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Article

Do Sustainable Consumers Have Sustainable Behaviors? An Empirical Study to Understand the Purchase of Food Products

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Abstract: Sustainability and the circular economy (CE) are issues of increasing interest to governments, investors, industry, and civil society; 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 behaviors. “Sustainable consumption” is a growing global concern that will link human behavior with the planet’s future. Negligent behavior by individuals in their daily lives has a significant impact on the environment, with devastating consequences for the survival of humankind itself. However, even though sustainability issues and the circular economy have now widely involved consumers, making them seem aware of how the behavioral ran has a direct impact on the environment, the percentage of people who accompany this awareness with truly sustainable behavior and who are therefore willing to embrace the goal of “saving the planet” is small. Therefore, this study hypothesizes that from a sample of consumers with a particular interest in environmental and sustainability issues, there are subsamples of consumers who show a particular interest in adopting sustainable purchasing behavior regarding food products. Our analysis adds essential results to the existing literature by using a methodology that can improve the homogeneity of a sustainable consumer dataset to assess consumer behavior. Through cluster analysis, one of the most widely used techniques, it is possible to extract a sub-sample of consumers with conceptions on environmental and sustainability issues that may influence their awareness of buying sustainable food products. The results show the presence of four different consumer clusters, Some consumers are sustainability and environmentally aware, other consumers are indifferent to environmental issues, and finally, some consumers show minimal attention to sustainability but little involvement in activities. The study shows that attention to environmental sustainability has clear policy and managerial and scientific implications that can increase consumer awareness.

Keywords: food; consumer behavior; sustainable consumers; cluster analysis



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1. 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 [1]. Despite the strong synergy between the two constructs, business models have often addressed the two issues separately. Indeed, the relationship between sustainability and CE is unclear [2]. The concept of sustainability is older than that of CE [3]. It is based on the balanced integration of economic, environmental, and social performance, or the triple bottom line (TBL) [2]. TBL is the most used approach to describe sustainability [4] and provides a framework for measuring business

performance and organizational success using the three lines [5]. The three “spheres” [2] act “as interdependent and mutually reinforcing pillars” [6] through processes of mutual causation and positive feedback [7]. The TBL recognizes that companies add economic value but can also impact environmental and social values [8]. However, CE tends to privilege the economic and environmental dimensions, providing only implicit benefits for the social dimension [2] because CE was born as a response to an unsustainable linear production-consumption system in which resources become increasingly scarce with evident negative repercussions for economies and the environment [9]. The main objective of CE is to adapt the production-consumption system to environmental sustainability requirements [9]. Some authors believe that the concept of CE should not be linked only to the efficient use of resources and that this view does not help to promote a systems approach, thus preventing companies from considering the impacts of CE strategies from a broader sustainability perspective [10]. Many authors [11–13] believe that the transition to CE comes through overcoming environmental, social, and economic challenges, but also through sharing values with consumers and overcoming organizational barriers. 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 [14].

However, although consumers exhibit positive attitudes, they need to put these exhibited attitudes into practice by engaging in responsible behavior. In fact, despite policy pushes and initiatives, guiding consumer behavior toward sustainable consumption is a challenging task [15]. As Sheoran and Kumar [16] point out, sustainable consumer behavior when purchasing products is highly dependent on the degree of product awareness. The acquired information is crucial for consumers to adopt sustainable behavior. Lack of information is a barrier to the sale of sustainable products. However, companies and governments must take appropriate initiatives and policies aimed at reducing the impact of barriers to make consumer behavior as sustainable as possible [16].

Some authors, such as van Bussel et al. [17], have pointed out that many consumers still lack key knowledge on some other specific sustainability issues, particularly food sustainability. Furthermore, consumers find it difficult to define the concept of “sustainability” and to estimate the environmental impact of their food choices. According to studies by van Bussel et al. [17], many consumers consider price, taste, and individual health as the most influential aspects of sustainability. The same authors point out that the role of governments and policymakers could be crucial. These could communicate knowledge about sustainability in a transparent, evidence-based, and controlled manner, to guide consumers toward responsible consumption and sustainable purchasing decisions [17]. This study hypothesizes that from a sample of consumers with particular interest in environmental and sustainability issues, there are subsamples of consumers who show a particular interest in adopting sustainable purchasing behavior regarding food products.

In the current economic and social context, it seems highly relevant and urgent to consider the gap between consumers’ attitudes toward sustainable consumption and their purchasing behavior toward sustainable products. This paper provides an understanding of who the consumers who claim to be sustainable are and who adopts sustainable behavior when purchasing a food product [18,19]. The study conducted provides insight into the gender of sustainable consumers, their age, educational qualification, profession, and the communication channels used to acquire information on sustainable food products with eco-labels. Finally, it determines whether they consider themselves to be environmentally conscious consumers and, in line with what they state, whether they engage in sustainable behavior when purchasing a product. Thus, the study aims at clustering who the consumers are who buy sustainable products.

For this reason, it is important to understand, through an empirical survey, what the fundamental level of consumer awareness of sustainability issues is, with a focus on the

environmental dimension, and to analyze what the main characteristics that distinguish a truly sustainable consumer are, through his or her behavior, from a pseudo-sustainable consumer.

The hypotheses of the present research are as follows:

H1. *What are the characteristics of a genuinely sustainable consumer.*

H2. *What is the real consumer awareness of sustainability issues.*

Therefore, the article is composed as follows: in Section 2, the primary research in the literature on the topic of sustainable consumer behavior is reported; in Section 3 is the description of the methodology; in Section 4 are the main results; in Section 5, the discussion is reported; and, finally, in Section 6 the conclusions of the paper are presented.

2. Literature Review

Circular Economy and Consumers/Citizens

The transition to sustainability and CE involves several challenges in environmental and economic terms and social terms through effective management of all stakeholders in the closed system [11–13].

In this context, consumers play a crucial role in reducing the environmental impact of business processes through their choices and behaviors [17]. Other authors [16] think that the issue of “sustainable consumption” is an increasingly important global concern that will inextricably link human behavior with the planet’s future. Negligent behaviors adopted by individuals in their daily lives generate a significant impact on the environment, with devastating consequences for the survival of humankind itself [20].

Sustainability and CE issues have also involved consumers/citizens. Over the years, politicians, governments, non-profit organizations, activist groups, and green entrepreneurs have created several initiatives to encourage “environmental citizenship behavior” [21], highlighting the adverse effects on the environment resulting from linear production and consumption system. Although the concept of environmental citizenship is still debated in the literature, given its complexity in terms of constructs [22]. Others [23] define it as “pro-environmental behavior, in public and private, driven by a belief in the fairness of the distribution of environmental goods, in participation, and the co-creation of sustainability policy”. Environmental citizens are particularly sensitive to sustainability issues and, to achieve this, can take individual and collective actions to protect the environment [21]. We would therefore see a social change resulting from the different importance that consumers/citizens assign to the fundamental values of civil society, causing a general growth of the consumer towards a new figure of a citizen who is increasingly demanding and attentive and who lives in the social sphere [24].

From a sustainability-conscious consumer/citizen comes equally sustainable behavior and consumption, defined by some authors [25] as the use of goods and services that improve the quality of life and minimize adverse effects in terms of resource use, waste emissions during the life cycle of a product or, more generally, as in the sourcing of products that possess social, economic, and environmentally friendly characteristics [26]. Other authors [27], instead, think that sustainable consumer behavior is a type of behavior 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 [28].

Concern appears to be a particularly important aspect in the consumption of sustainable products [29]. Being aware of the environmental impact of products positively influences the intention to consume sustainable products [30]. Environmental concern influences consumers’ personal norms leading them to consume sustainable products out of a sense of morality [31]. The role of environmental concern is crucial in directing consumers towards sustainable consumption.

Awareness leads consumers to be more inclined towards sustainable consumption. Being aware of labels and sustainability information conditions the consumer at the time of purchase [32]. Lack of awareness may lead consumers to disregard sustainability information when purchasing a product [33].

Consumers are also led to buying sustainable products by a sense of morality. Indeed, they are morally conditioned to buy sustainable products from the local area, with identifying brands [34]. Information on morality incentivizes the consumption of sustainable products and guides consumers in their purchasing choices [35]. Environmental ethics and moral obligation are key aspects of the propensity to purchase green products [36]. Indeed, consumers are conditioned by a moral obligation to the environment and a sense of guilt not to buy sustainable products [37].

Sustainable consumer behavior is linked to product quality, which is considered an essential component in satisfying customer needs [38] and influences the motivations for choosing to purchase a product [39]. The quality of a product is assessed directly by the consumer, who makes a judgment following an evaluation of the product's expectations thus considering a range of information items, such as the brand, the services, and the labels on the product [39]. Consumers use the information to evaluate product performance and check whether it meets their demands [40], therefore, one speaks of perceived quality, which is a set of judgment events or perceptions of quality derived by consumers [41]. From a circularity perspective, some authors [42] think that the definition of sustainable consumption should be based on the 3R imperatives of "reduce, reuse, recycle" [43]. Following these imperatives, sustainable consumption implies rethinking what to buy by choosing environmentally friendly brands or choosing products using eco-friendly principles, reducing consumption by buying less but better quality. A consumer who adopts circular consumption can support the transition to a circular economy that closes material loops with fewer environmental impacts [42].

Production methods and origin, such as certificates, are also important aspects of ensuring sustainable consumption [44–47] as is trust in eco-labels [48].

Linked to this dimension are elements such as knowledge of the meaning of the terms "recycled", "eco-friendly", and "energy efficient" in agricultural products. This means that the more informed a consumer is, in the sense that he or she knows specific terminology related to the concept of sustainability, the more likely he or she is to purchase sustainable products. Focusing on promoting the use of eco-labels and consumer behavior, the authors [48] identified several items including eco-label knowledge, consumer trust, value, and environmental concern. In particular, the latter item analyzes the issue of concern expressed by consumers about the deterioration of environmental quality (such as "global warming", "organic product", "climate change", and "greenhouse gas" [49]). Such awareness, therefore, drives consumers to the use of eco-labelled products for the purpose of reducing pollution [49,50]. In addition, consumers' "brand awareness" allows them to increase trust and reduce the information asymmetry between producer and consumer [49].

In this context, product promotion and related communication are key elements in increasing information and trust, motivating consumers to purchase [45,50–54] and making more informed choices including food choices [17,55]. Elements identified for this dimension include reduced use of natural resources (water and land), pesticide use, carbon emissions from food production, deforestation, and biodiversity loss. Finally, relevant label attributes such as products made with water-saving, energy-saving and waste-reducing practices are also included [56].

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 behavior and are therefore willing to embrace the goal of "saving the planet" is small [21]. Several authors [57], think that consumer survey results on the topic of sustainability also suffer from the so-called "social desirability bias" (p. 156), i.e., a "tendency for an individual

to present him or herself, in test-taking situations, in a way that makes the person look positive, about culturally derived norms and standards” [58]. This would explain why the importance of sustainability declared by consumers/citizens does not always translate into sustainable behavior.

The main obstacles that negatively affect sustainable consumption are high prices, perceived lack of environmental impact, lack of benefit to personal image, less use by family and friends, and lack of product awareness [16,59].

As a result, both retailers and manufacturers are challenged to understand this trend of “consumers’ internal conflict” in their markets and ensure, at the same time, product delivery and expected performance, as well as identification of critical areas that would allow for an adequate response to the increased ecological consciousness of consumers. Indeed, consumer behavior is the most unstable and unpredictable supply chain and requires special attention [28].

Table 1 synthesizes the main dimensions of the sustainable consumer behavior analysis studied in the literature.

Table 1. Dimensions of sustainable consumer behavior.

Dimensions	Items	Authors
Sustainable consumption	Trust in ecological labels Production method (certified organic, Organic production, Conventional) Origin (in the state, Domestic, imported) Knowledge of the meaning of terms (recycled, eco-friendly, organic, energy-efficient)	[44–47,54]
Promoting the use of eco-labels and consumer behavior	Knowledge eco-label Ecological quality Consumer confidence Environmental value and concern (aware of the terms “global warming”, “organic product”, “climate change”, “greenhouse gas”)	[48–50]
Eco label awareness	Improve consumer awareness Reduces information asymmetry Product promotion (Newspaper, Tv, Radio, Flyers, Personal experience, Internet) Product communication Sustainability in food choice (reduced use of natural resources, use of pesticides, carbon emission from food production, deforestation, and loss of biodiversity) Label attributes (products made with water-saving, energy conservation, and waste reduction practices)	[17,49,50,54–56]

Source: our elaboration.

3. Materials and Methods

In this study, a questionnaire was prepared to investigate consumers’ behavior toward sustainable consumption. The questionnaire derives from a detailed literature review, considering the factors used in other surveys and creating questions specific for this analysis. The questionnaire is anonymous to protect data and information about consumer participants. The questions were in Italian language and analyzed the following three sections:

1. Consumer’s analysis investigates information about the consumer’s general purchasing behavior. (e.g., On a scale of 1 to 7, what factors induce you to buy eco-labelled food products?; On a scale of 1 to 7, how important do you consider the following information in the eco-label of the product you buy to be?)
2. Sustainable consumer behavior analyses information on sustainable and circular consumer purchasing (e.g., Do you consider yourself an environmentally aware con-

sumer?; Please indicate on a scale of 1 to 7 how important environmental sustainability is to you)

3. Consumer profile contains information on socio-demographic features.

The research was performed in April and May of 2021 through Google Form, an online platform used for research purpose and social media [60–62]. The use of social media allows to collect data in large scale in a short period and without costs [51]. The sample of the survey comprises consumers from all regions of Italy. Finally, 430 questionnaires were collected, and deemed suitable for analysis 410, all eligible for the analysis. 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 [51,63]. In particular, the procedure used to collect the questionnaires is the snowballing and convenience method [51]. Nearly all questions are scored using a 7-point Likert scale (“1 = strongly disagree”; “7 = strongly agree”) [64,65]. The sample analysis involves a descriptive analysis of the respondents, including age, gender, income, and qualification. Subsequently, a factor analysis and cluster analysis were carried out with the aim of classifying the consumer’s behavior according to his usual consumption. The analyses were carried out using statistic program “STATA 12 Data Analysis and Statistical Software” [65].

4. Results

4.1. Descriptive Analysis of Consumer Profile

The first part of the result includes the descriptive statistics of 410 consumers. The descriptive analysis allows to obtain information about the socio-demographic profiles of respondents [45], showed in the following Table 2.

Table 2. Socio-demographic profiles.

Items	Variable	<i>f</i>	%
Gender	Woman	267	65%
	Men	143	35%
	Total	410	100%
Age	<25 years	80	20%
	26–35 years	150	37%
	36–45 years	85	21%
	46–55 years	61	15%
	56–65 years	31	8%
	>65 years	3	1%
Total		410	100%
Level of education	Middle school license	29	7%
	Higher diploma	171	42%
	Bachelor’s degree	94	23%
	Master’s degree	95	23%
	Post degree	21	5%
Total		410	100%
Total monthly income	<800 €	106	26%
	801 €–1220 €	92	22%
	1201 €–1500 €	89	22%
	1501 €–1700 €	44	11%
	1701 €–1900 €	34	5%
	1901 €–2100 €	23	6%
	>2100 €	22	8%
Total		410	100%

Source: our elaboration on the dataset.

In the following tables, are presented the results about the importance of the sustainability theme and purchase frequencies. Table 3 shows the importance of buying sustainable products with eco-labelling. Values are expressed as an average.

Table 3. Importance of eco-labelling for consumers.

	Items	Average	f	%
Eco-labelling importance	"1 = strongly disagree"		2	0.4%
	2		2	0.4%
	3		0	0.0%
	4		20	4.9%
	5		74	18.1%
	6		127	31.0%
	"7 = strongly agree"		185	45.1%
Total		6.13	410	100%

Source: our elaboration on the dataset.

Table 4 shows the average value of knowledge of word meaning about the preferences of consumers.

Table 4. Knowledge of word meaning.

Items	Average
Recycled	6.18
Eco-compostable	5.6
Organic	5.97
Animal Welfare	4.73
Healthy product	4.77
Environmental Sustainability	6.45

Source: our elaboration on the dataset.

The following Table 5 shows the average values of the communication channel used to consumers to obtain information about sustainable aspects of products.

Table 5. Communication channels.

Items	Average
Newspapers	4.00
TV	5.22
Radio	4.30
Social Media	5.61
Personal Experience	5.70
Flyers	3.57
Environmental organizations	4.70

Source: our elaboration on the dataset.

Finally, Table 6 shows the frequency of purchase sustainable products.

Table 6. Frequency of purchasing eco-labelling products.

Items	f	%
Once a week	201	49%
Twice a week	116	28%
Three times a week	56	14%
Four or more times a week	37	9%
Total	410	100%

Source: our elaboration on the dataset.

Subsequently, Table 7 shows that all dimensions significantly influence sustainable consumer behavior. Considering the aspects regarding the “customer’s concern”, the most critical element is the “water pollution from companies” (average value of 5.98); the elements regarding the “customer’s mindshare” are affected by the “lack of attention by companies to the reuse of waste” (average value 5.95); the aspects concerning the “awareness of environmental impacts” are affected by the “environmental policies” (average value 6.33).

Table 7. Descriptive statistic of quality dimensions.

Dimensions	Items	Var.	Obs	Mean	Std. Dev	Min	Max	Alpha	KMO
Concern	Environmental deterioration	var1	410	5.83	1.52	1	7	0.96	0.94
	Water soil and air pollution	var2	410	5.98	1.50	1	7		0.93
	Lack of environmental awareness by citizens	var3	410	5.68	1.62	1	7		0.96
	Lack of environmental awareness by companies	var4	410	5.82	1.55	1	7		0.96
	Lack of environmental awareness by public institutions	var5	410	5.75	1.59	1	7		0.96
	Lack of attention by companies to the reuse of waste	var6	410	5.75	1.58	1	7		0.97
	Lack of interest in domestic waste disposal by citizens	var7	410	5.73	1.63	1	7		0.96
Mindshare	Involved in environmental issues	var8	410	4.80	1.84	1	7	0.92	0.96
	Moral responsibility to green products	var9	410	5.62	1.58	1	7		0.97
	Improve environmental quality	var10	410	5.07	1.73	1	7		0.95
	Green product purchasing	var11	410	4.78	1.74	1	7		0.95
	Environmental policies	var12	410	5.91	1.50	1	7		0.92
	Social influence on environmental issues	var13	410	5.95	1.48	1	7		0.92
Awareness	Global warming	var14	410	6.20	1.37	1	7	0.96	0.93
	Water pollution	var15	410	6.31	1.31	2	7		0.94
	Climate changes	var16	410	6.12	1.39	1	7		0.96
	Depletion of non-renewable resources	var17	410	5.82	1.58	1	7		0.97
	Ice dissolution	var18	410	6.26	1.28	1	7		0.96
	Air pollution	var19	410	6.33	1.30	2	7		0.93
	Waste disposal	var20	410	6.18	1.36	1	7		0.96
Overall								0.97	0.95

Source: our elaboration on the dataset.

The “environmental deterioration” and the “lack of environmental awareness by companies” are the only aspects that present a lower average value (Environmental deterioration average value of 4.80; Lack of environmental awareness by companies’ average value of 4.78). Furthermore, Cronbach α has been calculated, which was used to test internal consistency for all items under respective variables [66]. Other studies highlight that the Cronbach α coefficient over 0.6 is adequate for basic research [67]. This is the reason why this study shows excellent internal consistency. Test KMO (Kaiser- Meyer- Olkin) has been conducted. This test is a specific measure of sample adequacy that can take a value between 0 and 1. When it takes on a too-small value, usually less than 0.5, the variable cannot be used for factor analysis [67–69]. In this case, the KMO value is very high (0.95), and each variable could be used to develop an analysis. Thus, the sample was found appropriate to perform the factor analysis. Finally, the correlation test was used to verify whether the observed variables contained misleading redundancies or made the results insignificant.

The standard deviation (SD) is the square root of the mean squared deviations [70]. The SD takes on different values capable of affecting the homogeneity of responses (Silvestri; Aquilani). In fact, SD has greater values when it deviates from the mean value indicating less homogeneity. In this case, the SD value is greater for the variables that make up the Concern and Mindshare dimensions, so the variables are different from each other and do not homogeneously represent the dimensions analyzed. The Awareness dimension has a lower SD value, so the variables are more homogeneous and representative of the analyzed dimension [67].

4.2. Factor Analysis and Cluster Analysis

Factor analysis (FA) is used in market research, especially on surveys of consumers seeking different opinions on specific product characteristics or perceptions of behavior. In this study, FA allows the analysis of consumer behavior, acquiring helpful information for the hypothesis to be tested [63].

A factor analysis was performed to eliminate multicollinearity problems, and the criterion adopted for identifying new factors was eigenvalues > 1, showing in the following Table 8.

Table 8. Eigenvalues.

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	13.37315	11.75732	0.6687	0.6687
Factor2	1.61583	0.49197	0.0808	0.7494
Factor3	1.12386	0.51745	0.0562	0.8056
Factor4	0.60641	0.11406	0.0303	0.836
Factor5	0.49235	0.10269	0.0246	0.8606
Factor6	0.38966	0.05149	0.0195	0.8801
Factor7	0.33817	0.02775	0.0169	0.897
Factor8	0.31042	0.02791	0.0155	0.9125
Factor9	0.28251	0.03251	0.0141	0.9266
Factor10	0.25	0.02166	0.0125	0.9391
Factor11	0.22834	0.03159	0.0114	0.9505
Factor12	0.19675	0.04311	0.0098	0.9604
Factor13	0.15365	0.0234	0.0077	0.9681
Factor14	0.13024	0.00873	0.0065	0.9746
Factor15	0.12151	0.01454	0.0061	0.9806
Factor16	0.10698	0.00913	0.0053	0.986
Factor17	0.09785	0.02332	0.0049	0.9909
Factor18	0.07453	0.0153	0.0037	0.9946
Factor19	0.05924	0.01069	0.003	0.9976
Factor20	0.04855		0.0024	1

Source: our elaboration on the data set. Notes: Number of obs = 410; Retained factors = 3; Number of params = 57.

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 [71].

Table 9 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 9. Rotation orthogonal Varimax (Kaiser off).

Factor	Variance	Difference	Proposition	Cumulative
Factor1	6.19	0.73	0.31	0.31
Factor2	5.45	0.97	0.58	0.58
Factor3	4.47		0.80	0.80

Source: our elaboration on the data set.

Factor interpretation was achieved by considering the so-called saturation matrix (Table 10), 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, factor 1tor1 synthesizes the variables related to the aspects regarding the customer's awareness (regarding, for example, global warming and water pollution). Factor 2 synthesizes the variables related to customer concern attributes (regarding, for example, environmental deterioration and lack of attention by companies to the reuse of waste). Finally, factor 3 synthesizes the variables related to the customers' mindshare (being like involved in environmental issues and moral responsibility to green products).

Table 10. Saturation matrix (factor loadings).

New Variables	Items	Var.	Factor 1	Factor 2	Factor 3	Uniqueness
Awareness—FA1	Global warming	var14	0.83			0.13
	Water pollution	var15	0.81			0.11
	Climate changes	var16	0.81			0.19
	Depletion of non-renewable resources	var17	0.75			0.32
	Ice dissolution	var18	0.84			0.12
	Air pollution	var19	0.83			0.12
	Waste disposal	var20	0.75			0.22
Concern—FA2	Environmental deterioration	var1		0.73		0.15
	Water, soil, and air pollution	var2		0.75		0.15
	Lack of environmental awareness by citizens	var 3		0.75		0.17
	Lack of environment by companies	var4		0.80		0.14
	Lack of environmental awareness by public institutions	var5		0.77		0.17
	Lack of attention by companies to the reuse of waste	var6		0.79		0.16
	Lack of interest in domestic waste disposal by citizens	var7		0.73		0.23
Mindshare—FA3	Involved in environmental issues	var8			0.74	0.30
	Moral responsibility to green products	var9			0.70	0.25
	Improve environmental quality	var10			0.83	0.19
	Green product purchasing	var11			0.80	0.24
	Environmental policies	var12			0.64	0.27
	Social influence on environmental issues	var13			0.63	0.26

Source: our elaboration on the data set.

4.3. 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 [63]. For this research, Ward's hierarchical method [60,61] is used in market analysis when the identification of the consumer group is influenced by marketing actions. Ward's method uses the dendrogram to identify consumer groups using similar strategies [63]. The number of groups was determined by inspecting the dendrogram (Figure 1).

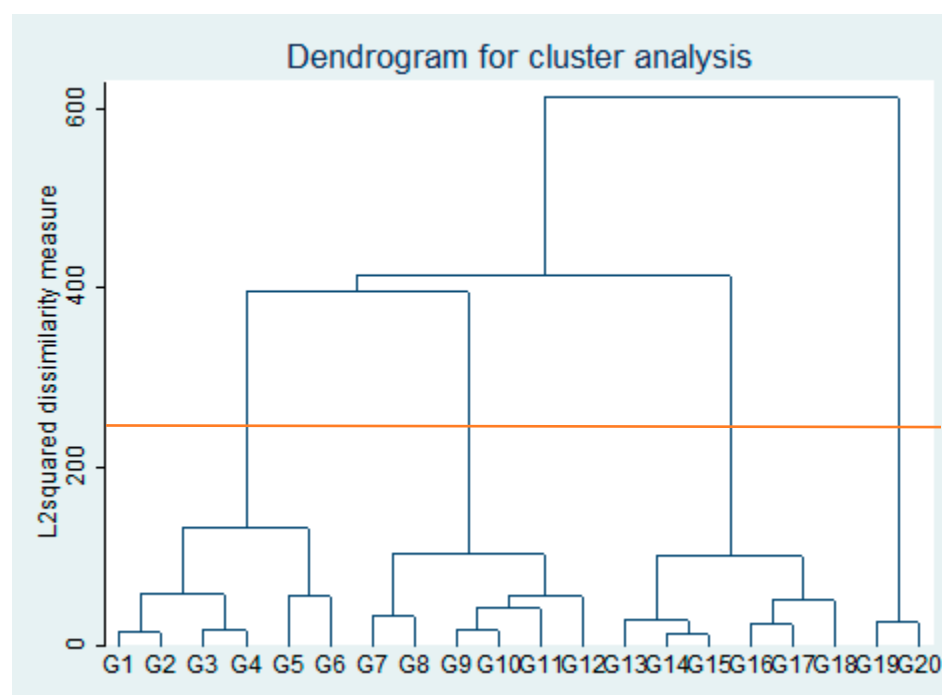


Figure 1. Dendrogram. Source: our elaboration on the data set.

Table 11 shows the socio-demographic variables of this study sample. The statistical significance of the socio-demographic variables (categorical variables) was validated through Pearson's chi-squared test [72] (see Table 11).

Table 11. Pearson Chi-square of categorical variables.

Variables	Pearson Chi-Square	Pr. > F	Sig.
Environmental sustainability importance	110.85	0.000	***
Level of importance of sustainability	39.21	0.000	***
Frequency of purchasing eco-labeled products	34.41	0.000	***
Communication channels (Newspaper)	58.17	0.000	***
Communication channels (TV)	103.67	0.000	***
Communication channels (Radio)	66.92	0.000	***
Communication channels (Social media)	148.16	0.000	***
Communication channels (Personal experience)	189.95	0.000	***
Communication channels (Flyers)	39.28	0.003	***
Communication channels (Environmental organization)	131.34	0.000	***
Gender	83.08	0.04	**
Age	17.83	0.071	**
Educational qualification	25.06	0.050	**
Job	33.57	0.072	**
Knowledge of word meaning (Recycled)	331.68	0.000	***
Knowledge of word meaning (Eco-compostable)	242.55	0.000	***
Knowledge of word meaning (Organic)	270.80	0.000	***
Knowledge of word meaning (Animal welfare)	123.30	0.000	***
Knowledge of word meaning (Healthy product)	121.70	0.000	***

Source: our elaboration on the data set. Notes: *** Significant at p -value < 0.01; ** p -value < 0.05.

Four groups were identified using the information derived from the Calinski/Harabasz indicator (Table 12) and the dendrogram analysis. The number of clusters to be considered can be defined through the Calinski and Harabasz indicator and the dendrogram [57]. 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 12. Calinski/Harabasz pseudo-F.

Number of Clusters	Calinski/Harabasz Pseudo-F
2	136.06
3	146.68
4	187.04
5	175.1
6	167.98
7	169.16

Source: our elaboration on the data set.

Table 13 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 13. 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	1.77×10^{-9}	3.28×10^{-9}	-2.66×10^{-9}

Source: our elaboration on the data set.

To validate the segmentation into four clusters, confirmatory analysis (Table 14) was performed.

Table 14. Analysis of Variance—Confirmatory analysis.

Analysis of Variance		
Factor	F	Prob > F
FA1	194.96	0.000
FA2	207.54	0.000
FA3	162.02	0.000

Source: our elaboration on the data set.

Notes: Results of Analysis of Variance show which the four-cluster subdivision significantly differentiates the average values of the individual groups (average values calculated on a case-by-factor basis) over the average total value. In this sense it can be stated that the 4-cluster subdivision has been effective in discriminating statistical units. Table 15 summarizes the socio-behavioral characteristics of four clusters.

Table 15. Clusters' characteristics.

Cluster	Gender	Age	Job	Educational Qualification	Frequency of Purchasing Eco-Labelled Products	Communication Channels	Environmental Sustainability Importance	Environment Attention	Knowledge of Word Meaning
Cluster 1—"Sustainable consumer"—50%	F	>46	Office workers or homemakers	University graduates	4 or more times a week	Newspapers (score 7); TV (score 5–7); Radio (score 5–7); Social media (score 7); Personal experience (score 7); Flyers (score 4–7); Environmental organizations (score 5–7)	High (score 7)	Yes	Recycled (score 7); Eco-compostable (score 7); Organic (score 7); Animal welfare (score 7); Healthy product (score 7)
Cluster 2—"Fake consumer"—17.32%	M	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 (score 1.5); TV (score 5–6); Radio (score 1–4, 6); Social media (score 5–6); Personal experience (score 4–6); Flyers (score 2–5); Environmental organizations (score 1.4–6)	Medium (score 4–6)	No	Recycled (score 6); Eco-compostable (score 5); Organic (score 5–6); Animal welfare (score 1.6); Healthy product (score 1.6)
Cluster 3—"Not engaged consumer"—22%	M	<25/36–45	Unemployed	High school diploma	Once a week	Newspapers (score 4.6); TV (score 7); Radio (score 5); Social media (score 7); Personal experience (score 4–5); Flyers (score 1); Environmental organizations (score 3–5)	Medium—High (score 5–6)	No	Recycled (score 6); Eco-compostable (score 6); Organic (score 5–6); Animal welfare (score 1); Healthy product (score 1.6)
Cluster 4—"Not sustainable consumer"—10.24%	M	<25 46–55	Office workers, homemakers, and retired	High school diploma	Once a week	Newspapers (score 1–3); TV (score 1–4); Radio (score 1–3); Social media (score 1–4); Personal experience (score 1–4); Flyers (score 1–3); Environmental organizations (score 1–3)	Low (score 1–5)	No	Recycled (score 1–4); Eco-compostable (score 1–3); Organic (score 1–4); Animal welfare (score 1–3); Healthy product (score 1–3)

Source: our elaboration.

5. Discussion

The analysis developed in this research shows significant findings regarding sustainable consumer behavior. The study aims to understand whether consumers who claim to be attentive to sustainability adopt sustainable behaviors. The study aims to answer the following hypothesis:

H1. *What are the characteristics of a genuinely sustainable consumer.*

H2. *What is the real consumer awareness of sustainability issues.*

H1. *What are the characteristics of a genuinely sustainable consumer.*

The results regarding H1 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 behaviors. 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. More 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 [55].

Additionally, consumers are unwilling to pay for the type of products they are least aware of and have never seen any advertising [26]. 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 [47,73–75], becoming a significant barrier to sustainable consumer behavior.

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 [67]. 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 some authors [16] related to friends and family not using sustainable products. According to some authors [76], negative experiences 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 behavior [77–80].

Cluster 1 predominantly comprises women, highlighting that the female gender is more sustainable than the male gender. Previous studies focusing on sustainable consumer behavior 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 [81]. Thus, women tend to be more forthcoming than men when adopting a sustainable behavior. Therefore, women are more concerned about social and environmental issues and report more socially and environmentally friendly purchasing behaviors [81].

However, the female gender is also present in cluster 4, “Not sustainable consumer”, which is entirely antithetical to cluster 1, “Sustainable consumer”. Cluster 4 comprises individuals who do not pay any attention to environmental issues and assume unsustainable behaviors. They are mainly young people under 25 years of age. According to some authors [82–84], young people tend to pay more attention to a product’s aesthetic aspects (attributes based on desire/hedonic) than 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 [85]. This means that young people would adopt sustainable behaviors 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 [16].

In this context, it thus appears that people tend to place a higher priority on utilitarian and sustainable values as they grow 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, [46] showed that consumers who adopt sustainable behaviors, 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”, while showing a good level of awareness about environmental issues and their consequences, do not seem to accompany this knowledge with a natural sustainable, or circular behavior. This result is exciting because it describes a situation widely discussed in the literature. Despite an apparent evolution of the consumer/citizen into an individual aware of the adverse effects caused by unsustainable human activities, few individuals are willing to embrace the goal of “saving the planet” [21]. Individuals in cluster 2 are also 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 behaviors [55] (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 behavior could arise due to the psychological distance of environmental threats [86,87] or habit [88], rejecting all “what is perceived as a power, a pressure, an influence, or any attempt to act upon one’s conduct” [89]. Finally, some authors [16] underline that consumers tend not to buy a green product because of their mindset, believing that their effort is not enough to change overall consumer behavior.

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. The lack of involvement could be linked to this group’s lack of trust in the producers of goods. To build trust among consumers, retailers of sustainable products must seek to communicate sustainability attributes credibly and transparently [90]. The lack of these two aspects generates information asymmetries typically found among sustainable products, given the difficulty of verifying their sustainability attributes [91]. Information asymmetry decreases consumer expertise in sustainable products. This lack of expertise correlates with low consumer empowerment, vital for long-term sustainable consumption choices [92].

H2. What is the real consumer awareness of sustainability issues

The second hypothesis aims to understand what consumers’ actual awareness of sustainability issues is.

The analysis showed that the level of awareness related to consumer knowledge and information. Cluster 1, “Sustainable consumer”, consists of individuals who seek and gather information on the topic of sustainability used all communication channels available to them. In contrast, individuals in Cluster 2, “Fake consumers”, rarely use communication tools to inform themselves about the level of environmental impact of the products they purchase. The lack of information thus generates an asymmetry that reduces consumers’ expertise on sustainable products. This lack of expertise correlates with poor consumer empowerment, which is vital for long-term sustainable consumption choices [92]. Therefore, education, training and adequate information seem to be the main tools to bridge the gap between awareness and behavior. Education provides long-term social benefits as it encourages public awareness [93] to establish consumer sovereignty and intelligently influence the supply of goods in the market [94,95]. In fact, as the results of our clusters show, cluster 1 is very sustainability-conscious and is the only one in which the respondents are familiar with words concerning sustainability. In cluster 1 they also know specific words such as “animal welfare” and “healthy product”.

This result again highlights the key role of consumer education and training [96]. Pack [97] stated in fact that “the educational level is seen as the strongest determinant because education is a precondition for the understanding of health and environmental-related information” (p. 28). The level of education contributes to making consumers more

aware of sustainability issues. It is no coincidence that Cluster 1 consists of individuals with the highest educational qualification (master's degree) in contrast to individuals in Cluster 2 and Cluster 3. Indeed, consumers with a higher level of education tend to purchase more sustainable products that contribute to the protection of the environment [98]. The purchase of products made for the total well-being of the entire environmental system is crucial for the purchase decision of consumers, who may decide not to buy a food product made without respecting certain rights, including those of animals [96]. Haider et al. [99], show that consumers are particularly interested in buying animal-friendly food because, globally, around 30% of current biodiversity loss and 15% of greenhouse gas emissions are linked to animal husbandry. More and more consumers say that aspects such as environmental protection and animal welfare are important when it comes to consuming food. Animal welfare was the most frequently selected response option [99].

However, just as in our study on Cluster 2 "Fake consumer", environmental sustainability is a reasonably important element for consumers, even if they state that they are not environmentally aware and do not care about the environmental consequences of unsustainable behavior. This non-sustainable behavior occurs even though the individuals in cluster 2 have a medium-high level of education (Bachelor's degree). Even though they are educated consumers, they do not show significant involvement in sustainability issues. Similar situation to the study conducted by Haider et al. [99] which shows that a part of the consumers interviewed, although affirming that aspects such as environmental protection and animal welfare are important when it comes to food consumption, would nevertheless be unwilling to reduce meat consumption because of animal suffering.

Another critical dimension is consumer involvement which contributes to increased awareness. Cluster 3, "Not engaged consumers" consists of individuals who do not have sustainable behaviors because they are not sufficiently involved in environmental issues. Thus, consumer involvement in environmental issues and perceived consumer effectiveness are the main drivers of strengthening the attitude-behavior link [100]. Increasing consumer/citizen awareness and providing incentives to strengthen individual responsibility through education, marketing and promotion should facilitate behavioral change. Thus, it should improve communication of product quality attributes and create greater transparency and trust through reliable certificates and labels [28]. A study showed that adequate education and information on the environmental impact of different light sources installed in residential settlements led citizens/consumers to choose the most sustainable option at the expense of price [94]. Therefore, education, training, and adequate information seem to be the main tools for bridging the gap between awareness and behavior. Education offers long-term social benefits as it encourages public awareness [93] to establish consumer sovereignty and intelligently influence the supply of goods in the market [94,95].

In this context, companies could play a special role by adopting a stricter self-responsibility in the sense of corporate social responsibility and offering an assortment of sustainable products, with a socially and environmentally compatible life cycle (supply chain) from raw material to waste disposal and recycling. This process could be supported by organizational and technological innovations and appropriate communication strategies [28].

Joint efforts and shared responsibility of consumers, businesses, (interdisciplinary) researchers, mass media, and policymakers are thus vital ingredients to ensure sustainable and circular development supported by equally sustainable and circular behavior and consumption.

6. Conclusions

The hypothesis of this research was to analyze consumer behavior by trying to identify environmental and sustainability issues that may influence their awareness towards sustainable behavior when purchasing a food product [18,19]

The aim of this research was to analyze whether consumers who declare themselves environmentally aware adopt sustainable behavior. 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 behavior. 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”).

The analysis shows that gender and age are the most significant variables, highlighting how women are more responsible for adopting sustainable behaviors, unlike young men. Communication tools also play an essential role in the characterization of clusters. Individuals with sustainable behaviors are also those with a higher level of education and use all communication channels at their disposal to retrieve information about the products they intend to purchase. In contrast, non-sustainable clusters pay little attention to communication channels.

From a managerial point of view, the results, therefore, highlight the need to invest more in communication channels and, to reach young people, exploit digital innovation, adopting simple but transparent languages and tools. The other barrier is IT asymmetry, which can only be broken down by formulating transparent and credible messages. Only in this way is it possible to create trust among consumers.

From a scientific point of view, it would be appropriate to go deeper into the theme of sustainable consumer behavior, focusing both on the socio-demographic dimensions of consumers but also on how digital tools can contribute to improving sustainable behavior.

From a strategic and policy perspective, the government can implement policies that sensitize and educate consumers about buying sustainable food products. Governments can carry out communication campaigns highlighting environmental benefits, through advertisements, newspaper articles, or documentaries, by doing so, governments can show the benefits of buying and using sustainable food products, trying to influence the purchasing choice of undecided consumers.

However, the research has limitations. Primarily the sample size, the sampling method itself (not accidentally 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 behaviors.

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References

1. Pieroni, M.P.P.; McAloone, T.C.; Pigosso, D.C.A. Business model innovation for circular economy and sustainability: A review of approaches. *J. Clean. Prod.* **2019**, *215*, 198–216. [CrossRef]
2. Geissdoerfer, M.; Savaget, P.; Bocken, N.M.P.; Hultink, E.J. The Circular Economy—A new sustainability paradigm? *J. Clean Prod.* **2017**, *143*, 757–768. [CrossRef]
3. Nikolaou, I.E.; Tsagarakis, K.P. An introduction to circular economy and sustainability: Some existing lessons and future directions. *Sustain. Prod. Consum.* **2021**, *28*, 600–609. [CrossRef]
4. Correia, M.S. Sustainability: An overview of the Triple Bottom Line and sustainability implementation. *Int. J. Strateg. Eng. (IJoSE)* **2019**, *2*, 29–38. [CrossRef]
5. Alhaddi, H. Triple Bottom Line and Sustainability: A Literature Review. *Bus. Manag. Stud.* **2015**, *1*, 6. [CrossRef]
6. UN. General Assembly. 2nd Committee. Follow-Up to and Implementation of the Outcome of the International Conference on Financing for Development: Report of the 2nd Committee: General Assembly, 60th Session. 2005. Available online: <https://digitallibrary.un.org/record/563815> (accessed on 15 November 2022).
7. McKelvey, B. Managing Coevolutionary Dynamics. 18th EGOS Colloquium, No. 4–6 July 2002; pp. 1–20. Available online: https://elearning.uolohcampus.com/bbcswebdav/institution/UKL1/DBA/201420_30/KDBA_305/readings/KDBA_305_Week03_McKelvey.pdf (accessed on 15 November 2022).

8. Lee, K.M. So What is the ‘Triple Bottom Line’? *Int. J. Divers. Organ. Communities Nations Annu. Rev.* **2007**, *6*, 67–72. [\[CrossRef\]](#)
9. Suárez-Eiroa, B.; Fernández, E.; Méndez-Martínez, G.; Soto-Oñate, D. Operational principles of circular economy for sustainable development: Linking theory and practice. *J. Clean. Prod.* **2019**, *214*, 952–961. [\[CrossRef\]](#)
10. Webster, K. What Might We Say about a Circular Economy? Some Temptations to Avoid if Possible. *World Futures* **2013**, *69*, 542–554. [\[CrossRef\]](#)
11. Opferkuch, K.; Caeiro, S.; Salomone, R.; Ramos, T.B. Circular economy in corporate sustainability reporting: A review of organisational approaches. *Bus Strategy Environ.* **2021**, *30*, 4015–4036. [\[CrossRef\]](#)
12. Ritzén, S.; Sandström, G.Ö. Barriers to the Circular Economy—Integration of Perspectives and Domains. *Procedia CIRP* **2017**, *64*, 7–12. [\[CrossRef\]](#)
13. Stewart, R.; Niero, M. Circular economy in corporate sustainability strategies: A review of corporate sustainability reports in the fast-moving consumer goods sector. *Bus Strategy Environ.* **2018**, *27*, 1005–1022. [\[CrossRef\]](#)
14. Purcărea, T.; Ioan-Franc, V.; Ionescu, Ș.A.; Purcărea, I.M.; Purcărea, V.L.; Purcărea, I.; Mateescu-Soare, M.C.; Platon, O.E.; Orzan, A.O. Major Shifts in Sustainable Consumer Behavior in Romania and Retailers’ Priorities in Agilely Adapting to It. *Sustainability* **2022**, *14*, 1627. [\[CrossRef\]](#)
15. Francis, A.; Sarangi, G.K. Sustainable consumer behaviour of Indian millennials: Some evidence. *Curr. Res. Environ. Sustain.* **2022**, *4*, 100109. [\[CrossRef\]](#)
16. Sheoran, M.; Kumar, D. Benchmarking the barriers of sustainable consumer behaviour. *Soc. Responsib. J.* **2022**, *18*, 19–42. [\[CrossRef\]](#)
17. van Bussel, L.M.; Kuijsten, A.; Mars, M.; van’t Veer, P. Consumers’ perceptions on food-related sustainability: A systematic review. *J. Clean. Prod.* **2022**, *341*, 130904. [\[CrossRef\]](#)
18. Seong, J.; de Souza, S.V.; Peterson, H.C. Seeds of Industry Sustainability: Consumer Attitudes towards Indoor Agriculture Benefits versus Its Advanced Technology. *Sustainability* **2023**, *15*, 2369. [\[CrossRef\]](#)
19. Kim, D.H.; Irakoze, A. Identifying Market Segment for the Assessment of a Price Premium for Green Certified Housing: A Cluster Analysis Approach. *Sustainability* **2023**, *15*, 507. [\[CrossRef\]](#)
20. Kostadinova, E. Sustainable Consumer Behavior: Literature Overview. *Econ. Altern.* **2016**, *1*, 224–234. Available online: <http://eds.a.ebscohost.com/eds/pdfviewer/pdfviewer?vid=12&sid=aa25746c-d74f-427f-9cc4-f45d3f43f224%40sessionmgr4007> (accessed on 19 November 2022).
21. D’Arco, M.; Marino, V. Environmental citizenship behavior and sustainability apps: An empirical investigation. *Transform. Gov. People Process Policy* **2022**, *16*, 185–202. [\[CrossRef\]](#)
22. Mueller, M.P.; Pontius, J.B.; Mueller, M.P.; Greenwood, D. *Environmental Discourses in Science Education*; Springer: Berlin/Heidelberg, Germany, 2020; Volume 4. Available online: <http://www.springer.com/series/11800> (accessed on 26 November 2022).
23. Dobson, K.S.; Dozois, D.J.A. Historical and philosophical bases of the cognitive-behavioral therapies. In *Handbook of Cognitive-Behavioral Therapies*, 3rd ed.; Guilford Press: New York, NY, USA, 2010; pp. 3–38.
24. Mirandola, R.; Bonechi, L.; Carmignani, G. *La Gestione Della Qualità Nelle Organizzazioni-Dalla Conformità All’eccellenza Gestionale*; Plus-Università di Pisa: Pisa, Italy, 2004.
25. Kilbourne, W.; McDonagh, P.; Prothero, A. Sustainable consumption and the quality of life: A macromarketing challenge to the dominant social paradigm. *J. Macromarketing* **1997**, *17*, 4–24. [\[CrossRef\]](#)
26. de Pelsmacker, P.; Driesen, L.; Rayp, G. Do consumers Care about ethics? Willingness to pay for fair-trade coffee. *J. Consum. Aff.* **2005**, *39*, 363–385. [\[CrossRef\]](#)
27. Leary, R.B.; Vann, R.J.; Mittelstaedt, J.D.; Murphy, P.E.; Sherry, J.F. Changing the marketplace one behavior at a time: Perceived marketplace influence and sustainable consumption. *J. Bus. Res.* **2014**, *67*, 1953–1958. [\[CrossRef\]](#)
28. Terlau, W.; Hirsch, D. Sustainable Consumption and the Attitude-Behaviour-Gap Phenomenon—Causes and Measurements towards a Sustainable Development. *Int. J. Food Syst. Dyn.* **2015**, *6*, 159–174. [\[CrossRef\]](#)
29. Yadav, R.; Pathak, G.S. Determinants of Consumers’ Green Purchase Behavior in a Developing Nation: Applying and Extending the Theory of Planned Behavior. *Ecol. Econ.* **2017**, *134*, 114–122. [\[CrossRef\]](#)
30. Al Mamun, A.; Nawli, N.C.; Hayat, N.; Zainol, N.R.B. Predicting the purchase intention and behaviour towards green skincare products among Malaysian consumers. *Sustainability* **2020**, *12*, 10663. [\[CrossRef\]](#)
31. Song, J.; Cai, L.; Yuen, K.F.; Wang, X. Exploring consumers’ usage intention of reusable express packaging: An extended norm activation model. *J. Retail. Consum. Serv.* **2023**, *72*, 103265. [\[CrossRef\]](#)
32. Siraj, A.; Taneja, S.; Zhu, Y.; Jiang, H.; Luthra, S.; Kumar, A. Hey, did you see that label? It’s sustainable! Understanding the role of sustainable labelling in shaping sustainable purchase behaviour for sustainable development. *Bus Strategy Environ.* **2022**, *31*, 2820–2838. [\[CrossRef\]](#)
33. Aprile, M.C.; Punzo, G. How environmental sustainability labels affect food choices: Assessing consumer preferences in southern Italy. *J. Clean Prod.* **2022**, *332*, 130046. [\[CrossRef\]](#)
34. Dangelico, R.M.; Schiaroli, V.; Fraccascia, L. Is COVID-19 changing sustainable consumer behavior? A survey of Italian consumers. *Sustain. Dev.* **2022**, *30*, 1477–1496. [\[CrossRef\]](#)
35. Chang, M.Y.; Chen, H.S. Consumer Attitudes and Purchase Intentions in Relation to Animal Welfare-Friendly Products: Evidence from Taiwan. *Nutrients* **2022**, *14*, 4571. [\[CrossRef\]](#)

36. Akhtar, R.; Sultana, S.; Masud, M.M.; Jafrin, N.; Al-Mamun, A. Consumers' environmental ethics, willingness, and green consumerism between lower and higher income groups. *Resour. Conserv. Recycl.* **2021**, *168*, 105274. [\[CrossRef\]](#)
37. Hojnik, J.; Ruzzier, M.; Ruzzier, M.K. Transition towards sustainability: Adoption of eco-products among consumers. *Sustainability* **2019**, *11*, 4308. [\[CrossRef\]](#)
38. Malekpour, M.; Yazdani, M.; Rezvani, H. Investigating the relationship between intrinsic and extrinsic product attributes with customer satisfaction: Implications for food products. *Br. Food J.* **2022**, *124*, 7. [\[CrossRef\]](#)
39. Szybillo, G.J.; Jacoby, J. Effects of different levels of integration on advertising preference and intention to purchase. *J. Appl. Psychol.* **1974**, *59*, 274–280. [\[CrossRef\]](#)
40. Brečić, R.; Ćorić, D.S.; Lučić, A.; Gorton, M.; Filipović, J. Local food sales and point of sale priming: Evidence from a supermarket field experiment. *Eur. J. Mark.* **2021**, *55*, 41–62. [\[CrossRef\]](#)
41. Espejel, J.; Fandos, C.; Flavián, C. The role of intrinsic and extrinsic quality attributes on consumer behaviour for traditional food products. *Manag. Serv. Qual.* **2007**, *17*, 681–701. [\[CrossRef\]](#)
42. Soyer, M.; Dittrich, K. Sustainable consumer behavior in purchasing, using and disposing of clothes. *Sustainability* **2021**, *13*, 8333. [\[CrossRef\]](#)
43. Reike, D.; Vermeulen, W.J.V.; Witjes, S. The circular economy: New or Refurbished as CE 3.0?—Exploring Controversies in the Conceptualization of the Circular Economy through a Focus on History and Resource Value Retention Options. *Resour. Conserv. Recycl.* **2018**, *135*, 246–264. [\[CrossRef\]](#)
44. Neumayr, L.; Moosauer, C. How to induce sales of sustainable and organic food: The case of a traffic light eco-label in online grocery shopping. *J. Clean Prod.* **2021**, *328*, 129584. [\[CrossRef\]](#)
45. Nekmahmud, M.; Fekete-Farkas, M. Why not green marketing? Determinates of consumers' intention to green purchase decision in a new developing nation. *Sustainability* **2020**, *12*, 7880. [\[CrossRef\]](#)
46. Apostolidis, C.; McLeay, F. To meat or not to meat? Comparing empowered meat consumers' and anti-consumers' preferences for sustainability labels. *Food Qual. Prefer.* **2019**, *77*, 109–122. [\[CrossRef\]](#)
47. Wheale, P.; Hinton, D. Ethical consumers in search of markets. *Bus. Strategy Environ.* **2007**, *16*, 302–315. [\[CrossRef\]](#)
48. Nguyen, H.T.; Le, H.T. The effect of agricultural product eco-labelling on green purchase intention. *Manag. Sci. Lett.* **2020**, *10*, 2813–2820. [\[CrossRef\]](#)
49. Thøgersen, J.; Haugaard, P.; Olesen, A. Consumer responses to ecolabels. *Eur. J. Mark.* **2010**, *44*, 1787–1810. [\[CrossRef\]](#)
50. Cerri, J.; Testa, F.; Rizzi, F. The more I care, the less I will listen to you: How information, environmental concern and ethical production influence consumers' attitudes and the purchasing of sustainable products. *J. Clean Prod.* **2018**, *175*, 343–353. [\[CrossRef\]](#)
51. Theodoridis, P.K.; Zacharatos, T. Food waste during Covid-19 lockdown period and consumer behaviour—The case of Greece. *Socioecon. Plann. Sci.* **2022**, *83*, 101338. [\[CrossRef\]](#)
52. Silvestri, C.; Aquilani, B.; Piccarozzi, M.; Ruggieri, A. Consumer Quality Perception in Traditional Food: Parmigiano Reggiano Cheese. *J. Int. Food Agribus. Mark.* **2020**, *32*, 141–167. [\[CrossRef\]](#)
53. Jad'ud'ová, J.; Badida, M.; Badidová, A.; Marková, I.; Ľahúňová, M.; Hroncová, E. Consumer behavior towards regional eco-labels in Slovakia. *Sustainability* **2020**, *12*, 5146. [\[CrossRef\]](#)
54. Nguyen, T.P.; Dekhili, S. Sustainable development in Vietnam: An examination of consumers' perceptions of green products. *Bus. Strategy Dev.* **2019**, *2*, 127–136. [\[CrossRef\]](#)
55. Eldesouky, A.; Mesias, F.J.; Escibano, M. Perception of Spanish consumers towards environmentally friendly labelling in food. *Int. J. Consum. Stud.* **2020**, *44*, 64–76. [\[CrossRef\]](#)
56. Staples, A.J.; Reeling, C.J.; Widmar, N.J.O.; Lusk, J.L. Consumer willingness to pay for sustainability attributes in beer: A choice experiment using eco-labels. *Agribusiness* **2020**, *36*, 591–612. [\[CrossRef\]](#)
57. Gerdt, S.O.; Wagner, E.; Schewe, G. The relationship between sustainability and customer satisfaction in hospitality: An explorative investigation using eWOM as a data source. *Tour. Manag.* **2019**, *74*, 155–172. [\[CrossRef\]](#)
58. Ganster, D.C.; Hennessey, H.W.; Luthans, F. Social Desirability Response Effects: Three Alternative Models. *Acad. Manag. J.* **1983**, *26*, 321–331. [\[CrossRef\]](#)
59. Harris, F.; Roby, H.; Dibb, S. Sustainable clothing: Challenges, barriers and interventions for encouraging more sustainable consumer behaviour. *Int. J. Consum. Stud.* **2016**, *40*, 309–318. [\[CrossRef\]](#)
60. Brito, K.D.S.; Filho, R.L.C.S.; Adeodato, P.J.L. A Systematic Review of Predicting Elections Based on Social Media Data: Research Challenges and Future Directions. *IEEE Trans. Comput. Soc. Syst.* **2021**, *8*, 819–843. [\[CrossRef\]](#)
61. Majeed, M.; Asare, C.; Fatawu, A.; Abubakari, A. An analysis of the effects of customer satisfaction and engagement on social media on repurchase intention in the hospitality industry. *Cogent Bus. Manag.* **2022**, *9*, 2028331. [\[CrossRef\]](#)
62. Sarfraz, M.; Hamid, S.; Rawstorne, P.; Ali, M.; Jayasuriya, R. Role of social network in decision making for increasing uptake and continuing use of long acting reversible (LARC) methods in Pakistan. *Reprod. Health* **2021**, *18*, 96. [\[CrossRef\]](#)
63. Bracalente, B.; Cossignani, M.; Mulas, A. *Statistica Aziendale*; McGraw-Hill: Milan, Italy, 2009.
64. Chirilli, C.; Molino, M.; Torri, L. Consumers' Awareness, Behavior and Expectations for Food Packaging Environmental Sustainability: Influence of Socio-Demographic Characteristics. *Foods* **2022**, *11*, 2388. [\[CrossRef\]](#)
65. Silvestri, C.; Aquilani, B.; Piccarozzi, M.; Ruggieri, A. Beef traditional food: Consumer before purchase preferences based on quality. *Ital. J. Food Sci.* **2020**, *32*, 16–44. [\[CrossRef\]](#)

66. Mubiru, K. Optimality of Supermarket Inventory Policies Under Stochastic Demand in Uganda: A Case Study of Milk Powder Product. In Proceeding of the Eighth Operations Research Society for Eastern Africa (Orsea) International Conference the Role of Operations Research, Dublin, Ireland, 23–26 June 2019.
67. Hair, E.; Halle, T.; Terry-Humen, E.; Lavelle, B.; Calkins, J. Children's school readiness in the ECLS-K: Predictions to academic, health, and social outcomes in first grade. *Early Child. Res. Q.* **2006**, *21*, 431–454. [\[CrossRef\]](#)
68. Kaiser, H.F. An index of factorial simplicity. *Psychometrika* **1974**, *39*, 31–36. [\[CrossRef\]](#)
69. Santouridis, I.; Trivellas, P. Investigating the impact of service quality and customer satisfaction on customer loyalty in mobile telephony in Greece. *TQM J.* **2010**, *22*, 330–343. [\[CrossRef\]](#)
70. Brown, G.W. Standard deviation, standard error: Which 'standard' should we use? *Am. J. Dis. Child.* **1982**, *136*, 937–941. [\[CrossRef\]](#)
71. Kaiser, H.F. The varimax criterion for analytic rotation in factor analysis. *Psychometrika* **1958**, *23*, 187–200. [\[CrossRef\]](#)
72. Adanacioglu, H.; Albayram, Z. A conjoint analysis of consumer preferences for traditional cheeses in Turkey: A case study on tulum cheese. *Korean J. Food Sci. Anim. Resour.* **2012**, *32*, 458–466. [\[CrossRef\]](#)
73. Annunziata, A.; Mariani, A. Consumer Perception of Sustainability Attributes in Organic and Local Food. *Recent Pat. Food Nutr. Agric.* **2018**, *9*, 87–96. [\[CrossRef\]](#) [\[PubMed\]](#)
74. Biel, A.; Dahlstrand, U.; Grankvist, G. Habitual and Value-guided Purchase Behavior. *AMBIO A J. Hum. Environ.* **2005**, *34*, 360–365. [\[CrossRef\]](#)
75. Cavender, R.C. Exploring the Influence of Sustainability Knowledge and Orientation to Slow Consumption on Fashion Leaders' Drivers of Fast Fashion Avoidance. *Am. J. Theor. Appl. Bus.* **2018**, *4*, 90. [\[CrossRef\]](#)
76. Öberseder, M.; Schlegelmilch, B.B.; Gruber, V. 'Why Don't Consumers Care About CSR?': A Qualitative Study Exploring the Role of CSR in Consumption Decisions. *J. Bus. Ethics* **2011**, *104*, 449–460. [\[CrossRef\]](#)
77. Jegethesan, K.; Sneddon, J.N.; Soutar, G.N. Young Australian consumers' preferences for fashion apparel attributes. *J. Fash. Mark. Manag. Int. J.* **2012**, *16*, 275–289. [\[CrossRef\]](#)
78. Rahman, O.; Koszewska, M. A study of consumer choice between sustainable and non-sustainable apparel cues in Poland. *J. Fash. Mark. Manag.* **2020**, *24*, 213–234. [\[CrossRef\]](#)
79. Seock, Y.-K.; Bailey, L.R. The influence of college students' shopping orientations and gender differences on online information searches and purchase behaviours. *Int. J. Consum. Stud.* **2008**, *32*, 113–121. [\[CrossRef\]](#)
80. Zelezny, L.C.; Chua, P.-P.; Aldrich, C. New Ways of Thinking about Environmentalism: Elaborating on Gender Differences in Environmentalism. *J. Soc. Issues* **2000**, *56*, 443–457. [\[CrossRef\]](#)
81. Luchs, M.G.; Mooradian, T.A. Sex, Personality, and Sustainable Consumer Behaviour: Elucidating the Gender Effect. *J. Consum. Policy* **2012**, *35*, 127–144. [\[CrossRef\]](#)
82. Rahman, A.A.; Islam, S.; Kalloniatis, C.; Gritzalis, S. A Risk Management Approach for a Sustainable Cloud Migration. *J. Risk Financ. Manag.* **2017**, *10*, 20. [\[CrossRef\]](#)
83. Chang, H.; Zhang, L.; Xie, G.-X. Message framing in green advertising: The effect of construal level and consumer environmental concern. *Int. J. Advert.* **2015**, *34*, 158–176. [\[CrossRef\]](#)
84. Godard, O.; Henry, C.; Lagadec, P.; Michel-Kerjan, E. *Traité des Nouveaux Risques*; Gallimard: Paris, France, 2002; p. 620.
85. Pena-Cerezo, M.A.; Artaraz-Minon, M.; Tejedor-Nunez, J. Analysis of the consciousness of university undergraduates for sustainable consumption. *Sustainability* **2019**, *11*, 4597. [\[CrossRef\]](#)
86. Gifford, R. The dragons of inaction: Psychological barriers that limit climate change mitigation and adaptation. *Am. Psychol.* **2011**, *66*, 290–302. [\[CrossRef\]](#)
87. Milton, N. *The Lessons Learned Handbook: Practical Approaches to Learning from Experience*; Elsevier: Amsterdam, The Netherlands, 2010.
88. Verplanken, B.; Roy, D. Empowering interventions to promote sustainable lifestyles: Testing the habit discontinuity hypothesis in a field experiment. *J. Environ. Psychol.* **2016**, *45*, 127–134. [\[CrossRef\]](#)
89. Champagne-Ardenne, R. Consumer resistance and power relationships in the marketplace. *Consum. Cult. Theory* **2018**, *295*, 5017879.
90. Chen, Y.; Chang, C. Enhance green purchase intentions. *Manag. Decis.* **2012**, *50*, 502–520. [\[CrossRef\]](#)
91. Heintz, L.T.; Baatz, A.; Beckmann, M.; Wehnert, P. Investigating sustainable NGO–firm partnerships: An experimental study of consumer perception of Co-branded products. *Sustainability* **2021**, *13*, 12761. [\[CrossRef\]](#)
92. Balderjahn, I.; Lee, M.S.W.; Seegebarth, B.; Peyer, M. A Sustainable Pathway to Consumer Wellbeing. The Role of Anticonsumption and Consumer Empowerment. *J. Consum. Aff.* **2020**, *54*, 456–488. [\[CrossRef\]](#)
93. Knapp, J. THE BENEFITS OF CONSUMER EDUCATION. *Adv. Consum. Interest* **1990**, *2*, 26–29. Available online: <http://www.jstor.org/stable/23862373> (accessed on 19 November 2022).
94. Stall-Meadows, C.; Hebert, P.R. The sustainable consumer: An in situ study of residential lighting alternatives as influenced by infield education. *Int. J. Consum. Stud.* **2011**, *35*, 164–170. [\[CrossRef\]](#)
95. Ferguson, A.R.; Breslow, M.I.; Buchanan, S. *Potential Economic Benefits of Consumer Education*; The Public Interest Economics Center: Washington, DC, USA, 1977.
96. Wongprawmas, R.; Mora, C.; Pellegrini, N.; Guiné, R.P.; Carini, E.; Sogari, G.; Vittadini, E. Food choice determinants and perceptions of a healthy diet among Italian consumers. *Foods* **2021**, *10*, 318. [\[CrossRef\]](#)

97. Pack, A. The Environmental Sustainability of Household Food Consumption in Austria: A Socio-Economic Analysis. 2007. Available online: www.wegcenter.at (accessed on 19 November 2022).
98. Stolz, H.; Blattert, S.; Rebholz, T.; Stolze, M. Frauen kaufen signifikant häufiger Biolebensmittel als Männer. (Foto: Flavia Müller, Bio Suisse) Biobarometer Schweiz: Wovon die Kauf-entscheidung für Biolebensmittel abhängt. *Agrar. Schweiz* **2017**, *8*, 62–69.
99. Haider, V.; Essl, F.; Zulka, K.P.; Schindler, S. Achieving Transformative Change in Food Consumption in Austria: A Survey on Opportunities and Obstacles. *Sustainability* **2022**, *14*, 8685. [[CrossRef](#)]
100. Gupta, S.; Ogden, D. The attitude-behavior gap in environmental consumerism. *APUBEF Proc.* **2006**, *3*, 199–206.

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