**Do sustainable consumers have sustainable behaviours? An empirical study helps us to understand this**

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**Abstract.** Sustainability and the Circular Economy (CE) are issues of increasing interest to governments, investors, industry and civil society, and for this reason, the implementation of a business model for circularity and/or sustainability is becoming crucial for achieving and maintaining a competitive advantage for various organizations. In this context, consumers play a crucial role in reducing the environmental impact of business processes through their choices and behaviours (van Bussel et al., 2022). However, even though sustainability issues and the Circular Economy have now widely involved consumers, making them seemingly well aware of how their behaviour can have a direct impact on the environment, the percentage of people who accompany this awareness with truly sustainable behaviour and who are therefore willing to embrace the goal of "saving the planet" is small (D’Arco and Marino, 2022). Through an empirical survey, the research aims to understand the actual level of consumer awareness of sustainability issues, with a focus on the environmental dimension, and to analyze the main characteristics that distinguish a genuinely sustainable consumer, through his behaviour, from a less sustainable consumer.

**Keywords.** Sustainability; Circular Economy, Sustainable Consumer, Sustainable Behavior, Cluster Analysis



# Introduction

Sustainability and Circular Economy (CE) are topics of increasing interest to governments, investors, industry, and civil society. For this reason, implementing a business model for circularity and/or sustainability is becoming critical to achieving and maintaining a competitive advantage for various organizations. It is not a coincidence that several approaches to innovation in business models have been proposed to meet the principles of circular economy or sustainability (Pieroni et al., 2019). In addition, with the growth of the conscious consumer and the intention to make green and ethical purchasing decisions, companies must integrate sustainability and CE at the core of their business and look for new ways to grow by improving purchasing efficiency and meeting the rapidly evolving needs of consumers, though also building a value-sharing relationship with them (Purcărea et al., 2022). However, although consumers exhibit positive attitudes, they fail to put these exhibited attitudes into practice by engaging in responsible behaviour. In fact, despite policy pushes and initiatives, guiding consumer behaviour toward sustainable consumption is a challenging and challenging task (Francis and Sarangi, 2022).

The purpose of this article is to understand, through an empirical investigation, what is the fundamental level of consumer awareness of sustainability issues, with a focus on the environmental dimension, and to analyze what are the main characteristics that distinguish a genuinely sustainable consumer, through his behaviour, from a consumer pseudo sustainable. Therefore, the article is composed as follows: in section 2, the primary research in the literature on the topic of sustainable consumer behaviour is reported; in section 3, the description of the methodology; section 4, the main results; section 5, the discussions and conclusions.

# Review of the literature

The transition to sustainability and CE involves several challenges not only in environmental and economic terms but also in social terms through effective management of all stakeholders in the closed system (Opferkuch et al., 2021; Ritzén and Sandström, 2017; Stewart and Niero, 2018).

In this context, consumers play a crucial role in reducing the environmental impact of business processes through their choices and behaviours (van Bussel et al., 2022). According to Leary et al., (2014), sustainable consumer behaviour is a type of behaviour that helps meet the current generation's needs without negatively affecting the ability of the environment to meet the needs of future generations. The responsible consumer seeks to consider economic (in terms of personal well-being), ecological (including animal welfare), and social aspects along the entire consumption chain, such as the type and number of products, their use, and disposal (Terlau and Hirsch, 2015).

However, despite this apparent evolution of the consumer/citizen into an individual who is aware of the adverse effects caused by unsustainable human activities, such as climate change, loss of biodiversity, melting ice, plastic pollution, and ocean pollution, the percentage of people who accompany this awareness with truly sustainable behaviour and are therefore willing to embrace the goal of "saving the planet" is small (D’Arco and Marino, 2022). The main obstacles that negatively affect sustainable consumption are high price, perceived lack of environmental impact, lack of benefit to personal image, less use by family and friends, and lack of product awareness (Harris et al., 2016; Sheoran and Kumar, 2022). However, to bridge the attitude-behaviour gap and improve sustainable consumption, several concrete measures can be implemented to increase consumer responsibility. According to Gupta and Ogden, (2006), consumer involvement in environmental issues and perceived consumer effectiveness are the main drivers of strengthening the attitude-behaviour link.

# Material and methods

## Questionnaire and data collection

In this study, a questionnaire was prepared to investigate consumers' behaviour on sustainable consumption.

The research was performed in April and May of 2021 through Google Form and social media (Brito et al., 2021; Majeed et al., 2022; Sarfraz et al., 2021). The difficulty in clearly identifying the population of customers led to the adoption of a non-probabilistic sampling scheme, specifically accidental sampling, as is widely used in market research (Bracalente, B., Cossignani, M., & Mulas, 2009).

The questionnaire analyzed the following three sections

● Consumer's analysis: containing information about the consumer's general purchasing behaviour

● Sustainable consumer behaviour, containing information on sustainable and circular consumer purchasing behaviour, with particular attention to their level of awareness and knowledge on the issue of sustainability and circularity of consumption.

● Consumer profile: containing information on socio-demographic features.

The Likert measurement scale was used to measure sustainable consumer perception with a score assigned to the respondents between 1 and 7, ranging from 'strongly disagree' (scoring value 1) to 'strongly agree' (scoring value 7) (Likert, 1932). The questionnaire was submitted online with Google Forms, and the sample was composed of 410 individuals. Data were analyzed using the statistic program "STATA 12 Data Analysis and Statistical Software" ([www.stata.com](http://www.stata.com)).

# Results

## Factor analysis

A factor analysis was performed to eliminate multicollinearity problems, and the criterion adopted for identifying new factors was eigenvalues <1. The so-called "rotation" of the initial factor solution was applied to aid interpretation. An orthogonal rotation of factors (the rotated factors remained uncorrelated) was applied using the varimax method (Kaiser, 1958). Table 1 shows the matrix of the main components (eigenvectors) of the factors, of which the first three have eigenvalues greater than 1. Moreover, they encompass 80.1% of the information contained in the original data set. For this reason, the first three factors were considered to identify the new variables.

*Table 1 - Rotation: orthogonal Varimax (Kaiser off)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Factor | Variance | Difference | Proportion | Cumulative |
| Factor1 | 6,19 | 0,73 | 0,31 | 0,31 |
| Factor2 | 5,45 | 0,97 | 0,27 | 0,58 |
| Factor3 | 4,47 | . | 0,22 | 0,80 |

*Source: our elaboration on the data set*

Factor interpretation was achieved by considering the so-called saturation matrix (Appendix A), where the correlations between the original variables and the factors were identified. Each variable is associated with others according to the highest correlation factor, and then this factor is interpreted according to the associated variables. In the following table, factor1 synthesizes the variables related to the aspects regarding the customer's awareness (like global warming and water pollution). Factor 2 synthesizes the variables related to customer concern attributes (like environmental deterioration and lack of attention by companies to the reuse of waste). Finally, factor 3 synthesizes the variables related to the customers' mindshare (like involved in environmental issues and moral responsibility to green products).

## Cluster analysis

While factor analysis summarizes dimensions macro elements, cluster analysis allows the grouping of individuals, based on shared characteristics, to form groups, or segments, characterized by high homogeneity (Bracalente, B., Cossignani, M., & Mulas, 2009). For this research, Ward's hierarchical method (Annunziata and Vecchio, 2013; Dahl and Næs, 2004) was used, and the number of groups was determined by inspecting the dendrogram. Four groups were identified using the information derived by the Calinski/Harabasz indicator and the dendrogram analysis. The number of clusters to be considered can be defined through the Calinski and Harabasz indicator and the dendrogram (Bracalente, B., Cossignani, M., & Mulas, 2009). The Calinski/Harabasz rule states that the number to be considered depends on the pseudo-F. Usually, the number of clusters with the highest pseudo-F is considered. The highest number of pseudo-F coincides with several factors equal to four. Table 2 shows the four consumer groups related to the new variables of quality dimensions. Based on the correlation link intensity, it is possible to define the characteristics of the four clusters. Cluster 1 is characterized by all three factors, unlike cluster 4, which is not discriminated by any three factors. Cluster 2 is characterized by FA1 and FA3, while cluster 3 is FA1 and FA2.

*Table 2- Cluster analysis– correlation link intensity*

|  |  |  |  |
| --- | --- | --- | --- |
| Cluster | FA1 - Awareness | FA2 - Concern | FA3 - Mindshare |
| CL1 – Sustainable consumer | 0,02 | 0,48 | 0,61 |
| CL2 – Fake sustainable consumer | 0,57 | -1,33 | 0,18 |
| CL3 – Not engaged consumer | 0,51 | 0,48 | -1,13 |
| CL4 – Not sustainable consumer | -2,15 | -1,14 | -0,80 |
| Total | 1,77E-09 | 3,28E-09 | -2,66E-09 |

*Source: our elaboration on the data set*

Finally, Table 3 summarizes the socio-behavioral characteristics of 4 cluster.

*Table 3- Clusters’ characteristics*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cluster** | **Gender** | **Age** | **Job** | **Educational qualification** | **Purchase of sustainable products** | **Communication channels** | **Environmental sustainability importance** | **Environment attention** |
| Cluster 1 - "Sustainable consumer" – 50% | Female | >46 | Office workers or homemakers | University graduates | 4 or more times a week | Newspapers, TV, radio, social media, personal experience, flyers and environmental organizations | High (score 7) | Yes |
| Cluster 2 - "Fake consumer"- 17,32% | Male | 26-35/ 46-55 | Freelancers, blue-collar workers, and retirees | Bachelor's degree to a post-graduate degree | Up to 3 times a week | Newspapers, TV, radio, social media, personal experience, flyers and environmental organizations | Medium (score 4-6) | No |
| Cluster 3 - "Not engaged consumer" – 22,44% | Male | <25/ 36-45 | Unemployed | High school diploma | Once a week | Newspapers, TV, radio, social media, personal experience, flyers and environmental organizations | Medium – High (score 5-6) | No |
| Cluster 4 - "Not sustainable consumer" – 10,24% | Male | <25 46-55 | Office workers, homemakers, and retired | High school diploma | Once a week | Little importance | Low (1-5) | No |

*Source: our elaboration on the data set*

# Discussion

The analysis developed in this research shows significant findings regarding sustainable consumer behaviour. The study aims to understand whether consumers who claim to be attentive to sustainability adopt sustainable behaviours.

The results show that out of four clusters, only one (Cluster 1 - Sustainable consumer) is composed of genuinely attentive individuals to environmental issues, accompanying their awareness with sustainable behaviours. These individuals gather information about environmental problems using all the communication channels at their disposal. This is significant given the importance of communication/educational channels in supporting the consumer at the time of purchase (Eldesouky et al., 2020). A greater degree of consumer education often goes hand in hand with a better understanding of environmental issues. Consumers show greater sensitivity or willingness to consider them as relevant attributes during their purchases (Eldesouky et al., 2020).

Additionally, consumers are unwilling to pay for the type of products they are least aware of and have never seen any advertising (De Pelsmacker et al., 2005). This demonstrates the importance of using appropriate communication channels to inform consumers about the environmental aspects of products. Lack of awareness/advertising regarding sustainable products among consumers reduces the likelihood of further purchase/use (Annunziata and Mariani, 2018; Biel et al., 2005; Carol Cavender, 2018; Wheale and Hinton, 2007; Young et al., 2009), becoming a significant barrier to sustainable consumer behaviour.

Among the communication channels contemplated in this research, personal experience emerges. Individuals in cluster 1, for their purchases, seem to rely heavily on their past experiences assigning a score of 7 (Likert scale 1-7) to the importance this factor has on their purchase choices, in line with the literature (Bernard et al., 2015). This aspect is crucial. A sustainable consumer who has positive shopping experiences can contribute to positive word of mouth, breaking down one of the main barriers highlighted by (Sheoran and Kumar, 2022) related to friends and family not using sustainable products. According to (Öberseder et al., 2011), negative experience and subsequent negative word-of-mouth can discourage the purchase of a particular product, even if it is environmentally friendly or made by a socially responsible company.

Another significance is related to gender and age, i.e., the two demographic variables considered most important in analyzing consumer behaviour (Jegethesan et al., 2012; Rahman and Koszewska, 2020; Seock and Bailey, 2008; Zelezny et al., 2000).

Cluster 1 predominantly comprises women, highlighting that the female gender is more sustainable than the male gender. Previous studies focusing on sustainable consumer behaviour have found a robust "gender effect": women are more likely than men to express concern about consumption's broader impacts and act on those concerns (Luchs and Mooradian, 2012). Therefore, women are more concerned about social and environmental issues and report more socially and environmentally friendly purchasing behaviours (Luchs and Mooradian, 2012).

Cluster 4 comprises individuals who do not pay any attention to environmental issues and assume unsustainable behaviours. According to some authors (Abdul Rahman et al., 2017; Chang et al., 2015; Godard et al., 2002), young people tend to pay more attention to a product's aesthetic aspects (attributes based on desire/hedonic) to functional and sustainable ones. Another critical aspect that young people consider when purchasing a product is the economic one, followed by the social one and the environmental one (Pena-Cerezo et al., 2019). This means that young people would adopt sustainable behaviours if the prices of green products were not as high as they often are. Price is one of the significant obstacles that have emerged in the literature (Sheoran and Kumar, 2022).

In this context, it thus appears that people tend to place a higher priority on utilitarian and sustainable values as they get older. Indeed, the age that characterizes cluster 1 is above 46 years old. The result obtained in our study is also reflected in another research. For example, (Apostolidis and McLeay, 2019) showed that consumers who adopt sustainable behaviours, such as consuming less meat to reduce environmental impact, are those who are over 46 years old and female.

The individuals who make up cluster 2, "Fake consumers", are individuals who rarely use existing communication tools to acquire information about purchases. This demonstrates (1) how a lack of information and education negatively affects sustainable behaviours (Eldesouky et al., 2020) (2) individuals in this cluster could fall into the category of those individuals who perceive information messages about environmental consequences as manipulative. People's resistance towards pro-environmental behaviour could arise due to the psychological distance of environmental threats (Gifford, 2011; Milton, 2010) or habit (Verplanken and Roy, 2016), rejecting all "what is perceived as a power, a pressure, an influence, or any attempt to act upon one's conduct" (Roux, D., & Izberk-Bilgin, 2018). Finally, according to (Sheoran and Kumar, 2022), consumers tend not to buy a green product because of their mindset, believing that their effort is not enough to change overall consumer behaviour.

Finally, regarding cluster 3, "Not engaged consumers", these are individuals who do not appear to be involved in environmental issues and, for that reason, state that they do not consider themselves sustainable consumers. Information asymmetry decreases consumer expertise in sustainable products. This lack of expertise correlates with low consumer empowerment, vital for long-term sustainable consumption choices (Balderjahn et al., 2020).

# Conclusion

The aim of this research was to analyze whether consumers who declare themselves environmentally aware actually adopt sustainable behaviour. Based on the 4 clusters identified in this study, only one (Cluster 1 - "sustainable consumer") comprises individuals who declare themselves attentive to environmental issues and accompany this awareness with natural, sustainable behaviour. The other clusters are instead composed either of individuals who are indifferent to environmental issues (Cluster 4 - "Not sustainable consumer") or of individuals who, despite showing a minimum of attention to sustainability, do not behave sustainably (Cluster 2 "Fake consumer") or lack involvement (Cluster 3 - " Not engaged consumer ").

From a scientific point of view, it would be appropriate to go deeper into the theme of sustainable consumer behaviour, focusing both on the socio-demographic dimensions of consumers but also on how digital tools can contribute to improving sustainable behaviour. However, the research has limitations. Primarily the sample size, the sampling method itself (not accidental probabilistic), and the national nature of the research. Future avenues of research should broaden the survey and include consumers who also live abroad. A more in-depth study of this topic could focus on communication tools and then analyze the impact of new digital tools on individuals' sustainable behaviours.

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