

ENVIRONMENTALLY SUSTAINABLE APPAREL ACQUISITION AND DISPOSAL BEHAVIOURS AMONG SLOVENIAN CONSUMERS

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Abstract:

Fibre production and textile processing comprise various industries that consume large amounts of energy and resources. Textiles are a largely untapped consumer commodity with a strong reuse and recycling potential, still fibres and fibre containing products ends up in landfill sites or in waste incinerators to a large extent. Reuse and recycle of waste clothing results in reduction in the environmental burden. Between 3% and 4% of the municipal solid waste stream in Slovenia is composed of apparel and textiles. This exploratory study examines consumer practices regarding purchase and the disposal of apparel in Slovenia. Data were collected through structured online survey from a representative random sample of 535 consumers. Responses to online questionnaire indicated the use of a variety of textile purchase and disposal methods. The influence of different sociodemographic variables on apparel purchase, disposal and recycling behaviour was examined. Moreover, the differences in the frequency of apparel recycling between consumers with and without an apparel bank available nearby were explored. This research was conducted, since it is crucial to analyse the means by which consumers are currently disposing their textile waste in order to plan the strategies that would encourage them to further reduce the amount of apparel sent to landfills.

Keywords:

environmentally sustainable consumer behaviour, apparel consumption, apparel acquisition, apparel disposal, environment, questionnaire, Slovenia

Introduction

Throughout the life cycle of apparel, everything from fibre manufacturing to garment disposal contributes towards environmental degradation. Fibres and fibre containing goods are in our daily lives distributed over a considerable extent. End uses include three categories: apparel, (clothing); 'interior and home textiles'; and 'industrial and technical textiles'. The apparel industry is the major end-use of such fibres, using about 44%, of the total output. The fashion industry is contributing to today's sustainability challenge in a number of ways [1]. It currently uses a constant flow of natural resources to produce 'fast-fashion' garments. The clothing industry is focused on low cost mass-production, sold at very low prices, based on the latest trends, which encourages consumers to purchase more than they need, resulting in external environmental and social impact. Recent report revealed that nowadays people are buying one-third more garments than four years ago [2].

Sustainable consumer behaviour can help solve the problem of excessive pollution caused by the consumption of textiles and apparel. In most governmental and intergovernmental programmes for rescuing the environment, consumers are designated as one target group [3]. In Europe, the changing legislative framework is forcing increasingly progressive recovery of textiles. One example is the European Directive on

the Landfill of Waste (Landfill Directive 1999/31/EC) that sets the targets for the diversion of Biodegradable Municipal Waste (BMW) [4].

A recent study [5] revealed that the Europeans recycle only 25% of their municipal solid waste (MSW) and that we are particularly wasteful with used textiles, with 75% of the 5.8 million tons discarded every year to landfills and being incinerated [5]. Information about textile purchasing and disposal behaviour is a necessary precursor to the establishment of organised textile-recycling programs.

Therefore, the purpose of this research was to identify ecoconscious consumer practices, especially in regard to the purchase and disposal of apparel among Slovenian consumers, quantity and type of apparel purchased and disposed, and attitudes towards second hand apparel. Aspect of purchasing and disposing process of apparel is a new area of research and involves the prepurchase and postpurchase components [6, 7]. Furthermore, the influence of different sociodemographic variables (age, education, status, place of residence), attitude variable (perceived convenience) and additional situational variable (presence of recycling apparel banks) on the apparel recycling frequency was examined. Also, the ways to increase second-hand sales are discussed. This study also seeks to identify elements of the sociodemographic profile of Slovenian environmentally sustainable consumer of apparel.

Environmentally sustainable apparel consumption

Environmentally sustainable apparel consumption includes apparel consumption behaviour (acquisition, stopping, using, maintaining and disposing) which is environmentally preferable to mainstream apparel consumption behaviour, because the intent of engaging in the behaviour is: to create less pollution and waste and/or to consume fewer natural resources [8]. Both the manufacturing processes involved in the production of apparel and the actual consumption generate pollutants.

Textiles and apparel compose the world's second largest industry and have a significant impact on our planet's resources [9]. The areas of greatest environmental impact in the production lifecycle phase include:

- significant use of energy and nonrenewable resources for fibre production;
- consumption of large quantities of water, crop land and chemicals based on nonrenewable resources for conventional cotton growing;
- emissions to air and water (e.g., arising from producing synthetic and cellulosic fibres) [2].

In the disposal phase, the landfilling of waste textiles presents another particular problem, since it takes long for synthetic products to decompose, while the garments from natural fibres decompose and produce methane, gas that contributes to the greenhouse effect. Leachate is produced as well when waste decomposes and causes the pollution of ground water [10]. Nevertheless, landfilling of waste textiles remains a commonly used method for disposing textiles in most EU countries. Between 3% and 4% of the municipal solid waste stream in Slovenia is composed of apparel and textiles. MSW constitutes 64% of the total mass of waste in Slovenia from which 70% is landfilled [11].

Changes in environmental ethic are reflected in consumer activism that managed to raise the environmental and ethical awareness of the general public, including an increase in demand for products perceived to be more 'environmentally friendly' (made with recycled, organic materials, Fair-trade production,...) by rejecting the acquisition of apparel made from fur, wool and animal skins and with paying attention to labels that confirms the application of sustainable materials, technologies and animal welfare during the production and processing of fibres (e.g. ecolabels, nonmulesing labels,...) [8, 12].

However, there is some doubt as to whether this interest and concern from consumers' point of view translates into decision making and behaviour. Generally consumers are interested in sustainable consumption, but they do not want it to cause inconvenience, through higher prices or uncomfortable materials [13]. This so-called 'environmental gap' indicates the need for in depth investigations into consumers' proenvironmental behaviours. The literature also offers many typologies of the consumers of textiles and apparel and of socially responsible consumers [14-16].

Environmentally sustainable apparel acquisition and disposal behaviour

Despite the increased attention in ecoconscious apparel, consumer behaviours remain relatively under-researched from a scientific perspective. Only a small body of literature is related to sustainable apparel acquisition and disposal consumer behaviour, focusing on narrow range of behaviours including: acquiring apparel made from environmentally preferable materials [16, 17] acquiring second-hand or classically styled apparel and avoiding apparel products for environmental reasons [18]. It was found that consumers who were familiar with recycling, preferred apparel made from recycled fibre. Nevertheless, when the price was manipulated, half of the respondents claimed they would purchase the lower priced apparel item, regardless of its' environmental impact [18]. Many sustainable products carry higher prices than conventional products, making the products unaffordable for many consumers. Some of the other barriers to ecoconscious behaviours identified in the literature include social and cultural norms [17]; the lack of necessary infrastructure [19]; motivation [19], values [20] and perceptions of time and effort required [20, 21].

In the context of consumption of clothing and textiles researches found consumers can possess some degree of environmental consciousness, but when buying apparel, they usually don't consider product's impact on the environment [17, 22]. Another research indicates that participants were engaged in a number of ecoconscious apparel acquisition behaviours. First, with extending the lifetime of their apparel; by acquiring apparel made from recycled or organic fibres or having other attributes perceived as environmentally preferable and acquiring apparel through sources believed to be environmentally preferable, including second-hand sources, ecoconscious and independently owned companies [22]. Also a number of studies have implicitly identified barriers to ecoconscious apparel consumption. Internal barriers identified in these studies include the absence of attitudes of environmental concern [16]; limited knowledge of the environmental effects of apparel consumption [8,17,22] and negative attitudes towards sustainable apparel [17].

Not many studies have examined second-hand apparel acquisition. Research exploring consumer attitudes towards second-hand apparel has focused only on the segment of consumers who already buy second-hand apparel regular [23]. In France [23, 24], America [24] and UK [23] during the past 20 years, various forms of second-hand and used product sales have proliferated. O'Reilly et al. [25] found that consumers' willingness to purchase used apparel depends on her or his knowledge about them. Another study indicated additional barriers for purchasing used apparel, such as the lack of cost savings, the condition of used apparel, the lack of accessibility to a trade-in or second-hand clothing stores and the stigma that second-hand apparel is associated with lower income [22]. Moreover, consumers observe others with a negative attitude towards second-hand apparel and adopt this behaviour as their [19].

Regarding apparel disposal, consumers can choose from several options: landfilling, donation, reuse, sale or exchange [26]. It was found that consumers dispose of clothing for a variety of reasons, including as inadequate size, old-fashionedness, boredom, wear [4, 27]; presence of stains, changes in taste, situational causes, lack of space and changes in style and fashion [28]. Donations to humanitarian organisations have proved to be the most commonly used the method of disposing of apparel [22, 27, 28], whereas fashion innovators most often dispose of their garments [4, 29]. The most commonly used methods of textile disposition were Salvation Army, passing on to family and friends, and using them as cleaning rags. Furthermore, convenience and familiarity with the disposal method influenced which methods were chosen for textile recycling. Humanitarian reasons are the main motivators for donating and convenience is motivated by deposition of apparel [27]. Some studies claim the opposite: that neither altruism nor corporate social responsibility is the main reason for the removal of apparel, but simply the lack of closet space, in the need for something new [28].

Gender was found to influence disposal patterns. Female students exhibited a stronger environmental attitude and were more likely to resell or donate old garments in comparison with man [29], while man were less likely to discard old apparel [8]. Since females tend to be generally more involved in fashion which results in purchasing 'fast-fashion' garments more frequently than man [30], we presume that because of today's 'fast fashion' low quality materials, that consumers tend to keep for a shorter time [6], females are disposing more apparel into trash bin compared to others. Here we hypothesise: 'Woman are depositing more apparel into trash bin compared to man.' Age also influenced disposal patterns: older participants were more likely to resell or donate waste apparel [29].

Reuse and recycling of waste apparel

The textile and apparel recycling effort is concerned with recycling, recyclability and the source reduction of both preconsumer and postconsumer waste. The textile recycling industry is able to process 93% of the waste without the production of any new hazardous waste or harmful by-products. Typically, recycling technologies are divided into primary (recycling a product into its original form), secondary (involves melt processing a plastic product into a new product that has a lower level of physical, mechanical and/or chemical properties), tertiary recycling (involves processes such as pyrolysis and hydrolysis) and quaternary approaches (referring to burning the fibrous solid waste and utilising the generated heat). All of these four approaches exist for fibre recycling [31].

Surveys explored the possibilities of mixing waste fibres with new ones [32]; manufacture of composite biomaterials made from textile waste [33]; with reinforcement using jute waste fibres, which can compensate the glass-fibre enforced composites, for example [34], and the possibility of using fibres, derived from waste tires for soil reinforcement or for use in a variety of construction materials [35]. It is also possible to synthesise new polymers from waste cotton fabrics [36] to

produce ethanol and biogas by using enzymatic hydrolysis followed by fermentation [37].

Considering postconsumer textile waste, nowadays many consumers dispose of their own unwanted textile waste to charity shops, such as Oxfam, Salvation Army and Cancer Research (in UK), where donations are sorted and sold in their own shops or to waste merchants. Staff at recycling units sort apparel and leather goods and send suitable items to Africa, East Europe and Asia, where they are reused; items that cannot be sold or donated are made into cleaning rags for the oil or automotive industries or sold to 'flocking' firms, where items are shredded for fillers in car insulation, roofing felts and furniture padding. Linen, cotton and viscose can be made into paper pulps, and wool can be recovered and felted or re-spun [31].

Impact of sociodemographics, perceived convenience and availability on apparel recycling frequency

Researchers have attempted to profile 'green' consumers using demographic (gender, education, place and ownership of home) and psychographic (the influence on values, goals and rewards) variables [5, 38–42]. Previous findings concerning the impact of demographics upon recycling behaviour do not follow a common pattern. In most cases, 'gender' has not been indicated as a discriminative factor [38–40]. 'Education' and 'income' provide similar patterns. Most of the studies failed to prove a significant relationship between 'recycling behaviour' and either 'income' [39, 41] or 'education' [39, 40]; on the other hand, a positive relationship between 'recycling behaviour' and 'education' was established [42]. There have been some studies, fewer in number, in which a positive relationship between 'recycling behaviour' and 'income' was found [39, 40].

In general, researches have profiled 'green' consumers as younger, better educated, with a higher income and politically liberal [38–42]. Although most findings about the impact of consumer's demographic characteristics on their environmentally conscious behaviour are contradictory it is clear that they exert a significant influence [43]. Here, we hypothesise: 'Gender, age, status, education and home residence are correlated with the degree of participation in apparel recycling'.

However, most studies indicate that demographic characteristics, when used alone, are poor predictors of recycling behaviour [42, 44]. Psychographic variables, the extent of environmental knowledge and concern, and the interaction of attitudes, goals and values have been more successfully in explaining recycling efforts and proenvironmental behaviour [39, 44]. Our article intends to extend earlier research by including 'perceived convenience' and 'availability of apparel banks' as variables in the prediction of textile recycling frequency as well as examining a more diverse population group [28]. Studies have shown that recycling rates largely depend on consumers' participation and their access to organised curbside recycling and that the accessibility of bins is even more important than the obtained rewards (e.g., payment or some other physical reward) [45]. The importance of availability is reinforced by the reported high recycling rates of traditional materials with

curbside collection [28]. Unavailable access to curbside recycling of waste textiles in Slovenia (organised on a national level), with the exception of ‘assembly centres located in remote areas, not easily accessible to consumers, is probably the main reason, why consumers still keeps discarding waste textiles into MSW to a considerable extent. We assume that the provision of apparel banks is associated with apparel recycling frequency. Here we hypothesise: ‘The availability of apparel bank is associated with apparel recycling frequency.’

Researchers have found out that people who find recycling inconvenient are less likely to recycle [40]. The link between attitudes and behaviour is probably the most researched issue in recycling related research. Theory of Reasoned Actions (TRA) is just one of the many attitude-behavioural models that hypothesises that behaviour is influenced through the intermediary of attitudes [46]. Attitude refers to a person’s overall evaluation of performing a certain behaviour. Positive relationships have been indicated in some cases [42, 47], while in others no relationship was found [48, 49]. Some of them [5, 50] have indicated a negative relationship between recycling convenience and recycling behaviour. In this study, we predict that consumers’ frequency of recycling waste apparel is increasing when their positive attitude towards recycling is increasing as well; when they believe that recycling is a convenient task. Here, we hypothesise: ‘Attitude towards the recycling of apparel (perceived convenience towards recycling) is positively related to apparel recycling frequency’.

Experimental

The data of the study were collected through an online (pretested) self-administered questionnaire, carried out in Slovenia in 2012 (in October). A total of 752 participants

opened the link (click-through rate was 95%), while 535 of them completed the survey (response rate was 67%). Random sample consisted of 80% of women (n = 428) and 20% of men (n= 107), including participants of all ages and statuses (Table 1). The proportion of men participating in the survey compared with the female seems rather small, but it reflects the real image. Most of the existing surveys examined only female segment of the population, since women are largely those who are responsible for the consumption of textiles in society. Textiles present professional occupation to 6% of respondents, 19% studied textiles and majority, while 54%, had no professional connection to textile. The respondents were well-educated, 39% of them finished second or third level education (Table 1).

The questionnaire included 17 questions shown in Tables 1 to 4 and was divided into two parts: the first part concerned environmentally conscious apparel acquisition (Table 1, 2), and the second part concerned the disposal of apparel (Table 3, 4). A five-point Likert scale, which is an indirect scale for measuring attitudes and/or statements, was used for some of the questions. It is widely believed that attitudes are best measured by way of multiple measures and the general trend in measuring environmental issues is via several items instead of single-item questions. The answers were evaluated using the methods of descriptive statistics and multivariate analysis.

A brief introduction regarding the study and definition of an ecoconscious consumer was presented in the introduction of the questionnaire: ‘The green consumer is defined as one who adopts environmentally friendly behaviours and/or who purchases green products over standard alternatives. Here, “environmentally-friendly” and “ecologically-conscious” are used interchangeably. This study focuses on recycling defined as “differentiating collections and refusing disposal of consumable items for recovery of materials or energy” [51].

Table 1. Sociodemographics of respondents

Age	Categories [years]	Frequency	Percentage [%]
1	18 - 20	64	15
2	21 - 40	263	63
3	41 - 60	131	17
4	61 or more	77	5
Status			
1	In School	54	10
2	Employed	164	31
3	Unemployed	176	33
Education			
1	less than 4 year high school	122	22
2	4 year high school	207	39
3	Second or third degree	206	39

Table 2. Questions used to explore sustainable apparel consumption in Slovenia

Question number	Question and its type	Categories
Q1	I am an ecoconscious consumer Likert scale, Table-one answer	1 Strongly Agree, 2- I Agree, 3- I'm neutral 4- I Disagree, ; 5 - I Strongly Disagree
Q2	How many pieces of apparel did you buy last year? Table- One answer	T-shirts and shirts; trousers and skirts; outerwear; socks & underwear; sports wear. Amount of apparel categorised into: 0, 1, 2-5, >5.
Q3	Does the economic crisis affect the amount of apparel purchased last year? Category - one answer	yes; no
Q4	Select elements, that you consider the most, during purchase of apparel! Category - more answers	a) Material's composition; b) origin; c) environmental labels; d) fashion trends; e) impact on the environment.
Q5	Classify in which of the presented eco conscious behaviours considering apparel you engage most frequently?(1- Every time; 2-Usually, in about 90% of the chances; 3- Frequently, in about 70% of the chances; 4- Sometimes, in about 50% of the chances; 5 – Occasionally, in about 30% of the chances, 1- Never.) Classification	Purchase of: a) classical styled apparel; b) second hand apparel; c) fair-trade apparel; d) apparel made with recycled fibres or organic fibre contents; e) quality apparel; f) repair and redecoration of apparel g) nothing of the above.
Q6	How many times per year do you buy second-hand apparel?	a) Never; b) 1x; c) 2-5x; d) 6-10x; e) >10x.
Q7	Sort the reasons against buying second-hand apparel! (1-most against, 6-least against)	a) Uselessness; b) price; c) no choice; d) unfashionedness; e) previous ownership; f) perception of cleanliness.
Q8	To what extent do you agree or disagree with the claims in relation to second-hand apparel? (1- I Strongly Disagree, 2- I Disagree, 3- I'm Undecided, 4- I Agree, ; 5 - I Strongly Agree)	a) They contribute to saving virgin resources; b) 2nd hand-apparel is unfashionable; c) expensive; d) for poor people; e) dirty, f) not enough sizes available; g) not enough shops around.

Results and discussion

The purpose of this research was to explore consumers' practices regarding sustainable apparel purchase and disposal. At the first question (Table 2_Q1), most participants ranked themselves into the third place on a five-point Likert scale, which represents 43% of all participants, the average mark was 3.3 (Figure 1).

Consumers identifying themselves as 'undecided' ecoconscious consumers were mostly women (87%), aged between 21 and 40 years (67%), employed (39%), with accomplished 4 year high school education (55%), living in a house (56%), in urban areas (66%). When buying apparel, they consider apparel composition the most (82%), followed by fashion trends (65%), origin (24%) and ecolabels (18%), while impact on the environment was considered the least (9%). The most consistent ecoconscious apparel acquisition behaviour among undecided 'ecoconscious' respondents (n =230) were purchase of classically styled and quality apparel with the same percentage (38%), followed by nothing of the stated (16%), purchase of Fair trade apparel (9%), repair and redecoration (5%) and purchase of second hand apparel that was practiced the least (5%).

Consumers who consider themselves ecoconscious (5 on a 5-point Likert scale) (n = 49) were mostly women (81%), aged between 21 and 40 years (51%), unemployed (47%), with higher education (57%), living in a house (58%) in rural areas (51%). When buying clothes, they considered apparel composition the most (86%), followed by fashion trends and origin of clothes both with the same percentage (45%). Only a small share considered an impact on the environment (37%) and ecolabels (35%). Consumers who do not consider themselves ecoconscious (n = 17) were also mostly women (47%), aged between 21 and 40 years, with higher education (75%), employed (35%), living in a house (64%), and in rural areas (67%). During the purchase of apparel, they considered fashion trends the most (54%), followed by apparel composition (38%), origin (23%) and environmental impact (12%), while only 6% of them paid attention to environmental labels during their purchase of apparel.

The most consistent ecoconscious apparel acquisition behaviour (Figure 2) among 'ecoconscious' (n = 49) respondents (items were taken from previous research [28]) were the 'purchase of classically styled apparel' followed by 'buying quality apparel', whereas the 'purchase of second-hand apparel' was practiced the least.

Table 3. Questions related to cloth disposal

Question number	Question and its type	Categories
Q1	Sort the methods of apparel disposal that you engage in more or less frequently! Classification 1- Every time; 2-Usually, in about 90% of the chances;; 3- Frequently, in about 70% of the chances; 4- Sometimes, in about 50% of the chances; 5 – Occasionally, in about 30% of the chances, 1- Never.)	a) Throwing into the trash bin; b) use as cleaning rags; c) donation to humanitarian org.; d) given to assembly centres; e) Human bin; f) repair and redecoration; g) passing on to family and friends.
Q2	How many pieces of apparel (last year) have you...? Table - one answer	Amount of apparel categorised into: a) 0; b) 1; c) 2-5; d) >5. For following methods of disposal: a) donation to others; b) use as cleaning rags; c) throwing into Humana container; d) donation to humanitarian organisations: e) Red cross; f) Caritas g) throwing into trash bin and h) given to assembly centres
Q3	In what condition is apparel when you decide to dispose it? Likert scale; Table - One answer	1 – Poor, 2- Fair, 3 – Good, 4 – Somewhat better, 5- Flawless
Q4	Classify reasons for apparel disposal! Classification (1–Frequently, 2 -- Occasionally, 3- Rarely, 4- Very Rarely, 5- Never)	a) Shortage of space; b) unfashionable items; c) confectional defects (missing zippers, buttons); d) uselessness; e) inadequate size.
Q5	How many pieces of apparel did you throw away into trash this year? Table- one answer	Amount of apparel categorised into: a) 0; b) 1; c) 2-5; d) >5 pieces. Type of apparel categorised into: a) T-shirts and shirts; b) trousers and skirts; c) stockings and underwear; d) outerwear; e) sports apparel.

Table 4. Questions used for exploring consumers' attitude towards recycling waste apparel

Question number	Question and its type	Categories
Q1	Separation of waste apparel is a convenient activity. Likert scale – Table – one answer	1 – I do not agree; 2 – I mostly disagree; 3 – I am neutral; 4 – I mostly agree; 5 – I agree
Q2	Select how many times per month you collect following household waste: 1) never; 2) 1–2×; 3) 3–6×; 4) 7–10×; 5) > 10×. Table – one answer	a) a) organic waste; b) glass; c) plastic; d) paper; e) apparel; f) apparel; d) hazardous waste
Q3	Is there a waste apparel bank available nearby your residence (within 1–5 km radius)? Table – one answer	a) yes; b) no; c) I don't know
Q4	Would you recycle if there was one? Contingency questions/IF question	a) yes; b) no

Mostly used disposal methods present among the same group of participants were (Figure 3): ‘passing on to family or friends’ and ‘donation to humanitarian organisations’, while given to assembly centres’ was practiced only by a few.

The only difference found between the stated groups of consumers more frequent use of one of the stated disposal methods – ‘repair and redecoration’ – a method unusual among other respondents.

Ecoconscious apparel acquisition behaviour

In the past year respondents bought mostly socks and underwear (Figure 4), with 60% of respondents buying more than five pieces ($\sigma=0.73$; $\bar{x}=3.5$); followed by T-shirts and shirts, with 53% of respondents buying more than five pieces ($\sigma=0.68$; $\bar{x}=3.4$); trousers and skirts (22%; $\sigma=0.75$; $\bar{x}=2.9$); sportswear (18%; $\sigma=0.96$; $\bar{x}=2.6$); and outerwear (13%; $\sigma=0.87$; $\bar{x}=2.5$). Participants stated that they bought the least amount of sports

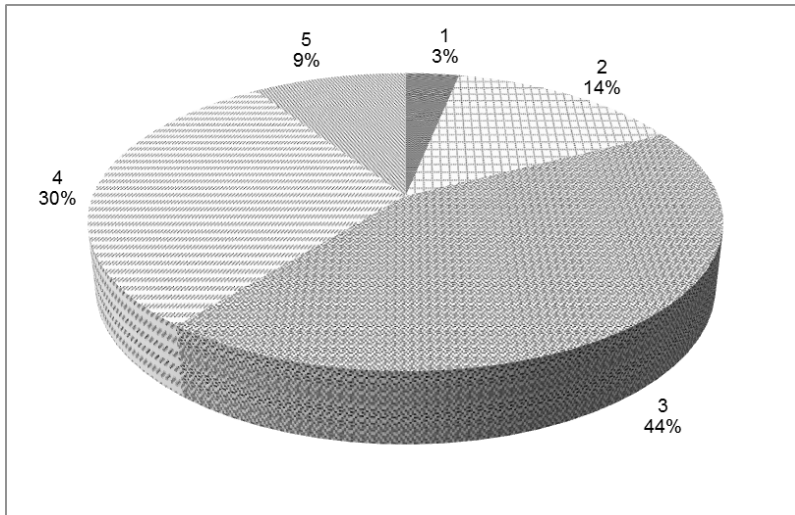


Figure 1. Consumers identifying themselves as eco conscious, using five-point Likert scale (1 – I strongly agree, 2 – I agree, 3 – I’m undecided, 4 – I disagree, 5 – I strongly disagree).

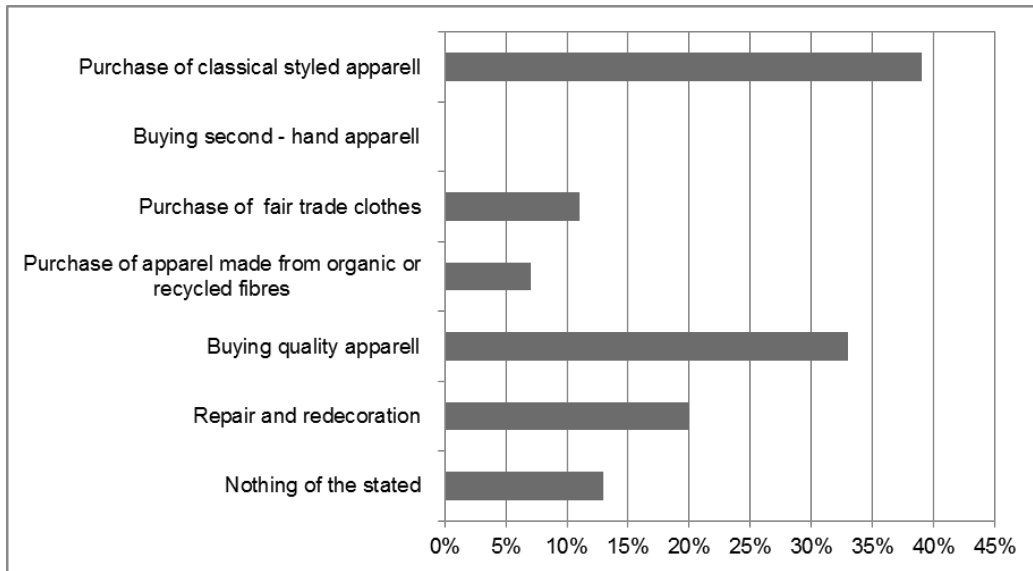


Figure 2. Most consistent ecoconscious apparel acquisition behaviour among ecoconscious respondents

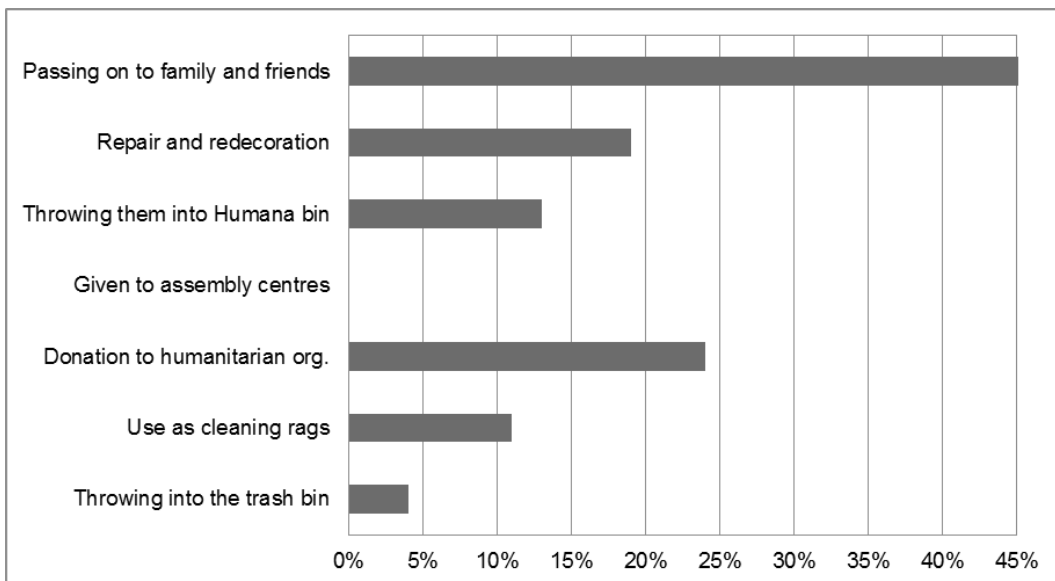


Figure 3. Mostly used disposal methods present among ecoconscious respondents

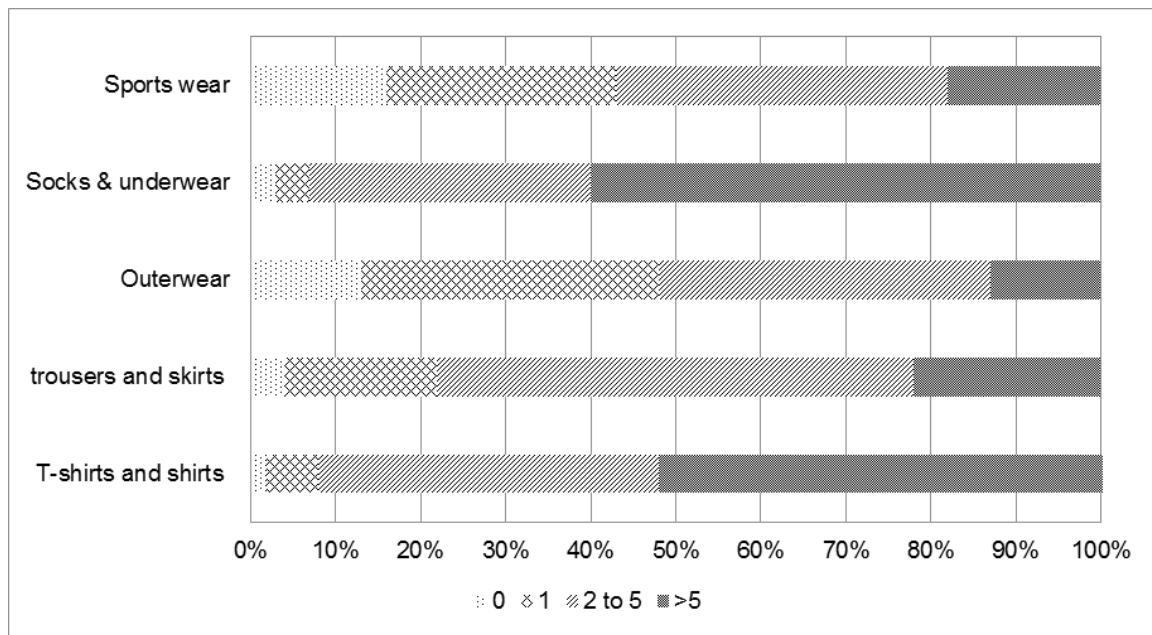


Figure 4. Amount (0, 1, 2 to 5 and > 5) and type of apparel, bought in 2012 by Slovenian consumers

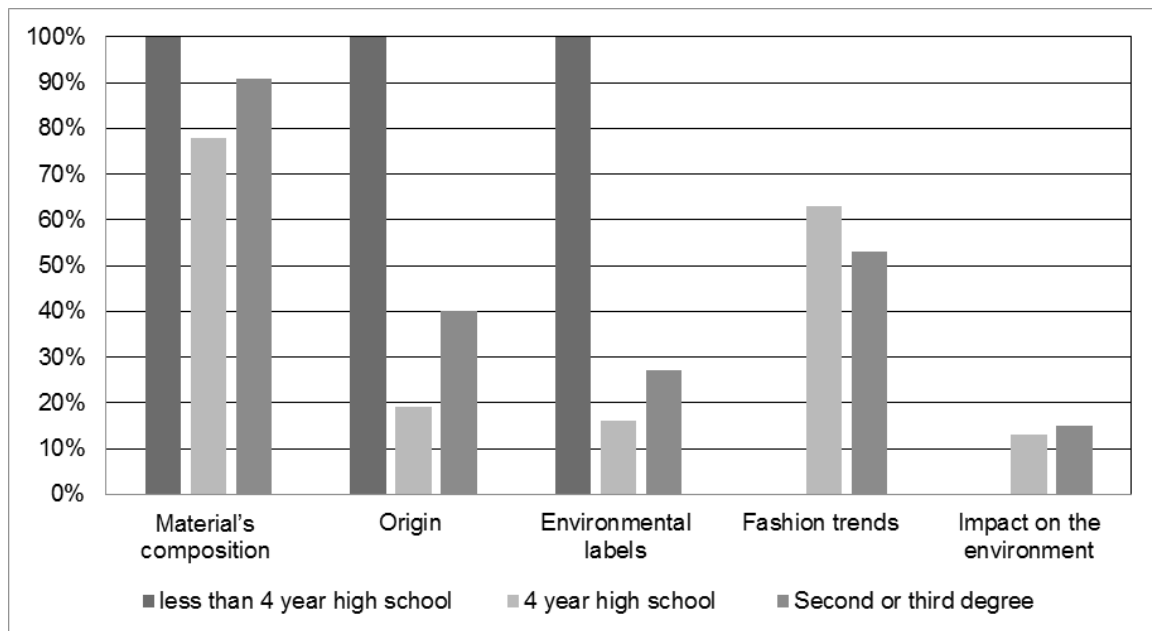


Figure 5. Education level and elements considered when purchasing apparel by Slovenian consumers

clothing, with 16% of the respondents not purchasing any pieces of sports clothing during the last year. Participants that bought only one piece of clothing a year tended to focus on outerwear (35% of them bought one piece), followed by two to five pieces of trousers and skirts (56%).

Consumers with lower than secondary school education (n = 122) (Figure 5) do not consider fashion trends and impact on the environment (0%) during their purchase of apparel, while on the other hand environmental labels, origin and material composition were fully considered among them (100%). The participants with the highest level of education – second or third level degree (n = 206), considered material composition the most (91%), then fashion trends (53%), origin of apparel (40%) and environmental labels (27%).

We also found out that material composition (Figure 6) is most considered among the respondents aged between 41 and 60 years, where 96% of them consider this element as the most important during apparel purchase. Origin (49%) and environmental labels were also (36%) most frequently considered in the same age group (41–60 years), while fashion trends are most considered by younger respondents (20 years or less – 81%). Twenty-five per cent of elder participants involved in the study (61 years or more) consider impact on the environment the most when purchasing apparel. This is consistent with previous studies, where age was found to influence consumption patterns [47, 48].

When purchasing apparel (Figure 7), material composition (90%), origin (41%) and environmental labels (27%) were

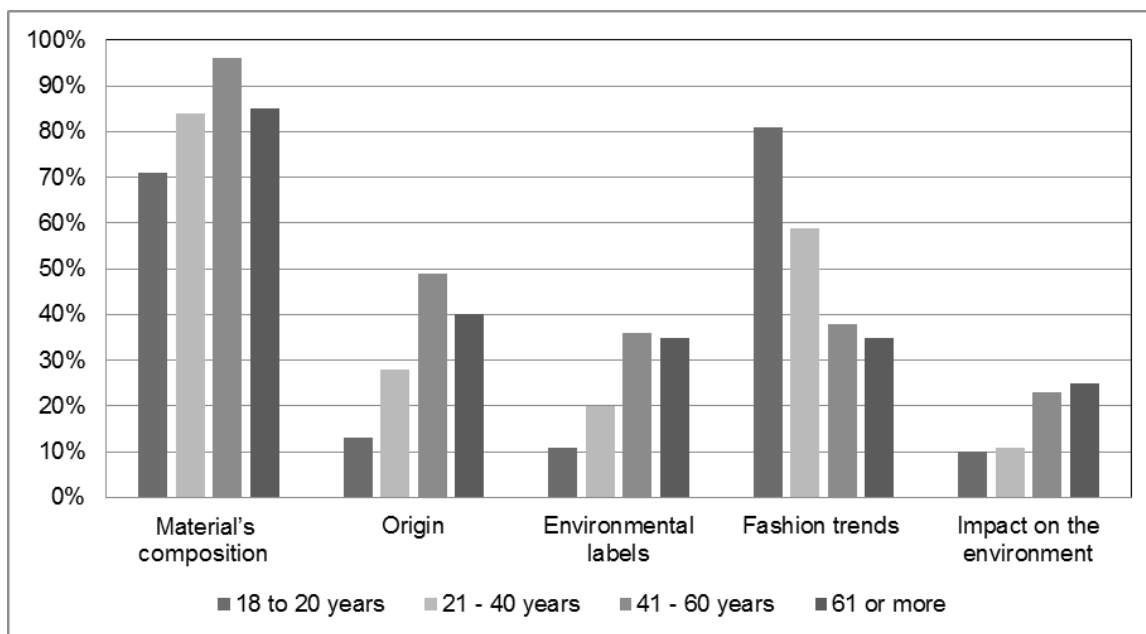


Figure 6. Elements considered when purchasing apparel according to age of respondents

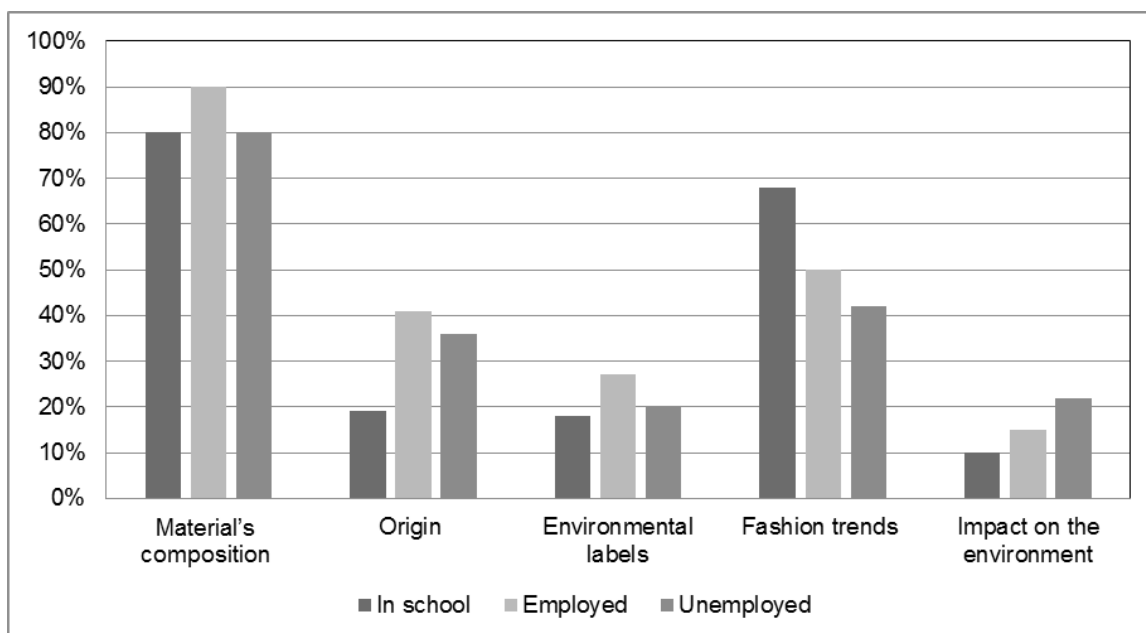


Figure 7. Element considered when purchasing apparel according to status of respondents

considered the most by the employed participants involved in the study; fashion trends by those still in school (68%) and the impact on the environment was considered among the unemployed participants the most (22%).

The economic crisis has affected the amount of apparel purchased by Slovenian consumers: 55% of them believe that they are buying less; 44% do not perceive any differences; and 1% stated that they buy more than before the crisis occurred ($\bar{x} = 1.9$; $\sigma = 1.0$).

In general, the largest share of participants indicated, that when purchasing apparel (Figure 8) they consider apparel composition to be the most important consideration (83%); followed by fashion trends (59%); origin of apparel (29%) and

environmental labels (21%). Only 13% of the respondents stated that when buying apparel, they consider environmental impact of the clothing production. This finding is consistent with that of Birtwistle [6, 52] survey, where comfort, pleasure, convenience, price and personal fashion needs, were rated as the most important attributes when acquiring clothing. Environmental attributes such as 'organic' or 'made from recycled material' weren't evaluated as the important ones when considering purchase. Consumers' preferences for ecofriendly apparel can, in due course, reduce the environmental impact of the apparel supply chain. However, the supply of ecofriendly apparel is dependent on consumers' demand for these products. Consumers ultimately determine the type of apparel products made available to them.

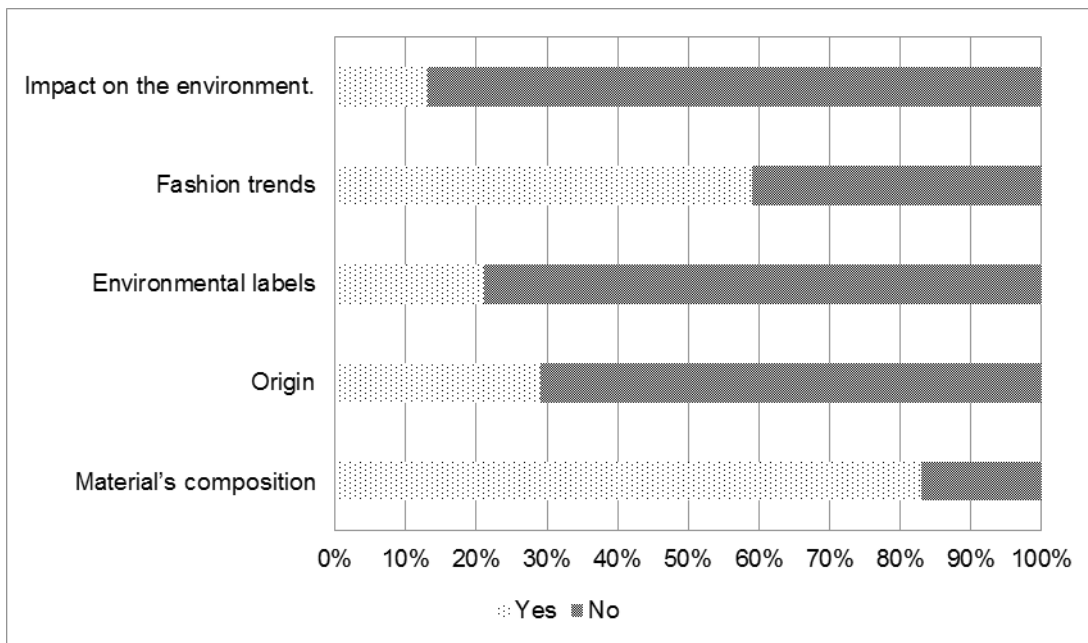


Figure 8. Elements considered when purchasing apparel by Slovenian consumers

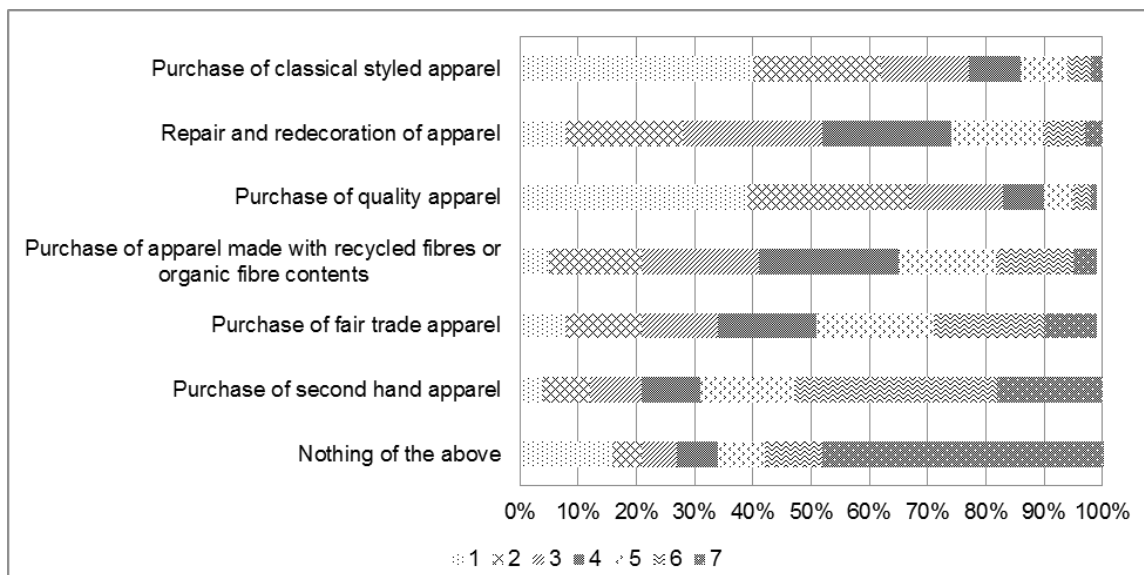


Figure 9. Frequency of consumers' engagement in different ecoconscious apparel acquisition behaviours (1 – Every time; 2 – Usually, in about 90% of the chances; 3 – Frequently, in about 70% of the chances; 4- Sometimes, in about 50% of the chances; 5 – Occasionally, in about 30% of the chances; 6 – Rarely, in about 10% of the chances; 7 – Never).

The most consistent ecoconscious apparel acquisition behaviour (Figure 9) was the 'purchase of classically styled apparel', as 40% of the respondents ($\delta=1.58$; $\bar{x} = 2.4$) ranked this behaviour 1st on the five-point Likert scale. The next highest ranked behaviour was the 'purchase of quality clothing' (39%; $\delta=1.45$; $\bar{x} = 2.3$). 'Repair and redecoration of textiles' ($\delta=1.50$; $\bar{x} = 3.5$) and 'purchase of clothing from fair-trade' ($\delta=1.77$; $\bar{x} = 4.2$) were ranked in the third place (8%), followed by the 'purchase of apparel made from recycled and/or organic fibres' (5%; $\delta=1.54$; $\bar{x} = 3.9$) and the 'purchase of second-hand clothing' (4%; $\delta=1.72$; $\bar{x} = 5.0$).

1.1 Second-hand apparel

The largest proportion of respondents (Figure 10) never buys second-hand apparel (70%), from which 8% identified

themselves as ecoconscious consumers (Table 2_Q1). This differs from the results of previous – foreign studies, where researches reported that second-hand apparel markets are constantly growing. In France [23, 24], America [24] and U.K [23] during the past 20 years, various forms of second-hand and used product sales have proliferated.

The respondents who never buy second-hand apparel in Slovenia are mostly women (79%), 21 to 40 years old (57%), still in school (46%), with the same proportion of average and higher education (43%). The majority of them lives in a house (56%) located in a city (60%). The respondents that buy second-hand apparel most frequently (5–10 times per year) are also women (60%) of the same age group (21–40 years old), still in school (67%) with the highest education (60% of them have obtained the highest level of education). They live

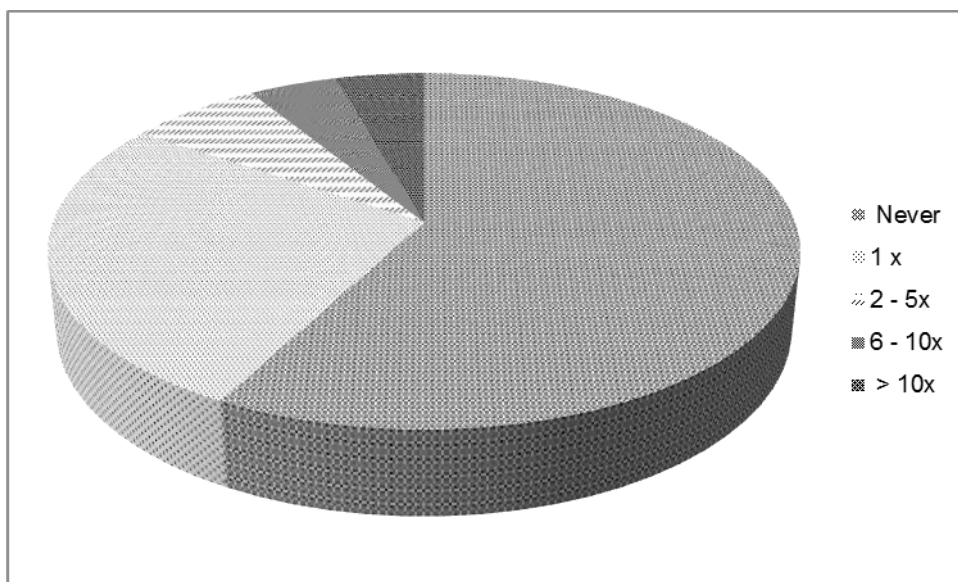


Figure 10. Number of second-hand apparel, bought per year by Slovenian consumers in 2012

in a house (67%) located in a city (60%). The only difference between them is their level of education, where woman with higher education buy second-hand apparel more frequently compared to others. Second-hand apparel was bought once a year by 18% of respondents, two to five times a year by 10% of respondents, 6–10 times by 1% and over 10 times a year by only 1% of respondents (Figure 10). The largest share of second-hand apparel was bought by respondents of 21–40 years of age, while the smallest share was purchased by those of 41–60 years of age. On average, the respondents bought 1.5 pieces of second-hand clothing last year ($\sigma=0.8$).

Obstacles preventing respondents from buying second-hand apparel were the perception of cleanliness (33% of the respondents stated this reason as the most repellent; $\sigma=1.70$; $\bar{x}=2.7$); prior ownership (31%; $\sigma=1.63$; $\bar{x}=2.7$), lack of choice (22%; $\sigma=1.64$; $\bar{x}=3.3$), uselessness (16%; $\sigma=1.33$; $\bar{x}=2.9$), old-fashioned clothing style (9%; $\sigma=1.5$; $\bar{x}=4.0$) and price (5%; $\sigma=1.48$; $\bar{x}=4.8$). The reasons stated by the respondents in Slovenia in this study are similar to those found abroad [22,23].

The majority also agreed that there are not enough shops available (46%; $\sigma=1.17$; $\bar{x}=4.0$) and that second-hand clothes can contribute to saving natural resources (44%; $\sigma=1.29$; $\bar{x}=3.8$). Fewer agreed that there is not enough apparel sizes available (18%; $\sigma=1.16$; $\bar{x}=3.4$) and that second-hand clothes are unsanitary (13%; $\sigma=1.36$; $\bar{x}=2.6$) and unfashionable (7%; $\sigma=1.2$; $\bar{x}=2.5$). An even smaller share thinks that second-hand clothes are intended for poor people (5%; $\sigma=1.22$; $\bar{x}=2.1$), whereas only 4% believe that they are too expensive ($\sigma=1.1$; $\bar{x}=2.2$).

The biggest obstacle constraining consumers from buying second-hand apparel lies in their perception of cleanliness. This problem presents the biggest obstacle to elder (61 or more with 43%) male respondents (40% stated this reason as the most repelling), unemployed (38%), with highest education (35%). The problem could be solved with an international independent label certification that would contain information

about dry cleaning. Moreover, an important reason against buying second-hand clothes lies in the organisational structure of this trade: with more shops, competition would rise and a better choice would probably attract more consumers.

1.2 Apparel disposal

Waste apparel is most frequently donated to other persons (passed on to family or friends) (41%; $\sigma=1.31$; $\bar{x}=2.3$), followed by using old clothes as cleaning rags (19%; $\sigma=1.61$; $\bar{x}=3.1$), donating them to humanitarian organisations (19%; $\sigma=1.81$; $\bar{x}=3.4$), repairing and redecorating (11%; $\sigma=1.89$; $\bar{x}=3.9$), disposing of them in a Humana container (15%; $\sigma=2.00$; $\bar{x}=3.9$), trash bins (6%; $\sigma=1.91$; $\bar{x}=5.0$) and taking them to an assembly centre where apparel is collected separately (1%; $\sigma=1.50$; $\bar{x}=4.9$) (Figure 11). The only difference between Slovenia and the U.K. or U.S.A. is that consumers abroad are more involved in charity recycling, which is the most commonly used method of disposing waste textiles [8, 22, 29].

In the past year, 56% of respondents ‘donated to others’ more than five pieces of apparel. On average, consumers donated 3.4 pieces of apparel in the past year to others ($\sigma=0.9$); followed by ‘use as cleaning rags’ with 37% ($\bar{x}=3.0$; $\sigma=1.0$); ‘disposition into Humana bin’ (29%; $\bar{x}=2.3$; $\sigma=1.3$), ‘donation to humanitarian organisations “Caritas”’ (18%, $\bar{x}=1.7$; $\sigma=1.2$) and ‘Red Cross’ (15%; $\bar{x}=1.7$; $\sigma=1.2$), disposition into trash bins (12%; $\bar{x}=2.1$; $\sigma=1.1$); and given to assembly centres, with a slightly smaller share (8%; $\bar{x}=1.5$; $\sigma=0.9$) (Figure 12).

Gender was found to influence disposal pattern; however, with regard to only one disposal practice, that is, ‘donation to others’, where females were more likely to donate their waste apparel: more than five pieces of apparel were donated most frequently among female respondents (88%), aged between 21 and 40 years (61%), with the highest education (51%), living in a house (56%) located in a city (60%). This is in accordance with previous research where gender was found to influence disposal patterns with female respondents more likely to

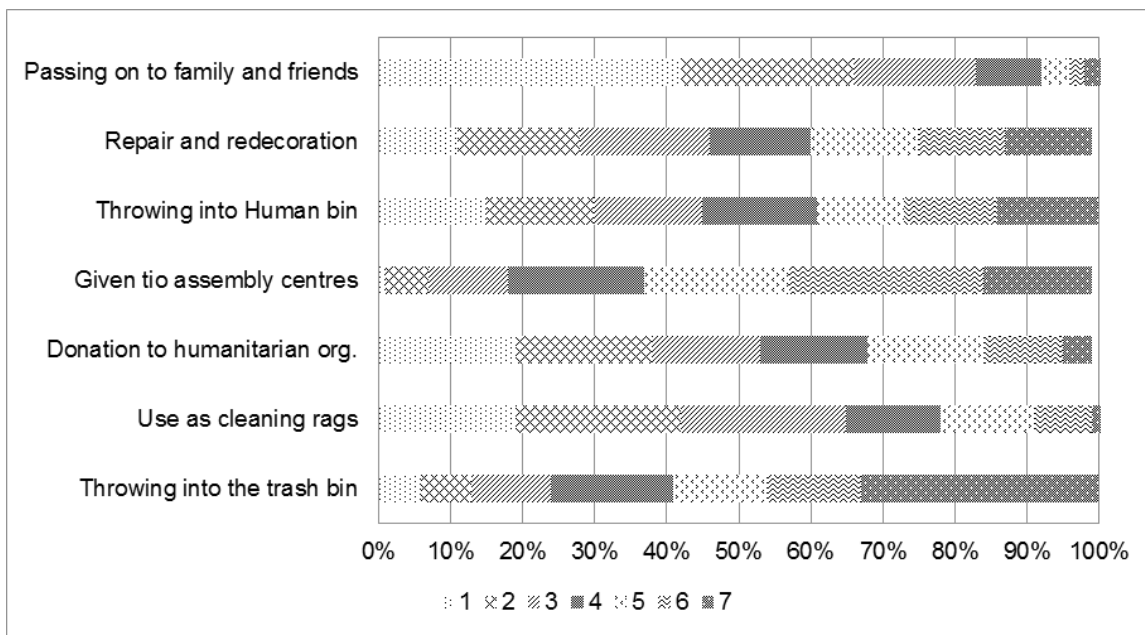


Figure 11. Use of disposal methods by consumers (1- Every time; 2-Usually, in about 90% of the chances.; 3- Frequently, in about 70% of the chances; 4- Sometimes, in about 50% of the chances; 5 – Occasionally, in about 30% of the chances, 1- Never.)

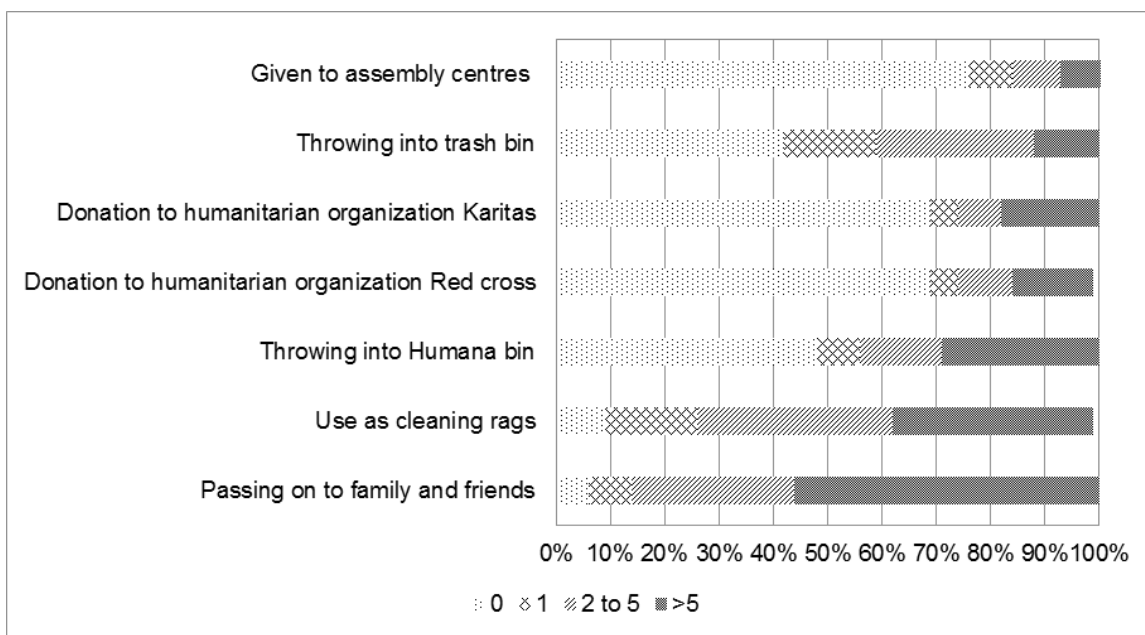


Figure 12. Quantity (0,1, 2 to 5 and > 5 pieces) of apparel disposed and methods used

donate old garments [29]. On the other hand, donation is not present at the studied male respondents – 57% of them have donated zero apparel in 2012. These respondents are in their most active age (21–40 years old – 67%), still in school (61%), with the highest education (61%), living in a house (65%) located in the countryside (57%). Age also influenced the disposal patterns with elder participants more likely to resell or donate second-hand textile products, the latter in accordance with previous findings [27].

From the environmental perspective, the most problematic method of disposing waste apparel is ‘throwing into trash bin’. We found that women are disposing larger quantities of

apparel into trash bin compared to men (Figure 13): more than five pieces was thrown into trash by 25 woman and 4 by male respondents; from two to five pieces by 64 female and 15 male respondents. The multivariate analysis revealed no correlation between gender and quantity of apparel disposed into trash bin ($r_s = 0.0495$; $p = 0.3331$). This is not in accordance with previous research, where men were less likely to discard old apparel into trash bin [27].

In the past year, more than five pieces of apparel was thrown into trash bin mostly by the unemployed respondents (15%), followed by the employed (13%) and the respondents who are still in school (11%).

Discarded apparel was in good condition, rated with the average grade of 3.1 ($\sigma = 1.12$; scale: 1 – poor to 5 – flawless). The participants reported that only 14% of apparel was in poor condition when discarded, whereas 7% of respondents replied that they discarded apparel which was in perfect condition.

Out of five possible reasons the respondents identified 'uselessness' as the main reason for clothing disposal (56%; $\bar{x} = 3.2$; $\sigma = 1.37$), followed by 'inadequate size' (27%; $\bar{x} = 2.4$; $\sigma = 1.25$); 'lack of space' (14%; $\bar{x} = 3.2$; $\sigma = 1.37$); 'old-fashionedness' (10%; $\bar{x} = 3.4$; $\sigma = 1.32$) and 'confectional defects', like missing buttons and zippers (2%; $\bar{x} = 3.5$; $\sigma = 1.07$). These results confirm findings of other studies, where apparel was removed due to the same reasons [4, 8, 27].

In municipal solid waste stream, socks and underwear were disposed of most frequently, with 17% of respondents disposing of more than five pieces ($\bar{x} = 2.4$; $\sigma = 1.13$), followed by T - shirts and shirts (3%; $\bar{x} = 1.6$; $\sigma = 0.89$), trousers and skirts (2%; $\bar{x} = 1.4$; $\sigma = 0.77$), sportswear (2%; $\bar{x} = 1.3$; $\sigma = 0.65$) and outerwear apparel (2%; $\bar{x} = 1.3$; $\sigma = 0.65$) (Figure 14). This fraction presents a particular problem because such items are usually disposed of in landfills. These items are considered intimate products, so people do not donate or reuse them.

Socks and underwear are mostly made of mixed materials, such as cotton/polyester blends, which are used to increase the strength of yarn and thus increase the product lifetime. The lifetime of the original clothing and textile products is essential

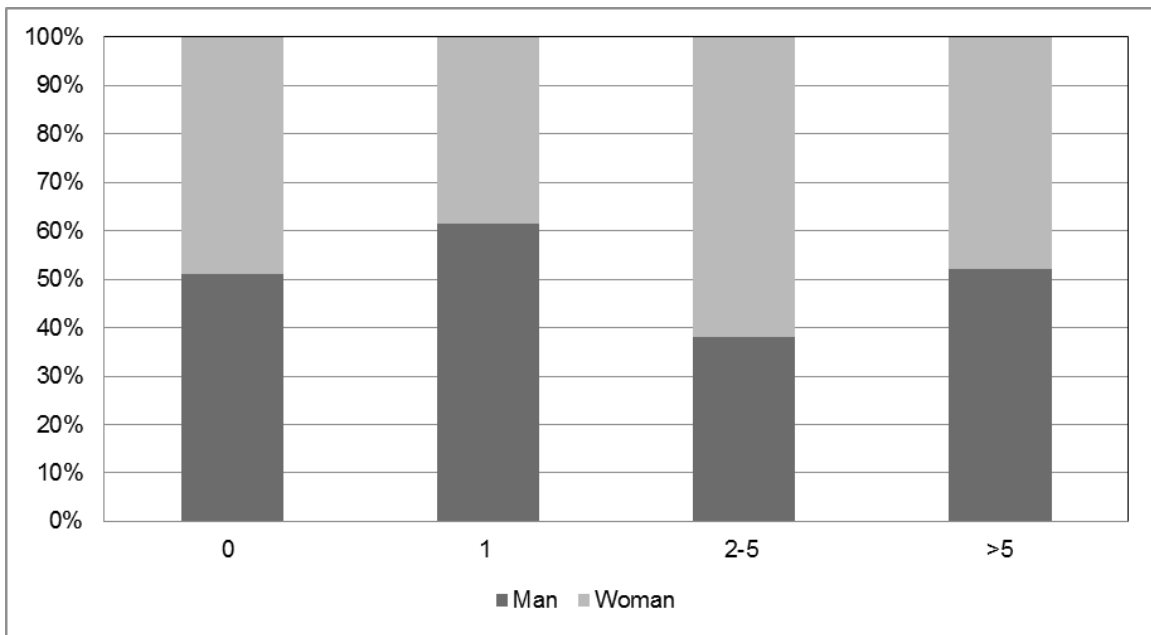


Figure 13. Quantity of apparel (0, 1, 2-5 and > 5) disposed into trash bin (year 2012) by gender

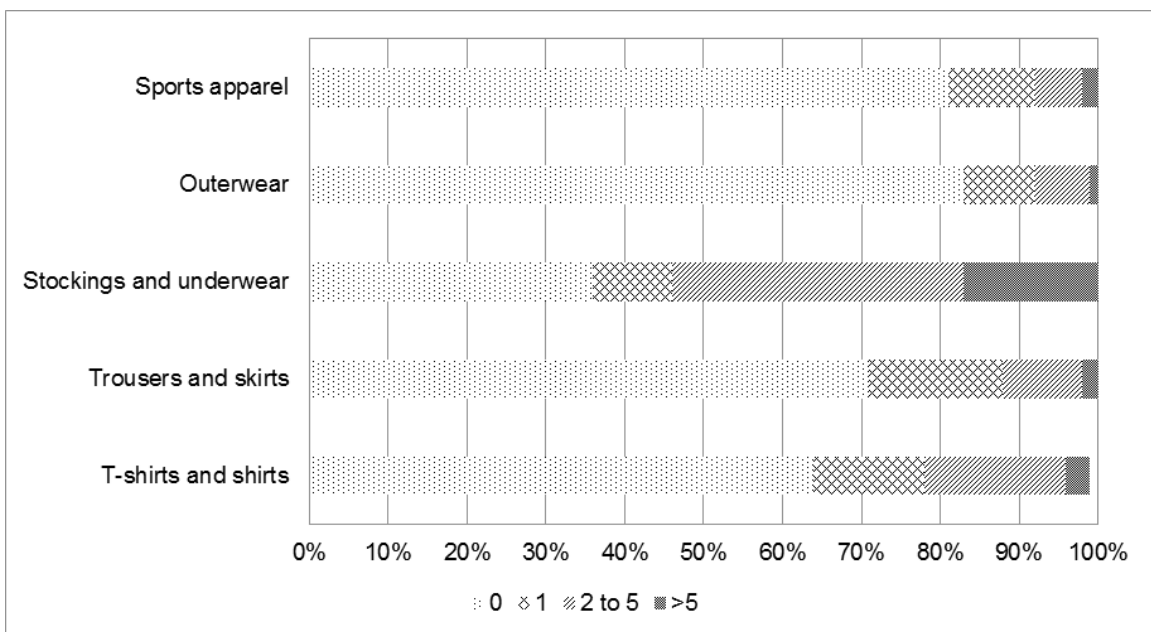


Figure 14. Graphical representation of amount and types of apparel disposed in municipal solid waste

for the environmental performance of the products; however, such blends, when considering chemical recycling, represent a greater challenge for recycling processes than do single materials.

Respondents disposed almost no outerwear, 83% reported that they disposed non in this year ($\bar{x}=1.3$), followed by sports' apparel (81%; $\bar{x}=1.3$), trousers and skirts (71%; $\bar{x}=1.4$); T-shirts and shirts (64%; $\bar{x}=1.6$) and then socks and underwear (36%; $\bar{x}=2.4$) (Figure 14). This is consistent with Birtwistle [52] findings, that cheaper apparel are disposed more often. There are feelings of guilt present, related to the disposal of expensive, higher quality items, worn only a few times, and these tended to be donated to charities, whereas cheaper apparel used for socializing would quickly become unwearable because of wear and tear and were simply discarded [52].

1.3 Sociodemographics attitude and situational variables as predictors of apparel recycling frequency

In general, the respondents reported high rates of recycling paper and plastic, 82% recycle paper and plastic very frequently; ($\bar{x} = 4.6$; $\sigma = 0.9$); then glass (78%; $\bar{x} = 4.6$, $\sigma = 0.8$), organic (76%; $\bar{x} = 4.5$; $\sigma = 0.9$) and hazardous wastes (68%; $\bar{x} = 4.4$; $\sigma = 0.95$). Only 28% recycle textiles ($\bar{x} = 3.2$; $\sigma = 1.45$) and 35% clothes ($\bar{x} = 3.5$; $\sigma = 1.41$). Recycling behaviour considering apparel differs from recycling plastic and other traditional commodities. The consumer must return them to another drop-off site; therefore, time and effort are required. The chi-square analysis was conducted to assess if the availability of an apparel bank was associated with the frequency of recycling waste apparel (Figure 15). A negative correlation was found between the stated variables ($r_s = -0.2094$; $p = 0.0000$). This is not in accordance with previous research, where it was found that recycling rates largely depend on consumers' access to organised curbside recycling [45].

In this section, we hypothesised that 'Gender, age, status,

education and home residence are correlated with the degree of participation in apparel recycling'. After the statistical testing, using the method of multivariate analysis (factor analysis), we established that no correlation exists between the degree of participation in apparel recycling and the following variables: age ($r_s = 0.0896$; $p = 0.0678$); gender ($r_s = 0.0220$; $p = 0.6567$); status ($r_s = 0.0830$; $p = 0.0935$); education ($r_s = -0.0781$; $p = 0.1143$) and home residence ($r_s = -0.0115$; $p = 0.8154$). The results are contradictory to some previous finding, where it was indicated that consumers holding higher education and higher socioeconomic status get more involved in the recycling activities than their counterparts [38]. As mentioned in previous research, age influenced the recycling behaviour, with the elder adults (45–46 years) more likely to resell or donate unwanted apparel [44] and to participate in textile recycling [48], which is not in accordance with the results of this research, where no correlation was found between age and participation in apparel recycling. We can conclude that apparel recycling frequency does not depend on consumer's age, gender, status, education and home residence.

We hypothesised that the availability of an apparel bank is associated with the apparel recycling frequency. After the statistical testing using the method of multivariate analysis (factor analysis), we discovered negative correlation between the stated variables ($r_s = -0.2009$; $p = 0.0251$). The results are not in accordance with previous results, where it was proven that the access to the curbside recycling significantly affected the amount and variety of recycled materials [27]. The respondents reported low apparel recycling rates, regardless of the fact that they have an apparel bank available nearby (Figure 15).

The majority of respondents (48%) perceived recycling as convenient, while only 10% saw it as an inconvenient activity. Furthermore, as stated before, in our study one additional measure of environmental attitudes was included to explain the apparel recycling behaviour, that is, the attitude towards the convenience regarding apparel recycling (measured upon

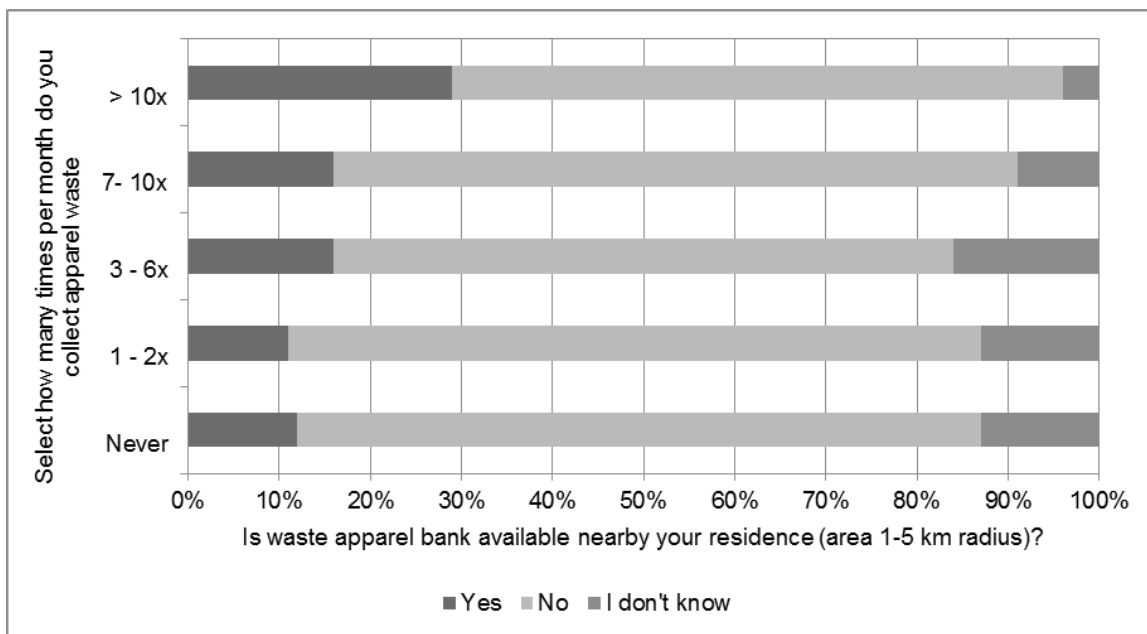


Figure 15. Frequency of apparel recycling – with, without and without knowing of existing waste textile/apparel bank available nearby.

5 point rating Likert scale). Here, we assumed that the attitude towards the convenience predicts the recycling behaviour and can serve as a proxy variable to identify the ecologically concerned consumers. We hypothesised that a positive correlation exists between the perceived convenience and the frequency of recycling waste apparel. After the statistical testing using the method of multivariate analysis, we discovered that there is a negative correlation between the stated variables ($r_s = -0.105$; $p = 0.0343$). This does not confirm results of previous study, where it was found that people who find recycling inconvenient are less likely to recycle [40].

CONCLUSIONS

The green movement in Slovenia is still in its infancy stage, so this is the first research attempt to provide a descriptive profile of an environmentally conscious consumer practices regarding apparel acquisition and disposal in Slovenia. In this study we concluded that apparel recycling frequency is not influenced by gender, age, status, education or home residence. We found that although consumers identify themselves as ecoconscious, their attitude is not reflected in their behaviour and confirmed the existence of environmental gap – the discrepancy between attitude and behaviour. Consumers can possess some degree of environmental consciousness, but when buying apparel, they usually don't consider product's impact on the environment. Ecoconscious segment of consumers similar consider material composition and fashion trends the most when buying apparel, while only a small proportion stated that they consider impact on the environment and environmental labels during their purchase of apparel. Also among ecoconscious consumers purchase of second-hand apparel was practiced the least. The only difference between ecoconscious and non-ecoconscious consumers was that ecoconscious consumers reported of more frequent use of one of the stated disposal method – 'repair and redecoration' – a method unusual among other respondents.

In general Slovenian consumers when buying apparel consider apparel composition the most, followed by fashion trends and origin of apparel, whereas environmentally sustainable attributes were rated as less important during purchase of apparel. The most consistent ecoconscious apparel acquisition behaviour was 'purchase of classically styled apparel', followed by 'purchase of quality clothing', 'repair and redecoration of apparel', 'purchase of apparel from fair trade', 'purchase of apparel made from recycled in/or organic' fibres, whereas the 'purchase of second hand clothing' was practiced the least.

Regarding apparel acquisition respondents bought mostly socks and underwear with more than half of the respondents buying more than five pieces in the past year, while sportswear and outerwear was bought the least. We found that consumers with less than four-year high school education, do not consider fashion trends during the acquisition of apparel, while environmental labels and material's composition were fully considered among them. Consumers with the highest education considered mostly the material's composition. Impact on the environment and material's composition during the purchase of apparel is considered among higher educated

older respondents, while fashion trends were considered among younger respondents, still in school.

We confirmed that buying second-hand apparel is not a common practice in Slovenia. More than half of the respondents stated that they did not buy any second-hand piece of apparel last year. We found that the only difference between consumers who never buy second hand apparel and consumers who buy second hand apparel on a regular basis is their level of education – woman with a higher education reported the buying of second-hand apparel more frequently compared with others. On average the respondents bought 1.5 pieces of second-hand apparel last year. The largest share of second hand apparel was bought by youngest respondents, whereas the smallest by the older respondents of the study. The biggest obstacle constraining consumers from buying second hand apparel lies in their perception of cleanliness, which present the biggest obstacle to elder, male respondents, unemployed with the highest education. The majority also agreed that in Slovenia there are not enough second-hand shops available.

Waste apparel is most often donated to other persons. Gender was found to influence only one disposal practice – donation to others. Donation was most present among female respondents, aged between 21 and 40 years, with the highest education accomplished, living in a house, located in the city. Donation to others was not present at the studied male respondents. On average, Slovenian consumers donated 3.4 pieces of apparel in the past year to others. Second the most used method of apparel disposal was the use of apparel as cleaning rags and third – the disposition into Humana bin. The smallest share of waste apparel was given to assembly centres. The first hypothesis was rejected. No correlation was found between gender and quantity of apparel disposed into trash bin. In the past year, more than five pieces of apparel was thrown into trash bin mostly by the unemployed respondents. Only 14% of apparel was completely destroyed when discarded. Respondents out of possible reasons for apparel disposal identified – 'uselessness' as the main reason, followed by 'inadequate size' and 'lack of space'. Only 6% of them threw them into the trash bin, while most consumers passed their unwanted apparel to their family and friends.

Investigation of appropriate psychographics characteristics could provide a better understanding and prediction of consumer recycling behaviour. We hypothesised that the attitude towards convenience predicts apparel recycling behaviour and can serve as a variable to identify ecologically concerned consumers. Negative correlation was found between perceived convenience of recycling and the frequency of recycling waste apparel. We also tested if the availability of apparel bank is associated with the recycling frequency, and found negative correlation. Majority of respondents reported that they have no apparel bank available nearby, within 1–5 km radius, while only small percentage reported of having one available. Findings of this study do not support the positive and the importance of convenience and availability of apparel bank as an influence on apparel recycling frequency. The respondents reported low apparel recycling rates, regardless of the fact that they have an apparel bank available nearby.

Recycling behaviour of apparel differs from recycling plastic, glass or other traditional recyclables included into curbside collection programmes. This study is intended to provide a framework for further dialogue regarding apparel purchasing and disposal behaviours. To become 'recycling- and resource-efficient society', consumers need to be educated in the wide variety of consumer commodities, such as apparel, which still has recyclable value.

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