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Consumer Awareness and Beliefs Regarding Sustainable Products

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ABSTRACT

Objective: To identify consumer awareness and beliefs regarding sustainable products according to a consumer profile.

Research Design & Methods: A quantitative approach was used. A questionnaire containing 24 variables was conducted using an online survey. 570 correctly completed records were obtained. The analysis used the difference test between structure indicators (chi-square), Kruskal-Wallis ANOVA and Mann-Whitney U test.

Findings: The best predictors of differences in consumer awareness and attitudes were respondents' education, gender and place of residence. Age and financial situation proved to be weak predictors.
Implications/Recommendations: The results make it possible to suggest thematic areas and groups (profiles) of respondents to which educational activities should be directed at various levels of education on the circular economy and sustainable development. Manufacturers seeking to promote product sustainability could also benefit from the study's results.
Contribution: The article identifies the product sustainability degree model as well as variables that create a consumer profile and differentiate consumers' awareness and attitudes towards sustainable products. The differences between individuals uare also classified.

Article type: original article.

Keywords: sustainable product, circular economy, awareness, attitudes, differentiation.

JEL Classification: Q01, C38, M31.

1. Introduction

Socio-economic progress, dynamic changes and scientific and technological development have negative consequences for the natural environment and, therefore, for human existence. This state results from the discrepancy between the pace of socio-economic progress and the natural ability of the environment to adapt (Sobczyk-Kolbuch, 2019). Social awareness and people's attitude towards the nature around them play an important role in restoring balance between socio-economic development and the environment (Daly & Farley, 2011; Sobczyk-Kolbuch, 2019). Crisis forces us to define a new model for the functioning of production and trade, which will take into account the reduction of the current level of consumption (Inquiry, 2021). Taking into account the survival of civilisation, the importance of issues related to sustainable social and economic development and the circular economy model (circular economy) should be treated as a priority (Archer, 2011; Gates, 2021; Markiewka, 2021).

Sustainable products are a subcategory of sustainable development (SD), growing out of the concept of SD, and at the same time stimulating it (Żuchowski & Żuchowska-Grzywacz, 2018). These products can be balanced in many ways (Leleux & van der Kaaij, 2019; Żuchowska-Grzywacz & Żuchowski, 2020). The first attempts to define sustainable products concerned cosmetics and foods (Żuchowski & Żuchowska-Grzywacz, 2018). These products were created by enriching conventional products with additional values related to their ecological friendliness, guaranteed quality, innovation, social responsibility, ethical behaviour, high health and environmental safety standards and many other constantly improved legal and normative indications (Żuchowski & Paździor, 2022).

In March 2022, the European Commission accepted and sent to the European Parliament a package of measures to make products more sustainable (European Commission, 2022). The direction of this sustainability assumes that, by 2030:

– most of them will be designed for increased operational durability, energy efficiency, recycling and reduced material consumption,

– consumers will be able to make more informed and sustainable purchases through access to information,

– entrepreneurs will remodel their business activities based on the principles of the circular economy.

For the purposes of this article, products are balanced in their circular life cycle in accordance with the principles of ESG (environmental, social, governance). Areas of product sustainability identified in the product sustainability model are presented in Figure 1.

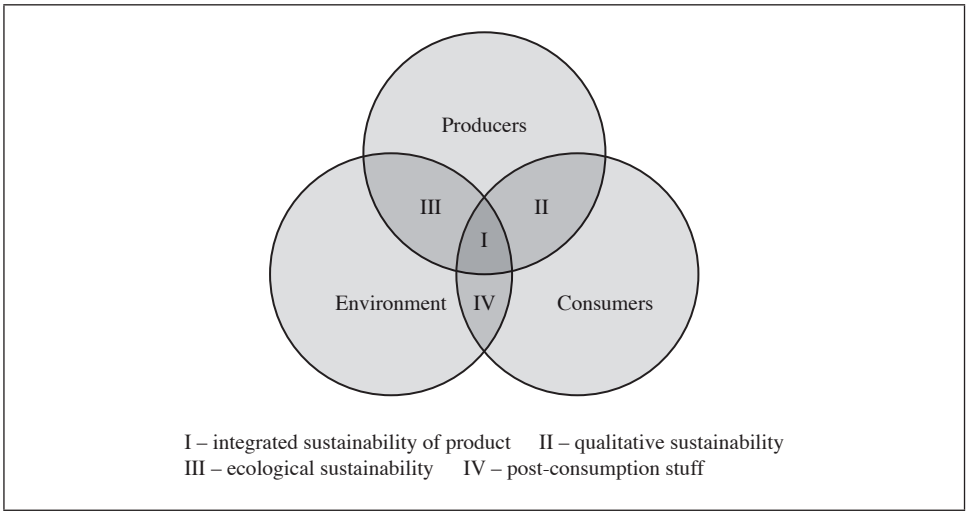

Fig. 1. Product Sustainability Model

Source: the authors.

In Figure 1, the highest degree of product sustainability is visible in area I, where saturation with added values comes from three factors: production, environmental impact and consumer awareness. This area includes products meeting the criteria of sustainable development and circular economy, integrating the balance between economic, social and environmental aspects.

The second area is qualitative sustainability, which is related to meeting customer needs through the functional features and quality of products. The Sustainable Products Initiative (SPI) assumes that to achieve the goals of a circular economy,

products should be designed with durability, energy efficiency, material savings, ease of repair and recycling in mind.

The third area includes ecological sustainability, which can be seen most noticeably on the sustainable products market, and is often marked with special certificates. Unfortunately, customers do not always recognise these labels. This can leave them confused and susceptible to greenwashing, and in need of education on their purchasing activities (Kozik, 2020).

The fourth area covers post-consumer processes after the end of the product life cycle. In this area, it is important to avoid creating "garbage" and focus on secondary raw materials. The results of the latest Global Sustainability Survey indicate that 75% of consumers consider environmental sustainability to be important when making purchasing decisions (Staniec, 2023). According to the results of other studies, the percentage is even higher, reaching 79% (Capgemini, 2020) or even 83% (Gul, 2022). Previous research on consumer awareness of sustainable development goals and sustainable behaviour is relatively limited and incomplete (Maciejewski, 2023). Trudel (2019) presents an important summary of research on sustainable consumer behaviour and the factors influencing such attitudes. Maciejewski (2020) examined the impact of the idea of sustainable development on the diversity of consumer behaviour. Zalega (2019), meanwhile, conducted research on attitudes towards sustainable development and sustainable behaviours among individuals from Generations Z and Y.

The subject literature also contains research results on awareness and knowledge of the Sustainable Development Goals (SDG) in various communities (Omisore *et al*., 2017; Smaniotto *et al*., 2020). Maciejewski (2023) notes that regardless of whether the research covers communities in developing countries or those belonging to the world's largest economies, effective promotion of the idea of sustainable development is necessary to achieve the adopted SDG goals by the 2030 deadline (UN, 2015). Other researchers also argue that social awareness in the rational management of unnecessary matter, acquiring pro-ecological habits, and the use of "economics of moderation" (Pach, Kowalska & Szyja, 2016) will be of key importance in the circular economy. Focusing purchases on sustainable products should help make achieving the goals set in the circular economy model a reality.

The aim of the present analysis was:

A: To identify consumer awareness and beliefs regarding sustainable products according to consumer profiles.

The following research problem was posed:

Q: Which formal characteristics of consumers differentiate their awareness and beliefs regarding sustainable products and what is the nature of this differentiation?

We opted to solve the problem using the quantitative approach.

2. Method

We posted a survey questionnaire on the website Ankieteo and used the CAWI method. The questionnaire was up from January 4 to 31, 2024. 570 correctly completed questionnaires were obtained and subjected to statistical processing. The sample is not representative, as it was not selected based on a sampling scheme. The survey questionnaire consisted of 24 items, where:

– items 1–5 concerned the formal characteristics of consumers,

– items 6–9 were designed to determine awareness and knowledge of the concepts of sustainable development, the circular economy, sustainable products and greenwashing,

– items 10–24 identified consumers' beliefs regarding sustainable products.

Selected variables were used in this analysis. Knowledge of concepts was measured on the basis of yes/no answers. Awareness was measured on a five-point scale, where 1 meant "definitely not" and 5 meant "definitely yes". A description of the variables is presented in Table 1.

Table 1. Description of Variables Used in Empirical Research

Variable Number	Description of Variable
P1	Respondent's gender
P2	Respondent's age
P3	Respondent's place of residence
P4	Respondent's education
P5	Assessment of the respondent's financial situation
P6	Knowledge of the term "sustainable development"
P7	Knowledge of the term "circular economy"
P8	Knowledge of the term "sustainable product"
P9	Knowledge of the term "greenwashing"
P10	Treatment of consumer leftovers in the household
P11	Indication whether the production of products affects climate change
P12	Indication whether products should support eco-friendliness even at a higher price
P13	Indication whether products should support fast fashion trends
P14	Indication whether it is advisable to deliberately shorten the life of products
P15	Indication whether the products should be highly durable
P16	Indication whether products should be energy-efficient
P17	Indication whether coal-based energy should be phased out in the production of products
P18	Indication whether it is advisable to allow testing of products on animals to increase consumer safety

Table 1 cnt'd

Variable Number	Description of Variable
P19	Indication whether, given the choice, the consumer would give up disposable and plastic packaging
P20	Indication whether packaging should be biodegradable
P21	Indication whether eco-labels should be displayed and popularised in commercial transactions
P22	Indication whether the obligation to repair, maintain and dispose of products should remain with the manufacturer
P23	Indication whether products should be climate-neutral and low emission
P24	Indication whether sustainable products improve living and working conditions

Source: the authors.

The results were prepared using statistical analysis, which included the differentiation tests: chi-square for structure indicators, Kruskal-Wallis ANOVA and Mann-Whitney U test for differences between means in groups. The chi-square test is performed to test the relationship between two nominal variables. It also examines the significance of differences in interest structures. The null hypothesis is that the variables are independent, and the alternative hypothesis is that they are not independent. The test is based on a comparison of the values (those obtained in the study) and theoretical values (calculated assuming that there is no relationship between the variables).

The Kruskal-Wallis test is the equivalent of one-way analysis of variance (ANOVA) where the distribution of variables deviates from the normal distribution. In this test, the null hypothesis is that the samples come from populations with the same distribution, while the alternative hypothesis states that they come from different distributions. The consequence of adopting the null hypothesis is that the levels of the factor being tested do not have a significant impact on the results observed. Similarly, the rejection of the null hypothesis results in the statement that the levels of the factor under study significantly affect the results. It is then said that a given factor differentiates the results. The Kruskal-Wallis test is appropriate when there are at least three grouping variable codes. Where there were only two, the Mann-Whitney U test was used. Here, the null hypothesis assumes equality of means for both study groups, with the alternative hypothesis stating that the means differ.

The Kruskal-Wallis ANOVA was used for variables having more than two codes (results shown in Tables 6, 8, 10, 12). When a variable had only two codes (results shown in Table 4) the Mann-Whitney U test was used. The level of significance for all of the tests was assumed to be $\alpha = 0.05$.

3. Structure of the Sample

The structure of the sample decomposed by control variables is shown in Table 2.

Table 2. Structure of the Sample

Variable	Category	*n*	%
Sex	woman	344	60.4
	man	226	39.6
Age	up to 34	271	47.5
	35–54	192	33.6
	55 and over	108	18.9
Domicile	village or city up to 5k	150	26.2
	city from 5k to 50k	159	27.8
	city from 50k to 500k	188	33.0
	city over 500k	74	13.0
Education	basic	47	8.3
	medium	316	55.3
	higher	208	36.4
Assessment of financial situation	bad	80	14.0
	average	363	63.7
	all right	127	22.3

Source: the authors.

Further analysis was carried out by examining the differences in the results in terms of consumer awareness and beliefs according to the five control variables included in Table 2.

4. Analysis of the Results

Due to the different response scales, differences were analysed separately for variables identifying awareness of concepts (P7 and P8) and variables measuring beliefs towards individual statements (P11–P24).

Table 3 shows the differences in the fractions of variables P7–P8 according to the respondents' gender.

Based on the analysis of the data in Table 3, it was found that men were more aware of the concepts for both variables. The respondent's gender is a factor that differentiates the knowledge of the concept of circular economy (P7), which is significantly greater for men. However, knowledge of the concept of a sustainable product (P8) is not statistically differentiated by gender, although the difference in fraction sizes is significant.

Table 3. Differentiation of the Fractions of P7–P8 Variables According to Respondents' Gender

Variable	Value	Category (%)		Sample (%)	*p*-value
		woman	man		
P7	yes	37	49	42	0.045*
	no	63	51	58	
P8	yes	57	64	59	0.093
	no	43	36	41	

Notes: * denotes statistical significance.

Source: the authors.

Table 4 shows the differences in the mean values of variables P11–P24 depending on the gender of the respondents.

Table 4. Differences in the Mean Values of Variables P11–P24 Depending on Respondents' Gender

Variable	Category		Total Average	*p*-value
	woman	man		
P11	3.91	3.65	3.81	0.001*
P12	3.62	3.37	3.52	0.001*
P13	2.64	2.88	2.74	0.006*
P14	2.42	2.45	2.43	0.965
P15	4.11	4.11	4.11	0.712
P16	4.19	4.06	4.14	0.062
P17	3.70	3.42	3.59	0.007*
P18	2.13	2.84	2.41	0.000*
P19	3.99	3.67	3.87	0.000*
P20	4.11	3.91	4.03	0.009*
P21	3.85	3.64	3.77	0.011*
P22	3.91	3.88	3.90	0.479
P23	4.06	3.85	3.98	0.017*
P24	3.96	3.66	3.84	0.000*

Notes: * denotes statistical significance.

Source: the authors.

Analysis of the data contained in Table 4 reveals that gender significantly differentiated the responses for 10 out of 14 variables. For all of them, the average response value (measuring agreement with a given statement, i.e. "level of belief")

was higher for women. Men returned higher mean response values for variables P13 and P18. However, their interpretation calls for the scale to be inverted, i.e. the higher the value, the lower the level of belief, as in the case of variable P14. Therefore, women turned out to be clearly more convinced of a product's sustainability and a circular economy for all variables.

Table 5 presents the differences in the fractions of variables P7–P8 according to respondents' age.

Table 5. Differentiation of the Fractions of P7–P8 Variables in Relation to Respondents' Age

Variable	Value	Category (%)			Sample (%)	*p*-value
		up to 34	35–54	55 or more		
P7	yes	40	56	42	42	0.000*
	no	60	44	58	58	
P8	yes	57	60	64	59	0.093
	no	43	40	36	41	

Notes: * denotes statistical significance.

Source: the authors.

For variable P7, the age of the respondents clearly differentiates the response fractions: the largest number of respondents who know the term "circular economy" are in the middle age group, i.e. 35–54 years old. This differentiation is statistically significant at the assumed level. In turn, for variable P8, measuring knowledge of the term "sustainable product", this knowledge increases in subsequent age groups. However, the differences are too small to be considered statistically significant. For both variables, awareness of the terms under consideration is the lowest among the youngest respondents.

Table 6 shows the differences in the mean values of variables P11–P24 depending on the age of the persons examined.

Table 6. Differences in the Mean Values of Variables P11–P24 Depending on Respondents' Age

Variable	Category			Total Average	*p*-value
	up to 34	35–54	55 or more		
P11	3.80	3.83	3.77	3.81	0.707
P12	3.52	3.54	3.47	3.52	0.737
P13	2.69	2.81	2.75	2.74	0.384
P14	2.43	2.51	2.89	2.43	0.309
P15	4.07	4.14	4.13	4.11	0.586
P16	4.02	4.22	4.17	4.14	0.226

Table 6 cnt'd

Variable	Category			Total Average	*p*-value
	up to 34	35–54	55 or more		
P17	3.58	3.56	3.64	3.59	0.878
P18	2.37	2.32	2.69	2.41	0.018*
P19	3.81	3.93	3.91	3.87	0.520
P20	3.96	4.08	4.13	4.03	0.271
P21	3.75	3.80	3.74	3.77	0.732
P22	3.79	4.01	3.96	3.90	0.021*
P23	3.91	4.01	4.10	3.98	0.161
P24	3.83	3.90	3.77	3.84	0.461

Notes: * denotes statistical significance.

Source: the authors.

Analysis of the data in Table 6 shows that for only two variables, P18 and P22, can the observed differences in responses due to the age of respondents be considered significant. For variable P18 (which has a reverse interpretation of the scale), the respondents' belief increases with age. For variable P22, the level of belief is clearly lower in the first age group (up to 34 years) than in the other two. This characteristic relationship also occurs for five other variables (P15, P16, P19, P20, P23), although it is not statistically significant (for variable P14 the differentiation is the opposite, as the interpretation of its scale is reversed). Further, for as many as eight out of the 14 variables (P11, P12, P15, P16, P19, P21, P22, P24), the level of belief is highest in the intermediate age group (35–54 years). The P14 variable is not included here because its interpretation requires reversing the scale.

In general, the analysis of Tables 5 and 6 leads to the conclusion that both the awareness of the issues under consideration and the belief in specific problems are clearly the lowest in the youngest age group.

Table 7 shows the differences in the fractions of variables P7–P8 depending on the place of residence of the people subjected to the study.

The analysis of the data contained in Table 7 allows us to conclude that in the case of variable P7 (knowledge of the term "circular economy"), the differences between the factions are small and it is difficult to indicate any direction of the relationship. Therefore, the differences proved statistically insignificant. However, in the case of variable P8 (knowledge of the term "sustainable product"), the differences in fractions are large and statistically significant. In the largest cities (those with over 500k inhabitants) knowledge of "sustainabile product" is significantly higher than in the three other groups.

Table 7. Differentiation of the Fractions of P7–P8 Variables Depending on Respondents' Place of Residence

Variable	Value	Category (%)				Sample (%)	*p*-value
		village or town up to 5k	city 5–50k	city 50–500k	city above 500k		
P7	yes	41	45	38	45	42	0.096
	no	59	55	62	55	58	
P8	yes	57	60	57	72	59	0.000*
	no	43	40	43	28	41	

Notes: * denotes statistical significance.

Source: the authors.

Table 8 shows the differences in the fractions of variables P11–P24 depending on the place of residence of the people participating in the study.

Table 8. Differences in the Mean Values of Variables P11–P24 by Respondents' Place of Residence

Variable	Category				Total Average	*p*-value
	village or town up to 5k	city 5–50k	city 50–500k	city above 500k		
P11	3.96	3.57	3.80	4.01	3.81	0.021*
P12	3.63	3.40	3.43	3.77	3.52	0.009*
P13	2.78	2.69	2.81	2.59	2.74	0.493
P14	2.53	2.48	2.46	2.05	2.43	0.023*
P15	4.13	4.04	4.05	4.36	4.11	0.027*
P16	4.14	4.05	4.12	4.41	4.14	0.073
P17	3.68	3.47	3.50	3.86	3.59	0.035*
P18	2.41	2.40	2.50	2.24	2.41	0.479
P19	3.87	3.77	4.16	3.87	3.87	0.056
P20	4.06	3.92	4.02	4.23	4.03	0.153
P21	3.81	3.72	3.70	3.96	3.77	0.116
P22	3.86	3.83	3.86	4.20	3.90	0.028*
P23	4.03	3.91	3.89	4.26	3.98	0.037*
P24	3.93	3.70	3.88	3.91	3.84	0.295

Notes: * denotes statistical significance.

Source: the authors.

Table 8 shows that for seven (P11, P12, P14, P15, P17, P22, P23) out of the 14 variables analysed, the differences found were statistically significant, though it is difficult to indicate a clear direction of the relationship. In the case of as many as eight variables (P11, P12, P15, P16, P17, P20, P21, P23), the inhabitants of the largest cities (over 500k inhabitants) are more convinced about these detailed issues, while inhabitants of villages and small (up to 5k) towns were, notably, the second most convinced. This conclusion is specific for five of these variables (P11, P12, P15, P17, P23). However, for variable P14 (with a reversed scale interpretation), an increase in respondents' beliefs clearly increased alongside the population size of the place of residence.

Table 9 presents the differences in the fractions of variables P7–P8 in relation to the respondents' education.

Table 9. Differentiation of the Fractions of P7–P8 Variables in Relation to Respondents' Education

Variable	Value	Category (%)			Sample (%)	*p*-value
		basic	medium	higher		
P7	yes	40	38	48	42	0.018*
	no	60	62	52	58	
P8	yes	45	56	69	59	0.000*
	no	55	44	31	41	

Notes: * denotes statistical significance.

Source: the authors.

The analysis of the data in Table 9 allows us to conclude that for both concepts the differences are statistically significant. The nature of the relationship is very clear: in groups with a higher level of education, the level of awareness of the terms under consideration is higher. For both concepts, the conclusions are worth considering.

Table 10 shows the differences in the mean values of variables P11–P24 in relation to the respondents' education.

Table 10. Differences in the Mean Values of Variables P11–P24 in Relation to Respondents' Education

Variable	Category			Total Average	*p*-value
	basic	medium	higher		
P11	3.32	3.75	4.00	3.81	0.001*
P12	3.39	3.49	3.59	3.52	0.320
P13	2.93	2.78	2.63	2.74	0.109

Table 10 cnt'd

Variable	Category			Total Average	*p*-value
	basic	medium	higher		
P14	2.50	2.56	2.23	2.43	0.004*
P15	3.74	4.04	4.29	4.11	0.000*
P16	3.70	4.06	4.37	4.14	0.000*
P17	3.45	3.53	3.70	3.59	0.059
P18	2.50	2.52	2.23	2.41	0.023
P19	3.43	3.78	4.09	3.87	0.000*
P20	3.45	3.97	4.25	4.03	0.000*
P21	3.39	3.71	3.92	3.77	0.001*
P22	3.42	3.86	4.05	3.90	0.000*
P23	3.59	3.88	4.22	3.98	0.000*
P24	3.61	3.74	4.05	3.84	0.000*

Notes: * denotes statistical significance.

Source: the authors.

Table 10 shows that for 10 variables the differences were statistically significant. Here, too, the nature of the differentiation is clear: those from groups with a higher level of education indicate a higher level of beliefs regarding specific issues. This relationship occurs for all variables, both those differentiated in a statistically significant way and those for which the results cannot be generalised.

Table 11 shows the differences in the fractions of variables P7–P8 in relation to the self-assessment of the financial situation of those surveyed.

Table 11. Differentiation of the Fractions of Variables P7–P8 in Relation to Respondents' Financial Situation

Variable	Value	Category (%)			Sample (%)	*p*-value
		bad	average	all right		
P7	yes	38	40	49	42	0.009*
	no	62	60	51	58	
P8	yes	52	59	67	59	0.000*
	no	48	41	33	41	

Notes: * denotes statistical significance.

Source: the authors.

The data in Table 11 show that for both circular economy (P7) and sustainable product (P8), there is a clear and statistically significant differentiation of fractions

in the context of the self-assessment of one's financial situation. People in a better financial situation are much more aware of the meaning of these terms.

Table 12 shows the differences in the mean values of variables P11–P24 in relation to the self-assessment of the financial situation of the study's participants.

Table 12. Differences in the Average Values of Variables P11–P24 in Relation to Respondents' Financial Situation

Variable	Category			Total Average	*p*-value
	good	average	all right		
P11	3.76	3.76	3.97	3.81	0.156
P12	3.65	3.49	3.53	3.52	0.228
P13	2.66	2.73	2.81	2.74	0.631
P14	2.51	2.41	2.45	2.43	0.743
P15	3.99	4.11	4.17	4.11	0.506
P16	3.98	4.14	4.27	4.14	0.141
P17	3.51	3.62	3.53	3.59	0.623
P18	2.41	2.43	2.36	2.41	0.896
P19	3.79	3.88	3.87	3.87	0.781
P20	3.76	4.09	4.02	4.03	0.019*
P21	3.59	3.82	3.71	3.77	0.143
P22	3.74	3.93	3.90	3.90	0.292
P23	3.89	3.99	3.98	3.98	0.746
P24	3.76	3.86	3.85	3.84	0.898

Notes: * denotes statistical significance.

Source: the authors.

Analysis of Table 12 shows that only for the P20 (packaging should be biodegradable) are the differences in the mean values of the variables statistically significant. The averages for people assessing their financial situation as average or good are significantly higher than for people assessing it as bad. In the case of four variables (P11, P12, P15, P16), the differentiation is weak (a higher self-assessment of the financial situation means a higher level of conviction on specific issues). However, this conclusion cannot be generalised. Interestingly, for eight variables (P14 – inverted scale, P17, P19, P20, P21, P22, P23, P24) the highest averages occurred in the group of people assessing their financial situation as average, and for variables P12 and P13 (the latter with reverse scale), the highest average pertained to those who saw their financial situation as bad.

5. Practical Implications and Discussion

Activities towards sustainable development are definitely having an increasingly significant impact on how enterprises are perceived and the purchasing decisions of consumers. Wide-scale information campaigns should therefore be perceived as the basis for actual action for a better tomorrow and creating an image that allows producers to win over consumers (Mazurek-Łopacińska & Sobocińska, 2010; Buechler & Lee, 2019; Vazquez *et al*., 2023).

Segmentation is a response to the heterogeneity of markets and is the basis for building modern marketing strategies (Wedel & Kamakura, 2002). It allows products, services and marketing strategies to be tailored to specific consumer groups (Vazquez *et al*., 2023). It therefore leads to better adaptation to consumer needs, while also helping companies better reach those consumers whose preferences have been taken into account when shaping marketing activities (Gurgul & Wtorek, 2024).

Segmentation also yields information about the differences that exist between consumers in relation to purchase motives, which result from their specific demographic, geographical, psychographic and behavioural characteristics (Smith, 1956). It leads to a more thorough understanding of consumer needs and their characteristics, and thus also to effective planning of marketing communication activities (Żakowska-Biemas, Gutkowska & Sajdakowska, 2013).

The present analysis may be used to suggest thematic areas and groups (profiles) of respondents to whom educational activities should be directed at various levels of education in the field of circular economy and sustainable development. The promotion of sustainable consumption should be implemented as early as possible. Educational and public institutions and other workplaces should set an example of pro-ecological behaviour and pro-ecological management (Szymoniuk, 2015). A range of researchers has emphasised the role education can play in this area (Kirchhoff, 2010; Sady, Żak & Rzepka, 2019; Watkins *et al*., 2021). Education creates the pillars of the civil society of the future (Biancardi, Colasante & D'Adamo, 2023). The results of other research (Vazquez *et al*., 2023) suggest that priority should be given to activities that increase consumer awareness of sustainable products. Researchers have also shown that an increase in consumer awareness leads to interest in products and, ultimately, their success on the market (Buechler & Lee, 2019). Consumer education on sustainable development and sustainable consumption is also a priority goal for the EU (Kobylińska & Zbierzchowska, 2011). The goals of this education and promotion include (Mazurek-Łopacińska & Sobocińska, 2010):

– encouraging people to make purchasing decisions that maximise quality and long-term usability,

– cultivating a healthy lifestyle,

– encouraging respect for nature and the environment,

– eliminating and segregating waste,
– encouraging people to save energy and water,
– popularising knowledge about environmental protection.

Manufacturers and distributors wishing to promote the sustainability of their products may also consider using the results of this study. Many recent research results support these conclusions (for example, Rypakova, Stefanikova & Moravcikova, 2015; Boyer, Hunka & Whalen, 2021; Franco Lucas *et al*., 2022; Gul, 2022; Sudirjo, 2023; Vazquez *et al*., 2023). A responsible consumer, guided by the principles of sustainable development, makes conscious consumer decisions (Jastrzębska, 2019).

6. Conclusions

By examining the diversity of consumers' awareness and beliefs, it was found that individual characteristics are predictors of the diversity of substantive variables. The conclusions include:

1. Education is the best predictor. Among people with a higher level of education, both the awareness of the concepts under consideration and beliefs about specific issues are higher.

2. The second most important predictor was gender. Women are clearly more convinced about the issues of sustainable products and circular economy, though they know these terms to a lesser extent.

3. Place of residence is the third most effective predictor. The level of belief in sustainable products is in many cases clearly the highest in two groups: residents of the largest cities and of villages and the smallest towns.

4. Age turned out to be a weak predictor of differentiation. The nature of the differentiation proves that the older people become, the more aware they are of the issues under analysis.

5. The self-assessment of one's financial situation is an equally weak predictor. Only a certain nature of differentiation is visible, according to which higher levels of beliefs are declared by respondents in a better financial situation. However, this conclusion is neither clear nor generalisable.

Overall, the study allowed us to understand the diversity of consumer beliefs regarding sustainable products according to formal characteristics, i.e. consumer profiles.

7. Research Limitations

This research has been limited by various methodological and practical factors. First, there is the test. While many took it, the study was carried out only using the CAWI method, so it is not entirely representative. Likewise, the number of

questionnaire items is quite limited. Moreover, the selection of variables for the questionnaire was discretionary.

8. Directions for Future Research

The results of the analysis provide a starting point for posing and solving further interesting problems. In particular, one could consider using multidimensional exploratory techniques – for example, classification trees and cluster analysis. We have previously done such analyses for consumers of electronic banking services (Lotko, 2018) and students of post-commodity fields of study (Lotko, Melski & Lotko, 2023). A number of studies have segmented consumers of sustainable products in this way (Rypakova, Stefanikova & Moravcikova, 2015; Boyer, Hunka, & Whalen, 2021).

Authors' Contribution

The authors' individual contribution is as follows: Each contributed a fifth.

Conflict of Interest

The authors declare no conflict of interest.

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