Izabela **OSTROWSKA**

AGE AS A DIFFERENTIATING FACTOR IN CONSUMER BEHAVIOR IN THE CONTEXT OF THE IMPLEMENTATION OF CIRCULAR WASTE MANAGEMENT

Izabela **OSTROWSKA** (ORCID: 0000-0001-5746-2749) – *Department of Spatial Management and Tourism, Institute of Spatial Management and Socio-Economic Geography, Faculty of Economics, Finance and Management, University of Szczecin*

Correspondence address:
Mickiewicza Street 64, 71-101 Szczecin, Poland
e-mail: izabela.ostrowska@usz.edu.pl

ABSTRACT: The aim of the article is to determine differences in getting rid of unnecessary but operational items from households by young and older people. This is a significant problem from the point of view of the implementation of the principles of the circular economy because successful implementation of the circular economy system in municipalities depends on the habits and behaviour of consumers. The article is of a research nature. The survey was conducted in January 2020 using the CAWI method on a representative sample of n=1012 adult Polish residents aged 18 to 60. In the case of most of the product categories studied, there are differences in the way young and older people deal with unnecessary items. Younger people are more willing to buy new things, but on a positive note, they also often declare willingness to resell products they no longer need. However, an unfavourable phenomenon is the inclination of young people to store unnecessary items in their households. Older people - in the case of most of the products tested - are willing to give them free of charge to people in need. By knowing which groups of subjects deal with unnecessary objects less responsibly, one will be able to take targeted actions to change their behaviour.

KEYWORDS: product disposal, generational differences, circular waste management, circular economy

Introduction

The circular economy is based on prosperity, which is achieved with respect for the natural environment. For this reason, it is assumed that economic growth will be separated from non-renewable resources consumed (Dziczek, 2017; Goddin et al., 2019). Waste management is increasingly recognised as an important part of the development of a closed-loop economy. To implement it, we can tap into valuable resources obtained from waste, thereby reducing our dependence on new raw materials. To fully implement the principles of a closed-loop economy, we need to change our consumption patterns and prioritise effective waste separation, promoting recycling and reuse of products (Komisja Europejska, 2014). It should be noted that on a macroeconomic scale, the amount of municipal waste produced is increasing year after year. This growing waste stream includes many efficient products that have been disposed of because they have been replaced by new, better products. Waste can be defined as any substance or object whose owner wants to dispose of, disposes of or is obliged to do so (Act, 2015). Since Poland's accession to the European Union in 2004, per capita waste generation has increased by almost 34%, rising from 256 kg to 342 kg. This rise in waste production can be attributed to economic development, the increased affluence of society, and the adoption of Western consumer lifestyles. It is worth noting that the average amount of waste generated by an individual in Poland is still 47% lower than the European Union average, which stood at 502 kg in 2019. However, it can be predicted that these figures will converge, leading to a significant increase in the amount of waste that needs to be managed (Tarka, 2021). It should be noted that within the European Union, there are countries inflating these statistics with particularly high standards of living, such as Denmark (781 kg per capita) and Germany (633 kg), as well as popular tourist destinations such as Cyprus (637 kg). In addition, countries outside the EU, such as Norway and Sweden, also generate more than 700 kg of waste per capita (Hryb & Ceglarz, 2021).

The main challenge in the European waste economy today is the transition to a circular economy, i.e. minimising the amount of waste generated and increasing the reuse of waste. Waste is a resource, provided it is managed effectively. This can be achieved by preparing it for reuse or using other recovery methods. The worst solution from the point of view of a circular economy is the storage of waste. European statistics show that around 30% of all solid waste is materials which are subsequently recycled, 28% is thermally neutralised, 23% is landfilled, and 17% is composted. In Poland, in 2020, 27% of the waste generated was recycled, 20% was thermally transformed with energy recovery, and 12% was composted. The share of waste disposed of by thermal transformation is growing (an increase of 5% since 2014). Although the amount of separately collected waste in Poland is increasing – in 2012, it was equal to 1005 thousand Mg, while in 2018, it was 3608 thousand Mg – still, 40% of municipal waste is transported to land-

fills. Landfilled waste should be treated as a loss of resources and a manifestation of economic inefficiency (GUS, 2021). It should be emphasised that public sector actors, including local government units, play a key role in ensuring sustainable development (Birney et al., 2010).

The aim of the article is to determine the differences in getting rid of unnecessary but operational items from households by young and older people. This is a significant problem from the point of view of the implementation of the principles of the circular economy because successful implementation of the circular economy system in municipalities depends on the habits and behaviour of consumers. When a consumer discards a functioning product prematurely, it results in the wastage of its value and usefulness. Furthermore, this premature disposal contributes to the growing quantity of waste that requires appropriate disposal. While the problem of recycling and recovering raw materials in this way is well analysed, disposal of operational items from households is not given attention. The article is based on the results of the author's own research, which was carried out on a representative sample of adult Poles.

In accordance with Directive (2008) of the European Parliament and of the Council, the implementation of which into Polish law is the aforementioned Waste Act, a five-level waste handling hierarchy should be applied. The first level involves waste prevention, focusing on strategies to reduce waste generation. The second level emphasises preparing waste for reuse and finding ways to give products a second life before considering disposal. Recycling is the third level, where materials are processed to create new products. The fourth level includes other recovery processes, which involve extracting valuable resources or energy from waste. Finally, the fifth level entails neutralisation, which aims to safely treat and dispose of waste without causing harm to the environment or human health. The priority for municipalities should be to create a system that will reduce the amount of waste, among others, by donating unnecessary items to those in need. Unfortunately, the Polish system focuses on the implementation of steps 3, 4, and 5, while the most important steps (1 and 2) are implemented to a limited extent only. In 2020, the European Commission announced the "New EU Circular Economy Action Plan for a cleaner and more competitive Europe" (Komisja Europejska, 2020), which aims to accelerate the transformational change required by the European Green Deal, while building on the circular economy actions implemented since 2015.

An efficient model of selective collection of municipal waste in the municipality requires the establishment of selective collection points for municipal waste (abbreviated as PSZOK). According to the Act, there should be at least one such point in each municipality. However, in Article 3, the following paragraph 2b is added after paragraph 2a: the municipality shall set up at least one stationary point for separate collection of municipal waste, alone or jointly with another municipality or municipality (Act, 2015).

The detailed manner of providing services by separate municipal waste collection points is determined by the municipal council by way of a resolution constituting an act of law. The municipality ultimately decides on the method of organisation and scope of PSZOK's activities. The fractions indicated in the Act constitute only a minimum catalogue of waste that the municipality is obliged to collect at PSZOK. There is no information in the Act on the obligation of the municipality to recover usable items, nor is there information that a possibility of bringing operational items from households should be created. Article 3(6a) reads, "may establish and maintain repair and reuse points for products or parts of non-waste products" (Act, 2015). It was only in the latest Draft of the National Waste Management Plan that there was the following provision: the creation of reuse points at PSZOK or other places open to the local community is planned to enable the exchange of second-hand products, as well as establishment of product repair points, promoting reuse, and raising awareness of the correct way of waste management and resulting benefits (Ministerstwo Klimatu i Środowiska, 2022). Reducing the amount of waste in the municipality requires taking into account the level of knowledge and needs of residents so that the waste management system is understandable, convenient and not burdensome to use. Otherwise, the amount of mixed waste will increase because residents will be getting rid of their waste by throwing it into the general garbage can.

An overview of the literature

Consumers play an important role in the implementation of a circular economy. They use and consume products, and their disposal of items no longer needed affects the amount of waste generated and the potential for further processing. Importance of the role of consumers in the economy of sustainable and responsible consumption is highlighted, among others, by Balderjahn (1988), Brewer and Stern (2005), Brosdahl and Carpenter (2010), Connell and Kozar (2010, 2014), Fletcher and Grose (2012), Meulenberg (2003), Lee (2011), Hill and Lee (2012), Cichelska (2017), Stern et al. (1997), Thøgersen (2000), Tanner and Kast (2003).

Brewer and Stern (2005) point out that the actions of individuals and households have a significant impact on the environment in the aggregate, so changing the behaviour of individuals and households can contribute to significant environmental improvements. As contemporary researchers of this issue note, circular strategies available to consumers are mainly related to the first six out of ten R's: refuse, rethink, reduce, reuse, repair, and refurbish. However, they can also use the product for another purpose (repurpose) or give it away for recycling. The main outcomes of conscious consumer behaviour include reducing consumption by using fewer things, using products more intensively, or reducing consumption by using products longer (Cramer, 2015; Jahren et al., 2020; Świrk, 2022).

Results of research carried out by several authors (Kinnear et al., 1974; Antil, 1984; Balderjahn, 1988; Roberts, 1996; Connel & Kozar, 2014) clearly indicate that when consumers are aware of environmental problems and believe that through their personal behaviour, they can contribute to solving an environmental problem, they are much more likely to engage in environmentally friendly behaviour. The level of environmental awareness of European consumers is worth analysing.

European survey results show that 94% of EU citizens believe that environmental protection is important to them. At the same time, 68% of Europeans surveyed are aware that their consumption habits have a negative impact on the environment. Respondents list climate change (53%), air pollution (46%) and increasing waste generation (46%) as the main environmental problems. Respondents want more action to be taken to protect the environment, and responsibility should be shared between large companies and industry, national and EU governments, and citizens themselves. According to survey participants, the most effective ways to solve environmental problems are to modify consumption habits (33%) and change the production and trade model (31%). Differences based on the age of respondents are evident, but they concern not so much the perception of the importance of environmental protection (it is important to 94% of respondents aged 15-24 and 94% of those aged 55+), but the areas affected or the media from which they get their information (European Commission, 2020; Ostrowska, 2022).

Representatives of individual generations have similar views and habits, resulting from the process of socialisation and education, which took place in similar socio-economic conditions. Also, opinions on ecology or recycling are, to a large extent, shaped by the process of school education and, thus, result from school programs adopted at a given time. A generation can be defined as a distinct group of people who share a similar time of birth and significant events at critical stages of development (Hysa, 2016).

In the Polish literature, one can find the claim that care for the environment and pro-environmental behavior are more noticeable in the 35+ group than in the younger group. Such a correlation between age and ecological attitudes is shown by many studies conducted in recent years. The ecological awareness of Poles increases with age, and the commitment and willingness to make individual efforts to protect nature also increases (Batory Foundation, 2018; Piekutowski, 2020; Blue Media Research, 2021). This may be related to the specifics of Poland or Eastern Europe compared to other Western European countries, where young people are the most involved in environmental activities. Younger people in Poland are better educated and have a better material situation than older people. According to an analysis by Czapliński and Błędowski (2014), material affluence, as measured by the number of electronic goods owned by elderly households, is statistically significantly lower than the number of goods in younger people's households. As the age of seniors increases, their material

wealth, especially the number of electronic goods, also decreases. The material wealth of both seniors' and younger households is correlated with the amount of income achieved (r = 0.35, p<0.001), as well as with the level of education (r = 0.36, p<0.001) that determines wealth, which results from greater openness to the purchase of market novelties and succumbing to fashion. On the basis of these data, it can be concluded that younger people will be affected by the problem of consumerism and getting rid of operational objects. However, whether it is possible to notice statistically significant differences in the handling of unnecessary objects in households related to the age of respondents – this issue was the subject of the author's own research.

Research methods

The survey was conducted in January 2020 using the CAWI method on a representative sample of n=1012 Polish residents between the ages of 18 and 60. The sample selection was controlled for socio-demographic variables such as gender, age, and size of locality of residence. The random-quota sampling used was related to the specifics of the survey using the CAWI method used in online surveys. Based on data from the Central Statistical Office (CSO), the demographic structure of people in Poland was determined. Using the formula for the necessary sample size, assuming the level of significance indicated earlier, and the maximum permissible estimation error, the target sample size was set at 1067 respondents. Taking into account previous information about the structure of the surveyed population, the preferred number of questionnaires that should be directed to a specific group of respondents was specified. This made it possible to control the survey sample due to its structure. Thus, the preconceived research sample size was 1,067 respondents, and the computer-assisted CAWI interview was conducted with this size in mind. Following the subsequent detailed verification of the obtained responses, 1012 questionnaires were left for the final analysis, which – with the originally assumed 95% confidence level – increased the estimation error to d=3%, which still ensures a high level of subject representativeness for the surveyed general population. To increase the accuracy of the analysis of quantitative data, the existence of a level of statistical significance of the relationship between variables was examined. For this purpose, the Mann-Whitney U test, chi-square test and Spearman correlation coefficient were used.

Table 1 presents the characteristics of the respondents based on the information contained in the statistical data.

Table 1. Respondents' socio-demographic characteristics (n=1012)

	Total [%]
Gender	
Female	53.6%
Male	46.4%
Age	
18-34 years	32.8%
35-44 years	30.3%
45-54 years	24.4%
With over 55 years	12.5%
Place of residence	
Countryside	33.2%
City up to 100.000 inhabitants	34.9%
City with 100.000 to 500.000	19.3%
City with over 500.000 inhabitants	12.6%

Source: author's work based on the results of the study.

Test results

The aim of the study was to identify the scale of the phenomenon of disposing of functional items from households and to learn the reasons for such phenomenon. Another issue was to find out the ways in which consumers dispose of these items. Eight categories of products (both durable and non-durable), which are used in households and comprise the majority of their consumption of material products, were examined. The study excluded products that cannot be safely and hygienically transferred for use by others – such as medicines, cosmetics, hygienic articles, and household chemicals. In the questions analysed, the results do not sum up to 100% due to the option of choosing more than one answer.

Analysis of the results should begin with examining the scale of the problem, i.e. the scale of the phenomenon of disposal of goods and usable products by the respondents. Figure 1 presents the declarations of respondents concerning the products they get rid of despite their further usefulness.

Analysing the survey results obtained, it can be concluded that for most of the analysed products, there is a phenomenon of disposal from households despite their continued usefulness. Food is affected to the least extent, but a level close to 30% is also significant on a national scale. Most households make decisions to dispose of functional items multiple times a year.
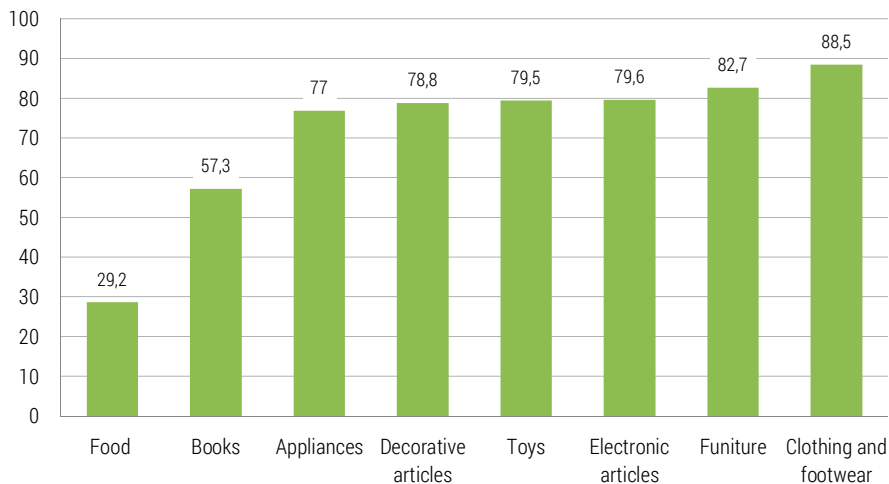
Figure 1. Scale of disposal of goods and usable products from households [in %]

Depending on the product under consideration, the reasons for getting rid of it from households are different (this problem was analysed in the article by Ostrowska (2022)), but there are also different ways of getting rid of it from households. Analysing the data on the reasons for getting rid of operational products from households, it can be noted that younger people are much more likely to cite the purchase of better products and the possibility of reselling them as the reason for disposal. Older people more often declare that the reason for disposal is lack of space, and also more often than younger people claim that they do not get rid of operational products.

Table 2 summarises the respondents' handling of unnecessary but operational objects.

There were 5 ways to choose from – handing over to those in need, handing over to the collection point, storing, reselling and the least ecological, i.e. throwing it in the trash. It is noticeable that the type of product affects the way it is disposed of. As much as 29.8% of unnecessary decorative items and 24.5% of good food go into waste containers, which indicates a significant waste of resources. Books are thrown away to the smallest extent (5.6% of responses). Unfortunately, 9.1% of people getting rid of electronic products and 10.2% of people getting rid of household appliances still throw them into a waste container or leave them next to the container; apart from the fact that the question concerned operational items, such behaviour is very unecological because all such equipment should get to separate waste collection points because it constitutes hazardous waste.

Table 2. Means of respondents' dealing with unnecessary but usable products

Type of product	Procedure				
	Throw in the trash	I store	I transfer to the collection points	I give to those in need	I sell
Food	24.5%	40.5%	14.4%	29.9%	3.7%
Clothes, footwear	12.1%	9.1%	40.6%	51.2%	28.0%
Books	5.6%	43.8%	22.8%	21.3%	30.4%
Electronic articles	9.1%	15.2%	38.9%	22.4%	41.4%
Furniture	18.4%	11.1%	22.7%	37.0%	40.7%
Decorative articles	29.8%	24.4%	17.7%	24.4%	27.6%
Household appliances	10.2%	13.0%	39.2%	27.3%	39.2%
Toys	11.1%	16.9%	25.5%	50.2%	29.6%

[data do not add up to 100% because the respondents could indicate more than 1 answer]
Source: author's work based on survey results, n=1012.

Differences in the approach to getting rid of unnecessary products due to consumers' age were the basis for more extensive analyses. It was checked whether, in the case of the tested products, it was possible to notice statistically significant differences in the strategies applied by the respondents (analysis results are presented in Tables 3-10). Due to the combination of data in the summary table and their readability, the presentation of the number of individual responses was abandoned. However, one should note that in this type of table, there will be cases of large unequal indications, while some individual reasons may not be selected.

Table 3 analyses the respondents' handling of unnecessary food in relation to their age. Food is a specific product because it has a fixed expiration date. For this reason, its purchase should be carefully planned, which may mean that sometimes there are too many products in households in relation to the needs of household members.

The Mann-Whitney U tests showed two statistically significant ($p < 0.05$) differences between the respondents' ages. Throwing in the garbage and reselling were indicated by significantly younger people. There are many opportunities to donate surplus food, but it usually requires effort because collection points are not widely available – especially in smaller towns. For several years, food-sharing cabinets have been created to make it possible to leave food for people in need. Such cabinets are organised by social organisations or councils of housing estates, with the consent of owners of a given area –municipality or private entity. Aid organisations also have their collection points, where such food can be

brought. However, despite the availability of such solutions, as many as 24.5% of respondents prefer to throw surplus food into a waste container.

Table 3. Respondents' handling of unnecessary but usable food and their age

| How do you handle food: | Age (in years): | | | | Statistical significance: |
| | method not selected | | method selected | | |
	M	SD	M	SD	
Throw in the trash	41.27	10.08	39.66	9.68	Z=2.167020, p=0.030234
I give to those in need	40.68	10.11	41.32	9.74	Z=1.00799, p=0.313461
I transfer to the collection points	40.94	10.05	40.45	9.72	Z=0.482475, p=0.629469
I sell	41.02	10.06	36.89	7.25	Z=2.27661, p=0.022810
I store	40.48	9.71	41.45	10.40	Z=1.385550, p=0.165885

Source: author's work based on survey results, n=1012.

Table 4 analyses the respondents' handling of unnecessary clothing and footwear in relation to their age. It is worth noting that containers for second-hand clothing are much more available in Poland than those for food. Also, in this case, their setting and ongoing service are dealt with by private entities, mainly companies dealing in the trade of second-hand clothing and organisations such as the Polish Red Cross (PCK) or Caritas. Many organisations collect clothing as part of collections for those in need, whether by collecting packed clothing from the streets into bags or at their collection points.

Table 4. Respondents' handling of unnecessary but usable clothes and footwear and their age

| How do you handle clothes and footwear: | Age (in years): | | | | Statistical significance: |
| | method not selected | | method selected | | |
	M	SD	M	SD	
Throw in the trash	40.78	9.96	41.54	10.28	Z=0.774837, p=0.438436
I give to those in need	39.85	9.79	41.85	10.11	Z=3.10093, p=0.001929
I transfer to the collection points	40.50	10.09	41.42	9.86	Z=1.523592, p=0.127612
I sell	41.74	10.29	38.64	8.86	Z=4.166869,p=0.000031
I store	41.16	9.94	37.96	10.15	Z=3.085244, p=0.002034

Source: author's work based on survey results, n=1012.

For this product category, Mann-Whitney U tests showed three statistically significant (p<0.05) differences between the respondents' ages. Handing over to those in need was indicated by significantly older people. Resale and storage were indicated by significantly younger people.

Books were the third group of products studied. In this case, there are opportunities in Poland to transfer books to some PSZOKs, special cabinets (bookcrossing), or supplement library collections. Table 5 shows an analysis of ways of getting rid of books depending on the respondents' age.

Table 5. Respondents' handling of unnecessary but usable books and their age

How do you handle books:	Age (in years):				Statistical significance:
	method not selected		method selected		
	M	SD	M	SD	
Throw in the trash	40.99	10.04	38.96	9.19	Z=1.399449, p=0.161679
I give to those in need	40.70	9.93	41.53	10.24	Z=1.01907, p=0.308171
I transfer to the collection points	40.73	10.09	41.35	9.71	Z=0.923174, p=0.355917
I sell	41.59	10.21	39.22	9.31	Z=3.33500, p=0.000853
I store	40.49	9.81	41.37	10.23	Z=1.33288, p=0.182572

Source: author's work based on survey results, n=1012.

In the case of books, Mann-Whitney U tests showed one statistically significant (p<0.05) difference between the respondents' age and the way they got rid of them. Resale was indicated by significantly younger people.

Table 6. Respondents' handling of unnecessary but usable electronic articles and their age

How do you deal with electronic articles:	Age (in years):				Statistical significance:
	method not selected		method selected		
	M	SD	M	SD	
Throw in the trash	41.03	10.05	39.32	9.45	Z=1.506504, p=0.131939
I give to those in need	40.30	9.86	42.85	10.25	Z=3.28661, p=0.001014
I transfer to the collection points	39.85	9.90	42.47	9.95	Z=4.06557, p=0.000048
I sell	41.75	10.33	39.63	9.38	Z=3.08259, p=0.002052
I store	41.36	9.91	38.13	10.10	Z=3.87575, p=0.000106

Source: author's work based on survey results, n=1012.

Table 6 presents the analysis and contains the respondents' handling of unnecessary electronic articles in relation to their age. In the case of operational electronic articles, they are not collected in Poland for delivery to those in need. Collections of waste equipment are organized at municipal points (PSZOKs) and in stores selling it. Consumers can give operational equipment to those in need using advertisements on the Internet on advertising portals or by placing information on social media. However, doing so requires a lot of consumer involvement and effort.

The Mann-Whitney U tests showed four statistically significant (p<0.05) differences between the respondents' age and the ways of disposing of electronic articles. Handing over to those in need and transferring to collection points were indicated by significantly older people. Resale and storage were indicated by significantly younger people.

Table 7 presents the analysis and specifies the ways of dealing with unnecessary furniture in relation to the respondents' age. Municipalities ensure the collection of furniture from housing estates on certain dates or at the request of a resident (door-to-door). Specific solutions depend on the municipality. Residents place unnecessary furniture in designated places, from where it is taken for disposal. It is up to the municipal managers whether the furniture is reused or disposed of. No data is available on what percentage is reused. Residents can give operational furniture to those in need on their own – just like in the case of small electronic items.

Table 7. Methods of dealing with unnecessary but usable furniture by respondents and their age

| How do you deal with furniture: | Age (in years): | | | | Statistical significance: |
| | method not selected | | method selected | | |
	M	SD	M	SD	
Throw in the trash	40.61	10.02	42.04	9.84	Z=1.83520, p=0.066476
I give to those in need	39.98	9.92	42.39	9.96	Z=3.688854, p=0.000225
I transfer to the collection points	40.63	10.05	41.70	9.80	Z=1.51475, p=0.129838
I sell	42.06	10.13	39.14	9.56	Z=4.47310, p=0.000008
I store	41.22	9.96	38.10	9.92	Z=3.238880, p=0.001200

Source: author's work based on survey results, , n=1012.

The Mann-Whitney U tests showed three statistically significant (p<0.05) differences between the respondents' age and the ways of getting rid of unnecessary furniture. Handing over to those in need was indicated by significantly older people. Resale and storage were indicated by significantly younger people.

Table 8 presents an analysis of the respondents' treatment of unnecessary decorative articles in relation to their age. In this case, too, there are no publicly available places where such operational items can be donated.

Table 8. Respondents' handling of unnecessary but usable decorative articles and their age

| How do you deal with decorative items: | Age (in years): | | | | Statistical significance: |
| | method not selected | | method selected | | |
	M	SD	M	SD	
Throw in the trash	40.86	10.10	40.90	9.78	Z=0.174134, p=0.861760
I give to those in need	40.43	9.95	42.23	10.06	Z=2.44065, p=0.014661
I transfer to the collection points	40.65	9.98	41.89	10.06	Z=1.45454, p=0.145799
I sell	41.32	10.10	39.69	9.66	Z=2.21743, p=0.026594
I store	41.20	9.96	39.86	10.09	Z=1.90420, p=0.056885

Source: author's work based on survey results, n=1012.

The Mann-Whitney U tests showed two statistically significant (p<0.05) differences between the respondents' age and the ways of getting rid of unnecessary decorations. Handing over to those in need was indicated by significantly older people. Resale was indicated by significantly younger people.

Table 9. Respondents' methods of dealing with unnecessary but usable household appliances and their age

| How do you deal with household appliances: | Age (in years): | | | | Statistical significance: |
| | method not selected | | method selected | | |
	M	SD	M	SD	
Throw in the trash	40.98	10.05	39.96	9.58	Z=0.938074, p=0.348207
I give to those in need	40.33	9.90	42.31	10.15	Z=2.718736, p=0.006554
I transfer to the collection points	40.08	9.92	42.10	10.02	Z=3.169301, p=0.001528
I sell	41.78	10.32	39.46	9.32	Z=3.335573, p=0.000851
I store	41.33	9.93	37.86	9.99	Z=3.880903, p=0.000104

Source: author's work based on survey results, n=1012.

Table 9 presents an analysis of the respondents' treatment of unnecessary but operational household appliances in relation to their age. Unnecessary household appliances are collected in Poland by sellers upon purchase of new equipment, there are also companies dealing with taking used equipment directly from households. Every consumer can also deliver such equipment to PSZOK.

However, in all these cases, this equipment is recycled and secondary raw materials are recovered from it.

The Mann-Whitney U tests showed four statistically significant (p<0.05) differences between the respondents' age and methods of getting rid of operational household appliances. Handing over to those in need and transferring to collection points were indicated by significantly older people. Resale and storage were indicated by significantly younger people.

Table 10 presents the analysis and specifies the ways in which respondents deal with unnecessary toys in relation to their age. Toys, like clothes, can be thrown into secondhand clothing containers, but also donated to charities.

Table 10. Respondents' handling of unnecessary but usable toys and their age

| How do you handle toys: | Age (in years): | | | | Statistical significance: |
| | method not selected | | method selected | | |
	M	SD	M	SD	
Throw in the trash	40.60	9.99	43.10	9.84	Z=2.51949, p=0.011753
I give to those in need	40.16	10.41	41.58	9.54	Z=2.573055, p=0.010081
I transfer to the collection points	40.67	10.06	41.47	9.83	Z=1.206285., p=0.227708
I sell	42.15	10.19	37.85	8.84	Z=6.094728, p=0.000000
I store	41.18	9.82	39.37	10.76	Z=2.425628, p=0.015282

Source: author's work based on survey results.

The Mann-Whitney U tests showed four statistically significant (p<0.05) differences between the respondents' age and the handling of unnecessary toys. Throwing it in the garbage and handing it over to those in need were indicated by significantly older people. Resale and storage to those in need were indicated by significantly younger people.

Conclusions

Table 11 contains an aggregated summary of statistically significant differences in the ways of disposing of products resulting from the respondents' age.

In the case of most of the product categories studied, there are differences in the way young and older people deal with unnecessary items. Knowing which groups of respondents deal with unnecessary objects less responsibly, it is possible to take targeted actions to change their behaviour.

Table 11. Differences in the ways in which respondents get rid of good and usable products by younger and older respondents

	Younger	Older
Food	**Throwing in the trash**, Resale	
Clothes, footwear	**Store**, Resale	Handing over to those in need
Books	Resale	
Electronic articles	**Store,** Resale	Handing over to those in need Return to collection points
Furniture	**Store**, Resale	Handing over to those in need
Decorative articles	Resale	Handing over to those in need
Household appliances	**Store**, Resale	Handing over to those in need Return to collection points
Toys	**Store**, Resale	**Throwing in the trash** Handing over to those in need

Source: author's work based on survey results.

These differences may result from generational differences, level of knowledge and different life situations. In the case of most of the products studied, older people are willing to give them free of charge to people in need. In the case of electronic products and household appliances, they are also more likely to take them to special collection points. Older people, compared to younger respondents, only throw toys into waste containers. Younger people are much more likely to declare getting rid of items due to the purchase of better products. Younger respondents demonstrate less care for the natural environment, and they are more likely to try new things and get rid of unnecessary ones. This behaviour causes an increase in the amount of municipal waste associated with the packaging of new products, but also the need to dispose of some products replaced prematurely. Younger people are more willing to buy new things, but a positive phenomenon is that they also often declare willingness to resell products they do not need. Thanks to this, resources are not wasted because these items are still used, but only their user changes. However, in the context of circular economy, an unfavorable phenomenon is the tendency of young people to store unnecessary items in households. This can cause many operational items to remain in households, which means that raw materials are wasted, and, in addition, these items are worn out and lose their usefulness. The assumption of circular economy is to keep objects in circulation as long as possible, i.e. in use.

As far as throwing away unexpired food is concerned, this problem applies especially to younger people. In this case, it is necessary to send a message addressed precisely to young people so that food can be given to people in need.

Younger people use different media than older people, and it is best to reach them with the message via the Internet. In the messages addressed to them, one ought to emphasise the negative impact of excessive consumption on the natural environment, inform them about the waste of resources such as products at their homes and notify them of possibilities of transferring unnecessary products.

As Thøgersen pointed out, some consumers may be aware that a particular behaviour is negative for the environment, but they may not know how to change their behaviour to be more environmentally sustainable (Thøgersen, 2000). Thøgersen (2000) concludes that knowledge is one of the key reasons why consumers make unsustainable choices and that the more knowledge a consumer has about the environment, the more likely a person is to engage in environmentally friendly behaviours. It is also a problem for many consumers to reach the special points because there are few of them in municipalities, and their specialisation is narrow (only selected types of products are collected). This problem was pointed out by Daneshvary et al. (1998) in relation to the recycling of clothing.

The greatest opportunities in this area are available to municipalities, which in the Polish system are owners of municipal waste generated in their area and are responsible for creating waste management systems (Ciechelska, 2017). In some municipalities, charity shops are run (e.g. in Warsaw, Szczecin), to which consumers can donate such unnecessary items. Municipalities support such shops by offering a lower rent for renting municipal premises. Revenues from sales are then credited to the account of the selected aid organisation. Municipalities should support non-profit organisations through appropriate information campaigns for residents, informing them what items and where they can be donated. Municipalities can also use PSZOKs (Selective Municipal Waste Collection Points) and create places where every resident can donate such items. In Szczecin, the municipality runs its own commercial outlet, the so-called Galeria Szpargałek. From the waste transferred to PSZOK and the collected large-dimension product, items suitable for further use are selected. Second-hand items are offered at the gallery which can be purchased by residents. Galeria Szpargałek is an activity carried out by the Municipal Services Company as part of its statutory activity and is an integral part of the selective collection point for municipal waste. There are no such solutions in other municipalities in Poland, which may be the reason for a large percentage of people who throw operational products into waste bins and a large scale of storage of unnecessary items in households. The introduction of operational product recovery elements into the waste management system enables longer preservation of the usable value of products and a significant reduction in the amount of waste. Thanks to this, the life cycle of products is extended, and, in addition, social benefits are achieved, which allows the needs of poorer social groups to be satisfied. It requires, above all, modification of consumer behaviour and the creation of a system of reception, incentives and proper communication that will convince consumers to change their habits and behaviours to more environmentally friendly ones.

Acknowledgements

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Izabela OSTROWSKA

WIEK JAKO CZYNNIK RÓŻNICUJĄCY ZACHOWANIA KONSUMENTÓW W KONTEKŚCIE WDRAŻANIA CYRKULARNEGO ZARZĄDZANIA ODPADAMI

STRESZCZENIE: Celem artykułu jest identyfikacja różnic w pozbywaniu się niepotrzebnych, ale nadal funkcjonalnych przedmiotów przez młodsze i starsze osoby. Jest to istotny problem z punktu widzenia wdrażania zasad gospodarki o obiegu zamkniętym, ponieważ możliwość implementacji systemu gospodarki cyrkulacyjnej w gminach zależy od nawyków i zachowań konsumentów. Artykuł ma charakter badawczy. Badanie przeprowadzono w styczniu 2020 roku przy użyciu metody CAWI na reprezentatywnej próbie n=1012 dorosłych mieszkańców Polski w wieku od 18 do 60 lat. W przypadku większości analizowanych kategorii produktów istnieją różnice w podejściu młodszych i starszych osób do niepotrzebnych przedmiotów. Młodsi ludzie są bardziej skłonni do kupowania nowych rzeczy, ale równocześnie często deklarują chęć odsprzedania produktów, których już nie potrzebują. Niekorzystnym zjawiskiem jest jednak tendencja młodych osób do gromadzenia niepotrzebnych przedmiotów w swoich domach. Osoby starsze – w przypadku większości badanych produktów - są skłonne oddać osobom potrzebującym. Identyfikacja grup osób, które mniej odpowiedzialnie obchodzą się z niepotrzebnymi przedmiotami, umożliwia podejmowanie ukierunkowanych działań mające na celu zmianę ich zachowań.

SŁOWA KLUCZOWE: pozbywanie się produktów, różnice pokoleniowe, gospodarka o obiegu zamkniętym, gospodarka odpadami