Circular economy in textiles and fashion—the role of a consumer

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9.1 Introduction

For many years, we have been following a so-called linear economic model, which is based on a simple "take-use-dispose" scheme. We are producing and consuming at an increasing rate, using up more and more natural resources, generating more and more waste, creating more and more serious environmental and social threats. It is becoming clear that this "linear" formula is coming to an end, as natural resources are exhausting, prices are fluctuating, economy is becoming dependent on suppliers from other countries, and threats for ecological and social balance are rising. The need to abandon the linear economic model in favor of circular economy (CE) is therefore becoming increasingly urgent. The CE model entails utilizing resources rationally, to ensure that (EllenMacArthurFoundation, 2013):

1. the value of products, materials, and resources is retained as long as possible, while the production of waste is minimized;
2. materials contained in the waste which is already produced can be reused.

The change from the linear to the circular model requires knowledge, awareness, and engagement of all market participants: manufacturers, technology designers, consumers, and legislators (Fig. 9.1).

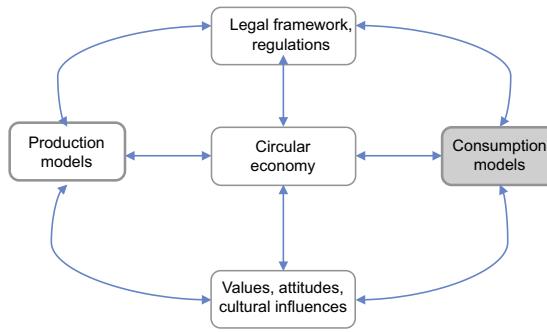

Figure 9.1 Interrelated market connections for the circular economy.

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The speed and scale of the change will depend on knowledge, awareness, and engagement of all market participants; it will involve the whole product life cycle, from design to utilization.

However, consumers will assume a special role in this transformation; the speed and success of these changes will depend on their choices, on the amount and quality of products they buy, on their openness to new business models, and on the manner of dealing with used products.

Challenges of the transformation leading to CE are related to every area of contemporary economies, but each branch of industry will have its own peculiar problems and methods of solving them. Peculiar features of individual industries will therefore require individual approaches and careful analyses.

The limitations of the linear economy model are particularly noticeable in the textile and clothing industry. Textiles and clothing are, next to food, one of the most basic groups of consumption goods; they accompany people from the moment of conception till death, being largely responsible for their well-being and health. For years, we have been observing the rising demand for relatively cheap clothing which is used for increasingly shorter periods of time. This results in increased production and a growing demand for cheap, easily accessible textile raw materials, as well as in the growing amount of textile waste.

The aim of this chapter is to assess the role of consumers in the transformation toward a CE, as well as to identify and assess the factors determining their behaviors in this area.

9.2 The need for a circular economy in textile and clothing industry

The textile and clothing industry plays an important role in the European manufacturing industry, employing 1.7 million people and producing a turnover of EUR 166 billion. The sector accounts for a 3% share of value added and a 6% share of employment in total manufacturing in Europe (EC, 2018). It is also one of the biggest industries, globally worth over $450 billion, in terms of nominal sales. However, the sector is also considered as one of the most polluting (Agrawal et al., 2013; Resta et al., 2016). The main environmental problems associated with the textile and clothing products are typically those associated with energy, water and chemicals consumption, direct CO_2 emissions, and solid waste (Resta et al., 2016). Those negative impacts on the environment occur with varying intensity in different stages of the textile or clothing product life cycle, with the different role of the consumers in their creation. The biggest consumer's direct impact is associated with the use and disposal phase (Table 9.1).

In the textile and clothing industry, the factors of special importance for shaping the current and future situation of the transformation toward a CE are fast-fashion culture and consumerism which results from it. These trends are the consequence of dynamic changes occurring both in production and in consumption. The fast-fashion model is the consumers' reaction to the accelerating pace of life; it involves their expectations of

Table 9.1 Environmental problems related to life cycle stages with the biggest negative impact from the producers and consumers

Environmental problems	Product life cycle with the biggest impact	
	Production	**Consumption**
Energy consumption	Production of man-made fibers, yarn manufacturing, finishing processes	Use phase: washing and drying clothes
Water and chemicals consumption	Fiber growth, wet pretreatment, dyeing and finishing activities	Use phase: laundry
Solid waste	Textile/clothing manufacturing	The disposal of products at the end of their life
Direct CO_2 emissions	Transportation processes within globally dispersed supply chains	

Author's analysis based on Resta, B., Gaiardelli, P., Pinto, R., Dotti, S., 2016. Enhancing environmental management in the textile sector: an Organisational-Life Cycle Assessment approach. Journal of Cleaner Production 135, 620–632.

greater flexibility of clothing companies, fast delivery, and new products at affordable prices. It is also a new, attractive business model which has contributed to the success of many clothing brands. This model is supposed to satisfy consumers' current needs as fast as possible, and at the same time it significantly depends on creating these needs artificially, on stimulating the demand for "disposable" products which can be immediately consumed; this model is based on thoughtless consumption which blindly follows trends (OLIVER_WYMAN, 2015; Remy et al., 2016; Sempruch-Krzemińska, 2014).

The fast-fashion model requires a significant reduction of costs, which allows to maintain relatively low prices of clothing. It also calls for speeding up production and delivery, while ensuring the possibility to increase the number of collections each year. Zara offers 24 new collections of apparel yearly; H&M offers from 12 to 16 collections, a new one every week. The average number of new collections introduced by clothing companies every year has risen by more than 200%, from 2 in 2000, to around 5 in 2011. Simultaneously, we have observed a decrease in the prices of clothing in relation to other consumer goods (Remy et al., 2016).

These factors induce constant increase in clothing production based on conventional, relatively cheap, and accessible raw materials; they also lead to constant growth in consumption. In the last 14 years, the number of clothes bought by an average consumer rose by 60% every year, and the global production of clothes doubled; what is more, 15 years ago people wore clothes for twice as long as today(Remy et al., 2016).

It should be remembered that, although production and consumption are faster, some factors do not change: fiber takes the same amount of time to grow (cotton needs about a year), no matter how fast the product enters the market; it is difficult to reduce the time of cleaning, bleaching, and dyeing. Accelerating production and consumption

inevitably leads to high environmental and social costs. Faster manufacturing of cheap clothes is possible only due to the exploitation of the workforce and natural environment (Fletcher, 2007; Koszewska, 2011a).

All this results in the constant growth of demand, which in turn increases the production of conventional textile raw materials and creates textile waste, which is difficult to recycle. The predicted growth of global population, especially of middle class, will further aggravate the situation. According to data gathered by the United Nations Population Fund, the world population has reached 7550 million in 2016, and is increasing by 1.2% every year. The speed of this increase is highest in Africa: 2.7% (UNFPA, 2017). At the same time, OECD estimates that by 2030 the middle class will amount to almost 5 billion people, while in 2009 it was 1.9 billion (OECD, 2011).

According to the Ellen MacArthur Foundation, yearly consumption on emerging markets is expected to rise from USD 12 trillion in 2010 to USD 30 trillion in 2025 (EllenMacArthurFoundation, 2012).

All these factors clearly indicate the necessity to change contemporary production and consumption models, from the linear model to the CE model (Fig. 9.2).

In the case of textile and clothing industry, which is characterized by a particularly long and globally dispersed production chain, it is a very tough challenge. It will require fundamental changes in the business models of clothing companies. The stage of product design will be crucial because the success of "closing the loop" in consecutive phases of its life cycle will largely depend on it. Durability, universality, as well as the possibility of recycling the product or recovering raw material from it will depend on the choice of raw material, on clothing construction, and on finishing processes. Commercial and technological viability of recycling largely depends on taking this phase into consideration at the stage of devising and designing the product.

Another crucial phase is collecting and sorting used clothes; it will decide how much of the precious raw material will be recovered from textile waste and how much will end up in landfill sites. Introducing positive changes in this area (increasing the recovery of raw material and decreasing the amount of landfill waste) will depend

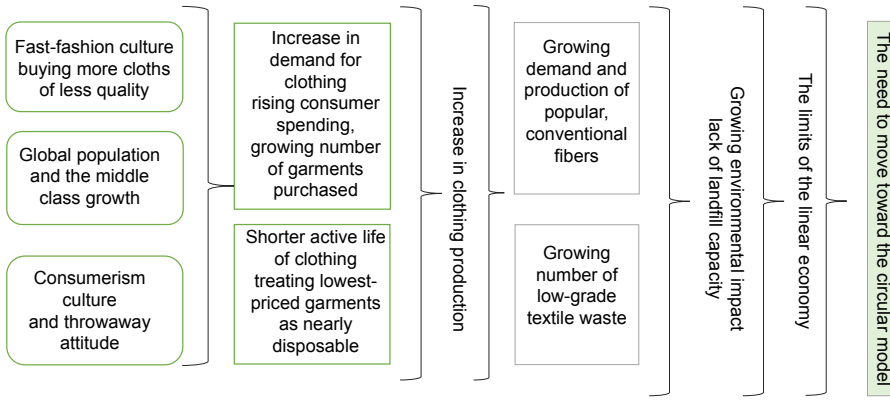

Figure 9.2 Consumer trends leading to the limits of the linear economy.

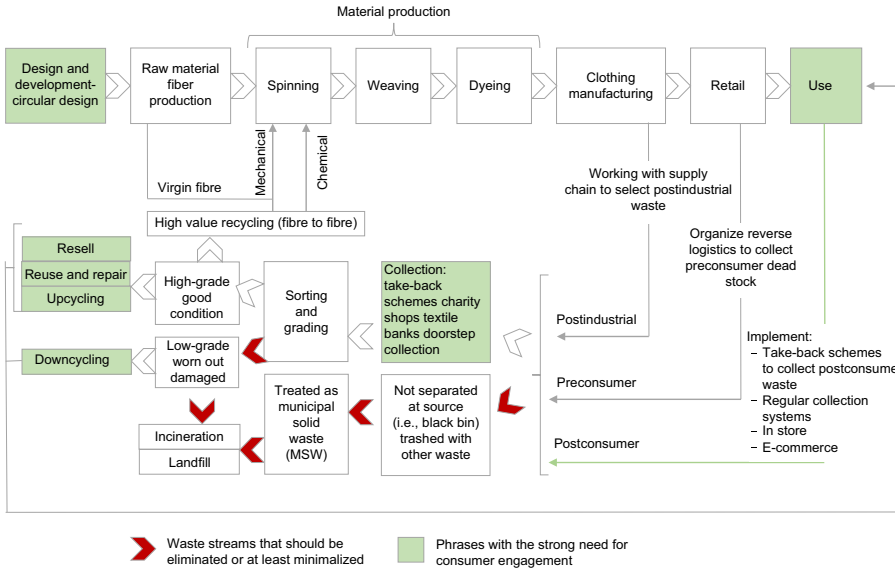

Figure 9.3 Phrases of the textile and clothing products' life cycle with direct consumer's impact.

on creating the effective systems of sorting textile waste and on the technologies allowing to recover raw material which account for considerable raw material diversity in clothing and textile products (common use of raw material blends: cellulose, protein, synthetic polymers) and for the composite structure of products (layered structure, e.g., of sportswear, or textile composites, e.g., for floor covering).

These changes will also be largely determined by consumer behavior. Fig. 9.3 presents the stages of textile and clothing products life cycle in which the engagement of the consumers may have a significant direct influence on positive changes, i.e., closing the loop and moving toward a CE.

9.3 The role of a consumer in the transformation of textile and clothing industry toward a circular economy

The role of a consumer in supporting the transformation of textile and clothing industry toward a CE will concern a few fundamental aspects (Fig. 9.4):

1. Openness to new business models, which involve activities such as sharing products, buying "user experience service" instead of a product itself (product service, e.g., leasing jeans instead of buying them), or being open to innovation, e.g., using 3D printing in textile and clothing industry (Lewandowski, 2016; Gullstrand Edbring et al., 2016; EllenMacArthur-Foundation, 2015).

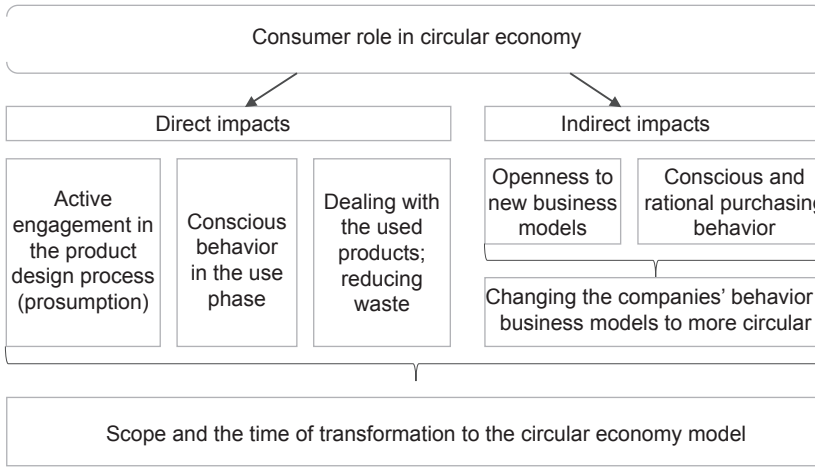

Figure 9.4 Aspects of consumer behavior influencing the scope and the time of the transformation to the circular economy.

2. Openness to cooperation with producers and engagement in design and production (prosumption), using methods such as User Centered Design or Design Thinking (Hannon et al., 2016).
3. Conscious and rational behaviors at the stages of purchasing and using a product: willingness to resist consumerism—deconsumption, rational purchasing, considering ecological aspects while making purchase decisions, appreciating product features such as durability, universality, modularity, repairability, life cycle extension, and recyclability (EllenMacArthurFoundation, 2012).
4. Methods of dealing with used, broken or useless textile and clothing products, as well as willingness to reduce textile waste generated by household (Laitala, 2014).

Some of the abovementioned consumer behaviors will directly influence positive change; these include, e.g., engagement in design and production, manner of use, or dealing with used and useless products.

Other behaviors will exert indirect influence such as consumers' decisions and actions induce changes in companies' behavior, indirectly making them change their business models or their production and distribution strategies (Fig. 9.4).

The following section of the chapter will present the results of my research on the selected aspects of consumer behavior.

9.4 Aim and methods of research

The aim of the research was to analyze the factors which determine consumer behavior in the selected areas relevant for CE; these factors include the following:

- **Proneness to consumerism**, manifesting in behaviors such as purchasing products without a real need, shopping for pleasure, tendency to be tempted by price reductions, purchasing products which are rarely used. Respondents gave an assessment on how typical the

abovementioned behaviors are of them, using a 5-degree scale (1, not at all typical of me; 5, very typical of me)
- **Dealing with used products**; in this respect the following behaviors were studied: household rubbish segregation, repairing broken products and using them until further repair is not possible, giving used products away to friends, family, charities, and making compost heaps from household food leftovers. Respondents assessed the frequency of these actions using a 5-degree ordinal scale (1, never; 2, seldom; 3, sometimes; 4, often; 5, always).
- **Dealing with unnecessary garments**; here a nominal multiple choice scale was used.

In order to establish the factors determining consumer behaviors in the areas relevant for CE, the study analyzed the dependence of behaviors on sociodemographic variables (such as sex, age, education level, financial status, place of residence), and in respect to dealing with useless garments also the dependence on the apparel choice criteria and on respondents' shopping habits.

The study methods applied were cross-tabulation analysis, chi-squared test, Somers' D coefficient, Spearman's Rho coefficient, and Mann−Whitney U test—for two independent samples. In order to divide consumers on the basis of their shopping habits and apparel selection criteria, k-means clustering analysis was applied.

The study on consumerism and dealing with used products was performed in 2015 as part of the project subsidized by the Visegrad Fund, "Prospects of the Visegrad cooperation in promoting a sustainable consumption and production model." It was conducted in four countries: Czechia, Poland, Hungary, and Slovakia, by means of the IMAS Online panel. Two thousand online surveys have been conducted. The sample in each country consisted of the respondents from this country aged 18 years and above (500 surveys per country). The choice of the sample was random-quota based. In the course of selecting samples, the quotas were set for each of the four countries according to the distribution of sex, age, and education level across the country. The request to participate in the survey was sent randomly within particular quotas to ensure that the sample is adequately dispersed, also regionally, and that it fulfils the representativeness conditions. This chapter reports on the results of the study concerning Poland.

The structure of the studied population corresponds to the distributions of sex, age, and education level in Poland (Table 9.2).

The study on dealing with useless garments was conducted on the random sample consisting of 981 Polish adult citizens (in 2010/2011). The surveys were carried out face-to-face by means of computer-assisted personal interviewing. The structure of the studied population is shown in Table 9.3.

9.5 The research results

The analysis demonstrates that Polish consumers declare little identification with the consumerist attitude. The vast majority of respondents (73%) declared that they purchase products only when they really need them. At the same time, only 28% were named as typical behaviors, such as buying for pleasure or buying products they hardly ever use later. A relatively large percentage of Polish consumers admitted that they find

Table 9.2 Sociodemographic structure of Polish respondents (research from 2015)

Gender	Male	50.2
	Female	49.8
Age	18−29 years	26.0
	30−39 years	19.4
	40−49 years	19.0
	50−59 years	20.8
	60+ years	14.8
Education	Primary	6.4
	Vocational	19.6
	Secondary	43.6
	Higher	30.4
Financial situation	I am well off	3.8
	I am pretty well off	28.0
	I am coping	53.6
	I am badly off	9.8
	I am poor	4.8

it difficult to resist price reductions and discounts (Koszewska, 2017) (almost 40% of responders considered such behaviors as typical (Fig. 9.5).

One of the aims of the study was to determine whether these behaviors depend on sociodemographic factors, such as financial situation, education level, age, or sex. The analysis of the distribution of answers and the results of statistic tests demonstrated that the behaviors analyzed depend mostly on the age of respondents. The correlation was relevant for all four questions. The values of the correlation coefficient indicate a weak negative connection between the age and consumerist behaviors (a positive connection concerned only a reversed question about the behavior denying proneness to consumerism: "I buy things only if I really need them"). Elderly people were less prone to consumerist behavior (Table 9.4, Fig. 9.6).

The respondents' level of education proved to have no statistically significant influence on any analyzed behaviors; with respect to financial situation, a statistically significant relation concerned only the tendency to buy for the pleasure of shopping. Somers' D correlation coefficient (−0.12; $P < 0{,}5$) indicates a weak, negative connection between the self-assessment of the financial situation and the tendency to buy for the pleasure of shopping. Respondents who assessed their financial situation as better more frequently admitted the wish to buy for the pleasure of shopping (Fig. 9.7).

The relation between sex and consumerist behaviors was also analyzed; for this purpose, Mann−Whitney U tests were carried out (statistical significance level 5.0%). The

Table 9.3 Sociodemographic structure of Polish respondents (research from 2010/11)

Gender	Male	47.6
	Female	52.4
Age	18–24 years	13.6
	25–34 years	17.4
	35–44 years	14.6
	45–54 years	18.1
	55–64 years	18.1
	65 years and older	18.3
Education	Primary	25.3
	Basic vocational	25.7
	Secondary	33.7
	Higher	15.3
Place of residence	Rural areas	37.6
	Town with population to 20,000	13.9
	20,000–100,000	20.0
	101,000–500,000	15.8
	501,000 and more	12.7

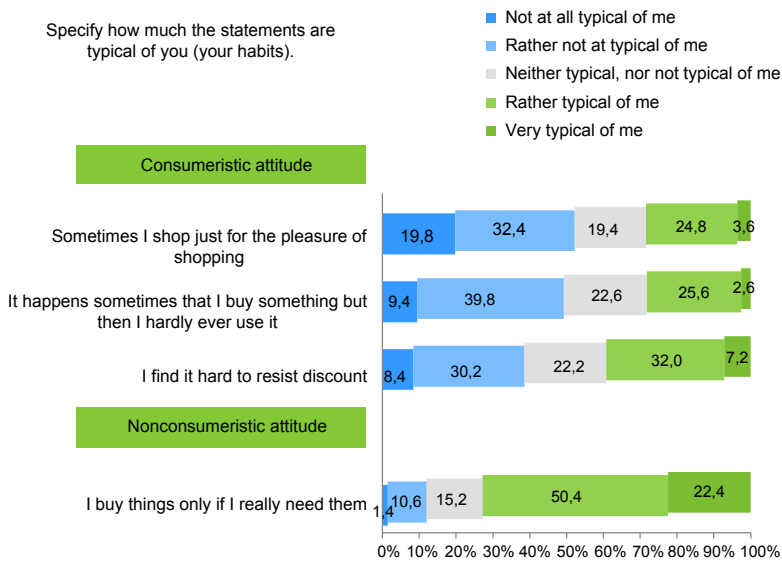

Figure 9.5 Consumerist behaviors of Polish citizens; percentage distribution of answers in 1–5 scale (5, very typical behavior; 1, behavior not typical at all).
From Koszewska, M., 2015. Sustainable Consumption Patterns in Visegrad Region - Polish Report.

Table 9.4 Values of Somers' D and Spearman Rho correlation coefficients which indicate the relation between consumerist behaviors and the age of respondents (statistical significance level $P < .05$)

Consumer behaviors		Somers' D coefficient value	Spearman Rho coefficient value
Consumerist behaviors	Sometimes I shop just for the pleasure of shopping.	−0.141	−0.176
	It happens sometimes that I buy something but then I hardly ever use it	−0.159	−0.206
	I find it hard to resist discount	−0.121	−0.154
Behaviors contradicting consumerism	I buy things only if I really need them	0.158	0.127

Source: Author's calculation by means of IBM SPSS software.

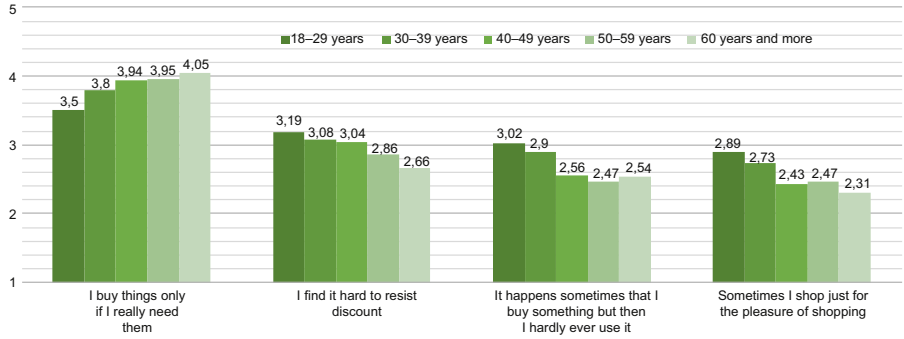

Figure 9.6 Consumerist behaviors of Polish citizens in relation to age—average values (Q) in 1−5 scale (1, behavior very typical; 5, behavior not typical at all).
Source: Author's analysis based on author's study results.

test results did not indicate any statistically significant difference between the behaviors of women and men in the analyzed areas, but the distribution of answers and average rank values suggest that women more often admit that they buy for the pleasure of shopping and find it hard to resist discounts and sales (Table 9.5, Fig. 9.8).

It is worth pointing out that for most questions the percentage of men who did not have an opinion was significantly higher than the percentage of women. This might suggest that shopping as an activity is less important for men and that they do not pay much attention to it (Fig. 9.8).

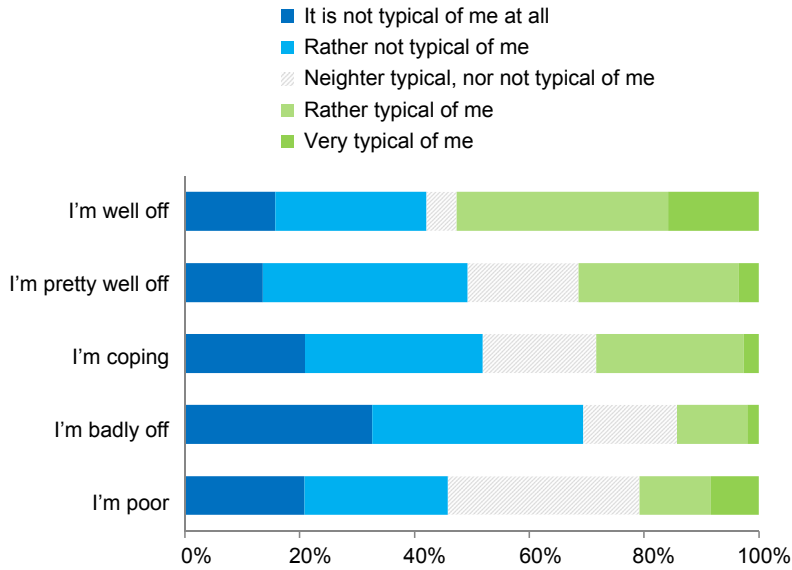

Figure 9.7 Relation between the respondents' self-assessment of their financial situation and the tendency to buy for the pleasure of shopping.
Source: Author's analysis based on author's study results.

Table 9.5 Mann−Whitney U test statistics—diversification of consumerist behaviors among men and women

Question	Sex	N	Average rank	U Mann−Whitney U test statistics
I buy things only if I really need them	Man	251	255.24	30,061 p: 0.426
	Woman	249	245.73	
I find it hard to resist discount	Man	251	243.84	29,577 p: 0.282
	Woman	249	257.22	
It happens sometimes that I buy something but then I hardly ever use it	Man	251	249.3	30,949 p: 0.845
	Woman	249	251.71	
Sometimes I shop just for the pleasure of shopping	Man	251	238.8	28,312 p: 0.06
	Woman	249	262.3	

Source: Author's calculation by means of IBM SPSS software.

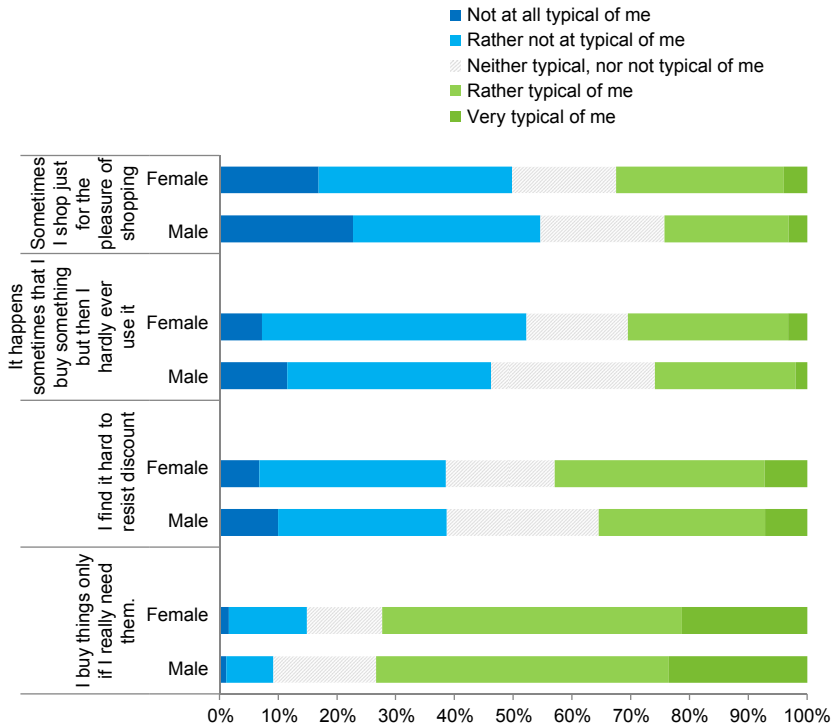

Figure 9.8 Consumerist behaviors in relation to respondents' sex.
Source: Author's analysis based on author's study results.

The second aspect of consumer behaviors relevant for CE is their way of dealing with used products. The vast majority of respondents declared that they always or often segregate household rubbish (78%). It feels encouraging that more than half of the respondents always or often give away used products to family, friends, or charities (60%) and repair broken products (56%), making their life cycle longer. A significantly less frequent activity is making compost heaps from household food leftovers (31% of respondents do it always or often) (Fig. 9.9).

Comparing environmentally friendly prepurchase and postpurchase activities demonstrates that Polish consumers much more often undertake postpurchase activities and the activities which do not demand wide knowledge and engagement, but are familiar and financially rewarding (Koszewska, 2015) (Fig. 9.10).

In this context, it appeared interesting to find out whether the frequency of these activities depends on the respondents' financial situation and on other sociodemographic variables.

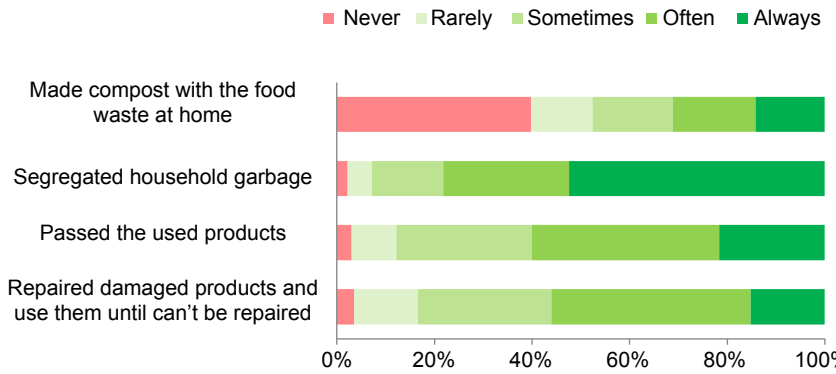

Figure 9.9 Ways of dealing with broken, useless, and used products.
Source: Author's analysis based on author's study results.

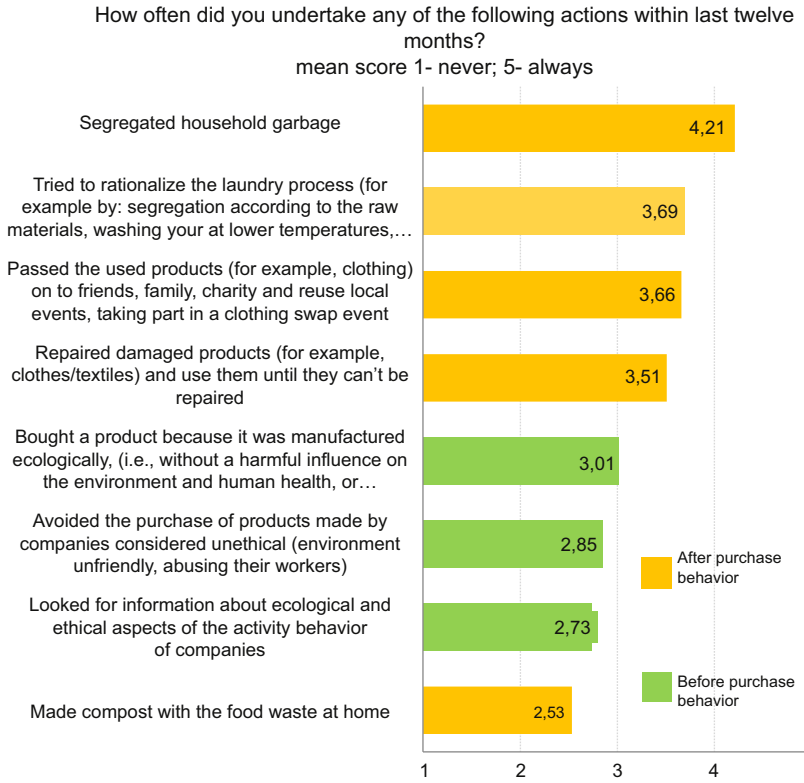

Figure 9.10 Environmentally friendly behaviors of Polish consumers.
From Koszewska, M., 2015. Sustainable Consumption Patterns in Visegrad Region - Polish Report.

Like in the case of consumerist behaviors, the analysis of the distribution of answers and the results of statistic tests demonstrated that the way of dealing with used/useless products depends more on the respondents' age, but also in this case this relation did not concern all analyzed behaviors. The connection was relevant for household rubbish segregation and for giving away used/useless products to friends, families, charities, etc. In both cases, the values of correlation coefficients indicated a positive connection between the age and the frequency of analyzed behaviors. Elderly people segregated rubbish and gave away useless products more often than younger people (Table 9.6, Fig. 9.11). It is quite surprising, however, that there is no statistically significant relation between the age of respondents and the frequency of repairing broken products. It would appear that elderly people are more inclined, and better skilled, to repair products.

Table 9.6 Values of Somers' D and Spearman Rho correlation coefficients which indicate the relation between the age of respondents and the frequency of segregating rubbish and giving away useless products (statistical significance level $P < .05$)

Consumer behaviors	Somers' D coefficient value	Spearman Rho coefficient value
Household rubbish segregation	0.2	0.27
Giving away used products to family, friends, and charities	0.09	0.12

Source: Author's calculation by means of IBM SPSS software.

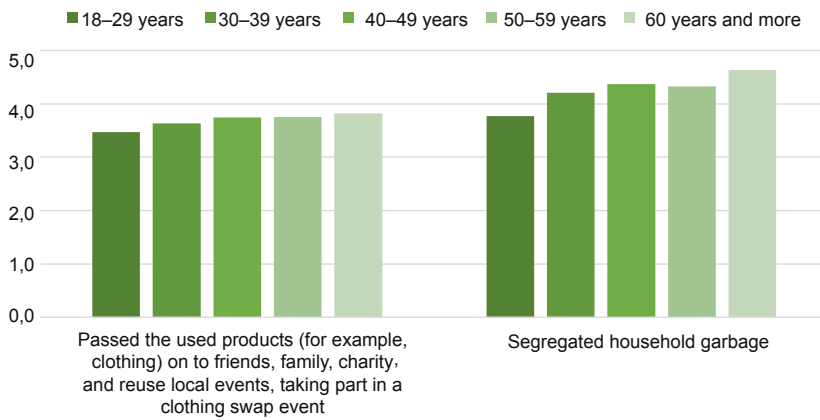

Figure 9.11 Relation between age and rubbish segregation/giving useless products away. Source: Author's analysis based on author's study results.

Education level was significantly related only to the frequency of rubbish segregation. The value of Somers' D correlation coefficient (0.2; $P < .005$) indicates a weak positive relation between education level and rubbish segregation. The better educated a person, the higher the declared frequency of rubbish segregation (Table 9.7, Fig. 9.12).

The study also analyzed different ways of dealing with used/useless products in relation to the respondents' sex. For this purpose, a Mann−Whitney U test was carried out (statistical significance level 5.0%). The test results indicated a statistically significant difference between the behaviors of women and men with respect to giving away used/useless products to family, friends, and charities. Women displayed such behaviors significantly more often than men (Fig. 9.13).

As the results of the survey about dealing with useless clothes demonstrated, Polish consumers declare that they act quite responsibly in this respect. The vast majority (over 60%) declares that they give clothes away to family, friends, or charities (e.g., Polish Red Cross), while 16% of respondents keep used clothes at home and only 8% throw them in the trash. Behaviors declared by respondents allow to conclude that most garments which are no longer useful remain in circulation for some time, which is favorable (Fig. 19.14).

Table 9.7 Mann−Whitney U test statistics—diversification of consumerist behaviors among men and women in relation to extending a product's life cycle

Behavior	Sex	N	Average rank	U Mann−Whitney U test statistics
Giving away used/useless products	Man	251	230.68	26273.5 p: 0.001
	Woman	249	270.48	

Source: Author's calculation by means of IBM SPSS software.

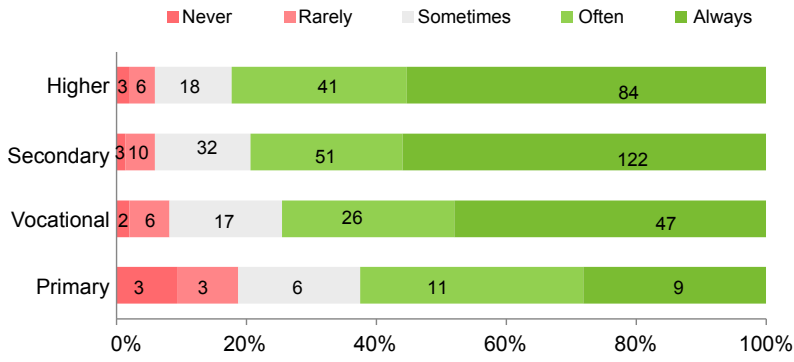

Figure 9.12 Relation between rubbish segregation and education level.
Source: Author's analysis based on author's study results.

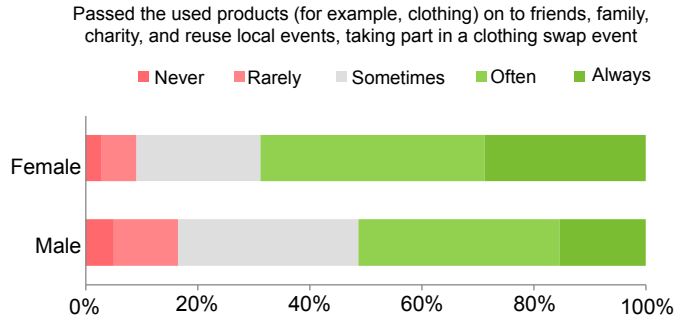

Figure 9.13 Relation between sex and giving away used/useless products to family, friends, and charities.
Source: Author's analysis based on author's study results.

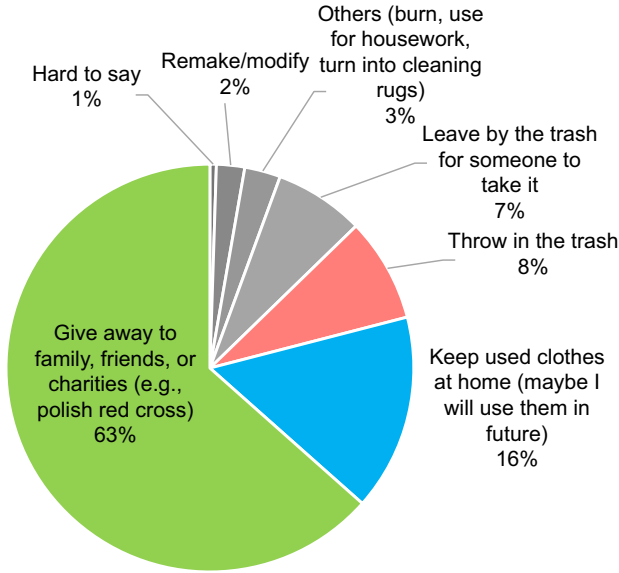

Figure 9.14 Ways of dealing with garments which the respondents are no longer going to wear.
Source: Author's calculation by means of IBM SPSS software.

The analysis of the distribution of answers as well as the results of the chi-squared test ($P < 0.05$) demonstrated that the ways of dealing with used garments depend on the respondents' sex, education level, and place of residence, but do not have a statistically significant relation to their age. Women gave useless clothes away to friends, family, or charities much more often than men did. At the same time, women less frequently threw useless clothes in the trash (Fig. 9.15).

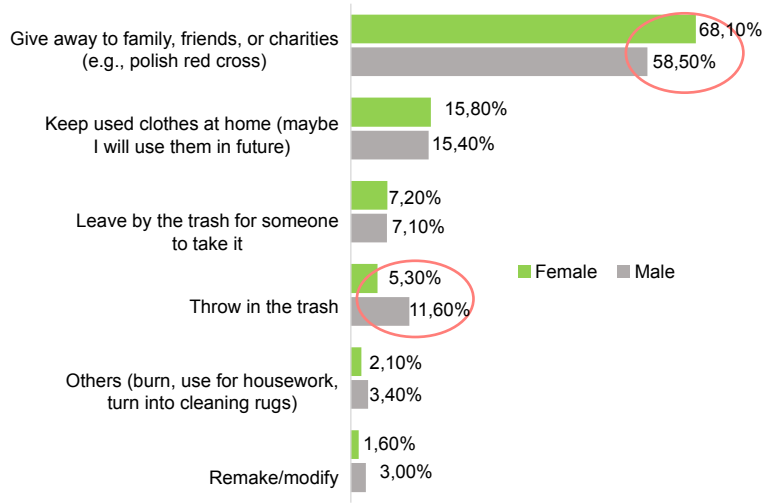

Figure 9.15 Ways of dealing with garments which the respondents are no longer going to wear in relation to the respondents' sex.
Source: Author's calculation by means of IBM SPSS software.

People with higher education significantly often threw less useless clothes in the trash and more often gave it away to family, friends, or charities (Table 9.8, Fig. 9.16).

Residents of rural regions less often than residents of big cities threw useless clothes in the trash, kept them with the intention of using them in the future, and altered them, while they less often gave the clothes away to friends or threw them into the Polish Red Cross collection bins (Table 9.9).

The results of the chi-squared test did not, however, allow to corroborate the hypothesis that there is a statistically significant relation between the way of dealing with useless clothes and the respondents' age. Nonetheless, the analysis of the distribution of answers allows to conclude that elderly people (65+) more often than other age groups kept useless clothes with the intention of wearing them or altered them. They less often gave them away to friends, family, or charities (Table 9.10).

In order to assess the influence of shopping habits and apparel selection criteria on the ways of dealing with useless clothes, the study analyzed the variability of those behaviors in the selected typological groups, described in detail in (Koszewska, 2013). Fig. 9.17 shows the characteristics and the share of particular typological groups in the population studied.

Both the results of the chi-squared test ($P < .005$) and the analysis of distribution of answers demonstrated that the ways of dealing with clothes no longer used depend on the consumers' shopping habits and their apparel selection criteria (Fig. 9.18).

The groups for which ecology and ethics are secondary at the stage of purchasing clothes more often declared the behaviors less desired for CE, such as throwing

Table 9.8 Ways of dealing with garments which the respondents are no longer going to wear in relation to education level

	Education				Total
	Primary	Vocational	Secondary	Higher	
Other (I incinerate them, I use them for household working clothes, I use them as a cleaning cloth)[a]	8.4	10.7	11.5	7.7	9.9
I give them away, e.g., to country people, I throw them into Polish Red Cross collection bins, etc.	53.8	59.3	67.1	77.5	63.3
I keep them because I might wear them yet	17.7	18.6	15.4	7.9	15.7
I convert them	5.6	1.2	0.9	1.3	2.2
I throw them into the trash	13.7	9.5	5.1	4.6	8.3
Hard to say	0.8	0.8	0.0	0.7	0.5

[a]Most frequent answers: I incinerate them, I use them for household working clothes, I use them as a cleaning cloth.
Source: Author's calculation by means of IBM SPSS software.

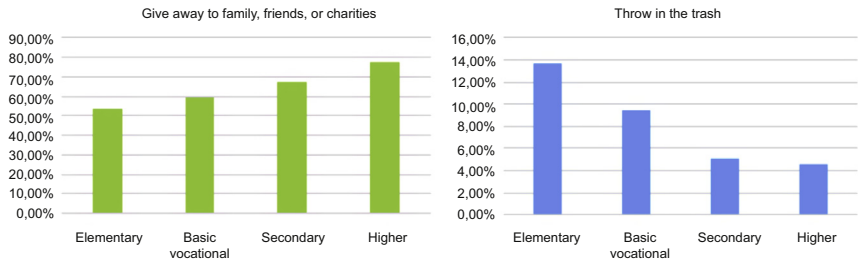

Figure 9.16 Ways of dealing with garments which the respondents are no longer going to wear in relation to education level.
Source: Author's calculation by means of IBM SPSS software.

useless clothes in the trash or keeping them at home. They less often gave these clothes away to the needy or to the organizations which deal with the utilization of garments.

The analysis of answers to the question about altering useless clothes may lead to interesting conclusions. This option was significantly more often chosen by a group of thrifty consumers, which might indicate that the decision to alter clothes to continue using them results not from knowledge and ecological awareness but from economic reasons.

Table 9.9 Ways of dealing with garments which the respondents are no longer going to wear in relation to place of residence [%]

	Rural regions	Town below 20,000 inhabitants	20,000–100,000 inhabitants	101,000–500,000 inhabitants	501,000 and more inhabitants	Total
I leave them by a dustbin for somebody to take	4.3	3.6	10.7	9.7	11.3	7.2
I give them away, e.g., to country people, I throw them into Polish Red Cross collection bins, etc.	49.6	70.8	67.3	76.8	73.4	63.4
I keep them because I might wear them yet	22.8	16.8	10.7	8.4	8.9	15.5
I alter them	4.1	1.5	0.5	0.6	2.4	2.2
I throw them into the trash	13.0	6.6	8.2	4.5	1.6	8.4
Other[a]	4.9	0.7	2.6	0.0	2.4	2.8
Hard to say	1.4	0.0	0.0	0.0	0.0	0.5

[a]Most frequent answers: I incinerate them, I use them for household working clothes, I use them for cleaning cloth.
Source: Author's calculation by means of IBM SPSS software.

Table 9.10 Ways of dealing with garments which the respondents are no longer going to wear in relation to age [%]

	18–24	25–34	35–44	45–54	55–64	65 or more	Total
I leave them by a dustbin for somebody to take	3.8	7.6	7.0	7.9	8.5	6.1	6.9
I give them away, e.g., to country people, I throw them into Polish Red Cross collection bins, etc.	64.7	65.9	69.9	61.6	66.7	53.9	63.5
I keep them beca use I might wear them yet	17.3	17.1	12.6	13.6	13.0	20.0	15.6
I alter them	1.5	2.9	0.0	3.4	0.6	4.4	2.2
I throw them into the trash	9.8	4.7	8.4	9.0	8.5	10.0	8.4
Other[a]	3.0	1.2	2.1	4.5	1.7	4.4	2.9
Hard to say	0.0	0.6	0.0	0.0	1.1	1.1	0.5

[a]Most frequent answers: I incinerate them, I use them for household working clothes, I use them as a cleaning cloth, I sell them.
Source: Author's calculation by means of IBM SPSS software.

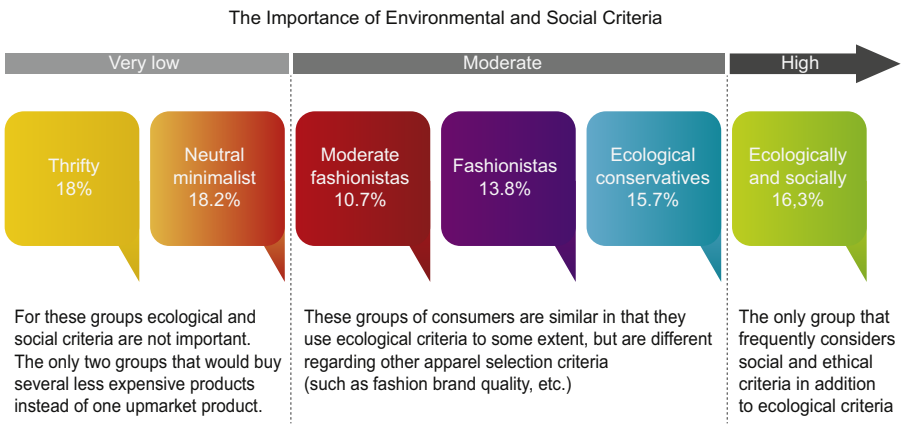

Figure 9.17 The typology of consumers based on apparel selection criteria and buying habits. Based on own research. The precise characteristic of consumer types in: Koszewska, M., 2013. A typology of Polish consumers and their behaviours in the market for sustainable textiles and clothing. International Journal of Consumer Studies 37 (5), 507–521.

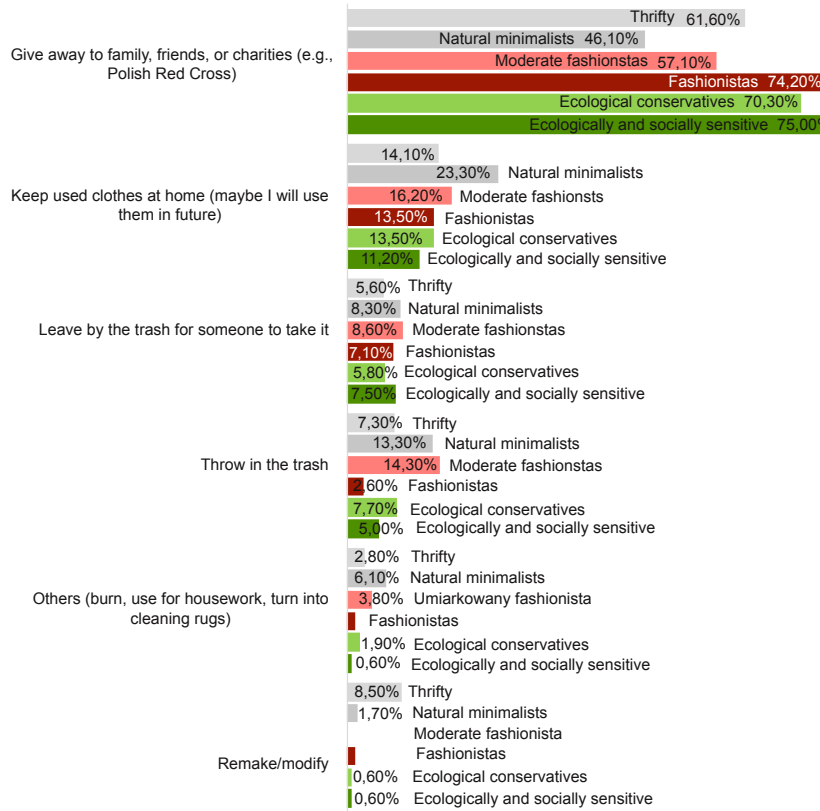

Figure 9.18 Variability of behaviors with respect to ways of dealing with useless clothes in selected typological groups.
Source: Author's calculation by means of IBM SPSS software.

9.6 Conclusions

The analysis demonstrates that Polish consumers declare little identification with the consumerist attitude, and that such behaviors depend mostly on the age of respondents, and not on sex, education level, or financial situation. Elderly people were less prone to behaviors such as shopping for pleasure, buying on impulse (discounts and sales), or buying products they do not later use.

The respondents' level of education proved to have no statistically significant influence on any analyzed behaviors; with respect to financial situation, a statistically significant relation concerned only the tendency to buy for the pleasure of shopping. Respondents who assessed their financial situation as better more frequently admitted the wish to buy for the pleasure of shopping.

Comparing environmentally friendly prepurchase and postpurchase activities demonstrate that Polish consumers much more often undertake postpurchase activities and the activities which do not demand wide knowledge and engagement, but are familiar and financially rewarding. The vast majority of the respondents declared that they always or often segregate household rubbish and more than half declared that they always or often give away used products to family, friends, or charities and repair broken products, making their life cycle longer. Like in the case of consumerist behaviors, the variable which most strongly determined the way of dealing with used products was the respondents' age, but also this relation did not concern all analyzed behaviors. Elderly people segregated rubbish and gave away useless products more often than younger people did. Education level was significantly related only to the frequency of rubbish segregation. The better educated a person, the higher the declared frequency of rubbish segregation.

The study concerning a particular product group, i.e., clothes, demonstrated that the way of dealing with useless clothes was significantly dependent on sociodemographic variables, such as sex, education level, and place of residence. In this case, age was slightly less important, but the analysis showed that elderly people (65+) more often than other age groups kept useless clothes with the intention of wearing it or altered them. The study also confirmed that the ways of dealing with useless clothes are significantly determined by previous shopping habits and by apparel selection criteria.

Taking into consideration the results of both conducted studies, it can be concluded that sociodemographic variables significantly determine consumer behaviors concerning CE, but the manner and range of this influence can vary according to a particular aspect of consumer behavior, as well as according to a product group.

It should be generally emphasized, however, that at the moment there is a limited number of comprehensive studies on consumer behavior related to the implementation of CE. The studies available are based only on selected aspects of behavior, like disposal practices (Constanza, 2012; Joung and Park-Poaps, 2013; Laitala, 2014; Weber et al., 2017), purchasing behavior (Gwozdz et al., 2017; Wang et al., 2014), and business models (Gullstrand Edbring et al., 2016); they embrace only part of population or they are not up to date.

The analysis undertaken in this chapter also has some limitations: the survey was conducted on two different groups of cnsumers in two different times and it embraced only some selected aspects of consumer behavior relevanot for CE. Moreover, it has to be noted that the study concerned consumer behavior in Poland, a country which, first, has only recently (compared with Western Europe) started to follow the trends of consumerist behaviors, such as fast-fashion, and, second, has yet to match the level of knowledge, ecological awareness, and environmental movement activity of those countries (Koszewska, 2011b).

Therefore, in order to confirm the results achieved or to identify potential differences between countries from various regions, it would be advised to repeat the study on a larger scale and to cover all aspects of consumer behavior relevant for CE.

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