

THE PERCEPTION OF PLANTS BY ELEMENTARY SCHOOL PUPILS: PRELIMINARY RESULTS

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Abstract

Plants are frequently overlooked by people compared to animals. The study investigated primary school pupils' attitudes toward plants in a sample of 159 pupils aged 9–13 years, which is a common age range for research on environmental and plant-related attitudes in primary education. The sample size is typical for a school-based survey study in environmental and biological education, allowing for reasonable statistical power in descriptive, inferential and multidimensional analyses. Data were collected using a 38-item questionnaire with a Likert-type scale (5-point scale from “strongly disagree” to “strongly agree”), a standard method for measuring attitudes in educational research. The questionnaire was divided into 6 factors following: 1. Importance of plants (9 items); 2. Interest to plants (10 items); 3. Necessity of plants (3 items); 4. Positive effect (4 items); 5. Animals and plants (4 items); 6. General attention (4 items); 7. Caring for or investment in plants (3 items). The influence of gender, grade level, ownership of garden and growing houseplants was examined. For the determination of psychometric characteristics of the research tool was the statistical methods like Cronbach's alpha and exploratory factor analysis used. The perception of plants was slightly positive. Gender and grade level were significant factors. On the other hand, ownership of garden and growing houseplants were insignificant.

Keywords: *Elementary school pupils, Likert type items, perception of plants, quantitative approach.*

1. Introduction

Plants are frequently overlooked by people compared to animals. This "plant blindness" stems from evolutionary adaptations that prioritize attention to moving, threatening, or familiar stimuli—such as animals—while plants, being visually similar, stationary, and often perceived as mere background, receive less notice (Balding & Williams, 2016). Yet plants play an irreplaceable role in the world: they form the foundation of ecosystems, produce the oxygen we breathe, provide our food, regulate climate by absorbing CO₂, supply materials for shelter and medicine, and support all animal life through habitats and resources. Without them, life on Earth would be impossible (e.g., Fancovicova & Prokop, 2011; Hiscock et al., 2019).

A review of scientific studies reveals a clear imbalance: far more research examines animal perception than plant perception. For instance, Jaun-Holderer et al. (2022) found that pupils and teachers identified more animal species than plant species, with animal perception also being more positive. Fancovicova et al. (2022) examined how aposematic signals and the presence or absence of flowers influenced lower secondary school students' perceptions of danger, attractiveness, and willingness to protect plants. Plants with aposematic signals scored higher on dangerousness and attractiveness but lower on willingness to protect compared to those without. Perceived attractiveness and willingness to protect decreased with age, while students with higher interest in plants rated species as more attractive and expressed greater willingness to protect them, regardless of aposematic signals. Similarly, Marcos-Wallas et al. (2023) assessed species literacy—from primary school to university—in the Spanish education system, confirming a strong bias toward animals at all levels. Although a weak positive correlation existed between animal and plant literacy, plants were consistently less recognized and identified. Comparable findings appear in other studies (e.g., Dünser et al., 2025; Nmar-Kendol & Fekete, 2025; Patrick & Tunnicliffe, 2011).

2. Research aims

The main aim of the study is to identify primary school pupils' attitudes toward plants. The additional aims were to find out the effect of gender, age, grade level, owner of garden and growing houseplants on the pupils' perception of plants.

3. Methods

3.1. Participants

The sample size was created by 159 Czech primary school pupils from 4th and 5th grade (65 vs. 94 respondents). The number of boys was 91 and 68 girls, 124 respondents are ownerships of garden (in this case, there are not real owners of garden, but the house, where they are living has got a garden). And the last variable was the growing of house plants, the 116 pupils said yes on this question and rest of then none. The average age of respondents was 10.75 years.

3.2. Research tool

The research tool was divided into two sections, the first one included demographic variables, which were presented in previous subchapter. The second part included 38 5-point Likert type items focused on the perception of plants. The questionnaire consisted of two scales. The first one comprised of 19 items and original authors were Fancovicova and Prokop (2010). These items were divided into two factors, the first was called "Importance of plants" (9 items) and second one was called "Interest to plants" (10 items). The second scale was created by Parsley et al. (2022), included 19 items and it was divided into 5 factors following: 1. Necessity of plants (3 items); 2. Positive effect (4 items); 3. Animals and plants (4 items); 4. General attention (4 items); 5. Caring for or investment in plants (3 items).

3.3. Data analysis

The obtained data were analysed by methods of descriptive, inferential and multidimensional statistical analyses. The validity of research tool was obtained by methodologists and primary school teachers. After their comments, the revisions were made. The construct validity was realized by explorative factor analysis, which divided items into factors, which were presented in previous subchapter. The reliability was reached by Cronbach's alpha coefficient (α). For the whole questionnaire was value $\alpha = 0.92$ and for the factor's values were from 0.71 to 0.90. The descriptive statistics was used for the mean score for perception of plants and for factors. The inferential statistics (t-test and Pearson product moments) was used for the determination of differences and relationships among variables.

4. Results

The perception of plants by primary school pupils was $x = 3.48$, which indicated slightly positive perception of plants. From the factors, the highest score was achieved by dimension "Importance of plants" ($x = 4.22$). On the other hand, the factor reagrding to interest to plants achieved score $x = 3.00$. The pupils realized the necessity of plants ($x = 3.91$), also general attention was positive ($x = 3.52$) also pupils had not got problems with caring for an investment in plants ($x = 3.46$). The effect of age was not statistically significant on the perception to plants ($r = -0.10$; $p = 0.21$). Between age a nd necessity of plants was negative relationship ($r = -0.28$; $p < 0.001$), also between age and importance of plants ($r = -0.25$; $p < 0.01$) and between age and dimension "Animals and plants" ($r = 0.19$; $p < 0.05$). It means that with older age pupils perceived plants better in comparison with animals. The effect of gender was significant on perception of plants ($t = 2.85$; $p < 0.01$). Girls perceived plants more positive than boys. The statistically significant difference was also found out in the factors "Interest to plants", "Positive effect", "General attention" and "Caring for or investment in plants". In all factors the girls achieved higher score in comparison with boys, except of one. The boys achieved higher score in comparison with girls only in factors "Animals and plants". The grade level had got statistically significant effect on perception of plants by pupils ($t = 3.16$; $p < 0.05$). The 4th grade pupils achieved higher score. The statistically significant effect was found out in factors "Importance of plants", "Necessity of plants" and "Positive effect". In all factors the 4th grade pupils achieved higher scores in comparison with 5th grade pupils, except of one. The 5th grade pupils achieved higher score in comparison with 4th grade pupils only in factors "Animals and plants". The ownership of garden had not got statistically significant effect on the perception of plants by primary school pupils ($t = 0.25$; $p = 0.80$). The only one statistically significant difference was observed in the dimension of "General attention" ($t = 2.32$; $p < 0.05$). The pupils with gardens achieved higher score. The influence of growing houseplants was insignificant ($x = 0.50$; $p = 0.62$). The effect of growing houseplants was significant only in the one case and it was in the factor "Importance of plants" ($t = 2.05$; $p < 0.05$). The pupils who did not grow plants had got more positive attitudes toward plants.

5. Conclusion

The provided text outlines positive plant perceptions among primary school pupils and suggests targeted research and curriculum adjustments to address age-related differences in plant awareness. Refinements improve clarity, academic tone, logical flow, and grammatical precision while aligning with established concepts like plant blindness. This version maintains the original meaning and structure for scholarly use. Findings indicate a positive perception of plants among primary school pupils, potentially stemming from their distinct perceptual worldview compared to older pupils and adults. Younger children exhibit greater curiosity about their surroundings and emphasize aesthetically pleasing elements such as grass and trees. Future research could therefore target older pupils, students, and adults to explore divergent plant perceptions across age cohorts, enabling the distribution of assessment tools to identify perception limits, knowledge gaps, and necessary revisions to biology curricula. Despite overall positive plant perceptions, certain factors reveal limited pupil interest, though they recognize plants' ecological importance; notably, animal perceptions often surpass those of plants, with gender variations evident (e.g., females sometimes showing stronger nature connections). Teachers in indoor and outdoor biology lessons should prioritize plants to counteract this bias, potentially yielding beneficial educational outcomes. Such interventions align with broader efforts to mitigate plant blindness through targeted pedagogy.

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