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Article

Towards Sustainable Consumption: Consumer Behavior and Market Segmentation in the Second-Hand Clothing Industry

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TOWARDS SUSTAINABLE CONSUMPTION: CONSUMER BEHAVIOR AND MARKET SEGMENTATION IN THE SECOND-HAND CLOTHING INDUSTRY

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Abstract

In this study, we use bibliometric analysis as a quantitative and systematic approach to assess the scientific landscape and present the existing literature, focusing on the consumer buying behaviour of second-hand clothing in the context of sustainability. We observe a decrease in the number of published papers on this topic, as evidenced by the limited number of papers in the Web of Science (WoS) database (41 papers) and Scopus (38 papers). Through co-occurrence analysis, we highlight the importance of consumer behaviour research in sustainable fashion and identify research gaps related to the absence of market segmentation analysis based on consumer behaviour and demographic information in the second-hand clothing market. To address these gaps, our research aims to identify the main factors that influence consumers to buy second-hand clothing products and to examine the profile of customers who make these purchases, focusing specifically on Romania. We collected data from 110 respondents through a questionnaire. Using two-stage clustering and ANOVA, we identify distinct consumer segments that share similar characteristics. These segments show variations in age, income, frequency of purchase, and reasons for choosing second-hand clothing. By addressing sustainability concerns and providing practical strategic options, our study aims to help businesses operating in the second-hand clothing market. Our findings align with previous research on diverse consumer segments with different attitudes and behaviours towards second-hand consumption.

Keywords: consumer behavior, second-hand clothing, market segmentation, sustainability, strategic options

JEL classification: Q01, Q56

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Introduction

Although buying second-hand clothing has become increasingly popular, research in this area remains limited (Padmavathy et al., 2019). Some researchers, such as Guiot and Roux (2010) and Styvén and Mariani (2020), have highlighted the economic motivations behind the purchase of second-hand clothing, including the reduced price and the possibility of obtaining unique items and from prestigious brands at a lower price. Moreover, Machado et al. (2019) analysed the role of consumers in the circular economy and highlighted the connections between financial motivations, quality, sustainability, and critical and ethical consumption in second-hand clothing.

Ögel's (2022) study explored young consumers' motivations for purchasing second-hand clothing, revealing that attitude and subjective norms are predictors of intention to purchase such products, but also that novelty and concern for environmental protection play a significant role in purchasing decisions.

Another study published by Zaman et al. (2019) demonstrates that those who buy second-hand clothing can be divided into three different groups based on their perception of this type of purchase. Their research focuses on the reasons why people tend to buy second-hand clothing, and these are not limited to financial reasons, but also include environmental aspects, recycling, and trends that encourage the reuse of clothes that many people tend to forget in the closet.

Also, Gwozdz et al. (2017) identified different consumer segments based on their clothing consumption patterns, showing that there are differences in purchasing behaviour and openness to more environmentally friendly business models.

Therefore, recent studies show that there is an increased need to understand consumer motivations and behaviour regarding the purchase of second-hand clothing, with a focus on sustainability and the circular economy, therefore providing a solid foundation for our research endeavour.

Our research is based on the bibliometric analysis of the scientific literature on consumer behaviour with respect to second-hand clothing and on a quantitative, exploratory, survey-type research conducted in Romania. Our aim is to identify the profile of second-hand clothing buyers and the factors that influence their decisions, focusing on assessing the impact of sustainability and circular economy principles. We used cluster analysis to identify market segments based on eight variables relevant to consumer behaviour and demographic information.

The novelty of our research lies in the focus on understanding the behaviour of consumers who purchase second-hand clothing, specifically in the context of sustainability. It also provides practical implications for companies operating in the second-hand clothing market by identifying market segments based on consumer behaviour and demographic information. The research gap covered in this study is the lack of sufficient understanding of consumer behaviour buying second-hand clothing in the context of sustainability and the absence of market segmentation analysis based on consumer behaviour and demographic information in the second-hand clothing market.

Our paper begins with a bibliometric analysis to map trends, influential works, and gaps in previous research on consumer behaviour when purchasing second-hand clothing. Then, we detail the research methods used. The next section consists of the results, where we present our findings, including the data collected and the market segments identified by cluster analysis. In the discussion, we interpret the results and correlate them with the existing literature by debating

their implications. The final section consists of conclusions, where we summarise the findings and highlight their importance in understanding consumer behaviour in the purchase of second-hand clothing, in the context of sustainability and the circular economy.

1. A bibliometric analysis: mapping trends, influential works, and research gaps

In this study, we use bibliometric analysis as an alternative to the traditional literature review because it provides a quantitative and systematic approach to assess the scientific landscape, identify research trends, and objectively analyse the existing literature.

Bibliometric analysis offers a distinct advantage over a traditional literature review by providing a quantitative and systematic approach to examining the scientific landscape.

The paper thus presents a bibliometric analysis of the main keywords related to the central objectives of this research, namely "second-hand clothing" and "sustainability". The research used renowned databases such as Web of Science and Scopus. The selection criteria were only the keywords, with no other criteria, with the aim of considering as many papers as possible. The Web of Science database provided 41 articles that met the predefined selection criteria, while Scopus provided a collection of 38 articles. The data collection was carried out in January 2023. For the subsequent analysis of the co-occurrence of keywords, VOSviewer (van Eck and Waltman, 2011) version 1.6.19 was used in a similar way to works of this type (Corboş et al., 2022; Triculescu, 2022). This software facilitated the creation of a map of keywords, allowing a visual representation of the relationships between them.

Furthermore, the paper provides a review of the five most influential articles, determined by the number of citations they received in both databases used for this study. The five most influential articles identified in the bibliometric analysis approach significantly reveal the context and main directions of research on consumer behaviour and market segmentation in the second-hand clothing industry.

Considering the dominance of business models focused on continuous consumption and globalised production systems with a major impact on the environment and society, the consumption of "sustainable fashion" takes on an almost paradoxical quality. This paradox is explored in the study by Bly et al. (2015), which focuses on a previously under-researched group of consumers – "pioneers of sustainable fashion consumption". These pioneers actively develop and communicate strategies for sustainable behaviour in fashion. They promote the purchase of fewer high-quality garments, leave the retail market, purchase only second-hand fashion items, and make or remodel their own clothes. For these consumers, sustainability involves both reducing measurable environmental or ethical impacts and incorporating broader concepts to achieve goals beyond sustainability or ethics.

Furthermore, the study by Bick et al. (2018) underlines the negative consequences of "fast fashion" business models that have led to the growth of clothing consumption and the impact on the environment and human health. This has created a global environmental justice dilemma in which consumers benefit from cheap clothes, but those who work near textile factories bear a disproportionate burden of environmental hazards. Increased consumption has also generated tons of textile waste in warehouses and second-hand clothing markets, particularly affecting low- and middle-income countries. In the same direction, Dissanayake and Sinha (2015) explore the concept of fashion re-manufacturing and the need for collaboration between key actors for sustainable development.

McNeill and Venter (2019) focus on motivators and barriers to collaborative fashion consumption, particularly among young women, and point out that in this category, social and ethical concerns are less motivators than individual identity expression. In addition, the study by Shrivastava et al. (2021) identified factors driving the adoption of online second-hand clothing rental platforms that promote circular fashion and sustainability.

Colasante and D'Adamo (2021) address the difference in consumer attitudes toward clothes made from eco-friendly and second-hand materials, highlighting the need for consumer awareness of the true meaning of sustainability in sustainable fashion.

The literature highlights the diversity and complexity of how consumers perceive and adopt sustainable consumption practices in the second-hand clothing industry and propose ways towards a more sustainable and ethical fashion industry which justifies our approach to identify the profile, factors of influence and impact of sustainability and circular economy on consumer behaviour.

Our research topic is relatively unusual, as evidenced by the limited number of published papers. Comparing the two databases, both highlight a notable focus on business-related research, with *Business and Management* topics occupying significant proportions in both WoS and Scopus. However, WoS gives more importance to *Sustainable Green Technology Sciences* and *Environmental Sciences*, indicating a greater focus on sustainability and environmental studies compared to Scopus. On the other hand, Scopus covers a wider range of subject areas, including *Computer Science, Psychology, Energy, Arts and Humanities, Social Sciences, Materials Science and Engineering*.

Figure no. 1 presents the results of a co-occurrence analysis performed on the main keywords related to the central research objectives, namely “second-hand clothes” and “sustainability”, extracted from WoS.

Therefore, we are talking about a visual representation of the analysis organised into four distinct groups. To be included in the analysis, keywords had to appear at least three times, resulting in a selection of 28 keywords out of a total of 272. Each group represents a set of keywords that frequently co-occur in the reviewed literature.

Group 1 indicates a focus on the various aspects and challenges associated with sustainable fashion, circular economy practices and the consumer perspective.

Group 2 highlights topics related to market dynamics, business models, and opportunities in sustainable fashion and the collaborative economy.

Group 3 explores the interplay between circular fashion, consumer behaviour, consumption patterns, design approaches, information technology, and the acceptance of sustainable practices.

Group 4 focuses on the psychological and behavioural aspects of sustainable consumption, including consumer intentions, purchasing behaviour and the role of second-hand clothing in promoting sustainable practices.

Figure no. 2, extracted from VOSviewer, presents the results of the bibliometric analysis performed on the main keywords related to the central objectives of the research, focusing on “second-hand clothes” and “sustainability” in the Scopus database. The analysis used a co-occurrence approach, setting a minimum threshold of three occurrences for keywords. Out of a total of 327 keywords, 19 met this threshold and were included in the analysis with data from Scopus.

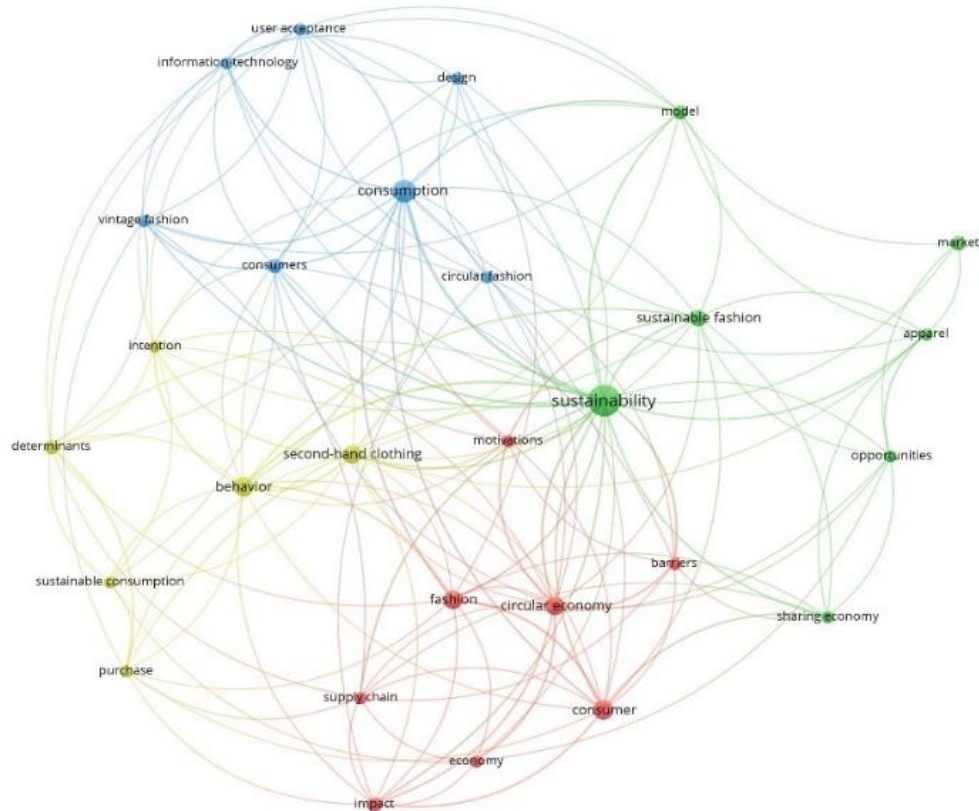


Figure no. 1. Network viewing of WoS database results in VOSviewer

The analysis identified three distinct groups based on keyword co-occurrence patterns:

Group 1 reflects the interconnections between clothing consumption, consumer behaviour, the fashion industry, and sustainability. This group suggests a focus on the environmental and social aspects of sustainable fashion, considering the role of the textile and fashion industry in sustainable development.

Group 2 highlights the economic and human aspects of the clothing industry and its connections to sustainability. Keywords in this group indicate a focus on topics such as the circular economy, economic engagement, and the role of retail in sustainable practices.

Group 3 emphasises the environmental dimensions of sustainability in the context of clothing and fashion. It includes keywords related to sustainable consumption practices, clothing reuse through second-hand markets, and recycling efforts in the clothing industry.

The co-occurrence analysis we have performed highlights the importance of consumer behavior research in the context of sustainable fashion. Both figure no. 1 and figure no. 2 show groups addressing different aspects of second-hand clothing and sustainability. However, there is a notable research gap regarding the specific behavior of second-hand clothing buyers and the absence of market segmentation analysis based on consumer behavior and demographic information in the second-hand clothing market.

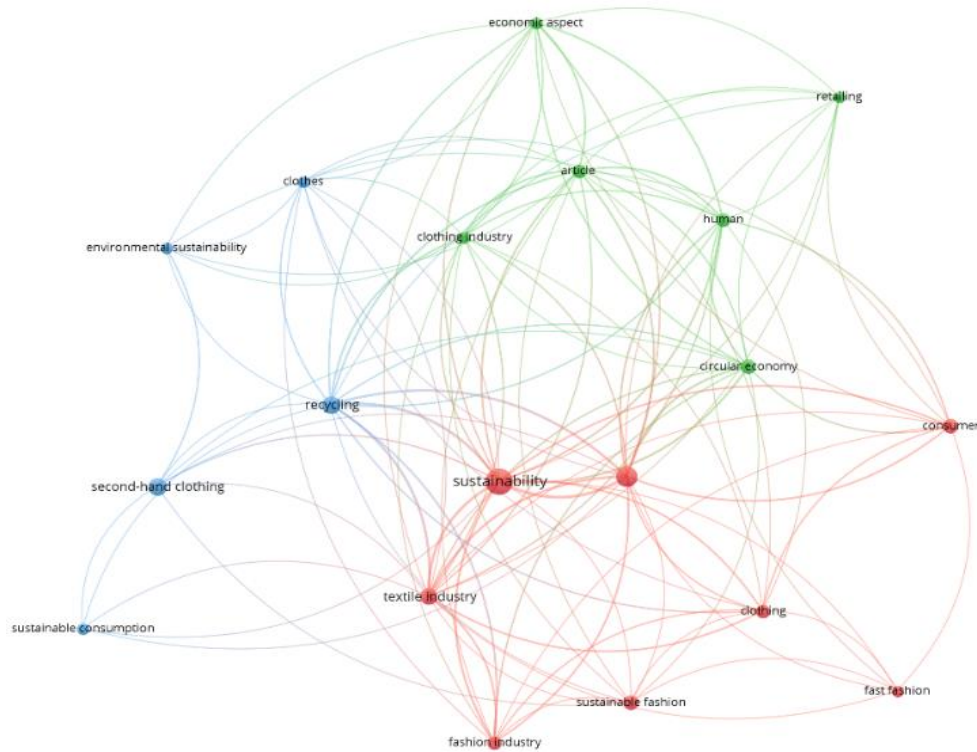


Figure no. 2. Network viewing of Scopus database results in VOSviewer

The need to research the behavior of consumers of second-hand clothes is important for several reasons. First, it helps to understand consumer motivations, preferences, and concerns, which can inform marketing strategies and communication campaigns to promote sustainable fashion practices. Second, examining consumer behavior can highlight barriers and challenges that prevent widespread adoption of second-hand clothing, allowing for the development of targeted interventions to overcome these barriers. Finally, exploring consumer demographic and psychographic profiles can help market segmentation, leading to customized strategies that address specific consumer segments and their unique needs.

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consumer demographic and psychographic profiles can help market segmentation, leading to customised strategies that address specific consumer segments and their unique needs.

2. Research method

The purpose of the research is to identify the profile of second-hand clothing buyers and the factors that influence their decisions, which are reflected in the reasons that influence consumers to choose second-hand clothing products. In this sense, we will carry out a pilot study on the Romanian market to fulfil the objectives of the study.

The main objectives of our study are the following:

- Identifying the profile of customers who buy second-hand clothing in Romania;
- Identifying the main factors that influence the decisions of these customers regarding the purchase of second-hand clothing;
- Assessing the impact of sustainability and circular economy principles on consumer behaviour in purchasing second-hand clothing;
- Market segmentation based on consumer behaviour and demographic information to identify distinct consumer segments.

As part of this research, we formulated several hypotheses that underlie our analysis of the second-hand clothing market. These are our initial assumptions about consumer behaviour and motivations in this market. Our aim is to better understand the characteristics and preferences of these consumers by testing the following hypotheses:

- Hypothesis 1: There are distinct consumer segments in the second-hand clothing market, differentiated by purchase frequency, age, income, preferred purchase channel, and motivations.
- Hypothesis 2: All consumer segments that buy second-hand products are motivated mainly by the perception of good value for money and the desire to contribute to a circular economy.
- Hypothesis 3: Younger consumers with lower incomes are more likely to buy second-hand products.
- Hypothesis 4: Consumers who prefer to buy second-hand products from brick-and-mortar stores are more likely to be motivated by the sensory experience and the opportunity to examine the products before purchase.

The first step of our research was creating a questionnaire to identify and understand consumer behaviour. The questionnaire included 10 questions, 7 of which were related to their buying behaviour (how often they buy second-hand clothes), the reasons they buy second-hand clothes, and the places where they usually buy (social media platforms, online stores, or physical stores), with a list of their preferences. Other 3 questions were related to age, area of origin, and income.

The second step in our research was to join specific Facebook groups for this type of business, second-hand clothes, and invite people from these groups to answer the questionnaire, as well as share it publicly on other social media platforms such as Instagram.

The last step was data collection, with the questionnaire open between October and December 2022. Overall, 16.37% of the respondents come from rural areas, while 83.63% come from urban areas. Table no. 1 presents in detail the socio-demographic profile of the respondents and includes as a percentage of the total respondents: the age categories, the environment of origin, and the incomes by age category.

Table no. 1. The socio-demographic profile of the respondents

| Age category (years) | 18-24 | 25-30 | 31-40 | 41-50 | 50-60 |
|--|--------------------------|------------------------|-------------------------|-------------------------|------------------------|
| Values (% of total respondents) | 50% | 9.09% | 24.55% | 13.63% | 2.73% |
| Area of origin (% of total respondents) R = rural / U = urban | R = 10.91% U = 39.09% | R = 1.82% U = 7.27% | R = 1.82% U = 22.73% | R = 0.91% U = 12.72% | R = 0.91% U = 1.82% |
| Income by age group - RON (% of total respondents) | 18-24 | 25-30 | 31-40 | 41-50 | 50-60 |
| 1600 – 2000 | 35.45% | 1.82% | 0% | 2.73% | 0% |
| 2000 – 3000 | 7.18% | 3.63% | 3.67% | 0% | 0% |
| 3000 – 4000 | 0.91% | 0.91% | 2.78% | 2.73% | 0.91% |
| 4000 – 5000 | 4.55% | 0.91% | 6.36% | 1.82% | 0.91% |
| 5000 – 6000 | 0% | 1.82% | 0.91% | 3.64% | 0.91% |
| 6000 – 8000 | 0% | 0 | 5.45% | 1.82% | 0% |
| >8000 | 0.91% | 0 | 5.45% | 1.82% | 0% |

To achieve its objectives, the research involved structuring the data in such a way as to obtain eight variables through which we wanted to identify some elements related to the profile of customers of second-hand products. This includes information about where they prefer to buy second-hand items, their reasons for choosing such products, and elements such as respondents' age, income, and background. In addition, the variables used are inspired by the main works identified in the specialised literature (Ferraro et al., 2016; Machado et al., 2019; Mukherjee et al., 2020; Borusiak et al., 2020; Colasante and D'Adamo, 2021; Wang et al., 2022; Koay et al., 2022) and can be described as follows: Places where consumers most often purchase second-hand items (POA); The frequency with which consumers buy second-hand products (AI); The reasons why consumers buy second-hand products (ROA); Consumer perception on the evolution of second-hand product purchases (BSHB); Consumer perception of supporting the circular economy by purchasing second-hand products (CEC); Consumer age group (AGE); The environment of origin of consumers (AREA); Consumer income range (INCOME).

To identify homogeneous groups of consumers in the form of market segments, we used the two-stage clustering approach using IBM SPSS 26.0. We assumed that each identified cluster would represent a market segment, as clusters are formed based on several common elements. Furthermore, to ensure that we identify homogeneous and strict consumer groups, we used one-way ANOVA analysis of variance to test for significant differences between the consumer groups used. Through this pilot study, we aim to identify the main characteristics of consumers who choose to buy second-hand clothing and their main reasons for buying, so that we can develop strategic options that can be used in practice by the managers of these businesses. In addition, we approach the issue of sustainability from the perspective of the circular economy.

The hierarchical clustering technique used by SPSS’s two-stage clustering approach has two key stages. The k-means method with a predetermined number of initial clusters is often used to assign each observation to an initial cluster based on its proximity to the cluster centroid in the first step (Everitt et al., 2011). Using a similarity metric, such as the Euclidean distance between cluster centroids, the second step consists of merging the initial clusters into larger clusters (Milligan and Cooper, 1985; Johnson and Wichern, 2007).

3. Results

In exploratory data analysis, the two-step clustering approach is often used and is particularly beneficial for large data sets where the conventional k-means technique may be difficult to automate.

Usually, the two-step clustering approach in SPSS can automatically determine a certain number of clusters. However, because our goal is to identify market segments and characterise them, and because we will later use one-way ANOVA to determine differences between groups, we set a predefined number of five clusters.

An effective technique for assessing the quality of clusters in a clustering investigation is the silhouette measure (Rousseeuw, 1987). The silhouette measure for cohesion and separation for our data was 0.2, which can be considered a reasonable value. However, there is no fixed threshold for a “good” silhouette measure value, as the desired value depends on the context and specific objectives of the clustering analysis. We consider the value obtained to be satisfactory, as we aim to identify homogeneous groups of customers, which may not have identical but rather similar characteristics. Our clustering analysis identified relevant elements. First, table no. 2 shows the distribution of clusters, where we can observe a fairly balanced and uniform distribution of them, in relation to our general results.

Table no. 2. Distribution of clusters

| | | N | % of Combined | % of Total |
|-----------------|----------|-----|---------------|------------|
| Cluster | 1 | 21 | 19.1% | 19.1% |
| | 2 | 25 | 22.7% | 22.7% |
| | 3 | 17 | 15.5% | 15.5% |
| | 4 | 21 | 19.1% | 19.1% |
| | 5 | 26 | 23.6% | 23.6% |
| Combined | | 110 | 100.0% | 100.0% |
| Total | | 110 | | 100.0% |

As we can see in Table no. 3, the results of the one-way ANOVA analysis show that there were significant statistical differences between the clusters (p value < 0.05), demonstrating the validity of the final clustering in making accurate predictions based on the eight variables used as dependent variables (Hair et al., 2010).

Table no. 3. Validity of clusters based on one-way ANOVA analysis

| Variables | Cluster Members | F | P Value |
|-----------|-----------------|--------|---------|
| AI | (1-5) | 16.404 | 0.000 |
| AGE | (1-5) | 32.101 | 0.000 |
| INCOME | (1-5) | 36.207 | 0.000 |
| POA | (1-5) | 21.244 | 0.001 |

| Variables | Cluster Members | F | P Value |
|-----------|-----------------|-------|---------|
| ROA | (1-5) | 5.121 | 0.001 |
| AREA | (1-5) | 9.382 | 0.000 |
| BSHB | (1-5) | 1.636 | 0.001 |
| CEC | (1-5) | 1.547 | 0.004 |

Cluster analysis revealed five groups. Appendix 1 presents the five groups created and provides a comparison between them. We will now describe each cluster according to the results obtained. It should be noted that each cluster represents a homogeneous group of customers, which can be viewed as market segments.

Cluster 1 represents 19.1% of the results obtained and contains 21 entries. The profile of the consumer associated with this cluster is predominantly characterised by the purchase of second-hand products once every two to three months, being 31-40 years old, having an income of over 8000 RON, buying mainly from Facebook groups created for this purpose, the reason for the purchase being the perception of a good quality/price ratio, coming mainly from urban areas and considering that in the future people will buy more and more second-hand products, which encourages the contribution to a more circular economy by reusing products.

Cluster 2 represents 22.7% of the results obtained and contains 25 entries. The profile of the consumer associated with this cluster is predominantly characterised by the purchase of second-hand products monthly, being 41-50 years old, having an income between 5000-6000 RON, buying mainly from physical stores, the reason for the purchase being the perception of a good quality/price ratio, mainly coming from urban areas, and considering that in the future people will buy more and more second-hand products, which encourages contributing to a more circular economy by reusing products.

Cluster 3 represents 15.5% of the results obtained and contains 17 entries. The profile of the consumer associated with this cluster is predominantly characterised by the purchase of second-hand products once every two to three months, being 18-24 years old, having an income between 1600-2000 RON, buying mainly from physical stores, the reason of purchase being the lower price, coming mainly from urban areas, and considering that in the future people will buy more and more second-hand products, which encourages the contribution to a more circular economy by reusing products.

Cluster 4 represents 19.1% of the results obtained and contains 21 entries. The consumer profile associated with this cluster is predominantly characterised by the purchase of second-hand products once a year or less often, being aged 18-24, having an income between 1600-2000 RON, buying mainly from physical stores and websites, the reason for the purchase being the lower price, mainly coming from urban areas and considering that in the future people will buy more and more second-hand products, which encourages contributing to a more circular economy by reusing products.

Cluster 5 represents 23.6% of the results obtained and contains 26 entries. The profile of the consumer associated with this cluster is predominantly characterised by the purchase of second-hand products monthly, being 18-24 years old, having an income between 1600-2000 RON, buying mainly from physical stores, the reason for the purchase being the perception of a good quality/price ratio, mainly coming from rural areas and considering that in the future people will buy more and more second-hand products, which encourages the contribution to a more circular economy by reusing products.

It should be noted that within the characteristics of the market segments there are dominant elements that determined their belonging to a specific cluster.

Analysing the results, we obtained in relation to the formulated hypotheses, it can be concluded that there are aspects that do not completely align with our initial expectations. The results confirm Hypothesis 1, showing the existence of distinct consumer groups in the second-hand clothing market, differentiated by purchase frequency, age, income, preferred purchase channel and motivations. This suggests adequate market segmentation and significant differences between consumer groups. Furthermore, the results do not fully confirm hypothesis 2. Although the circular economy and the perception of value for money are important factors for second-hand buyers, there are other complex motivations that influence the decisions of these consumers. Therefore, not all consumer segments that buy second-hand products are motivated solely by these two aspects.

Hypothesis 3 is partially confirmed by the results obtained. Younger consumers with lower incomes are indeed more likely to buy second-hand products, but the reason for their purchases is not just about lower prices; there are other considerations that influence their purchasing choices. Finally, the results do not fully confirm hypothesis 4. Although the preference for buying in brick-and-mortar stores may be related to the sensory experience and the possibility to examine the products before purchasing, there are other reasons for choosing this purchase channel. Therefore, not all consumers who prefer brick-and-mortar stores are motivated solely by the sensory experience.

To sum up, the cluster analysis revealed a diversity of motivations and characteristics of consumers of second-hand products, indicating that this market cannot be simplified into a single type of consumer or a single motivating factor. Segmenting and understanding the complexity of the market can help companies develop more effective marketing strategies and address the varied needs of different consumer groups.

4. Discussions

The results of this study are consistent with previous research that has identified several consumer segments with different attitudes and behaviours towards the consumption of second-hand goods (Guiot and Roux, 2010; Ferraro et al., 2016; Liang and Xu, 2018). The results of the study of the five most influential articles published in WoS and Scopus suggest that the reasons why people engage in fashion consumption are aesthetics, creativity, and novelty, for which they have found new ways to be satisfied, rather than giving up the pleasure to buy clothes. It also promotes the idea that people living in high-income countries can support and promote global environmental justice by purchasing high-quality clothing, repairing their clothing, and shopping at thrift stores. These findings stimulated the present research to provide the literature with recent findings on the subject.

The five clusters identified in this study suggest that second-hand buyers can be differentiated based on frequency of purchase, age, income, preferred purchase channel and motivations.

Cluster 1 is consistent with previous research that identified a segment of consumers motivated by the economic and environmental benefits of second-hand consumption (Machado et al., 2019).

Cluster 2 is similar to a segment identified by D'Adamo et al. (2022), who found that those who prioritise ecological concerns, and the circular economy are more likely to engage in second-hand consumption.

Cluster 3 is consistent with previous research that identified younger consumers likely to engage in second-hand consumption and being motivated by economic and environmental concerns (Yan et al., 2015).

Cluster 4 is similar to a segment identified by Haraldsson and Peric (2017), who found that some consumers engage in second-hand consumption occasionally and are motivated by economic and environmental concerns.

Cluster 5 is similar to a segment identified by Yan et al. (2015), who found that younger people prioritise environmental concerns and the circular economy and are more likely to engage in second-hand consumption.

In terms of frequency of purchase, the results of this study are consistent with previous research that has found that people buy second-hand products with varying degrees of frequency. For example, as we have shown, some studies have found that individuals tend to buy second-hand products occasionally, while others have found that they buy second-hand products frequently.

In relation to age and income, previous research has also identified these as key factors influencing second-hand buying behaviour. For example, younger consumers and those with lower incomes are more likely to buy second-hand products than older consumers or those with higher incomes.

The fact that some consumers prefer to buy second-hand products from brick-and-mortar stores is consistent with previous literature that has identified the importance of tactile experiences and the ability to examine products before purchase as key factors influencing consumer preferences for brick-and-mortar shopping (Flavián et al., 2017).

A study by Tu et al. (2022) found that perceived value for money and environmental concerns were important reasons for purchasing second-hand. Another study (Clausen et al., 2010) found that the desire to save money and contribute to environmental sustainability was the main motivation for consumers to buy second-hand products. These findings are similar to the results of the current study, which identified value for money and the desire to contribute to a circular economy as important reasons for consumers to buy second-hand products.

The findings of this study are consistent with the findings of Borusiak et al. (2020) and Koay et al. (2022), who also identified a positive relationship between people's attitudes towards the positive impact of second-hand purchases on sustainable consumption and their intention to engage in second-hand purchases. This further supports the idea that people who have positive beliefs about the environmental and social benefits of second-hand buying are more inclined to express their intention to participate in this type of consumption.

Other research (Cervellon et al., 2012) found that second-hand purchases were more prevalent among younger and lower-income consumers. This is consistent with the current study, which found that younger individuals (18-24 years) with a monthly income of 1600-2000 RON are more likely to buy second-hand products. The fact that some consumers prefer to buy second-hand products from brick-and-mortar stores is consistent with other research (Wang et al., 2022; Wang et al., 2022; Zhang et al., 2022), who found that brick-and-mortar shopping offers a more immersive and sensory experience than online shopping and that the ability to examine products

before purchase was a key factor influencing consumer preferences for brick-and-mortar stores. This preference for brick-and-mortar stores was also reflected in the current study, which found that some consumers prefer to buy second-hand products from brick-and-mortar stores. Other studies have also shown that the points of purchase of second-hand products are a good determinant of their purchase (Mukherjee et al., 2020).

Overall, the results of this study add to the body of literature on second-hand consumption by identifying specific clusters of consumers based on their behaviour and motivations. These findings can help retailers better understand and address the needs of different consumer segments to promote sustainable consumption. Furthermore, the results of this study are largely consistent with previous literature on consumer behaviour related to second-hand purchases. Previous research has also identified price, quality, and the desire to contribute to a circular economy as key factors that motivate consumers to buy second-hand products.

Conclusions

The study identified five market segments useful to second-hand sellers based on purchase frequency, age, income, preferred purchase channel and motivations. These segments include consumers motivated by good value for money and the desire to contribute to a circular economy, younger consumers with lower incomes, and those who occasionally buy second-hand products. The study's findings could help retailers better target different consumer segments to promote sustainable consumption. Previous research has also shown that younger people and those with lower incomes are more likely to engage in second-hand consumption and that some consumers prefer to buy second-hand products from brick-and-mortar stores.

Retailers should consider the identified clusters when targeting their marketing efforts to second-hand consumers. They could use different marketing strategies for each cluster to better satisfy their motivations and preferences. Additionally, retailers could devise different pricing strategies for each group. For example, cluster 3 consists of younger consumers with lower incomes who buy second-hand products once every two to three months and are motivated by lower prices. Therefore, retailers could offer more affordable prices for this cluster to attract them.

Second-hand retailers may also consider offering second-hand products in brick-and-mortar stores, as this may appeal to some consumers who prefer a tactile experience and the ability to examine products before purchase.

Policymakers could promote sustainable consumption by educating consumers about the benefits of second-hand consumption and by increasing the availability of second-hand products in brick-and-mortar stores and online platforms. Politicians should also consider offering incentives to traders selling second-hand products, such as tax breaks or subsidies, to promote circular economy practices and reduce waste. In addition, policymakers could also consider implementing regulations to ensure the quality of second-hand products and to protect consumers from fraudulent or dangerous items.

Overall, these managerial and policy implications aim to encourage more sustainable consumption practices and promote the circular economy.

Based on the results and discussions, we recognise the existence of a potential new market segment, which may be represented by consumers of second-hand products motivated by both economic and environmental concerns, purchase items with varying degrees of frequency (from

monthly to once a year or less) and are either younger consumers with lower incomes or those with higher incomes. The preferred purchase channel can vary, with some consumers preferring to buy items in brick-and-mortar stores, while others prefer to shop online.

Research could also examine the impact of sustainability certifications and product labelling on consumer behaviour in this segment, as well as the potential to incentivise sustainable behaviours through rewards programs or loyalty schemes.

However, there are some research gaps that this type of study could address in future research. First, the research only focuses on the Romanian market, so future studies could expand the field to other regions to gain a broader perspective. Second, the research only examines the consumer side of the second-hand clothing market and does not explore the supply side or overall market dynamics. Finally, research could consider conducting a longitudinal study to track changes in consumer behaviour over time and provide a more comprehensive understanding of the factors driving second-hand clothing consumption.

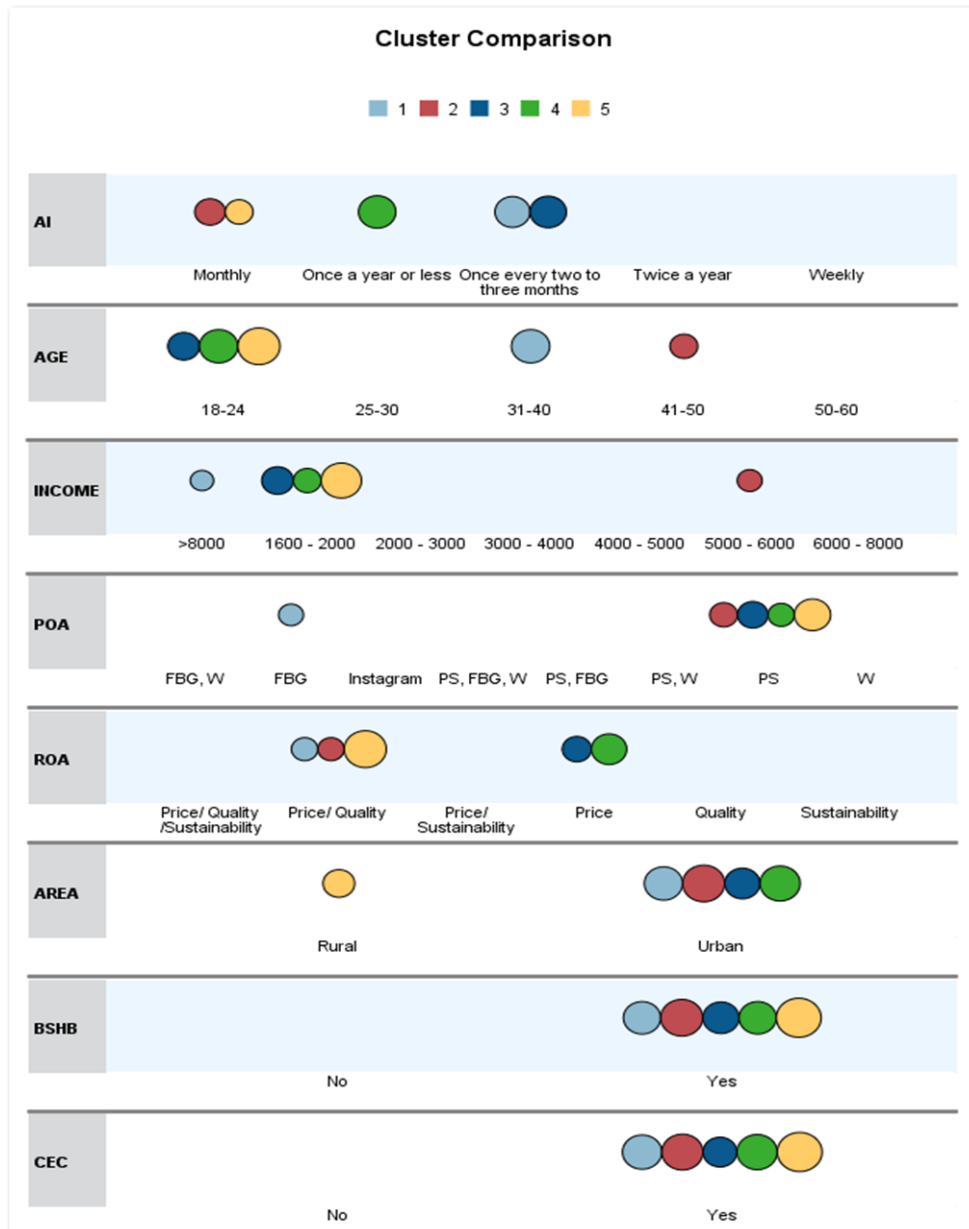
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Appendix 1. Comparison between clusters



Notes: FBG = Facebook Groups, W = Websites, PS = Physical Stores. / AI = Purchase Interval, POA = Place of Purchase, ROA = Reason for Purchase, BSHB = Secondhand Buying Behaviour, CEC = Contribution to the Circular Economy.