire (MEG, 2021), supplemented with socioeconomic characteristics. Independent samples t-tests were used for statistical analysis.

Findings from the Czech Republic will help identify which socioeconomic factors (e.g., parental education, employment status, health disadvantages) most strongly influence students' environmental attitudes, enabling more precise educational interventions. The research deepens understanding of how SES and other disadvantages shape students' environmental values and attitudes while advancing social innovation in environmental education. These insights may enrich theoretical knowledge on environmental literacy and improve targeted educational strategies.

Keywords: environmental attitudes, socioeconomic status (SES), students

1. Introduction

Socio-economic status (SES) is among the most intensively examined constructs in the social sciences and offers a powerful lens for explaining inequalities across human development (Bradley & Corwyn, 2002; Li et al., 2020; von Stumm et al., 2022). Over the past two decades, this lens has been applied to environmental literacy - an combination of knowledge, values and behaviours related to the natural world.

Many studies link higher SES to stronger pro-environmental attitudes and behaviours, presumably through richer cultural capital and broader informal learning opportunities (Stevenson et al., 2013; OECD, 2020; Mónus, 2022; Harris et al., 2025). Yet the evidence for SES effects on the cognitive dimension of EL is mixed, and the well-documented SES gap in academic achievement does not always replicate in environmental knowledge (Fisman, 2005; Stevenson et al., 2013; OECD, 2023).

Accordingly, the present study pursues two main objectives: (1) to examine the relationship between socioeconomic status — operationalised through parental education, parental occupation and health-related disadvantage — and the environmental values and attitudes of 11- to 15-year-old pupils; and (2) to determine which specific components of socioeconomic status (e.g., father's and mother's education level, type of employment, presence of special educational needs) exert the strongest influence on pupils' environmental values and attitudes.

We surveyed 643 pupils with the standardised Environmental Literacy Questionnaire for Pupils (MEG) and collected detailed family SES data. After outlining our sample and analytical approach, we present the findings, discuss limitations, and sketch the next phase of the project—designing and testing school-based interventions to strengthen environmental education.

2. Methods

2.1 Participants and Procedure

The final sample comprised 643 pupils aged 10–16 years (M = 12.82, SD = 1.57) from Grades 5–9; each grade contributed roughly one fifth of the participants. Boys represented 52 % (n = 335**)** of the sample, girls 43 % **(**n = 276**),** and 5 % **(**n = 32**)** of pupils did not report their gender. About 60 % **(**fathers n = 382, mothers n = 387**)** of fathers and mothers had completed an upper secondary programme, 20 % **(**fathers n = 119, mothers n = 129**)** held a university degree, and 13 % **(**fathers n = 85, mothers n = 83**)** had not progressed beyond lower secondary education; the remainder did not provide educational data. Parental occupation could be classified for roughly three quarters of respondents, among whom high and medium status positions each accounted for about a quarter, while low status manual work predominated for one third of fathers and one seventh of mothers; missing cases largely reflected unemployment, disability, parental leave, or absent parents.

The pupils attended five public elementary schools in the Moravian Silesian Region of the Czech Republic, selected to capture varied contexts — a rural village school, a large housing estate school, a city centre school, a peri urban (edge of town) school, and one located in an area with a higher concentration of socially disadvantaged children. Fourteen per cent **(**n = 94**)** of respondents had been formally identified as having special educational needs (SEN), whereas 5 % **(**n = 30**)** withheld this information. Data were gathered between February and May 2025 (during the second half-year of the 2024/25 school year). The subsequent sections detail the measurement instruments and statistical procedures applied in the study.

2.2 Measures

Socio-economic Status (SES)

Parental socio-economic status was derived from pupil-reported information on both parents' education and occupation. Educational attainment was coded according to the International Standard Classification of Education 2011 (UNESCO Institute for Statistics, 2012): parents with at least a bachelor's degree were classified as having tertiary education (ISCED 5–6), those who had finished upper-secondary school with a state school-leaving certificate—including post-secondary programmes—as upper-secondary graduates (ISCED 3A, 4),

holders of vocational apprenticeship certificates (without a school-leaving certificate) as upper-secondary non-graduates (ISCED 3C), and parents whose schooling did not exceed lower-secondary level as having only lower-secondary or primary education (ISCED 0–2).

To complement the educational dimension, each parent's occupation was classified—using a modified Erikson–Goldthorpe–Portocarero (EGP) class scheme (Erikson et al., 1979; see also Erikson & Goldthorpe, 1992; adaptation by Katrňák, 2005)—into high, medium, or low occupational status. The high-status category comprised professionals, managers, entrepreneurs and senior civil servants; the medium category included clerical and administrative workers, small business owners, farmers and supervisors; and the low category consisted of manual workers across all sectors. Treating education and occupation separately a single conceptual frame allowed us to capture both the cultural and labour-market facets of SES while retaining sufficient detail for subsequent multivariate analyses.

Health Status

The Czech commitment to inclusive education has diversified classrooms, requiring teachers to accommodate pupils who differ in cognitive ability, home language, cultural background and health-related conditions. Learners who need such adaptations are officially classified as pupils with special educational needs (SEN)**.** According to § 16 of the Education Act (Education Act, 2004, § 16), a child is recognised as having SEN when support measures are necessary to realise educational potential or exercise schooling rights on an equal footing with peers. In our analyses this status is captured by the binary variable Health Status, which simply records whether or not a pupil has been formally identified as SEN.

Support measures specified in the Education Act are detailed further in Decree No. 27/2016 Coll., § 2, and range from counselling and curricular or assessment adjustments to assistive technologies, individual education plans, teaching-assistant support and adaptations to the physical learning environment (Decree No. 27/2016 Coll., 2016, § 2). Accordingly, the binary variable Health Status in our analyses indicates simply whether a pupil has been granted any of these legally defined supports—yes or no.

These national provisions mirror a broader international commitment to inclusive schooling. The Salamanca Statement (UNESCO, 1994) first framed "special educational needs" as any learning barriers—physical, cognitive, social or linguistic—that require additional support, a principle later reinforced by the UN Convention on the Rights of Persons with Disabilities (2006), which guarantees an equal right to high-quality, inclusive education with reasonable accommodations. Most recently, UNESCO's *Inclusion and Education: All Means All* report (2020) has expanded the term SEN beyond disability to encompass disadvantages linked to poverty, migration or cultural and linguistic minority status, emphasising a moral imperative to remove systemic barriers for every learner. By coding *Health Status* as the presence or absence of formally recognised support measures, we situate our analysis within this international understanding of SEN while remaining faithful to the legal definitions that govern Czech schools.

Environmental Literacy

Environmental literacy is commonly conceived as the constellation of environmental knowledge, values, attitudes, beliefs and behaviours that enable an individual to make informed, responsible decisions in environmental contexts (Roth, 1992; Hollweg et al., 2011). The North American Association for Environmental Education characterises an environmentally literate person as someone who, individually and collectively, applies relevant knowledge, cognitive skills and affective dispositions to enhance the well-being of people and the planet (Hollweg et al., 2011). Building on this multidimensional view, recent studies emphasize four inter-related components—conceptual understanding, affective

dispositions, perceived personal efficacy and pro-environmental action—that together capture the breadth of the construct.

In the Czech Republic, environmental literacy is most often assessed with the Methodology for Assessing Pupils' Environmental Literacy (MEG) (Činčera & Kroufek, 2021), a standardised 35-item questionnaire designed for lower-secondary pupils. The basic version of MEG contains three sub-instruments that measure (1) environmental values and attitudes, adapted from the three-dimensional 2-MEV model (Bogner, 2018; Wiseman & Bogner, 2003); (2) beliefs about one's ability to influence environmental conditions, based on Powell et al. (2011); and (3) self-reported pro-environmental behaviour. Items are answered on five-point Likert scales and have shown acceptable internal consistency in national validation studies involving more than 29,000 Czech pupils (Cronbach's $\alpha \approx 0.64–0.83$ across subscales; Činčera & Kroufek, 2021). MEG's conceptual framework and item pool draw on a wide range of international research conducted in Taiwan, Israel, the United States, China, South Africa, Turkey, North Macedonia and elsewhere (Hsu & Roth, 1998; Yavetz et al., 2009; McBeth & Volk, 2009; Cheng & So, 2014; Swanepoel et al., 2002; Tuncer et al., 2007; Srbinkovski et al., 2010).

For the present study we administered the standard MEG core and appended several context-specific blocks: items on place attachment, attitudes toward energy and energy-related environmental issues, and a 12-item multiple-choice knowledge test on energy in environmental contexts. These supplements represent a minor modification of MEG's extended version and were tailored to the objectives of our action-research project. Scores for each MEG subscale were computed separately and combined, where appropriate, into an overall environmental literacy index used in subsequent analyses.

2.3 Data Analyses

All quantitative analyses were conducted in IBM SPSS Statistics 29. Composite scores for each environmental-literacy scale were obtained by summing the relevant items, and their internal consistency was evaluated with McDonald's omega total (ω), a reliability coefficient that performs well under congeneric measurement conditions (Flora, 2020).

Socio-economic status in environmental literacy was examined with separate one-way analyses of variance (ANOVA) in which parental education and occupation served as independent factors. Whenever the one-way ANOVA reached significance, we applied Tukey's post-hoc comparisons and reported eta-squared (η^2) to gauge the practical magnitude of group differences (Adams & Conway, 2014). Differences associated with pupils' health status were tested with independent-samples t-tests; because the groups of pupils with and without special educational needs were of unequal size, effect sizes were expressed as Hedges' *g*, which corrects for small-sample bias (Hedges, 1981).

Ethics Approval

The study was conducted in accordance with the ethical standards of the 1964 Declaration of Helsinki and its later amendments. It was approved by the Ethical Committee of the Faculty of Education, University of Ostrava (Ref. No. OU-1233/45-2025).

3 Results

3.1 Psychometric Properties and Descriptive Statistics

To address our research objectives, we begin by summarising the psychometric properties of the environmental-literacy scales and then test whether pupils' values and attitudes vary across the socioeconomic indicators defined in Objectives 1 and 2. The results of the descriptive statistics (Table 1) indicate that all scales measuring environmental literacy

among students were normally distributed: skewness and kurtosis were within the range of -1.00 to +1.00. Reliability estimates of all environmental literacy subscales were satisfactory and ranged from ω = .73 to ω = .84.

Table 1: Descriptive statistics and reliability estimates

Environmental literacy	**N**	**# of items**	***SD***	**Skewness**	**Kurtosis**	**McDonald's ω**
Preservation of Nature (PRE)	624	9	6.56	-.45	-.02	.77
Utilization of Natural Resources (UTL)	624	7	5.35	-.12	-.24	.73
Appreciation of Nature (APR)	623	5	5.49	-.48	-.66	.84
Environmental Locus of Control (ELOC)	623	4	3.67	-.64	-.28	.78
Pro-environmental Behaviour (PEB)	620	10	8.65	.10	-.28	.84

Source: Authors' own elaboration

3.2 Environmental Literacy Differences by Parental Education

First, we examined whether environmental-literacy outcomes vary by parental education. A one-way ANOVA for fathers' education revealed a significant effect on the *Utilization of Nature* (UTL) subscale, with a small practical magnitude (see Table 2). Because all UTL items were reverse-scored, lower values reflect a more pro-environmental orientation. Post-hoc Tukey tests showed that pupils whose fathers had only primary education scored higher on UTL—i.e., were less pro-environmentally oriented—than pupils whose fathers held a university degree (p = .003) or an upper-secondary certificate with a school-leaving examination (p = .040). No significant differences emerged on the remaining environmental-literacy dimensions.

Table 2: One-way ANOVA for differences in environmental literacy among students with various levels of father's education

	father's education	***M***	***SD***	***df* between groups**	***df* within groups**	**F**	**Sig.**	**η^2**
Preservation of Nature (PRE)	primary	31.14	6.54	3	576	0.85	.47	.004
	secondary w/o exam	31.81	6.39					
	secondary w. exam	32.35	6.17					
	university	32.35	6.78					
Utilization of Natural Resources (UTL)	primary	21.18	4.89	3	576	4.28	.005	.022
	secondary w/o exam	22.76	5.17					
	secondary w. exam	23.07	5.54					
		23.89	5.74					
Appretiation of Nature (APR)	primary	16.72	5.06	3	575	0.75	.52	.004
	secondary w/o exam	17.55	5.60					
	secondary w. exam	17.73	5.28					
	university	17.74	5.75					
Environmental Locus of Control (ELOC)	primary	14.30	3.28	3	575	0.49	.69	.003
	secondary w/o exam	13.95	3.60					
	secondary w. exam	13.81	3.74					
	university	13.71	3.88					
Environmental Behaviour (PEB)	primary	29.90	8.69	3	572	0.61	.61	.003
	secondary w/o exam	30.78	8.68					
	secondary w. exam	29.85	8.72					
	university	29.58	8.50					

Note. df = degrees of freedom; η^2 = eta-squared effect size
Source: Authors' own elaboration

Regarding mothers' education, a one-way ANOVA likewise revealed a significant effect on the *Utilisation of Nature* (UTL) subscale, although the practical magnitude was small (see Table 3). Post-hoc Tukey tests indicated that pupils whose mothers had only primary schooling scored higher on UTL—that is, were less pro-environmentally oriented—than pupils whose mothers held a university degree ($p < .001$) or an upper-secondary certificate with a school-leaving examination ($p = .004$). The same pattern appeared for pupils whose mothers had completed vocational upper-secondary programmes without a school-leaving certificate; their UTL scores also exceeded those of pupils with university-educated mothers ($p = .030$). No significant differences were found on the remaining environmental-literacy dimensions.

Table 3: One-way ANOVA for differences in environmental literacy among students with various levels of mother education

	mother's education	***M***	***SD***	***df* between groups**	***df* within groups**	**F**	**Sig.**	**η^2**
Preservation of Nature (PRE)	primary	32.35	6.49	3	589	0.74	.53	.004
	secondary w/o exam	31.59	6.25					
	secondary w. exam	31.76	6.44					
	university	32.59	6.87					
Utilization of Natural Resources (UTL)	primary	20.89	5.00	3	589	7.20	< .001	.035
	secondary w/o exam	22.51	5.17					
	secondary w. exam	23.19	5.42					
	university	24.23	5.38					
Appretiation of Nature (APR)	primary	17.61	5.03	3	588	0.58	.63	.003
	secondary w/o exam	17.19	5.63					
	secondary w. exam	17.46	5.41					
	university	18.03	5.57					
Environmental Locus of Control (ELOC)	primary	14.67	3.26	3	588	1.95	.12	.010
	secondary w/o exam	13.51	3.50					
	secondary w. exam	13.76	3.89					
	university	14.02	3.76					
environmental Behaviour (PEB)	primary	30.98	8.98	3	585	0.46	.71	.002
	secondary w/o exam	29.73	8.35					
	secondary w. exam	29.80	9.05					
	university	30.21	8.21					

Note. df = degrees of freedom; η^2 = eta-squared effect size
Source: Authors' own elaboration

3.3 Environmental Literacy Differences by Parental Occupation and Special Educational Needs

Next, we explored whether environmental-literacy scores differ across parental occupational status. A one-way ANOVA revealed a significant effect for the *Utilisation of Nature* (UTL) subscale only, with a small practical magnitude (see Table 4). Because UTL items were reverse-scored, higher values indicate a less pro-environmental orientation. Tukey's post-hoc comparisons showed that pupils whose fathers held high-status occupations scored higher on UTL than those whose fathers were in medium-status ($p = .040$) or low-status positions ($p < .001$). No significant differences emerged for the remaining environmental-literacy dimensions.

Table 4: One-way ANOVA for differences in environmental literacy among students with various levels of father's occupational status

	father's occupational status	***M***	***SD***	***df* between groups**	***df* within groups**	**F**	**Sig.**	**η^2**
Preservation of Nature (PRE)	high	33.09	6.47	2	488	1.48	.23	.006
	medium	31.80	6.09					
	low	32.41	6.38					
Utilization of Natural Resources (UTL)	high	24.59	5.02	2	488	7.03	< .001	.028
	medium	23.05	5.64					
	low	22.47	5.11					
Appretiation of Nature (APR)	high	18.11	5.50	2	487	0.75	.47	.003
	medium	17.43	5.81					
	low	17.46	5.08					
Environmental Locus of Control (ELOC)	high	13.95	3.65	2	487	1.37	.26	.006
	medium	13.58	3.78					
	low	14.22	3.30					
Pro-environmental Behaviour (PEB)	high	29.80	7.95	2	484	0.42	.66	.002
	medium	30.50	8.41					
	low	30.61	8.79					

Note. df = degrees of freedom; η^2 = eta-squared effect size
Source: Authors' own elaboration

Maternal occupational status showed the same overall pattern. A one-way ANOVA identified a marginally significant effect—of small practical magnitude—on the reverse-scored *Utilisation of Nature* (UTL) subscale only (see Table 5). Because higher UTL scores denote a less pro-environmental orientation, the Tukey post-hoc test indicated that pupils whose mothers held high-status occupations were marginally less pro-environmentally oriented than those whose mothers were in low-status positions (p = .050). No other environmental-literacy dimensions differed significantly across maternal occupational categories.

Table 5: One-way ANOVA for differences in environmental literacy among students with various levels of occupational status

	mother's occupational status	***M***	***SD***	***df* between groups**	***df* within groups**	**F**	**Sig.**	**η^2**
Preservation of Nature (PRE)	high	32.29	6.46	2	473	1.33	.27	.006
	medium	32.48	6.25					
	low	31.17	6.50					
Utilization of Natural Resources (UTL)	high	23.75	5.04	2	473	2.90	.05	.012
	medium	23.61	5.24					
	low	22.20	5.46					
Appretiation of Nature (APR)	high	17.65	5.44	2	473	0.94	.39	.004
	medium	18.10	5.24					
	low	17.19	5.40					
Environmental Locus of Control (ELOC)	high	13.71	3.54	2	473	1.50	.23	.006
	medium	14.26	3.58					
	low	13.64	3.76					
Pro-environmental Behaviour (PEB)	high	29.48	7.92	2	470	1.69	.19	.007
	medium	30.93	8.63					
	low	29.60	8.09					

Note. df = degrees of freedom; η^2 = eta-squared effect size
Source: Authors' own elaboration

Finally, we compared environmental-literacy outcomes by pupils' health status, operationalised as the presence or absence of special educational needs (SEN). Independent-samples *t*-tests (with Hedges's *g* to correct for unequal group sizes) revealed significant, yet

small, differences on two subscales (see Table 6). Because the *Utilisation of Nature* (UTL) items are reverse-scored, lower UTL values indicate a more pro-environmental stance. Pupils without SEN scored lower on UTL and higher on the *Appreciation of Nature* (APR) subscale than their peers with SEN, suggesting a generally stronger pro-environmental orientation among the former group.

Table 6: Independent sample t-test for differences in environmental literacy among students with different health status

Variables	w/o special needs		with special needs		*t*	*df*	Sig.	Hedges' *g*
	M	*SD*	*M*	*SD*				
Preservation of Nature (PRE)	32.05	6.55	31.37	6.91	0.92	597	.36	.104
Utilization of Natural Resources (UTL)	23.17	5.27	21.92	5.50	2.09	597	.04	.235
Appretiation of Nature (APR)	17.75	5.42	16.26	5.67	2.42	596	.02	.273
Environmental Locus of Control (ELOC)	13.85	3.66	13.91	3.70	-0.14	596	.89	-.016
Pro-environmental Behaviour (PEB)	29.92	8.43	30.51	9.53	-0.60	594	.55	-.068

Note. df = degrees of freedom
Source: Authors' own elaboration

4 Discussion and Conclusion

Both research objectives were achieved. Objective 1—to examine the link between pupils' environmental values and attitudes and their socioeconomic status (SES)—was met by detecting a statistically significant, though modest, SES effect on a single affective dimension of environmental literacy: the reverse-scored *Utilisation of Nature* (UTL) scale (η^2 = .012–.035). Objective 2—to identify the SES components that matter most—was satisfied by showing that pupils whose parents had only primary education and those whose fathers held high-status occupations displayed the weakest pro-environmental orientation on UTL. Maternal occupational status followed the same trend at a marginal level, while all other SES indicators and the remaining four subscales (*Preservation of Nature*, *Appreciation of Nature*, *Environmental Locus of Control*, *Pro-environmental Behaviour*) showed no significant differences.

These modest SES effects stand well below the "classic" SES–achievement link observed in core subjects (Sirin, 2005) and the robust academic gap repeatedly documented across school systems (OECD, 2023; Reardon, 2011). Similar selective patterns have been reported elsewhere: Stevenson et al. (2013) detected SES differences only in pro-environmental behaviour among U.S. middle-schoolers, whereas PISA 2018 data show that the probability of being "environmentally enthusiastic" rises with family ESCS (OECD, 2020). Two factors may blunt SES influence in the Czech context**:** (a) environmental education (EVVO) is mandated as a cross-curricular theme throughout the national curriculum (MŠMT, 2021, RVP ZV, § 6.5), which can equalise knowledge and attitudes, and (b) long-standing outdoor traditions, such as hiking and scouting, cultivate pro-nature values across social strata (Činčera et al., 2021; Krajhanzl, 2010).

Special educational needs (SEN) displayed a similarly selective pattern. Pupils with SEN were less pro-environmentally oriented on UTL (Hedges's $g = 0.24$) and on Appreciation of Nature ($g = 0.27$), while other subscales remained unaffected. Restricted access to outdoor experiences—due to physical barriers or the need for additional support—may widen this behavioural gap, whereas inclusive classroom practice appears sufficient to level cognitive

outcomes (European Agency for Special Needs and Inclusive Education, 2016; Vítková, 2015).

These findings must be interpreted cautiously. First, the cross-sectional design precludes causal inference and captures only a snapshot of pupils' environmental literacy. Second, self-reported variables are susceptible to social-desirability bias and inaccuracies, particularly in the parental SES indicators provided by children. Third, the data came from five public schools in a single region and contained notable proportions of missing SES cases, limiting generalisability. Future research should therefore combine self-reports with objective SES measures, follow pupils longitudinally, and expand sampling to a more diverse set of schools and communities.

Although the present analyses represent only an initial stage of a broader action-research programme, they nonetheless provide practical guidance for refining both practice and subsequent inquiry. Because SES and SEN differences centred on behavioural dimensions, forthcoming waves will track concrete habits (e.g., energy conservation, waste separation) with objective indicators and test field-based, experiential EVVO activities coupled with school–family collaboration. Results from these pilots will feed back into the next action-research cycle, enabling more precise evaluation designs and evidence-based adjustments to the curriculum and community outreach.

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