Acta Sci. Pol.
Oeconomia 22 (4) 2023, 15–30
acta_oeconomia.sggw.pl ISSN 1644-0757 eISSN 2450-047X DOI: 10.22630/ASPE.2023.22.4.22

ORIGINAL PAPER

Received: 20.07.2023
Accepted: 27.12.2023

SIMILARITIES AND DIFFERENCES IN THE GREEN ATTITUDES OF CONSUMERS FROM DIFFERENT AGE GENERATIONS – INTERNATIONAL COMPARISONS

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ABSTRACT

Aim: To aim of this paper is to identify similarities and differences in the pro-environmental attitudes of consumers from different countries, as well as being representatives of different age cohorts. **Methods:** The analyses are based on the results of surveys conducted in four European countries (Germany, Italy, the Czech Republic, and Poland). An international quantitative survey using the author's survey questionnaire was conducted using the CAWI technique on a sample of a total of 2,566 respondents. Association rules, which are among the data mining tools used to build descriptive models, were used in the data analysis. **Results:** The results presented in this study allow us to distinguish patterns of behavior in terms of pro-environmental attitudes and actions, as well as similarities and differences by age and place of residence in this respect. Respondents from older age groups (i.e., 'Baby Boomers' and 'Generation X') are significantly more likely to declare taking pro-environmental actions than respondents from younger age groups (i.e., 'Generation Y' and 'Generation Z'). The opposite situation can be observed in the case of negative answers regarding taking pro-environmental actions. **Conclusions:** The authors of the study believe that the study should be repeated to check whether the declared attitudes and behaviors are the result of a specific situation that differs from other periods (the study was carried out during a pandemic) or whether they are of a constant nature, allowing us to see differences in consumer behavior between age groups and countries. Another possible direction under consideration for further research is to analyze the undecided group in more detail in order to determine the reasons for this.

Keywords: organic consumption, consumer behavior, international comparisons, associations
JEL codes: D11, D12

INTRODUCTION

Greening issues have recently received a lot of attention from academics, researchers, businesses, and politicians, primarily because of the increasing threats to the environment, planet, and climate. Therefore, research into consumers' greening behavior is growing in importance. It is true that there are noticeable differences between the declarations and behavior of young and old people towards climate change. The former expose their positive attitude to ecology in its various aspects, but do not confirm the expressed beliefs in attitudes.

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The latter exposes their opinions less, but the decisions they make are based on their individual experiences, expressed in attitudes and motives. They are also the result of their ability to satisfy their needs, the changes they have experienced in access to products, their freedom of choice in the face of market offerings, and their personalities. Empirical studies can only identify similarities and differences in the pro-environmental attitudes of consumers of different age generations, taking into account the country of residence. On the basis of such identification, and in an international context, it is possible to determine the extent to which it is possible to speak of certain regularities.

The purpose of the article is to identify and evaluate the pro-environmental behavior of consumers belonging to different cohorts (generations). With this in mind, the following research question was formulated: What are the differences in the environmental basics of buyers from different age groups (cohorts)?

The authors posed the following hypotheses:

H_1: Taking pro-environmental actions by respondents results in taking further/other actions in this area regardless of the age group.

H_2: Respondents from older age groups (i.e., Baby Boomers, Generation X) are more likely to report taking pro-environmental actions than those from younger age groups (i.e., Generation Y and Generation Z).

H_3: There are differences in the pro-environmental actions taken by age groups in the countries studied.

The article is structured as follows. After a brief introduction and literature review, the focus is on the characteristics of the highlighted cohorts. This is followed by a conceptualization of the study and a description of the research sample and its characteristics, which is subsequently supplemented by an analysis of patterns of green consumer behavior and green consumer behavior in different age generations. The article concludes with the main conclusions.

LITERATURE REVIEW

According to many futurologists, the 21st century will be an ecological age, although this does not mean that this is a generally shared opinion. Despite the ongoing discourses, the shift towards sustainable consumption, also in ecological terms, can undoubtedly be considered one of the leading megatrends of today. There is growing concern for the state of the environment, and awareness of climate risks and health risks, if only because of the COVID-19 pandemic, which calls for a new approach to consumption towards its greening and, therefore, green consumer attitudes towards meeting needs with the use of consumer goods and services.

Green consumption, most generally, has been defined as the tendency to express the value of protecting the environment through one's consumption behavior [Haws et al. 2014]. As consumers become environmentally conscious, they place more importance on environmentally friendly purchases [Gleima et al. 2013]. Research on eco-consumption, also known as green consumption, is gaining prominence in studies by international and Polish authors [Alfredsson 2004, Gilg et al. 2005, Grønhøj 2006, Reattie 2010, Peattie 2010, Haws et al. 2013, Gleima et al. 2013, Pagiaslis et al. 2014, Sobczyk 2014, Zhao et al. 2014, Moser 2015, Neale 2015, Antonetti and Maklan 2016, Wilczak 2016, Yadava and Pathak 2017, White 2019, Patrzałek 2019, Dąbrowska and Janoś-Kresło 2022, Maheswari and Sujatha 2023].

A review of research on green consumption [Semprebon et al. 2018] is noteworthy. Among other things, it has been pointed out that in consumer research, while one strand of research focuses on individual characteristics, expertise, and environmental concern as antecedents of consumers' propensity to engage in green behavior [Brough et al. 2016], another strand of research focuses attention on how social norms operate in this process [Goldstein et al. 2008].

An important context in view of the growing research interest in green consumption is the demonstrated lack of reference in the literature to the green gap and the lack of research on the methodologies and paradigms used in the available studies [ElHaffar et al. 2021]. At the same time, it is highlighted that despite the variety of methods employed, there is still room for improvement in terms of methodology, paradigm, and theory. Qualitative research and experimental projects were considered important, and the rational para-

digm cannot be replaced, but it should complement the current trend favoring behavioral economics.

However, it seems that the research method chosen must be adapted to the research problem and the research assumptions made.

Based on an analysis of articles from 2000–2018, the literature identifies seven categories of green consumption drivers: behavioral factors, socio-demographic variables, intrapersonal values-environment, intrapersonal values-not-environment, personal opportunities, product and producer factors, and contextual factors [Kryk 2011, Roose 2014, Testa et al. 2021].

Referring to socio-demographic variables, as noted by Brochado et al. [2017], the age variable in the context of green consumption has been the focus of several researchers [Roberts 1996, Straughan and Roberts 1999, Akehurst et al. 2012], with mixed results. According to some, green consumers are older people [Roberts 1996], while others believe that younger people are more receptive to green marketing issues [Straughan and Roberts 1999 Akehurst et al. 2012]. Straughan and Roberts [1999] explain this phenomenon as a link between environmental concern (EC) and the time in which individuals were born. If a person grows up in a period where environmental issues are publicized, that person will be more sensitive to environmental and ecological issues. Gonçalves and Viegas [2015], on the other hand, argue that older consumers may be more aware, have more knowledge and experience, and hence are more receptive to sustainable goods and services.

Jain and Kaur [2006] rightly point out that not all consumers are equally green. Univariate and multivariate analyses indicate the presence of statistically significant associations between socio-demographic characteristics and various constructs of environmental awareness. This is important for building effective marketing strategies and environmental campaigns and influencing the behavior of selected segments of green consumers.

In addition to conscious consumer choices, four main sources of the greening of consumption can be distinguished. These are the spread of new lifestyles, the increase in energy and raw material prices, the impact of state policy and social organizations (consumer activation), marketing, and infrastructure factors [Dabrowska et al. 2015].

It can, therefore, be said that the greening of consumption is a conscious act of the consumer who, perceiving the effects of excessive consumption (consumerism), aims to reduce the purchase of goods and services and their consumption, thereby influencing the reduction of production factors and transport costs, including the reduction of greenhouse gas emissions, as well as contributing to the reduction of post-production and post-consumption waste production.

At the same time, the alarm is sounding that people have purchased more goods and services in the last five decades than all previous generations combined [Rosse 2014].

The changes in the market and consumer behavior, and the shift from 'homo economicus' to 'homo ecologicus', are a manifestation of changes in consumer attitudes, which require awareness and competence-based building of green attitudes. As Barack Obama said, 'We are the first generation to realize that they are destroying their planet and the last generation that can still do something about it' [Confronting… 2018]. The processes of greening consumption and de-consumption require adequate consumer competence, which should be understood as 'theoretical knowledge and practical skills that distinguish a person from others in the efficient, effective, quality-oriented fulfillment of lower and higher-order needs while maintaining responsibility for the choices and decisions made' [Dabrowska et al. 2015].

Consumer knowledge and soft skills largely determine green attitudes in consumer market behavior. Companies operating internationally, nationally, and locally should take into account changes in consumer attitudes and value systems in their production, sales, and marketing activities. Only then will we be able to refer to green activities as a general tendency for consumers and companies to take social responsibility for the greening of consumption.

Green consumption challenges consumers to replace perishable goods with goods with a longer life

cycle, not to accept planned obsolescence of products, to consume goods and services more sparingly, and not to accept unethical behavior of companies towards their employees; therefore, it can be said that green attitudes are an integral part of social responsibility. It also challenges companies, whose production should be rational in their use of non-renewable natural resources and the reduction or elimination of toxic waste, the use of recyclable packaging, and the introduction of 'clean production' principles aimed at obtaining consumer products using more cost-effective and healthier methods.

One of the key elements of green consumption is buying green products, boycotting non-organic products, and gaining knowledge about the activities and behaviors of companies in order to make conscious decisions about the purchase or consumption of the products they offer on the market.

In other words, the drive to make consumption greener increasingly requires the cooperation of market participants, both consumers and businesses. Consumers need to make the right choices of goods available on the market, choosing those goods that are not harmful to the environment, for example, by choosing products that have not been tested on animals or those that are packaged in biodegradable packaging. In this way, they can influence the offerings of companies. In turn, businesses play an important role in the process of shaping baskets in which there will be an increasing number of organic products. These activities should be supported by the dissemination of relevant information about such products, which in turn influences the level of environmental awareness of consumers [Dąbrowska and Janoś-Kresło 2022].

The analyses will be based on the results of surveys conducted in four European countries (Germany, Italy, the Czech Republic, and Poland). To analyze the data, association rules, among other data mining tools used to build descriptive models, were used.

CHARACTERISTICS OF THE AGE GENERATION

The concept of a generation (generations) should be understood as a group of people born in the same time interval who, due to their similar age, experienced similar events, and grew up in similar conditions and times. Yusoff and Kian [2013] emphasize that a generation groups

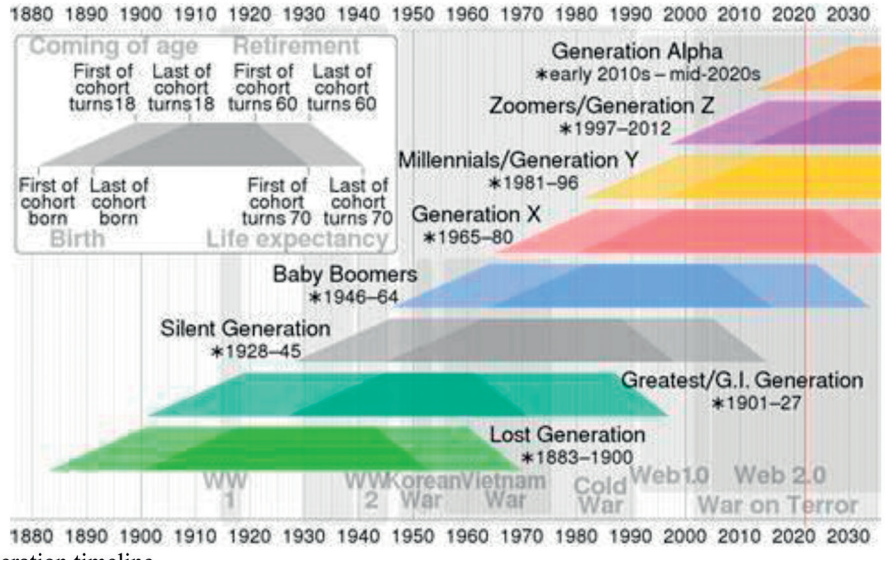

Fig. 1. Generation timeline

Source: https://en.m.wikipedia.org/wiki/File:Generation_timeline.svg [accessed: 16.12.2023]

together people of a certain age range, shaped by similar conditions, technologies, and life events that they experienced at critical stages of development. In the literature, the division into generations is not clear-cut, hence we may encounter different date ranges (Fig. 1).

In general, it can be said that each of these generations has been shaped by different socio-cultural, economic, or political events.

To better understand the environmental attitudes of each generation, MIT AgeLab conducted a nationwide survey asking Millennials (born between 1980 and 2000) how they perceive their green attitudes and behaviors compared to older generations. Baby Boomers and Generation X (1965–1979) were also asked to compare their attitudes and behaviors with those of their younger counterparts.

The results of the survey indicate that the majority of Millennials believe they are more concerned about environmental protection than older generations. At the same time, the majority of adults who make up these older generations (Baby Boomers and Generation X) saw themselves as more environmentally minded than in their twenties. Even if the opinion of the Baby Boomers and the environment is bad, they do not see it this way. However, research shows that simply believing in the importance of protecting the environment does not translate into green actions – at any age. Yossi Sheffi, director of MIT's Center for Transportation and Logistics and author of 'Balancing Green: When to Embrace Sustainability in a Business (and When Not To)', points out that no matter what age we are, we tend not to put our money where our green priorities are and writes: 'While many studies show that the majority of consumers say they want sustainable products, sales figures show that only a small percentage are actually willing to pay more to buy them'.

However, there are other places where mature adults may be more likely to show their green passion, such as when investing: the AgeLab findings may help explain the rapidly growing level of interest in ESG investments, which have increased by more than 97% over the past 20 years. ESG investments are those that take into account the environmental and social impact of companies.

Baby Boomers and Generation X people entering retirement have one more way to make an impact on the environment beyond their wallets – volunteering. According to the Bureau of Labor Statistics, older representatives of Generation X and Baby Boomers do a significant amount of volunteer work, which means that environmental activities – cleaning riverbanks, cleaning bird feathers, saving sea turtles – are often in the hands of these individuals. As Baby Boomers will have a lot more time on their hands in the coming decades, they will have the opportunity to show their commitment and leave a very personal mark on the environment.

Earth Day, celebrated annually, is a reminder of the importance of caring for the environment. The campaigns promote active action for the planet, as well as education on risks and correct habits in society.

In the minds of today's younger environmental activists, Americans aged 45 and older may be seen as having committed unforgivable environmental sins over the past decades. But, if the data tell the truth, the environment may be less a theater of generational warfare and more an opportunity to find common ground. In today's longevity economy, the immense power of older people as voters, consumers, investors, and volunteers may be the catalyst and the best hope we have for a more sustainable society in the coming century [Greener… 2018]. This does not only apply to US citizens.

METHODS

An international quantitative survey with the use of the author's survey questionnaire was conducted by means of the CAWI technique on a total of 2,566 respondents, with the following sample distribution: § Poland: n = 1001 respondents, § Czech Republic: n=` = 500 respondents, § Germany: n = 528 respondents, § Italy: n = 537 respondents. The sample structure ensured representativeness by age, gender, size of locality of residence, and region in line with the structure of the population in each country for those in the 18-65 age group. The survey was conducted in August-September 2020. Sampling was carried out from the following operators: § Poland: epanel.pl – a panel owned by the research company ARC Rynek i Opinia, the other countries: panels available on Cint.

The organizers of the study assumed that an attitude is a fairly constant tendency to value someone or something (the object of the attitude) positively or negatively,

Table 1. Characteristics of different age generations by country and gender (in %)

Variables		Generation Z	Generation Y	Generation X	Baby Boomers
Country	All four countries	14.42	36.83	34.45	14.30
	Poland	50.81	38.31	36.20	35.69
	Germany	14.86	19.37	23.08	23.43
	Czech Republic	17.57	21.59	17.08	21.80
	Italy	16.76	20.74	23.64	19.07
Gender	Female	54.05	46.67	49.43	59.40
	Male	45.95	53.33	50.57	40.60

Source: own compilation based on the results of the survey.

within which the affective, cognitive, and behavioral components can be distinguished. An environmental attitude, on the other hand, is a consumer attitude manifested towards selected green or non-green behavior.

Both elements of the behavioral and cognitive components of behavior were used in the research conducted. These are:

- purchase of well-labeled organic products,
- checking the recyclability of packaging and products,
- checking that cosmetic products are not tested on animals,
- controlling water, energy, and gas consumption,
- consciously avoiding products that cause damage to the environment,
- paying attention to environmental issues when comparing two similar products,
- the belief that people would be better off if they consumed less.

When describing the results of the study, a breakdown into cohorts (age generations) was used. The breakdowns for each age generation were as follows: the Builders (1925–1945), Baby Boomers (1946–1964), Generation X (1965–1979), Generation Y (1980–1994) and Generation Z (1995–2010) (Generations Defined: 50 Years of Change over 5 Generations). Table 1 shows the characteristics of each cohort by the demographic variables adopted for the study.

Association rules were used for data analysis [Agrawal et al. 1993]. Association rules are one of the methods of mining large data sets. They allow the discovery of new, potentially useful knowledge in the form of patterns or rules on various issues such as economic, market, or social, among others.

Association rules are categorized among the data mining tools used to build descriptive models (descriptive, built without a teacher). The aim of the association discovery process is to extract regularities with corresponding probabilities in large data sets. Association rules are represented in the form of the relation $X \rightarrow Y$, where X and Y are disconnected sets of elements selected from some universe of elements [Larose 2006]. The former measure is defined as the probability of the conjunction of events $P(A \cap B)$ and the latter (rule confidence) is the conditional probability $P(A|B)$.

$$\text{support}_{AB} = P(A \cap B) \quad (1)$$

$$\text{confidence}_{AB} = \frac{P(A \cap B)}{P(A)} \quad (2)$$

When analyzing large databases, it is important to remember that the number of possible association rules increases as the number of attributes increases. In this case, not all found rules can be considered interesting and valid. One of the more commonly used methods to evaluate the quality of association rules is the lift/interest ratio. It is the quotient of the probability of the conjunction of events A and B and the product of the probability of event A and the probability of event B [Brin et al. 1997].

$$LIFT = \frac{P(A \cap B)}{P(A)P(B)} \quad (3)$$

High values of the certainty coefficient aiming at $+\infty$ indicate very strong associations. Values equal to 1.0 indicate no association, while a value of 0 indicates that no such rule can be found that would increase the probability of a successor [Brin et al. 1997, Łapczynski 2014]. To analyze the collected data, binary, one-dimensional, and one-level association rules were used[1].

RESULTS

Taking pro-environmental measures by respondents

Analyzing the combined responses of respondents from the four countries in terms of attitudes toward pro-environmental behavior during the pandemic, it can be noted that only for some of them, there is a clear predominance of positive answers ("yes") over negative ones ("no"). Such is the case with declarations of conscious avoidance of products that cause damage to the environment (62% yes and 22% no); the use of ecological aspects when comparing purchased products (51% yes and 30% no); and the view that humanity needs to reduce the amount of consumption (61% yes and 20% no).

A much smaller preponderance of positive responses can be observed in the case of declarations of increased attention to issues of recyclability of packaging and products. Increased attention in this regard is declared by 47% of respondents. Negative answers to the above issue were given by 41%, while no opinion in this area was indicated by 12% of respondents.

In the case of subsequent attitudes toward pro-environmental behavior, the distribution of affirmative and negative answers is comparable (buying properly labeled eco-friendly products: 43% yes and 41% no; controlling water, energy, and gas consumption: 47% yes and 45% no) or there is a clear preponderance of negative answers (checking whether cosmetic products are tested on animals: 39% yes and 47% no). Further analysis of the data shows that among those declaring positive attitudes toward environmentally friendly behavior, only 6% indicate only one, 21% indicate two or three, and 54% indicate four or more.

The basic insights presented above provide a basis for searching the dataset using association rules. From the set of rules obtained (min. support = 10%, min. trust = = 5%), it is possible to extract subsets of rules showing associations between positive declarations in the field of pro-environmental behavior, as well as associations between declarations denying taking the indicated actions.

Positive declarations regarding the purchase of properly labeled organic products are linked to positive declarations regarding paying more attention to cosmetic products not tested on animals. Nearly 27% of respondents answered the indicated questions affirmatively (support = 27.01%, see Table 2 item 1). Positive declarations in terms of acquiring well-labeled organic products also correlate with other positive responses to subsequent questions in this area. The successors in such rules are:

- increased attention to whether products and packaging can be recycled. Nearly a third of respondents answered affirmatively to such questions (support = 32.19%); (Table 2 item 2).
- paying attention to environmental aspects when evaluating two comparable products. Such actions are declared so by 33.48% of respondents (Table 2 item 3)
- consciously avoiding products that cause environmental damage (Table 2 item 4). In this case, both actions are declared by 37% of respondents.
- controlling the consumption of utilities, i.e., gas, water, electricity) (Table 2 item 5). In this case, nearly 30% of respondents declare such actions.
- the belief that less consumption of products and services will make people better off (Table 2 item 6). One-third of respondents answered in the affirmative to such questions.

[1] A binary or Boolean association rule is a rule in which there are data that can take only two values: 1 (true, yes) or 0 (false, no). Binary rules show the co-occurrence of data. Single-dimensional association rules are those in which there is data representing the same value domain. Single-dimensional association rules are those in which the data represent the same level of abstraction.

An in-depth analysis of the generated rules reveals that qualitatively similar rules can be seen when swapping the indicated variables between predecessors and successors of rules[2]. In the same set of rules, more complex rules are possible, i.e., having more than 1 item in the predecessor or successor, and they concern different stages of the purchase decision. For example, it can be stated that paying attention to ecological issues when comparing products and purchasing well-labeled ecological products is accompanied by actions to avoid products that cause damage to the environment, checking the possibility of recycling packaging, and belief in the positive effects of reducing human consumption (Table 2 item 7).

In the case of negative answers, similar relationships can be observed, i.e., a negative declaration to one question coexists with negative answers to other questions about attitudes toward pro-environmental behavior (Table 3).

Table 2. Examples of generated association rules containing in the predecessor or successor an affirmative answer ("yes") to selected survey questions

Rule number in the table	Antecedent	==>	Consequent	Support (%)	Confidence (%)	LIFT
1	Purchase of well-labeled organic products (answer yes)	==>	Checking that cosmetic products are not tested on animals (answer yes)	27.01	61.88	1.58
2	Purchase of well-labeled organic products (answer yes)	==>	Checking the recyclability of packaging and products (answer yes)	32.19	73.75	1.56
3	Purchase of well-labeled organic products (answer yes)	==>	Paying attention to environmental issues when comparing two similar products (answer yes)	33.48	76.70	1.49
4	Purchase of well-labeled organic products (answer yes)	==>	Consciously avoid products that cause environmental damage (answer yes)	37.00	84.00	1.36
5	Purchase of well-labeled organic products (answer yes)	==>	Controlling water, energy, and gas consumption (answer yes)	28.00	64.00	1.36
6	Purchase of well-labeled organic products (answer yes)	==>	The belief that people would be better off if they consumed less (answer yes)	33.00	75.00	1.23
7	Paying attention to environmental issues when comparing two similar products (answer yes); Purchasing well-labeled organic products (answer yes)	==>	Consciously avoiding products that cause environmental damage (answer yes); Believing that people would be better off if they consumed less (answer yes); Checking the recyclability of packaging and products (answer yes)	20.97	62.63	2.07

Note: Support determines the percentage of responses containing the predecessor and successor of the rule in the set of all responses analyzed. Confidence determines the percentage of responses containing the predecessor and successor of the rule in the set of responses containing the predecessor of the rule. Rules for which LIFT is greater than 1 were selected for analysis.

Source: own elaboration based on the survey.

[2] The confidence coefficient is a unidirectional measure. This means that the value of the confidence coefficient for rule A→ B can be different from that of the confidence coefficient for rule B→A.

Table 3. Examples of generated association rules containing in the predecessor or successor a negative answer ("no") to selected survey questions

Rule number in the table	Antecedent	==>	Consequent	Support (%)	Confidence (%)	LIFT
1.	Checking the recyclability of packaging and products (answer no)	==>	Paying attention to environmental issues when comparing two similar products (answer no)	21.90	53.88	1.81
2.	Purchase of well-labeled organic products (answer no)	==>	Paying attention to environmental issues when comparing two similar products (answer no)	21.59	52.91	1.78
3.	Paying attention to environmental issues when comparing two similar products (answer no)	==>	Checking the recyclability of packaging and products (answer no)	27.98	68.58	1.69
4.	Checking that cosmetic products are not tested on animals (answer no)	==>	Checking the recyclability of packaging and products (answer no)	30.83	65.75	1.62
5.	Checking the recyclability of packaging and products (answer no)	==>	Controlling water, energy, and gas consumption (answer no)	27.59	67.88	1.52
6.	Controlling water, energy, and gas consumption (answer no)	==>	Paying attention to environmental issues when comparing two similar products (answer no)	26.34	59.09	1.45

Notes: same as in Table 2.

Source: own compilation based on the survey.

The above-generated rules indicate that taking some pro-environmental actions should result in taking other pro-environmental actions, and conversely, shying away from one action will most likely result in not taking others.

Pro-environmental behavior of consumers in different age generations

The behavioral patterns identified above can be taken as a starting point for testing the existence of similarities and differences in the pro-environmental behavior of the different age generations.

The first noticeable similarity concerns the element included in the cognitive component, i.e., the belief that people would be better off if they consumed less. In each age generation, about 60% of respondents from each cohort respond positively to such a statement. It can also be seen that the level of skepticism towards such a statement varies in each group (higher in younger generations, lower in older ones), as well as a high level against other analyzed elements of lack of opinion in this regard (Table 4).

Analyzing individual items included in the behavioral component, one can see a higher level of positive statements in older age generations (Baby Boomers, Generation X) than younger ones (Generation Y, Generation Z). The opposite is evident in the case of negative responses – a higher level of such responses for younger generations than for older ones (Table 5).

It is also noticeable that the share of different age groups varies when declaring no opinion (answer "difficult

Table 4. Distribution of respondents' responses toward the belief that people would be better off if they consumed less by cohort (in %)

Cohort name	Yes	No	Hard to say
Baby Boomers	63.22	14.71	22.07
Generation X	61.88	17.87	20.52
Generation Y	59.68	23.17	17.14
Generation Z	61.89	21.08	17.03

Source: own compilation based on the survey.

Table 5. Distribution of affirmative and negative responses in each element of the behavioral component (% from row)

	Generation Z		Generation Y		Generation X		Baby Boomers	
	Yes	No	Yes	No	Yes	No	Yes	No
Acquisition of well-labeled organic products	42.16	45.41	40.42	45.71	45.81	35.41	48.23	36.51
Checking the recyclability of packaging and products	46.22	42.16	42.96	45.61	50.11	36.76	53.41	35.69
Checking that cosmetic products are not tested on animals	35.95	50.81	37.88	50.26	40.50	43.10	41.69	43.32
Controlling water, energy, and gas consumption	42.43	47.30	44.76	47.41	49.43	41.63	51.77	41.69
Consciously avoid products that cause environmental damage	58.65	26.76	58.41	27.62	63.80	18.55	70.84	13.90
Paying attention to environmental issues when comparing two similar products	49.46	34.59	48.68	34.07	54.52	25.11	52.59	24.52
The belief that people would be better off if they consumed less	61.89	21.08	59.68	23.17	61.88	17.87	63.22	14.71

Source: own compilation based on the survey.

to say") in relation to a specific pro-environmental behavior. The lowest level of indecision can be seen in the case of the issue of controlling water, energy, and gas consumption. It is at a similar level across generations, i.e., about 10%. A slightly higher level is noticeable in the case of checking the recyclability of packaging and products. In this case, the percentage in each generation varies from 11% to 13%. A greater disparity can be seen when declaring well-labeled organic products. In younger generations, the percentage of undecided is lower than in older generations (Generation Z – 12%, Generation X – 19%). Similar disparities can be seen when checking whether cosmetic products are not tested on animals. The highest percentage of undecided across cohorts is found when paying attention to environmental issues when comparing two similar products. There are significantly fewer undecideds in this area among respondents from younger cohorts (Generation Z – 16%, Generation Y – 17%) than among older ones (Generation X – 20%, Baby Boomers – 23%).

Differences in environmental measures taken by cohorts in the countries studied

Subsequently, responses to the aforementioned questions were extracted from the database and divided into individual cohorts, taking into account the country of the respondent. Analyzing the results obtained, one can notice a high percentage of positive responses (at least 50%) from Italian respondents regarding behavioral as well as cognitive components. The second observation made can be seen in the relatively low proportion (with certain exceptions) of undecided respondents who have no opinion. Their share, depending on the issue raised, does not exceed 20% (however, it should be remembered that the pandemic experience period was not very long). With each issue raised, in addition to the two groups of respondents indicated, groups of opponents of taking such measures have formed. The size of such groups did not vary by country and age generation. Below are the conclusions and observations for each age generation.

In the case of Generation Z, as mentioned above, the strong pro-environmental attitude of Italian respondents is noticeable. Each question analyzed is answered affirmatively by between 50% and 70% of respondents. A lower level of affirmative responses can be seen among respondents from Germany. Here, the level of affirmative answers ranges from 40% to 55%. The last two countries, i.e., the Czech Republic and Poland, are characterized by variation in the level of affirmative responses. For example, the level of declarations regarding the purchase of well-labeled organic products is higher in the Czech Republic (42%) than in Poland (35%). A comparable level is noticeable when checking the recyclability of packaging and products. On the other hand, it is different (i.e., higher in Poland than in the Czech Republic) when checking whether cosmetic products are tested on animals or controlling water, energy, and gas consumption.

In the case of Generation Z, the size of the undecided group is relatively small, ranging from 8 to 15% of responses to individual questions. Such a situation results in a preponderance of negative responses over affirmative responses in some situations, e.g., when declaring that cosmetic products are not tested on animals for respondents from the Czech Republic and Poland.

The second cohort analyzed is Generation Y. Here, one can repeat the observations made when analyzing Generation Z regarding Italy and Germany. As for respondents from this generation from the next two countries, i.e., the Czech Republic and Poland, one can see a higher level of affirmative for the latter. The exceptions to this rule are the issues of conscious avoidance of products that cause environmental damage and the belief that people would be better off if they consumed less (similar levels of affirmative responses for Germany, the Czech Republic, and Poland). In some cases, there is a preponderance of negative answers over affirmative ones, thus indicating the existence of a sizable group of opponents of such measures. This is particularly true of respondents from the Czech Republic and Poland. Details are presented in Fig. 2.

The next cohort, Generation X, also replicates the patterns identified in the previous two age generations, i.e., high levels of positive declarations by respondents from Italy and Germany versus lower levels by respondents from the Czech Republic and Poland. Noteworthy is the high level of declarations that respondents from Poland (54%) control the use of water and other utilities more often compared to respondents from Germany (45%) or the Czech Republic (29%). Compared to previous generations, the group of undecided is growing, while the highest percentage can be observed among respondents from Poland.

On the other hand, among respondents from the Czech Republic, one can observe a large group of those who deny taking certain pro-environmental actions (manifested by the predominance of negative answers over positive ones). This includes: buying well-labeled eco-friendly products, checking the recyclability of packaging and products, checking that cosmetic products are not tested on animals, and controlling water, energy, and gas consumption. Worth noting for this age generation is the similar percentage of affirmative and negative responses from German respondents regarding checking that cosmetic products are not tested on animals and controlling water, energy, and gas consumption.

The last age group is the Baby Boomers, and one can notice a higher level of affirmative responses relative to earlier generations. At the same time, there are groups

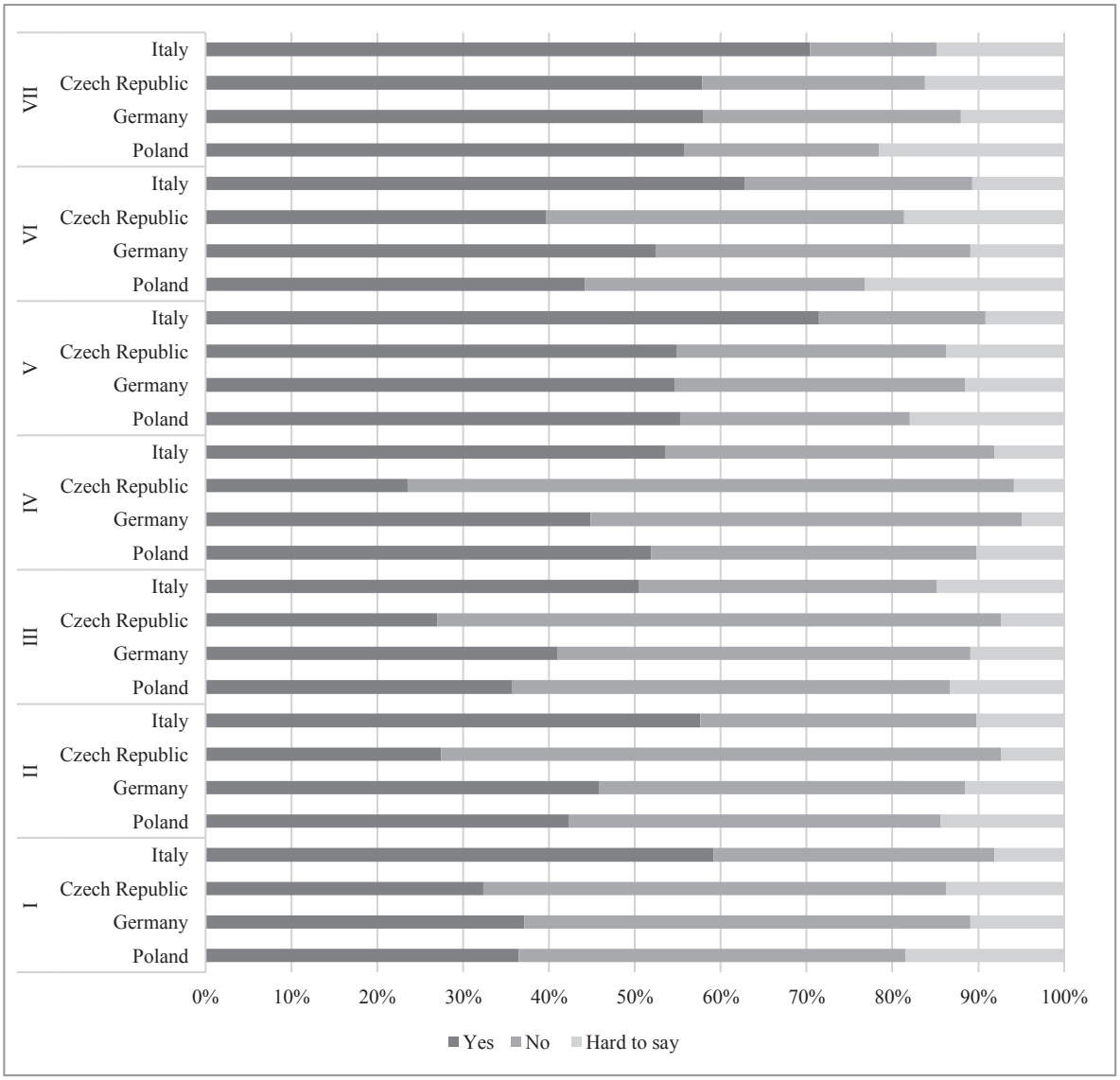

Fig. 2. Attitudes toward the behavioral and cognitive components of the pro-environmental behavior of Generation Y respondents by country.

Note: I –- purchasing well-labeled organic products; II –- checking the recyclability of packaging and products; III –- checking that cosmetic products are not tested on animals; IV –- controlling water, energy, and gas consumption; V –- consciously avoiding products that cause environmental damage; VI –- paying attention to environmental issues when comparing two similar products; VII –- believing that people would be better off if they consumed less.
Source: own compilation based on the survey.

that do not take pro-environmental measures and larger groups of undecided respondents than other cohorts.

Greater indecision can be seen primarily among respondents from Poland and the Czech Republic relative to respondents from the other two countries. It concerns buying well-labeled organic products, checking the recyclability of packaging and products, checking the fact that cosmetic products are not tested on animals, or paying attention to environmental issues when comparing two similar products. The level of indecision in these cases varies, ranging from 18 to 39% of the generation size of Baby Boomers from a given country.

The second significant issue in this age group is the high level of declarations of not taking certain actions by respondents from the Czech Republic. The lack of taking action relates to buying well-labeled organic products, being able to recycle packaging and products, checking that cosmetic products are not tested on animals, and controlling the use of water and other utilities.

DISCUSSION AND CONCLUSIONS

The results of the research presented here make it possible to distinguish patterns of behavior in terms of green attitudes and activities, as well as similarities and differences by age and place of residence in this respect.

In the case of behavioral patterns during a pandemic, it can be observed that the fact of taking green actions should result in other, subsequent actions being taken in this field. At the same time, the opposite behavioral patterns can be observed, i.e., the fact that refraining from taking action will result in other green actions not being taken.

Respondents from older age groups (i.e., 'Baby Boomers' and 'Generation X') are significantly more likely to declare that they take green actions than respondents from younger age groups (i.e., 'Generation Y' and 'Generation Z'). The opposite situation can be observed in the case of negative answers regarding taking green actions.

Considering another variable within the cohorts (country of residence of the respondent), a high percentage of affirmative responses can be seen in each age group in terms of respondents from Italy taking green actions. A lower level of affirmative responses can be seen among respondents from Germany. The last two countries, i.e., the Czech Republic and Poland, are characterized by variable levels of affirmative responses but lower than the previous two countries. This may be explained by the traumatic experience of Italians during the pandemic (given the survey period) relative to the other countries surveyed.

Relating the results obtained regarding the attitudes of the cohorts towards ecological issues to the results of other studies, it can be said that they are confirmed by the results and conclusions of other researchers, e.g., Roberts [1996] or Gonçalves and Viegas [2015]. It can also be seen in this regard that they are consistent with the threads of other studies, e.g., the issue of attitudes towards ecology of young people in Poland [Listowski et al. 2022], where ecology finds a higher place in relation to other values (it is in 25th place out of a possible 29).

The results obtained also correspond with the findings of other authors. For example, according to Peluso et al. [2021], who conducted a study in 2020 in Italy with a sample of 817 respondents from Italy, older consumers are more likely to increase their purchases of environmentally sustainable products. They also point out that consumers in this age category increased their spending on sustainable products during the pandemic as a result of the response to the COVID-19 health crisis.

The current study has three key limitations that present opportunities for future research. The first is that the research is focused only on selected European countries (two countries classified as major European economies and two countries classified as developing economies). In order to confirm the observed relationships, it would be necessary to conduct research on this topic in other countries on the European continent. The research results presented here focus on the actions taken in connection with the purchase of products. Therefore, the findings made cannot be generalized to other pro-environmental behaviors (such as recommerce). Future research could examine other behaviors to see if the situation in which the research took place inspires pro-environmental attitudes and paves the way for more sustainable consumption. In addition, future research could provide an answer regarding the sustainability of the observed effects, i.e.,

examine whether the effects that were observed during the outbreak will persist in subsequent periods.

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PODOBIEŃSTWA I RÓŻNICE W POSTAWACH PROEKOLOGICZNYCH KONSUMENTÓW Z RÓŻNYCH GENERACJI WIEKU – PORÓWNANIA MIĘDZYNARODOWE

STRESZCZENIE

Cel: Celem artykułu jest wskazanie podobieństw i różnic w postawach proekologicznych konsumentów z różnych krajów, ale też będących przedstawicielami różnych kohort wiekowych. **Metody:** Podstawą analiz są wyniki badań przeprowadzonych w czterech krajach europejskich (Niemcy, Włochy, Czechy i Polska). Międzynarodowe badanie ilościowe przy wykorzystaniu autorskiego kwestionariusza ankiety przeprowadzono techniką CAWI na próbie liczącej łącznie 2566 respondentów. W analizie danych wykorzystano reguły asocjacyjne, zaliczane do narzędzi *data mining* stosowanych do budowania modeli opisowych. **Wyniki:** Przedstawione wyniki badań pozwalają na wyodrębnienie wzorców zachowań w zakresie postaw i działań proekologicznych, a także podobieństw i różnic ze względu na wiek i miejsce zamieszkania w tym zakresie. Respondenci ze starszych grup wiekowych (tj. „Baby Boomers" i „pokolenie X") istotnie częściej deklarują podejmowanie działań proekologicznych niż respondenci z młodszych grup wiekowych (tj. „pokolenie Y" i „pokolenie Z"). Odwrotną sytuację można zaobserwować w przypadku negatywnych odpowiedzi dotyczących podejmowania działań proekologicznych. **Wnioski:** Autorzy badania uważają że należy powtórzyć badanie sprawdzając czy deklarowane postawy i zachowania są wynikiem specyficznej, odbiegającej od innych okresów sytuacji (badanie było przeprowadzone w okresie pandemii) czy mają charakter stały pozwalający dostrzegać różnice w zachowaniach konsumenckich między poszczególnymi grupami wieku i krajami. Innym możliwym, rozważanym kierunkiem w dalszych badaniach jest dokładniejsza analizy grupy niezdecydowanych w celu ustalenia przyczyn takiego stanu rzeczy.

Słowa kluczowe: konsumpcja ekologiczna, zachowania konsumentów, porównania międzynarodowe, asocjacje