

Consumers' Perceptions of Environmental Protection and Exploring Pathways to Sustainable Solutions

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Sustainability and environmental protection are the most popular issues of our age, and they function as a social purpose as well. However, delineating the dimensions of responsibility in these realms remains a subject of intense debate, as consumer perspectives often diverge from those held by corporate and governmental entities. This study examines primarily consumer surveys, seeking to elucidate the facets of environmentally conscious attitudes and the factors exerting influence from the consumer standpoint. Individual behaviors are undeniably shaped by an individual's acquisition of knowledge, experiences, and orientations, all of which are cultivated through the lens of their environmental perception. This encompasses an understanding of the intricate ecological systems, as well as the recognition of the social, economic, and political dynamics that impact these systems. This study embarks on a comprehensive exploration of the environmental attitudes within the sampled population, placing special emphasis on environmental orientation. Through a synthesis of quantitative and qualitative consumer opinions, it unveils the distinctive aspects of responsibility at the levels of government, corporations, and individual consumers. As the analysis unfolds, a pivotal question emerges: What opportunities can be discerned at these three levels (state, corporate, and consumer), through the lens of environmental protection? In doing so, it seeks to unravel pathways toward a more sustainable and ecologically responsible future. Results show that the influence of both the government and businesses is pivotal in shaping consumers' environmental attitudes. Consequently, it follows that the state and corporate sector must also function effectively in the case of environmental concepts and actions to steer consumers toward sustainable consumption.

1. Introduction

The most important environmental protection problems concerning modern societies today, such as climate change, the loss of biodiversity, water shortage, the negative effects of environment pollution on health, the quality of air, the depletion of resources as well as the management of waste and chemical substances, are not newly appearing phenomena. Humanity has felt the effects thereof to a more or lesser extent since the industrial revolution (Nagy, 2011). Sustainability needs a rethinking of the entire life cycle of materials. Based on Huang's (2023) summary, the concept of sustainable development has been adopted by governments all over the world, and it has been profoundly integrated into public thinking since it was presented in the report entitled "Our Common Future" proposed by the UN World Commission on Environment and Development more than 30 y ago (Bonnedahl et al., 2022). On 25 September 2015, the 193 member states of the United Nations adopted the Sustainable Development Goals (SDGs), built on the success of the Millennium Development Goals, which aim at eliminating poverty, protecting the planet, and ensuring that each person enjoys peace and prosperity as a part of a new universal agenda (Fukuda-Parr and Muchhala, 2020). The 17 SDGs and the 169 objectives related to them (Breuer et al., 2023) include the interrelated social, economic, and environmental dimensions of sustainable development (Toledo-Vazquez et al., 2022) and provide a uniform guideline for action for national governance (Schmidt-Traub et al., 2017). Accelerating the progress towards the SDGs has more and more become an indispensable task for nations (Yin et al., 2018). Several researchers and international organizations

have developed sustainability indicators in order to monitor and analyze the progress and the changes made in the field of sustainability, in the regions of interest, this way enabling governments to provide a scientific basis for establishing policies related to sustainable development (Kim, 2023). The cases of sustainability assessment at global (Sarkodie, 2022), national (Zhang et al., 2022), regional (Pandey and Asif, 2022), and urban (Mauree et al., 2019) scales have been widely studied (Huang, 2023). Since the 1970s, scholars have carried out several studies focusing on environmental concerns in order to identify the determining factors of environmental behavior (Elgaaied, 2012). The cognitive determining factors, including beliefs, values, and environmental knowledge that imply environmental concern, are fundamental factors that make people willing to change their behavior or choices (Situmorang et al., 2020). The new environmental paradigm (NEP) scales suggested by Dunlap et al. (2000) were used to evaluate environmental orientations according to different aspects and objects (Situmorang et al., 2023). The differences in environmental orientation influence the behavior aiming at climate change mitigation, where people being more conscious of the effects of anthropogenic activities exerted on nature behave positively towards various environmental issues, for example, in order to reduce greenhouse gas emissions. In the recent period, several studies have been published that examined the attitude of the Hungarian population towards sustainability (MNB, 2023). Based on the results, it can be concluded that the Hungarian population is concerned about their environment, and the willingness to take action is also more and more typical. However, definite steps are missing in many cases, even if we know we should do more for our environment than what we are currently doing (MNB, 2023). In a survey carried out in 2019, 95 % of the respondents already answered that they find environmental protection important, and the latest research also proves that since then, it has become even more important for Hungarians to live a sustainable lifestyle and protect our environment (Eurobarometer, 2020). The following research question was formulated on the basis of the researchers' previously presented results: To what extent can the examined Hungarian sample identify with the NEP statements, and what external factors affect the environmental attitude?

Two hypotheses, which are based on secondary data, are connected to the research question. The purpose of the hypothesis test is to explore the attitude of Hungarian consumers depending on the research question. The two hypotheses are the following:

- H1: The level of identifying with NEP is higher than average.
- H2: Consumers' environmental attitude is affected by the surroundings in which they live.

2. Methodology

The research is based on a quantitative questionnaire survey. The data was collected from November 2022 to April 2023. During this period, 2,224 consumers answered the questions using the snowball method. The research covered the entire territory of Hungary. The questionnaire contains 74 questions, out of which 65 questions made up the content of the survey as 5-point Likert scale type questions, 6 multiple-choice questions assessed the demographic characteristics of the respondents, and 2 questions were open questions. In the current study, the Environmental Orientation (EO) group of questions and an open question were examined. As the first step of the research, consumer attitude was examined, for which the New Ecological Paradigm scale was used. The New Ecological Paradigm scale measures the support of the "pro-ecological" worldview. This measuring type is widely used in the field of environmental education and open-air recreation, as well as in other areas where differences in behavior or attitudes are explained with underlying values, worldviews, or paradigms. The scale consists of individual responses given to fifteen statements that measure agreement or disagreement. The 7 even-numbered items, if the respondent agreed with them, represent statements supported by the dominant social paradigm (DSP). The 8 odd-numbered items, if the respondent agreed with them, were meant to reflect the approval of the new environmental paradigm (NEP) (Dunlap et al., 2000). In the current study, only the NEP statements, i.e., the odd-numbered items, are examined. In this case, the DSP is not the subject of the examination. The eight NEP statements underwent preliminary testing before the large-scale data collection. As a result, one statement was excluded (The Earth is like a spaceship with very limited room and resources). As a result, the modified NEP scale included in the study examined 7 statements and was given the group name Environmental Orientation. In the rest of the research, the respondents answered an open question, starting from their answers to the closed questions. Here, they could express their opinion regarding environmental protection. 147 evaluable answers were given to the open question, which clearly outlined the main topics. In connection with this, a secondary data analysis was carried out in connection with the sustainability data of some items in Hungary.

3. Results and discussion

The "Mean" column shows the average of the responses on a scale of 1-5. This indicates to what extent consumers share an opinion about the given statements on average. The average values range from 3.99 to

4.34, which indicates that consumers agree with the environment-related statements. The "Median" column shows to what extent the middle value of the data differs from the median value of the data. In the cases of EO3, EO4, EO5, and EO6, the median value is 5.00, implying that the majority of respondents gave the highest score on the five-point scale to these statements. In the cases of EO1 and EO7, the median value is 4.00, signaling that here, most respondents provided a score of 4.00. The "Mode" column shows the most commonly appearing value among the data. Here, the mode is always 5.00, and it indicates that most respondents chose the highest score for each statement. It can be concluded that the attitude of consumers towards the environment is positive since the answers have mainly high scores (4 and 5). Consumers definitely share the opinion that environmental protection is important and that humanity should pay more attention to protecting the Earth and wildlife.

Table 1: Characteristics of the examined attitude statements

| Factor Attitude Statement | Mean | Median | Mode |
|--|------|--------|------|
| EO1 We are approaching the limit of the number of people the earth can support | 3.99 | 4.00 | 5.00 |
| EO2 When humans interfere with nature, it often produces disastrous consequences | 4.07 | 4.00 | 5.00 |
| EO3 Humans are severely abusing the environment | 4.34 | 5.00 | 5.00 |
| EO4 Plants and animals have as much right as humans to exist | 4.25 | 5.00 | 5.00 |
| EO5 Despite our special abilities, humans are still subject to the laws of nature | 4.26 | 5.00 | 5.00 |
| EO6 The balance of nature is very delicate and easily upset | 4.24 | 5.00 | 5.00 |
| EO7 If things continue on their present course, we will soon experience a major ecological catastrophe | 4.18 | 4.00 | 5.00 |

Table 2: ANOVA table of environmental orientation and environmental factors affecting the individual

| | Sum of Squares | df | Mean Square | F | Sig. |
|--------------------|----------------|----|-------------|--------|------|
| EO1 Between Groups | 187.790 | 4 | 46.947 | 43.866 | .000 |
| EO2 Between Groups | 165.597 | 4 | 41.399 | 45.651 | .000 |
| EO3 Between Groups | 190.636 | 4 | 47.659 | 63.981 | .000 |
| EO4 Between Groups | 173.098 | 4 | 43.274 | 42.202 | .000 |
| EO5 Between Groups | 237.263 | 4 | 59.316 | 77.201 | .000 |
| EO6 Between Groups | 222.204 | 4 | 55.551 | 68.916 | .000 |
| EO7 Between Groups | 243.044 | 4 | 60.761 | 72.600 | .000 |

Table 2 shows the results of the ANOVA (one-way variance analysis) tests in the case of different variables. Specifically, "4 df" means that there are four degrees of freedom available for analysis in the given test. The values seen in column "F" show how significant the differences between the groups are. The relationship between the significance of results (p-value) and degrees of freedom means that the lower the Sig. (e.g., .000), the more significant the result. In this analysis, the four degrees of freedom and very low Sig. (below 0.001) suggest that the results are highly significant and likely not due to chance. A significant result indicates that the outcomes of a statistical test are likely not due to random chance. It signifies that observed differences or relationships are real and statistically confirmable. It can be concluded that the "F" values are very high and the "Significance" (p-value) values belonging to this are very low, indicating that for each variable, there are significant differences between the groups in terms of the given variables. That means that there are large and statistically significant differences between the averages between each group for all the examined variables. The surroundings affect the individual's environmental orientation. The connection proved to give rise to further but more in-depth investigations. Based on this, consumers had to answer an open question. 147 evaluable answers were given to the question, and clearly visible groups emerged based on the answers. Each group has an outstanding consumer response that covers the group's attitude. The established groups are the following:

- The support of education aiming at environmental protection since childhood in school: " Since childhood, everyone should be educated to pay attention to their environment."
- Environment-related education of children within the family: "Environmentally-conscious education is not only an institutional (kindergarten, school) task. A good example showed by the parents and the family is (would be) much more important for the younger generation."
- Motivating advertisements: "I think it would motivate our society if we saw more positive advertisements ... the majority of people ignore it because of the negative news, advertisements."
- Providing information to consumers efficiently (about environment protection solutions, corporate problems): "...if you don't especially look up the information, or if it doesn't get much media coverage, it often turns out only later that you shouldn't have bought anything from there. I would fully agree with not supporting them, but I often don't even know that I bought something from a place like this."

- Optimizing the prices of sustainable products: "Probably I would also buy an eco-bag in the shops if the traditional one wasn't cheaper."
- Development of the infrastructure of settlements (e.g., waste collectors should be placed at more places, the public transport system should be developed): "I think that the way the world is organized and works should be changed to be able to reach significant changes to protect the environment. Certainly, there are still plenty of opportunities, even at the individual level. However, the public transport system is not developed enough, for example, to make people not living in a big city give up using a car."
- Preference and support of renewable energy sources: "In my opinion, renewable resources should be primarily used (solar energy, wind energy)."
- Punishment of companies exerting large environmental impact: "The environment should be primarily protected and paid attention to at the corporate level. The consumer level is secondary."
- Effective implementation of environmental taxes: "Additional taxes must be imposed on products which are harmful to the environment and health. This way, environmentally friendly products can even become cheaper. This income should be spent fully on alleviating the damage."
- Complex change: "...endless economic growth is not possible on a planet with finite resources, this model is not viable in the long term, and new social systems are needed instead of consumer societies."

Based on the answers received, it can be concluded that the broader and immediate surroundings in which consumers live play a crucial role for them. This confirms the results of the variance analysis (Table 2) created from the questionnaire survey.

Starting from the closed and open questions of the questionnaire, it is recommended to pay attention to the surroundings in which the consumer lives their daily life. In the current case, this is Hungary. In the following, the examination of the situation of sustainability in Hungary is put into focus.

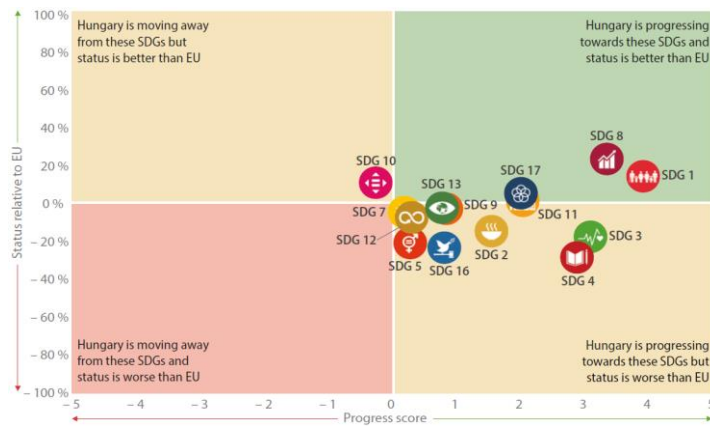


Figure 1: The situation of the 17 SDGs in Hungary compared to the European Union

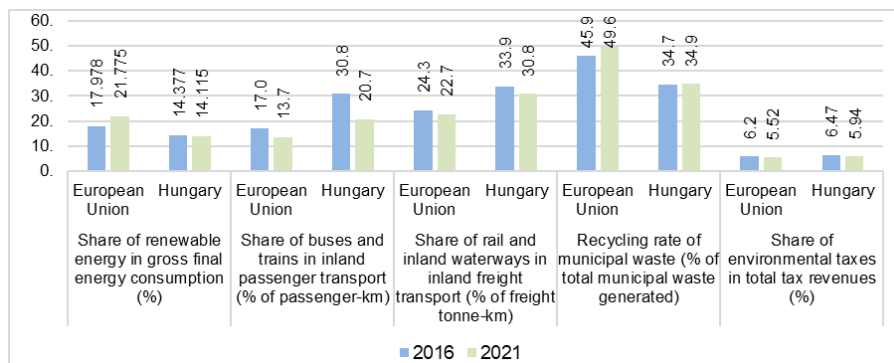


Figure 2: The situation of SDGs in Hungary related to the questionnaire survey

The most accurate examination point of sustainability aspirations and situation is the European Union's SDG goals. The 17 SDGs are the following: SDG 1 No poverty; SDG 2 Zero hunger; SDG 3 Good health and well-being; SDG 4 Quality education; SDG 5 Gender equality; SDG 6 Clean water and sanitation; SDG 7 Affordable and clean energy; SDG 8 Decent work and economic growth; SDG 9 Industry, innovation and infrastructure;

SDG 10 Reduced inequalities; SDG 11 Sustainable cities and communities; SDG 12 Responsible consumption and production; SDG 13 Climate action; SDG 14 Life below water; SDG 15 Life on land; SDG 16 Peace, justice and strong institutions; SDG 17 Partnerships for the goals (United Nations, 2023). Figure 1 shows the situation of the complex SDG goals in Hungary, compared to the EU average. The vertical axis shows the position of the SDGs in the presented country within the distribution of the member states, compared to the EU average. The status of the SDGs in the upper part of the graph is above the EU average, while the status of the SDGs in the lower part is below that. The right side of the graph shows those SDGs where the country has made progress, while the left side shows moving away from the SDGs (Eurostat, 2023f). Later on, the factors mentioned by the consumers in the questionnaire survey will be examined.

Figure 2 shows some indicators related to the questionnaire survey. According to the directive on renewable energy sources, the indicator „Share of renewable energy in gross final energy consumption” is defined as the share of energy consumption from renewable energy sources within the gross final energy consumption (Eurostat, 2023a). The indicator „Share of buses and trains in inland passenger transport” indicates the share of buses - including buses and trolleybuses - as well as trains in domestic passenger transport (Eurostat, 2023b). Tram- and underground systems are not included, as the data collection methodology for these means of transport is not sufficiently aligned among the Member States. This may distort the Hungarian results due to the missing extensive underground- and tram networks. The indicator „Share of rail and inland waterways in inland freight transport” measures the share of railways and inland waterways within inland freight transport. Domestic goods transport includes road-, rail- and inland waterway transport (Eurostat, 2023c). The indicator „Recycling rate of municipal waste” measures the amount of municipal waste recycled or prepared for reuse divided by the total amount of municipal waste generated. Recycling includes recycling of the material, composting, and anaerobic breakdown. The waste of settlements mainly consists of household waste, but it can also include similar waste produced by small enterprises and public institutions, which is collected by the municipal government. The latter part of municipal waste may differ at each settlement and country, depending on the local waste management system (Eurostat, 2023d). In connection with the indicator „Share of environmental taxes in total tax revenues,” environmental taxes are defined as taxes based on a physical unit (or its substitute) of something that has been proven to have a definite negative impact on the environment. There are four types of environmental taxes: energy-, transport-, pollution-, and resource taxes (Eurostat, 2023e). On the whole, the indicators in Hungary can be regarded as good.

4. Conclusions

The focal question of the study was to what extent the examined Hungarian sample can identify with the NEP statements and what external factors affect the environmental attitude. Two hypotheses based on secondary data are connected to the research question. The purpose of the hypothesis test is to explore the attitude of Hungarian consumers in terms of the research question. According to the first hypothesis (H1), the extent of identifying with NEP is higher than average. The hypothesis was confirmed because, in the case of the attitude scale, the average value of the answers given to 6 statements out of 7 exceeds 4. This means that consumers can identify with the NEP statements to a great extent, and their environmental attitude is positive. However, this still does not predict concrete action in itself. According to the second hypothesis (H2), consumers' environmental attitudes are affected by the surroundings in which they live. This hypothesis was also confirmed because there is a strong, significant correlation between the NEP attitude and the impact of environmental influences. It can be stated that the situation of the external environment influencing the consumer is extremely important. The public and corporate sectors belong here. The relationship is clearly reflected in the consumer responses as well, which was measured in the open question. The role of the state and the company is important for the consumer and determines their environmental attitude. It can be concluded from this that the state and corporate sector must also function effectively in the case of environmental concepts and actions to steer consumers toward sustainable consumption. As for Hungary, sustainability-related attempts are clear. The situation of the selected SDG goals mostly looks better compared to the EU average in the examined period (2016-2021), but additional actions are still required from the point of view of further development.

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