

Article

Sustainable Information in Shoe Purchase Decisions: Relevance of Data Based on Source

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Received: 14 March 2018; Accepted: 11 April 2018; Published: 13 April 2018



Abstract: The aim of this work was to analyse consumers' attitudes to economic, environmental, and social information on shoe labels, in particular on sustainable consumption, and also to examine the importance of the source of the information. Three steps were followed to develop an appropriate method of extracting, analysing, and interpreting the information contained in the questionnaire used in the survey: an Exploratory Factorial Analysis (EFA) to evaluate the reliability and dimensionality of the questionnaire; a Cluster Analysis (CA) and an Analysis of Variance (ANOVA) to test the ability of the questionnaire to identify different customer categories and the main purchase characteristics included in the questionnaire to characterize each homogeneous group; and a tree classification method using the Chi-Squared Automatic Interaction Detector (CHAID) to characterize the hypothetical scenario of the purchase selection. The results show that consumers, especially those aged between 21 and 30, are concerned about elements related to economic, environmental, and social dimensions on shoe labels. The most important variable in the purchase process was the presence of Environmental Management Systems (e.g., ISO 14001, EMAS). These results could help to optimize the information on shoe labels and would add value by including variables other than environment and price.

Keywords: environmental information; ecolabels; consumer's perception; credibility; factor analysis; cluster analysis

1. Introduction

Shoe purchases have increased more than twofold in the last century, from an average of one pair per year in 1950 to 2.6 pairs per year in 2005 [1] and three pairs per person in 2013 [2], at the European level, and EU consumption was 4.2 pairs per person in 2008 [3]. Less than 5% of shoes are recycled, with most of them ending up in a landfill. The reason for this increase is due to their seasonality and impulsive buying, which can make up 50% of total sales [4].

Fashion companies now have to face a competitive market and better informed consumers, for which they rely on sophisticated information and logistic systems, especially on accurate and reliable forecasting systems [5]. This sector consumes a large amount of resources and generates a great deal of pollution, but their use and disposal often have the most severe impact [6].

Clancy et al., reviewed and analysed the textile industry's impact on the environmental and social perspective of sustainability [7]. They found large efforts had been made in the sector in the upstream value chain (fair labour and cleaner fibre production, dye manufacturing, and colouring processes),

but in the downstream value chain use, re-use, recycling, and disposal had not received the same attention. The post-sale life cycle stages have a large potential for improvement in environmental performance. They highlight that designers need information to have a clear vision of design for sustainability. This sustainable design process requires the stakeholders, as established in the Rio Earth Summit, Agenda 21, “to encourage and promote the development of a framework of programs in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production”. Agenda 21 identified ecolabels as one way of achieving this objective [8].

Companies can include environmental information on their products either for regulatory reasons or to influence consumers’ purchase decisions. As defined by the International Standards Organization (ISO), ecolabels fall into this latter group. Mass-consumer products such as shoes commonly use what ISO calls Type I (ISO 14024:1999) and Type II (ISO 14021:1999) [9,10]. Type I Ecolabels are multicriteria-based and third party-certified. Type II Ecolabels, or self-declared claims, consist of statements made by manufacturers for which they assume responsibility. Surveys carried out by the European Union show that consumers are becoming more concerned with environmental issues in general and tend to search for environmental information that certifies the companies’ good environmental behaviour [11,12].

Green consumerism is defined as an end of pipe approach, where the intention is not to change the system, but to modify the production processes and the products consumed, while Sustainable Consumption needs a change of policy frame to reduce consumption and increase product utility [13]. In Green consumerism, consumers are willing to read, understand, and buy ecolabels (Type I, II, or EPDs) which offer environmentally concerned products. However, sustainable consumption should take into account long term aspects that consider the life cycle of the product and its functions. Sustainability should not create new consumer needs. In this line, Akenji designed a political framework for sustainable consumption based on three key factors: Right stakeholder attitude; facilitators provide an enabling environment or a course of action for a transition to sustainability; and the appropriate infrastructure to permit this selection as the most sustainable option [13]. However, from the sustainability point of view (and not only environmental), Shao et al., showed that consumers are increasingly concerned about the social impact of a product’s production phase and are demanding more information about it [14].

Ease of access to information is important because consumers’ uncertainties seldom induce potential buyers to actively search for product information [15]. The provision of product information seems to be particularly promising for young consumers, as they are interested in checking the information and extending it if necessary. They seek more detailed product information and use this information precisely [16–18]. People aged between 18 and 30 years old are currently described as the most educated ones, being thirsty for knowledge and having grown up in a technological environment [19]. Osburg et al., identified four consumer segments: three motivated segments (an environmentally oriented, an environmentally and quality oriented, and a quality oriented segment) and an “unmotivated” segment, which does not show any kind of orientation [20]. In consequence, it would be interesting to know more about the exact classification of segments, to facilitate the result.

To focus its efforts, the footwear industry should therefore identify which segment/kind of consumer is most open to sustainable information. From a practical point of view, it is important to know the type of information with the strongest influence on purchasing decisions in each group of products. How consumers make decisions for purchasing a green product was studied recently through a structural model that combined the variables of the purchase with particular characteristics of each group of products [21].

The different studies show that different groups of products and consumer groups should be studied in particular ways, because each consumer group needs focused efforts in order to improve the relation with customers offering specific information (of their interest).

The paper is structured as follows: Section 2 gives a brief review of the literature on the customer’s perception of ecolabels and focuses on sustainable information. Section 3 describes the study method

and approach. Section 4 gives the results obtained and concludes with an analysis of the most important findings, the limitations, and our intentions for further research.

2. Background

Ecolabel information has sense if consumers take it into account. This process of internalization has been proven to be affected by sociocultural traits [22], socioeconomic traits [23], and psychological traits [24]. Teisl et al., surveyed over 500 US automotive consumers on their perception of five types of labels (on whether or not they included environmental information, graphic information, or Ecolabels). Two main questions were assessed: consumers' trust in the label and whether it would modify their purchase decision. The results were segmented into two consumer groups: those who trust Ecolabels in general (and are influenced by them), and those who only do so if they include extended information. The consumers' social level proved to be the key to their behaviour: those with a higher education requested extended information in order to trust the label, whilst those with medium and low educational qualifications generally trusted and were influenced by the existence of any type of label [23].

Thompson et al., carried out two studies on how certified/ecolabeled forest products (furniture and plywood) appealed to a segment of environmental conscious consumers and their willingness to pay a premium for certified products [24]. Not surprisingly, one of the socioeconomic traits that predicted categorization in the first group was previous awareness and knowledge of the certification itself. Testa et al., extended this last conclusion to a more general group of Italian consumers, for which general knowledge of environmental labelling schemes was strongly correlated with consideration of environmental criteria in the purchase decision [25].

The effects of information have mostly been studied in the food industry, which is characterised by its strict requirements on what information should be provided on product content. In this sector, consumers from Italy, Holland, the UK, and the USA will actively seek information during the purchase of a product, although the same information might even be confusing to others [26]. On nutritional labels in particular there is a niche of consumers who are concerned about information on quantity and quality, most particularly in relation to health aspects. Gracia et al., observed that older and more educated consumers are more likely to perceive benefits from mandatory nutritional labelling programs as beneficial [26].

Several authors found that detailed information on household appliances positively influences the decision to purchase [27,28]. The main motivation for consumers to look for this type of information was the potential savings due to reduced energy consumption. Heinzle et al., found, for the German market, that the effect of household appliance labels was greater for the already-established schemes than for an increased level of detail [29]. Some consumers have a preference for products with some sort of certificate or label, although none of the five Dutch agro food labels they analysed were found to solve consumers' doubts related to environmental impact, compliance with standards, and recommendations for use [30]. They considered that the information that was available was not sufficiently regulated and raised serious doubts about its validity.

In an analysis of 58 food information schemes through expert interviews and consumer surveys in the European Union, they showed that only part of a product's consumers would trust the information without verification. The authors thus claim that lack of transparency is the cause of the low acceptance of ecolabels [31]. Daugbjerg et al., supported this claim, since they found that Danish consumers tend to decide on the spot and therefore cannot verify the content of the label [32]. They must generally rely on their previous knowledge or on trust.

On the other hand, consumer trust and credibility of the source reviewed by Taufique et al., show that: consumer trust is based on three main aspects to take into account (for the organic food market more than a certificate/ecolabel), where the third party certified labelling scheme can reduce information asymmetry between producer and consumer; and consumer distrust may make it hard for them to understand the meaning/content of the eco-labels. The credibility of the source based on

labelling of a product plays a vital role in consumer assessments and intentions towards the products and, as one of the exogenous factors, can influence consumers in terms of their purchase decision. However, the nature of credibility is subjective [33].

Products require ecolabels to gain the trust of consumers, although the language they use seems to have generated some confusion [34]. Environmental product information in itself may not influence the purchase decision if the consumer does not understand its impact, and hence it also depends on the trust that consumers give to the certification scheme and the ecolabel.

Consumers' trust in information varies depending on the information quantity, the type of information, the trust in the source, the product type, and whatever preconceived ideas they may have about the products' environmental impact [27]. Trust in the food information disseminated by public bodies is greater than that observed for private entities, according to 757 Italian consumer surveys [35], in which 42.0% trusted both public and private sources of information, 26.8% trusted only public sources, 10.9% merely trusted private sources, and 20.3% trusted neither public nor private sources.

Some authors suggest that increasing the amount of information can improve one's ability to correctly identify environmentally conscious products [27]. Consumers are only willing to buy environmentally sound products if they can assess the environmental information beyond a yes-no system (either it has the label or not). A graded system offers more trust, and—according to their simulation—motivates industry to perform better than a static benchmark [36]. Explicit information is also preferred by Asiatic consumers of air conditioners and refrigerators [37], since users select a product based on the energy savings they can expect. A similar value was given to a more detailed system in a study on business-to-business in the Swedish food sector [38]. In the same sector and country, this effect is bound to be smaller the further the company is from the consumer in the value chain [39].

According to Eurobarometer, studies on the credibility of different organisations among consumers show that environmental protection associations exhibit the highest percentage (37%), whilst scientists also have high reliability according to these sources (40%) [40,41]. In other Eurobarometer studies, the credibility of environmental claims from producers was specifically included. The answers were similar in both studies, with around 50% of consumers trusting the claims [14,15]. In the agricultural sector, it was proved that factors such as experience and expertise appeared more useful than whether the company was private or public [42].

Information preference has been extensively assessed—always outside the shoe industry, on which this paper focuses—but the effect of trust on the purchase decision is still a relatively unexplored area [43]. The relevance of the footwear industry is the extended use of products like basic goods, the large quantity of SMEs, and jobs generated. In this sense, some studies reflect consumers' knowledge, commitment, and general awareness of consumers. This model clarifies how consumers weigh environmental and economic benefits while choosing green products [44], but this is proved in a large city and for green food products.

The Valencia Community (in the east of Spain) is in first place in production and export terms, with 50% of the total. Footwear is Valencia's fifth largest export, occupies 9% of local companies, and creates 6% of all jobs in the region [45]. It was assumed that the consumers in this area shared common knowledge linked by language and the educational system. In other words, apart from the information provided with the product, the consumers shared cultural elements that could influence their perception of the product. At the same time, the study was published taking into account the trends related to consumer information displayed on shoe labels, which is not very different.

It has been proven through previous analysis that the results of the research of different authors shows the partiality of the preferences or the concepts analyzed that influence the way of selecting a product. In the case of the footwear sector, identifying the segments of consumers and their customers would help to optimize production, while adding value to the consumers of products of mass use.

3. Case Study and Data Collection

This paper focuses on the research question: “Can the sustainable information presented on a label affect decisions on shoe purchases?” To answer this question, we carried out a study based on a survey, as described below. The following particular aims have been established for our work: to evaluate the reliability, validity, and multidimensionality of the questionnaire; to test its ability to identify clusters of customers with different trust levels in the ecolabels’ information; and to characterize those customer typologies according to descriptive characteristics related to the importance of different criteria in the purchase decision.

3.1. Sample

An initial pilot survey was carried out with 14 survey experts on the information displayed on labels, with six face-to-face and eight online surveys. They were asked to fill in the survey and then to briefly explain what the survey was about. After this, minor modifications were made to the language used in the survey.

The data was gathered during the months of June and July 2011. The sample included over 500 consumers from the Valencia Community (Spain). Questionnaires were distributed in person among university students from different degree courses and local stores. An online survey was made with a private platform to manage the responses. In total, 89 responses were obtained on paper and 214 online. We used both paper and online surveys to increase the number of responses. The equivalence of the data collected from both questionnaires was previously checked [46]. These consumers were considered to have access to similar publicity and have a similar experience of the local market.

The sample was composed of 27% men and 73% women. The most common age group was 31 to 40 years old (35% of the sample). All of the respondents were residents of the Valencia Community and 53% of the sample had university degrees. These percentages do not present any major biases in reference to the population of the region of Valencia, although the sample is skewed towards a female audience.

3.2. Questionnaire

A survey was designed and checked by experts to analyse how information on labels affects consumers’ purchasing decisions.

This survey was divided into three sections. The first section of the questionnaire was on general information about the type of shoes the subject usually bought and their average price. The second gathered the self-perceived importance of different criteria in the purchase decision using a five-point Likert scale ranging from ‘strongly disagree-1’, ‘disagree-2’, ‘not disagree-3’, and ‘agree-4’, to ‘strongly agree-5’ for each attribute [47]. The different item criteria are listed in Table 1.

The design of the survey used some concepts grouped by Taufique [36], such as consumer trust and credibility of the source and different types of ecolabels to evaluate knowledge and consumer trust, proposed by Ozzane and Vlosky [48,49].

The attributes related to the environment were grouped items codified as k, l, ll, and n. The attributes related to the social dimension were evaluated through questions m, p, q, r, and s. The connections among the questions made it possible to deduce some results about trusting labels and the credibility of third parties as certifying bodies. Bulleted lists look like this:

Table 1. Item Criteria included in the second Section of the questionnaire.

a	It seems to be made of good materials	k	It has cleaner production labels (e.g., ISO 14001, EMAS)
b	I like the color	l	It has information on how much of it can be recycled when I discard it
c	I like the brand	ll	It has information about its geographical origin
d	It follows a classic model	m	It shows that the manufacturer follows international agreements on workers' rights (e.g., from the International Labour Organization, ILO)
e	It follows current trends	n	It shows information about its environmental impact, to be compared with others (e.g., its carbon footprint)
f	It seems resistant	o	I can cross-check the information in the label online
g	The price is good	p	It shows a ranking or rating of the product within its category (e.g., energy efficiency labelling for white line products)
h	I like the shop where I found it	q	The environmental information they provide is supported by a known research group (e.g., from universities)
i	The salesperson has a good opinion about it	r	The environmental information they provide is supported by a consumers' association (e.g., from OCU, the Spanish Association for Consumers and Users)
j	It has quality labels (e.g., ISO 9001)	s	The environmental information they provide is supported by an independent organization (e.g., AENOR, the Spanish Standards Organization)

Note: The importance of each attribute was given by a five-point Likert scale.

The third section asked the participants to choose one of four pairs of shoes (label based on [50]). The information included the price and different types of sustainability-related aspects. These criteria included workers' rights (as the percentage of possible measures applied up to a hypothetical maximum value), CO₂ emissions during manufacturing, recyclable percentage of the shoe, and a non-defined environmental certificate. Each of these attributes corresponded loosely to one of the sustainability-related information sources included in the first section of the survey.

The price was increased when the sustainability criteria became stricter in order to measure the surveyee's sensitivity to it. The options were unordered so that the differences would not be obvious (Figure 1). The fourth and last section on personal information was included to establish correlations between different samples [50].

The average values of workers' rights were based on an average compliance with the fundamental conventions and recommendations of the International Labour Standards (ILO), ratified by Spain. The higher score depends on whether the manufacturer voluntarily adopts the labour standards up to a maximum of 100 points.

The value of CO₂ emissions produced in footwear manufacturing was based on a Life Cycle Assessment of ten pairs of ladies' shoes, taking the average results in this category [51]. The recyclability item offers the possibility of participating as a consumer in the process. The maximum value (100%) offers the possibility of all the materials being recycled and used in a new manufacturing process. The Eco-Management and Audit Scheme (EMAS) or Environmental management systems (ISO 14001:2004) [52] certificate are popular among businesses who know about the "clean production" concept and strive for continuous improvement.

The web site included is a link to obtain extended information about the sustainable label and in-depth criteria (actually, a QR code can replace the link). This element was based on the information currently available in the operator programs of Environmental Product Declarations (EPDs).

Finally, the scale of reference score can help the consumer to objectively distinguish a product from others in the same category, taking into account the same criteria value in all cases [49].

1	2	3	4
€65,99	€71,99	€ 68,99	€ 74,99
Workers' rights (ILO) 80	Workers' rights (ILO) 100	Workers' rights (ILO) 85	Workers' rights (ILO) 100
CO ₂ eq emissions (manufacture) 0,12 gr	CO ₂ eq emissions (manufacture) 0,11 gr	CO ₂ eq emissions (manufacture) 0,12 gr	CO ₂ eq emissions (manufacture) 0,10 gr
Recyclability 60%	Recyclability 70%	Recyclability 70%	Recyclability 72%
ISO 14001 CERTIFICATE	EMAS CERTIFICATE	ISO 14001 CERTIFICATE	ISO 14001 CERTIFICATE
			
Scoring system develop by Shoes SME's www.availableonline.com	Scoring system develop by Shoes SME's www.availableonline.com	Scoring system develop by Shoes SME's www.availableonline.com	Scoring system develop by Shoes SME's www.availableonline.com
Minimum score:50 Maximum score: 100	Minimum score:50 Maximum score: 100	Minimum score:50 Maximum score: 100	Minimum score:50 Maximum score: 100
Average score of the product: 70	Average score of the product: 75	Average score of the product: 72	Average score of the product: 85

Figure 1. Comparison of shoe labels proposed in survey.

3.3. Research Method

A series of multivariate statistical methods were applied to analyse the underlying structure of the SET questionnaire used by the Universidad Polit cnica de Valencia (UPV) in order to develop an appropriate methodology for extracting, analysing, and interpreting the information contained in the questionnaire. In a first step, an Exploratory Factor Analysis (EFA) was developed in order to evaluate the reliability, validity, and dimensionality of it. The purpose of factor analysis is the reduction and summarization the information contains in a number of original variables into a smaller set of new, named dimensions or factors that better represent the underlying structure with a minimum loss of information.

For the reliability of the scales, we used α Cronbach as a measure of goodness of fit [53,54].

Then, to assess the features or items that could significantly affect the purchase selection, an Analysis of Variance (ANOVA) was performed with the twenty items criteria in the purchase decision (Section 2) as independent variables and the four hypothetical scenarios of purchase (Section 3) as dependent variables. This study evaluates the equality of measures for the four scenarios simulated by analysing all the variables included in the ecolabel simulation.

In a second step, Cluster Analysis (CA) was used to test the ability of the questionnaire for the identification of different categories of customers based on the twenty criteria included in the ecolabel that can affect the purchase decision with the purpose of study if customers' responses have significant implications in the purchase decision. We used the BIRCH (Balanced Iterative Reducing and Clustering Using Hierarchies) first proposed by Zhang, Ramakrishnon, and Livny and later improved by Chiu et al. [55,56]. Compared with traditional cluster analysis methods, BIRCH has the advantage of working particularly well with large datasets and can handle both categorical and continuous variables simultaneously.

In the last step, a tree classification method, the Chi-Squared Automatic Interaction Detector (CHAID), was used in order to characterize the different lecturer's categories obtained with CA according to the variables or items from the second section that were significant in ANOVA as the independent variables and the purchase option as the independent variable. The decision tree used the Chi-Squared Automatic Interaction Detector (CHAID), which is a tree classification method originally proposed by Kass [57]. The aim was to segment the variable purchase option and establish homogenous groups based on the dependent variables in Section 2. This technique creates trees in which each node identifies a split condition to yield optimum prediction or classification. The split predictor variable is the one with the smallest Bonferroni adjusted p -value. The stopping rule for determining the most suitable splitting degree was fixed at a maximum depth of five splits under the root node.

4. Results and Discussion

Table 2 summarizes the means, standard deviations, skewness, and kurtosis measures of all the characteristics or items in Section 2. According to the results, the items have sufficient dispersion, with standard deviations between 0.954 (lowest) and 2.563 (highest), which, according to Viladrich et al. [58], are acceptable values. It can be seen that variables with an average higher than four are items m, n, o y, and p, i.e., the manufacturer follows international agreements on workers' rights, gives information on the environmental impact, pollution aspects can be compared with others, the information on the label can be verified online, and the ranking or rating of the product within its category (e.g., energy efficiency labelling for white line products).

Table 2. Descriptive data.

Item	N	Minimum	Maximum	Average	Standard Deviation	Asymmetry	Kurtosis
a	257	1	6	4.10	0.928	−0.786	0.243
b	257	1	6	3.97	0.954	−0.708	0.673
c	257	1	6	2.70	1.225	0.418	−0.143
d	257	1	6	2.27	1.275	0.885	0.307
e	257	1	6	3.02	1.308	−0.075	−0.875
f	257	1	6	3.83	1.007	−0.814	0.636
g	257	1	5	3.83	1.083	−0.769	−0.002
h	257	1	6	2.57	1.270	0.374	−0.776
i	256	1	6	2.18	1.184	0.760	−0.158
j	257	1	6	2.42	1.390	0.562	−0.779
k	257	1	6	2.49	1.426	0.509	−0.839
l	257	1	6	2.11	1.163	0.920	0.148
ll	257	1	6	2.66	1.343	0.323	−0.923
m	256	1	7	4.80	2.482	−0.452	−1.526
n	257	1	7	4.68	2.551	−0.355	−1.665
o	257	1	7	4.68	2.563	−0.368	−1.658
p	257	1	7	4.69	2.558	−0.366	−1.668
q	257	1	6	2.36	1.328	0.593	−0.674
r	257	1	6	2.35	1.327	0.610	−0.649
s	257	1	6	2.27	1.300	0.815	−0.214

To check the internal consistency of the items, we first analysed their correlations and then the Cronbach α -value. The correlations between the items in the second section of the questionnaire scale are moderate and significant in almost all cases, without highlighting any item whose correlation with all other items on the scales is too low. We obtained a Cronbach α -value of 0.849, higher than 0.8, which indicates a high internal consistency [59] and suggests that the questionnaire scales have suitable internal consistency values. To assess the reliability and validity of this section, we used exploratory factor analysis (EFA) and the Cronbach's alpha test for each indicator.

The results of the exploratory factorial analysis (EFA) indicate that the sample is adequate, based on the sample adequacy index (0.853) and Bartlett's sphericity test ($p < 0.000$). The application of EFA leads to the identification of five relevant factors that explain 73% of the overall data variance. Table 3 shows the structure matrix, with the variable loadings (correlation coefficients, r) for each of the five factors. As this table shows, the highest loadings ($r > 0.50$) [60] for component 1 correspond to the items coded as j, k, l, ll, q, r, and s, with all of them being related to compliance with standards, transparency of information, or references from external and reliable stakeholders. The parameter explains 44.01% of the total variance and can be known as "Extended sustainability information".

Following the same criterion of the highest loadings for each component, the second factor explains 10.90% of the variance, and is mainly related to items c, e, and h, which are mainly related to "Fashion". The third factor is only negatively related to colour, and so was named "Colour". The fourth factor is again related to an item coded as d and can be named "Classic". The last factor is only related to an item coded as g, which can be labelled as "Price". Although the last three factors can be considered as a single-item, several studies compare the predictive validity of single-item and multiple-item measures [61].

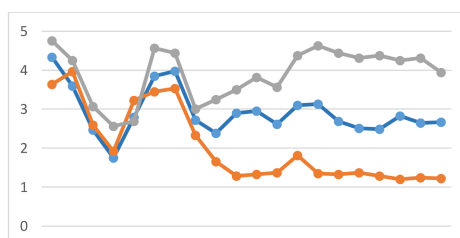
Table 3. Rotated factors matrix from items Section 2: distribution of components.

Item	Components				
	1 Extended Sustainability Information	2 Fashion	3 Colour	4 Material Properties	5 Price
a	0.475	−0.153	0.445	−0.106	0.306
b	−0.007	0.501	−0.630	0.006	0.206
c	0.161	0.655	0.022	−0.399	−0.237
d	0.159	−0.012	−0.092	0.651	−0.543
e	−0.152	0.802	0.046	−0.060	0.197
f	0.408	−0.187	0.456	0.140	0.269
g	0.335	0.304	−0.015	0.561	0.588
h	0.276	0.695	0.171	0.184	−0.161
i	0.578	0.245	0.418	0.165	−0.323
j	0.771	0.154	0.147	−0.283	0.058
k	0.825	0.173	0.202	−0.115	−0.102
l	0.849	−0.027	−0.022	−0.195	−0.048
ll	0.800	0.057	0.203	0.118	0.010
m	0.859	−0.053	0.020	0.067	0.029
n	0.909	−0.065	−0.113	−0.026	−0.021
o	0.804	0.083	−0.218	0.133	0.017
p	0.858	−0.146	−0.287	−0.003	0.073
q	0.880	−0.191	−0.237	−0.079	−0.029
r	0.869	−0.126	−0.270	0.061	−0.021
s	0.848	−0.130	−0.166	−0.149	−0.036

Note: All factorial loads higher than 0.5 have been marked in bold.

An Analysis of Variance (ANOVA) was then performed to find the features or items in Section 2 that could significantly affect the purchase selection (Third Section). The results are shown in Table 4. The significant variables that can affect the hypothetical purchase decision are the item codes a, e, j, k, l, ll, m, np, q, r, and s. Apart from material price and fashion, all of these are related to sustainable characteristics (Extended sustainable information) included in Factor 1, so verifying the relevance of the transparency of information or references from external reliable stakeholders.

BIRCH defined the simplest structure that represented homogenous solutions as a three-cluster solution, according to the Bayesian Information Criterion or Schwartz's Bayesian Criterion. Figure 2 shows the profiles of each cluster, which represent the mean scores of the different items in Section 2. Cluster 1 is composed of 37.5% of the survey respondents and contains all the items with low scores, in almost all cases lower than three. Cluster 2 comprises 47.1% of the survey respondents with intermediate scores between two and four, and Cluster 3 is composed of 15.4%, with scores higher than four for nearly all items.

**Figure 2.** Profiles of each cluster.

In Clusters 1 and 2, the age of the respondents was mainly between 31 and 40 (41% and 28%, respectively). In Cluster 3, the age was between 21 and 30 (37.5%). This result can be interpreted as younger people being more environmentally concerned when they choose footwear.

Table 4. ANOVA results.

Item	Sum of Squares	gl	Root Mean Square	F	Sig.
a	12,860	3	4287	4890	0.003
b	1785	3	595	689	0.561
c	1866	3	622	533	0.661
d	6170	3	2057	1795	0.153
e	14,126	3	4709	2874	0.040
f	1792	3	597	571	0.636
g	11,747	3	3916	4145	0.008
h	8681	3	2894	1801	0.152
i	2207	3	736	516	0.673
j	19,263	3	6421	4247	0.007
k	22,289	3	7430	4637	0.004
l	15,879	3	5293	4602	0.005
ll	23,745	3	7915	5481	0.002
m	27,908	3	9303	4947	0.003
n	25,004	3	8335	5727	0.001
o	10,939	3	3646	2189	0.094
p	22,851	3	7617	5345	0.002
q	16,921	3	5640	3482	0.019
r	20,908	3	6969	4644	0.004
s	20,326	3	6775	4731	0.004

Note: Significance level at 5%.

Finally, a CHAID analysis was performed to characterize the hypothetical scenario of purchase selection, with the variables or items from the second section that were found to be significant in ANOVA as dependent variables and the purchase option as the independent variable. We obtained a tree with three branches or classification levels (see Figure 3). The first split variable was the shoe has cleaner production labels (e.g., ISO 14001, EMAS), which is the most significant.

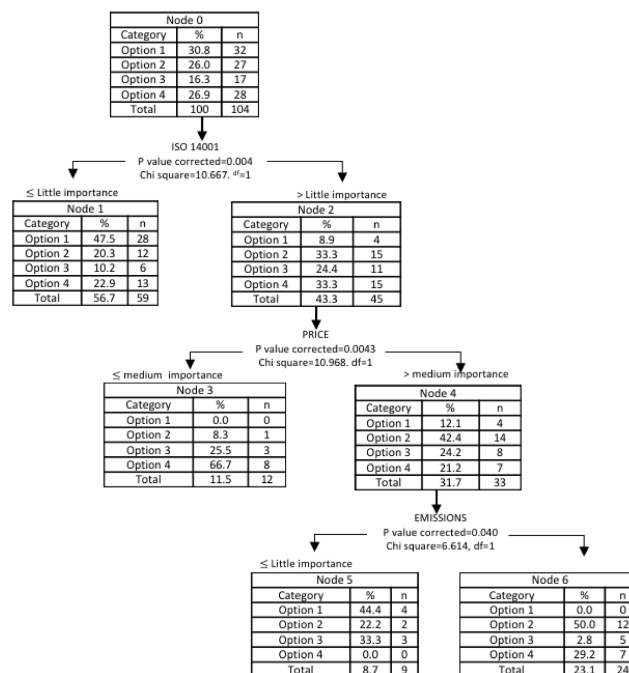


Figure 3. Classification tree for the variable 'selected option' in the second Section.

The first segmentation in Node 1 included 59 consumers who gave little or medium importance to the shoe having a clean production label (e.g., ISO 14001, EMAS), whilst Node 2 included those

(47) who found it important. Node 2 was subsequently subdivided into Nodes 3 and 4, based on the importance given to price. Node 3 had 12 consumers who gave low or medium importance to price, and Node 4 had 33 consumers who gave it high or very high importance. Finally, Node 3 was again subdivided, based on the importance given to information about the shoe's environmental impact, to be compared with others (e.g., carbon footprint). In total, 50% of the observations were correctly classified using this method.

On one hand, 47.5% of the responses in Node 1 and 8.9% of the participants in Node 2 chose the first purchasing scenario. The last group gave less importance to ISO 14000 information on the label.

On the other hand, Nodes 5 and 6 obtained an estimation of the importance given by the respondents to CO₂ emissions; 29.2% of the consumers who gave most importance to this information chose label 4, which shows the best CO₂ scenario in manufacturing emissions.

These results confirm that the different descriptive variables or items contained in the questionnaire have a clear explanatory capacity and hierarchical influence on the purchase options, especially if the shoe has clean production labels (e.g., ISO 14001, EMAS) and information on its environmental impact to be compared with others (e.g., its carbon footprint).

From the result showed in Figure 3, the respondents that selected the option with the highest score for environmental aspects by the replies tended to give value to environmental certificates (ISO 14001-EMAS). The next favourite option was a lower price for consumers. The consumers in this group evaluated whether the information was backed by a prestigious external group, followed by the percentage of recycled product materials.

The importance of price is followed by the information available and depends on the consumers' perception of the product's sustainability.

5. Conclusions and Further Research

Consumers' purchase decisions are a very complex phenomenon, and even more so as they can only consider the sustainable information available to them. This study managed to shed some light on how consumers trust different information and how that influences their purchase decision.

The results of EFA validate that a model with five correlated dimensions is the best solution for explaining the underlying structure of the questionnaire. This result is important, because although environment information is an essential source of data for quality improvement and customer satisfaction, it is necessary to take into account additional aspects like price and fashion and the possible correlation between them.

The results show that consumers not only need environmental information, they need sustainable information about the product they are choosing. Among the variables studied, the main influencer was 'Extended sustainable information', which included external support to sustainability (certificates, reviews, etc.). Within this factor, the most outstanding was the influence of environmental management systems (the survey gave ISO 14001 as an example). Another relevant factor was the availability of extended environmental information (searchable, expandable, and/or comparable between products).

Given the ISO 14001's national scope, it is quite reasonable to assume that the obtained results are relevant for all of Spain, despite other cultural factors possibly having an effect. To evaluate whether the results can be generalized outside Spain, the survey could be repeated in other countries by amending the section "simulation of a purchase decision" (ecolabel), which is based on the parameters available to buyers in both the Valencia Community and Spain. However, it is important to determine the importance of the sustainable information per product group or category in order to assess if the results can be generalised accordingly.

BIRCH allowed the identification of three customer categories. This differentiation was not associated with particular item criteria included in Section 2, which is reflected in the parallel structure of the cluster profile.

The study's most important finding was the analysis of the purchase decision itself, and how each factor influenced it. As we can appreciate in the CHAID analysis, the results show that environmental performance information from environmental management systems has the highest influence on the purchase decision, even higher than price (which was the second discriminating criterion), and is in agreement with the findings of previous studies [24].

One possible interpretation is that environmental management systems are procedures connected to continuous improvement, which are based on updated norms/rules. Their relevance in promotion campaigns is thus obvious and should be accepted by manufacturers. This would require the product to be clearly superior when it comes to sustainable claims, hence the positive effect of avoiding greenwashing. However, many current products with a good environmental performance fail to communicate this information to the public. According to the background, the 18–35 year-old consumer segment was the most interested in the information presented in this study. Young consumers sought more detailed product information and used this information precisely [16–20]. A segment was identified that was interested in comparing more information, which can be interpreted as willingness to evolve from Green Consumerism to Sustainable Consumption [19].

In fashion-based products, shoes being one such case, manufacturers disregarded the source from which consumers got their information and the influence of information in general on the purchase decision [62]. This explains the lack of information in the shoe market and suggests a potential development.

This study sheds some light on the trust that consumers give to different types of stakeholders and different information displayed on a label, but it was difficult to reach a further level of detail, i.e., assessing individual labels, institutions, associations, or even companies, without considering the effect of the brand.

The study also considered a purchase decision in which reliable sustainable information was offered to purchasers. Further research could explore different purchase situations: when the information is presented in a way that might not be believed, when the consumer is overloaded with other types of information, or when information is clearly missing or biased. Another possible way of exploring the way information is presented is to consider the stakeholders giving such information, or even the effect of joint stakeholders communicating the information.

The method used involved an ad-hoc scale and experiment for measuring the influence of different aspects on the purchase decision. It would be relevant to expand and develop the method so as to create a robust tool applicable to any geographical constraints and market niches. No relevant differences were found between men and women, although the skew of the sample towards a female audience could also be further developed. Another aspect worth further study is the knowledge or influence of each aspect. The survey described here did not contain the "unknown" answer option, which could be included in further research to assess how educated consumers are in each of the information sources or categories presented, by adding such an answer to the questionnaire.

As the study found preliminary evidence of the tangible role of sustainable information on consumers' purchase decisions, manufacturers, certification schemes, and businesses should reconsider the way they present their information and the value of potential interactions in the future.

This work does of course have certain limitations. As stated previously, we used a small sample comprised of students from Valencia with a specific questionnaire and the possibility of generalising to another questionnaire, sample, or region should be studied. If we use a previously validated and published questionnaire, we will be able to compare our own findings with those from other studies. It is possible that analyses based on larger sizes or different contexts with other populations would generate different results.

The different statistical analyses carried out are not only applicable to this questionnaire in this specific area, but can also be applied in different questionnaires and sectors, such as research or management. Our method is expected to serve as a practical guideline that, subject

to possible modifications in the future, may become an essential tool used by researchers for their continuous improvement.

Author Contributions: Bélgica Pacheco-Blanco carried out the theoretic and empirical research and design and wrote the paper. Mónica Martínez-Gómez carried out the statistical analysis of results and wrote the paper, Daniel Collado-Ruiz and Salvador F. Capuz-Rizo designed, wrote and supervised this paper.

Conflicts of Interest: The authors declare no conflict of interest.

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