Investigating sustainable consumption behaviors: a bibliometric analysis

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Abstract

Purpose – The research carried out a bibliometric analysis of the literature on environmental sustainability from a demand perspective by analyzing the scientific contributions published in the last twenty years.

Design/methodology/approach – A bibliometric analysis was carried out to outline the scientific studies development, identifying the most discussed topics and those that would require future research. In total, 274 articles published between 1999 and 2021 were collected through the Web of Science database and analyzed with the SciMAT software.

Findings – By systematizing the literature results, the study revealed a steady growth in the number of publications and in the research areas, highlighting a substantial evolution of the research topic.

Research limitations/implications – The study contribute for conceptual, methodological and thematic development of the topic, systematizing the results of existing studies and providing useful indications for the promotion of sustainable consumer habits.

Originality/value – The study attempts to bridge the gap in current literature by offering a holistic view on the role of consumer behavior in pursuing sustainability goals, identifying both the most treated areas and the emerging ones that can represent opportunities for future research.

Keywords Environmental sustainability, Consumer behavior, Bibliometric analysis, Literature review

Paper type Research paper

1. Introduction

In recent decades, the unprecedented growth of consumption has led to a use of natural resources significantly higher than their ability to regenerate, causing their gradual decrease, loss of biodiversity and environmental degradation (Alisat and Reimer, 2015; Bogueva *et al.*, 2017). The severity of the effects related to the assumption of consumption habits based on socio-economic desires, rather than on actual needs, is fueling the transition to sustainable consumption and production models (Bulut *et al.*, 2017; Goyal *et al.*, 2022; United Nations Environment Programme, 2015).

The concept of sustainable consumption was first addressed at the public policy level in 1992 during the Rio de Janeiro Earth Summit where the Global Goals for Sustainable Development were set. Subsequently, the United Nations Conference on Sustainable Development (commonly known as "Rio +20") took place in 2012, which resulted in a political outcome document containing clear and practical measures for implementing sustainable development. In 2015, the 2030 Agenda for Sustainable Development was signed, setting out a 15-year plan to achieve the *sustainable development goals*.

Because of the growing global commitment to sustainability, individuals are increasingly conscious of the need to change purchasing and consumption behaviors (e.g. Hopwood *et al.*, 2005; Kostadinova, 2016). This consciousness translates, on one hand, into sustainable consumption practices and, on the other hand, into the request for eco-friendly products (Luzio and Lemke, 2013). Then, companies are expected to be more environmentally friendly, namely, to pay attention to sustainability in all its components: environmental, economic and social. In response to these expectations, many companies have begun to put the value generation in a sustainable way at the center of their business strategies, aiming to achieve performance objectives while respecting people and the environment (Hristov *et al.*, 2022). The result is the shift from a traditional marketing, that relies on abundant resources availability and promotes purchases to meet needs and desires (Csikszentmihalyi, 2000; Swim *et al.*, 2011), to a sustainable marketing that emphasizes resources' reuse and renewal to counteract their scarcity (McDonough and Braungart, 2002; Mont and Heiskanen, 2015).

If the importance of sustainable consumption is a shared opinion (Hopwood *et al.*, 2005; Nash, 2009), the same cannot be said with reference to its definition. Lee (2014) identifies sustainable consumption as a conscious and personal choice of individuals that reflects their interest in protecting the environment. Hornibrook *et al.* (2013) refer to a behavior that implies the correct use of goods and services aimed at satisfying one's needs and improving the quality of life. Bulut *et al.* (2017) and Seyfang (2005) broaden the definition referring to an approach that involves individual and social factors (i.e. economies, behaviors and policies of individuals and nations) in evaluating sustainable consumption habits and guaranteeing of the well-being of future generations.

Understanding the nature of pro-environmental behaviors and the factors that favor or hinder their implementation is mandatory to overcome the challenge of sustainability. This is the reason why scientific literature has been dealing with this complex issue for years. In this perspective, marketing and behavioral sciences play a key role (White *et al.*, 2019). If initially the attention was devoted to profiling the "green consumer" (Anderson and Cunningham, 1972; Kilbourne and Beckmann, 1998), then the research moved on to the identification of predictors of sustainable consumption by all the consumers not only by "green consumers" (e.g. Ali *et al.*, 2019; Bulut *et al.*, 2017; Kotler, 2011; Menon and Menon, 1997).

In this sense, a holistic view on the role of consumer behavior in pursuing sustainability objectives is still lacking. Systematic review is, therefore, justified in order to obtain a systemic and current view of the topic. Considering these premises, this paper intends to carry out a bibliometric analysis of the literature on environmental sustainability from a demand perspective by analyzing the scientific contributions published in the last twenty years (from 1999 to 2021).

The aim of this study is to investigate how and to what extent sustainability issues influence consumer habits and choices. In particular, the assessments of consumer behavior on the demand side provide significant information on the aptitude to incorporate sustainability assessments into purchasing behavior, revealing significant information for the management and strategic governance of companies. More precisely, the study attempts to answer to the following research questions (RQ).

RQ1. What is the descriptive bibliometric information on publication on environmental sustainability from a demand perspective?

RQ2. What are the focuses and trends of the literature?

RQ3. What are the insights of the literature in terms of future research avenues?

This SLR attempts to fill the research gap, investigating the real perception that consumers have regarding the effectiveness of their purchasing behavior and their beliefs for achieving sustainability, by tracing the evolutionary picture of the issue, identifying both the most

treated areas and the emerging ones that can represent opportunities for future research. From a theoretical viewpoint, systematic literature reviews contribute significantly for conceptual, methodological and thematic development of different domains, by integrating extant research, identifying knowledge gaps and inconsistencies and developing new theoretical frameworks (Palmatier *et al.*, 2018; Hulland and Houston, 2020; Marabelli and Newell, 2014). More specifically, the study provides a conceptual framework for linking consumer behavior and environmental sustainability, through a focus on demand, highlighting the most developed thematic areas and identifying possible lines of future research. From a managerial point of view, the research fits into the line of studies on sustainability as a global challenge for governments, companies and people, providing readers with an understanding of the state of the art of the research topic and systematizing the results of the studies. Existing (Paul and Criado, 2020; Paul *et al.*, 2021). Considering the UN 2030 Agenda, the study provides useful information for the promotion of sustainable consumption habits. Furthermore, it investigates the sub-themes connected to sustainable consumption, which most capture the attention of consumers, influencing the positioning strategies of products by companies. Finally, it identifies under-explored areas that have the potential to influence consumption habits in a sustainable way.

The paper is structured as follow: section 2 provides a theoretical perspective of the research; section 3 describes the methodology; section 4 discusses the results and section 5 describes the limitations of the study. Finally, section 6 explains the conclusions, implications and future research avenues.

2. Theoretical perspective
Modern society seems divided by two major trends: on the one hand, the growing demand for new products; on the other, the widespread concern for the responsible exploitation of natural resources (Piligrimienė *et al.*, 2020; Lubowiecki-Vikuk *et al.*, 2021).

According to Balderjahn *et al.* (2013) sustainable consumption is reflected in three dimensions: environmental, social and economic. In other words, the purchase act is inspired by the awareness of the impact that a certain product determines on the ecosystem, on the conditions of the workers involved in the production process and on the willingness to use financial resources to obtain it (Balderjahn *et al.*, 2018).

For these reasons, the literature has provided different interpretations of sustainable consumer behavior, sometimes placing a focus on the purchase of green products, on recycling, on the ethical conscience of the consumer or on the characteristics of the products purchased (Kempton *et al.*, 2019). In any case, all research lines recognize the environmental impact of consumer choices, which justify the concerns of national and international government institutions, engaged in the implementation of programs to promote the sustainability of consumption (Harris *et al.*, 2016).

Matharu *et al.* (2020) have analyzed the determinants of sustainable consumption, demonstrating that a lifestyle based on health and sustainability encourages consumer behavior towards the use of eco-sustainable products. Still others have observed that the intention to purchase eco-sustainable goods depends on the type of product and is in any case correlated to the utilitarian value perceived by the consumer (Park and Lin, 2020). Anyhow, recent studies interested in exploring the cognitive variables related to sustainable behaviors have highlighted, on the one hand, that social factors and technological knowledge favor sustainable consumption by forming the basis of the sharing economy (Dabbous and Tarhini, 2019; Goyal *et al.*, 2022); on the other hand, contingent factors such as social influence and price improve the sustainable performance of consumers and suppliers (Wang *et al.*, 2019). Recent trends have explored the role of the micro foundations of sustainable consumption, which manifest themselves in the relationship between moral conscience and reduction of

consumption, where individual responsibility expresses the spontaneous recognition of contributing to environmental well-being (Culiberg *et al.*, 2022).

Considering the theory of planned behavior, some scholars have recognized how the consumer's attitude towards sustainable products is influenced by many factors that act as barriers, such as the high price, the perception of the negative impact linked to the purchase or consumption of certain products, but also as incentives for sustainable consumption, referring to the brand image or the use of that product by friends or relatives (Sheoran and Kumar, 2020).

Therefore, companies should adopt solutions to overcome these barriers, in order to encourage the choice and consumption of sustainable products. Furthermore, segmentation strategies must consider the internationalization of markets and the consequent cosmopolitanism of consumers, who increasingly appreciate products from abroad. Therefore, consumer attitudes, preferences and disposition towards products help companies to adopt product positioning strategies capable of meeting sustainable consumer behavior (Makrides *et al.*, 2021).

3. Methodology

This study adopts the bibliometric analysis method for the literature review, a technique widely used to map the evolution of the mindset and to identify the key elements (i.e. countries, authors, journals) in different research areas (Cobo *et al.*, 2011, 2012; Morris and Van der Veer Martens, 2008). It is a systematic domain-based review (Paul and Criado, 2020) which analyses an extensive amount of published research to highlight statistics, figure out trends, compare and contrast findings and identify knowledge gaps and future research avenues.

Using procedures from the extant literature (e.g. Capobianco-Uriarte *et al.*, 2019; Castillo-Vergara *et al.*, 2018; Paul and Benito, 2018), the study was structured in the following steps (Figure 1): (1) definition of the analysis framework; (2) database selection; (3) definition of search criteria; (4) coding and processing of materials; (5) data analysis.

The preparation of the protocol followed the SPAR-4-SLR procedure (Paul *et al.*, 2021) in order to ensure careful planning, consistency and transparency. Figure 2 details the information to enable the reliability and replicability of our study.

The topic investigated is environmental sustainability from the perspective of consumer behavior. Web of Science (WoS) has been identified as the database for searching and selecting empirical and theoretical contributions in the literature. WoS appears successful in comparison with the other scientific sources because, with a census of more than 12,000 international journals, it is the most comprehensive database with reference to studies in the
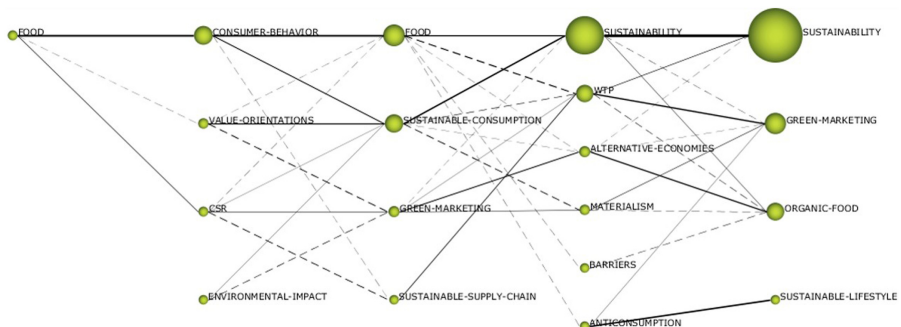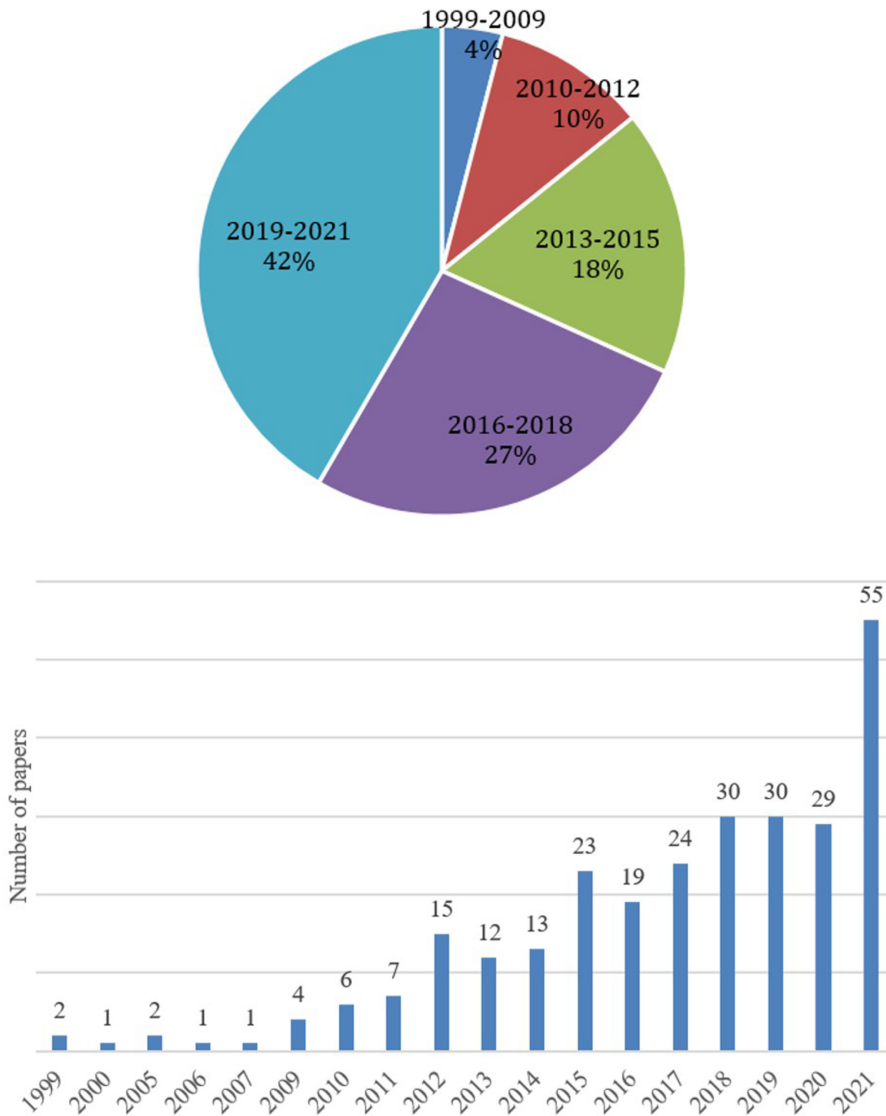

Figure 1.
Bibliometric analysis process

Figure 2.
Procedure for
reviewing using the
SPAR-4-SLR protocol

social sciences (Norris and Oppenheim, 2007; He *et al.*, 2017) and provides citation indices functional to the bibliometric analysis (Chang *et al.*, 2021; Waltman, 2016). Furthermore, WoS is the most used database in socio-economic disciplines (Montero-Navarro *et al.*, 2021), as it is comparable to Scopus in size, however it has a standard format for which data cleaning procedures are almost zero (Zupic and Čater, 2015). Previous research (e.g. Harzing and Alakangs, 2016) has shown that using multiple databases simultaneously does not increase the amount of contributions collected but, on the contrary, generates numerous duplications.

The search of scientific papers in WoS has been made in October 2021 and extends from 1999 to 2021. Based on the scope of the research, the keywords *"sustainability"* AND

"*consumer*" were selected as search terms in "TITLE-ABSTRACT-KEYWORD". The choice of the keywords was guided by the aim of considering as much relevant literature as possible while not going too far into unrelated fields (Chang *et al.*, 2021). On the other hand, considering more specific keywords would have led to neglect some of relevant papers on the topic. Other bibliometric analyses performed during the recent years on the topic of sustainability have used a similar approach (Ertz and Leblanc-Proulx, 2018; Montero-Navarro *et al.*, 2021; Vila-Lopez and Küster-Boluda, 2020). In order to border the collection of contributions in the fields of marketing and consumer behavior, only the areas of "business", "management" and "behavioral science" were considered. The "document type" filter has been set to exclude books, book chapters, conference proceedings and working papers. Only published journal articles were considered as the academic community acknowledges them as the most advanced and up-to-date knowledge sources (Nova-Reyes *et al.*, 2020). As suggested by Caiado *et al.* (2017), the collection was limited to documents written in English. The filter for the publication period has been left free ("all years"). The first published study on the subject defined the starting year of the period of analysis, namely 1999. The last search parameter set concerns the bibliographic indexes that allow to detect the number of citations of a publication and of an author over time: "Sci-Expanded" and "SSCI".

The research process led to the identification of 1,037 papers in the period 1999–2021. All the abstracts were read to ensure their consistency with the topic of interest. First, all duplicates have been removed. Second, all papers that dealt with the issue of sustainability but were not consistent with the topic were excluded. Some of them, for example, did not adopt the consumer perspective, or they dealt with the financial sustainability issue or with the development of Corporate Social Responsibility strategies. Following the cross-check mechanism suggested by Zupic and Čater (2015), two researchers read all the abstracts separately and independently proceeded to exclude off-topic papers. Papers that were excluded by only one of the two researchers were discussed together with a third researcher in a joint session. The research team jointly determined the solutions, identifying which papers should be excluded and which papers should be kept in the sample. Any inconsistency was resolved through discussion until a final consensus was reached. After this careful screening, 274 papers were considered valid for the analysis.

Bibliometric analysis (fourth and fifth steps in Figure 1) is divided into two macro-areas: performance analysis and scientific mapping analysis (SMA) (Noyons *et al.*, 1999). Using the information provided by WoS, the performance analysis aims to evaluate the characteristics of the contributions (i.e. type, journal, citations, country) from a descriptive viewpoint (Narin and Hamilton, 1996). The scientific mapping identifies, through a content-analysis, the structural and evolutionary aspects of the subject under investigation (Börner *et al.*, 2003). SMA was carried out by the SciMAT software (v1.1.0.4) which creates longitudinal scientific maps using bibliometric indicators, such as h-Index and co-word analysis for the study of co-occurrences among words (Callon *et al.*, 1983; Castillo-Vergara *et al.*, 2018). Furthermore, SciMAT identifies the interactions among research lines in order to identify the mature and emerging ones (Callon *et al.*, 1991), tracing their temporal evolution.

To perform the scientific mapping, the collected papers were divided into five time periods: 1999–2009; 2010–2012; 2013–2015; 2016–2018; 2019–2021. The first period is longer than the others in order to collect a sufficient number of contributions. This often happens in longitudinal studies that apply co-word analysis as the papers published on a new topic are generally few at the starting period and then gradually increase. The last period, on the other hand, provides useful information for identifying future research opportunities (Cobo *et al.*, 2011).

The following indices were considered for the analysis: the equivalence index as a similarity measure to normalize the networks; the Jaccard index as a measure of evolution of the themes; the index of inclusion as a measure of overlap between time periods; the number

of citations and the h-index to derive the relevance of the keywords; the simple centers algorithm to extract clusters (Alonso *et al.*, 2009; Callon *et al.*, 1991; Cobo *et al.*, 2011; Hirsch, 2005; Peters and van Raan, 1993).

4. Results

4.1 Descriptive analysis

As Figure 3 shows, studies analyzing sustainability from a consumer perspective began to appear in 1999, with the Ger's paper on high and low impact consumption practices published in Advances in Consumer Research. In the first decade (1999–2009) the interest in the topic was still marginal, but in 2010–2011 it began to flourish as the continuously increasing number of papers demonstrates.

A journal-based analysis has been carried out. The 274 selected articles were published in 67 different journals. The International Journal of Consumer Studies is at the top of the rankings covering 13% of the academic production, followed by Appetite (7%). In third position are the Journal of Business Research, the Journal of Retailing and Consumer Services and Business Strategy and the Environment (6%).

A third descriptive analysis concerns the number of citations for each paper. The work by Luchs *et al.* (2010) published in the Journal of Marketing emerges at the top of the ranking with 392 citations (Table 1). Their results (a) identify the associations consumers make with the concept of ethics, (b) demonstrate that the value of sustainability depends on the
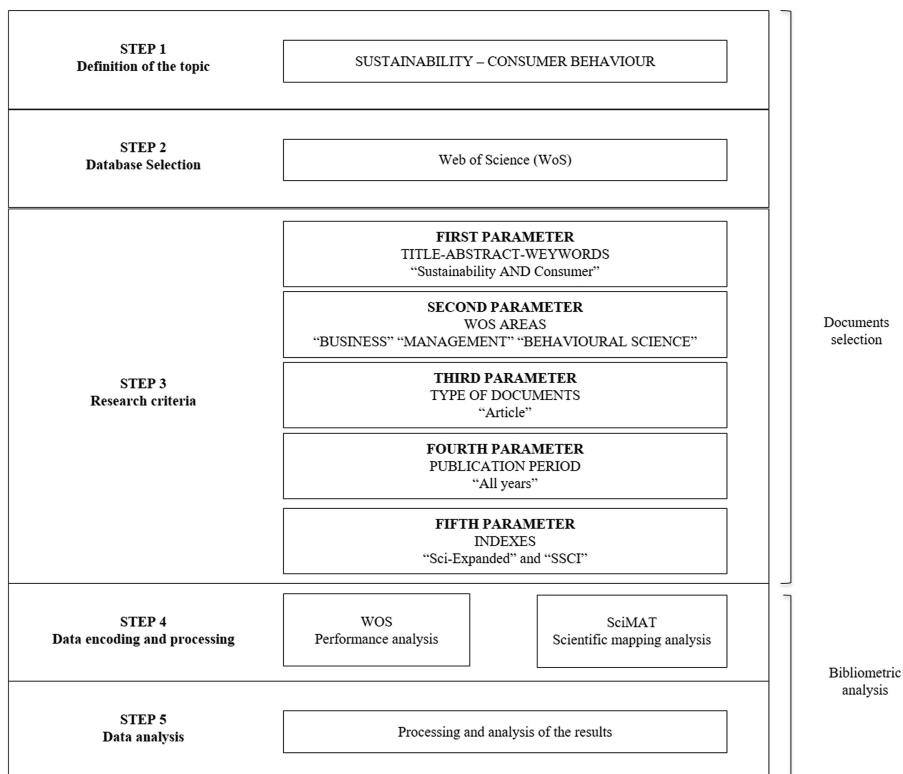
Figure 3.
Trends in publications
by periods

Authors	Title	Journal	Year	Citations
Luchs, M.G., Naylor, R.W., Irwin, J.R., Raghunathan, R	The Sustainability Liability: Potential Negative Effects of Ethicality on Product Preference	*Journal of Marketing*	2010	392
Gleim, M.R., Smith, J.S., Andrews, D., Cronin, J.J.	Against the Green: A Multi-method Examination of the Barriers to Green Consumption	*Journal of Retailing*	2013	234
Albinsson, P.A., Yasanthi Perera, B.	Alternative marketplaces in the 21st century: Building community through sharing events	*Journal of Consumer Behavior*	2012	202
Vanhonacker, F., Van Loo, e.J., Gellynck, X., Verbeke, W.	Flemish consumer attitudes towards more sustainable food choices	*Appetite*	2013	160
Van Doorn, J., Verhoef, P.C.	Willingness to pay for organic products: Differences between virtue and vice foods	*International Journal of Research in Marketing*	2011	152
McDonald, S., Oates, C.J., Young, C.W., Hwang, K.	Toward sustainable consumption: Researching voluntary simplifiers	*Psychology and Marketing*	2006	150
Seyfang, G.	Shopping for sustainability: Can sustainable consumption promote ecological citizenship?	*Environmental Politics*	2005	144
Thøgersen , J.	Country Differences in Sustainable Consumption: The Case of Organic Food	*Journal of Macromarketing*	2010	141
Horne, R.E.	Limits to labels: The role of eco-labels in the assessment of product sustainability and routes to sustainable consumption	*International Journal of Consumer Studies*	2009	140
Csikszentmihalyi, M.	The costs and benefits of consuming	*Journal of Consumer Research*	2000	137
Verain, M.C.D., Bartels, J., Dagevos, H., Sijtsema, S.J., Onwezen, M.C., Antonides, G.	Segments of sustainable food consumers: a literature review	*International Journal of Consumer Studies*	2012	133

Table 1.
The ten most cited contributions in the period 1999–2021

perceived advantage of the product category (c) and that the negative consumer expectations about sustainable products can be mitigated through marketing actions, such as explicit information regarding the product.

Finally, an analysis of the most used theoretical frameworks is proposed (Table 2). The Theory of Planned Behavior (TPB)/Theory of Reasoned Action (TRA) (Ajzen, 1985, 1991; Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) and the Construal Level Theory (CLT) (Liberman and Trope, 2008; Trope and Liberman, 2010; Trope *et al.*, 2007; Van Boven *et al.*, 2010) are the principal approaches adopted. TPB (Ajzen, 1985, 1991), as an extension of the TRA (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975), states that the individual's behavioral intention – which determines the actual behavior – is guided by three antecedents, namely subjective norms, attitude towards the specific behavior and perceived behavioral control. This theory has been considered a very useful framework in evaluating the human behavior in different contexts, including green consumption and general environmental behaviors (e.g. Chen, 2020; Dangelico *et al.*, 2021; Kang *et al.*, 2013; Kim and Seock, 2019; Kumar *et al.*, 2021; Moser, 2016; Taneja and Ali, 2021). CLT posits that individuals construct

Theory	Authors	Periods	Number of papers
Construal Level Theory	Liberman and Trope (2008), Trope and Liberman (2010), Trope et al. (2007), Van Boven et al. (2010)	2013–2015	1
		2016–2018	2
		2019–2021	2
Theory of Planned Behavior/ Theory of Reasoned Action	Ajzen (1985, 1991), Ajzen and Fishbein (1980), Fishbein and Ajzen (1975)	2013–2015	3
		2016–2018	11
		2019–2021	9
Attribution Theory	Fritz (1958), Kelley (1973)	2016–2018	2
		2019–2021	1
Costly Signaling Theory	Bird and Smith (2005), Miller (2000)	2013–2015	1
		2019–2021	2
Hierarchy of Effects Theory	Lavidge and Steiner (1961)	2013–2015	1
		2016–2018	1
Perceived Consumer Effectiveness	Belz and Peattie (2009)	2013–2015	1
		2016–2018	1
Regulatory Focus Theory	Higgins (1997)	2013–2015	1
		2019–2021	1
Self-determination Theory	Deci and Ryan (1985)	2013–2015	1
		2019–2021	1
Stakeholder Theory	Freeman (1984)	2010–2012	1
		2013–2015	1
Triple Bottom Line	Elkington (1997)	2013–2015	1
		2016–2018	1
Value-Belief-Norm Model	Stern (2000)	2013–15	1
		2016–18	1
Consumer Demand Theory	Louviere et al. (2000), Varian (2009)	2010–2012	2
Signaling Theory	Rynes (1991), Spence (1973)	2019–2021	2
Value-attitude-behavior Model	Homer and Kahle (1988)	2016–2018	2

Table 2.
The main theoretical frameworks

different mental representations of stimuli in their environments, which vary in terms of the degree of abstraction (Liberman and Trope, 1998; Trope and Liberman, 2000, 2003). The level of abstraction depends on the psychological distance of an object or an event that changes their perception and mental representation by the individuals. Literature has suggested that the CLT provides an adequate framework for explaining and predicting different important aspects of consumers' decision-making, also in the context of sustainable behaviors (e.g. Bartikowski and Berens, 2021; Ryoo et al., 2017; Schill and Shaw, 2016; Yang et al., 2015; Wei and Jung, 2021). Attribution Theory (Fritz, 1958; Kelley, 1967) and Costly Signaling Theory (Bird and Smith, 2005; Miller, 2000) have also been adopted as theoretical frameworks by three paper, respectively, in the periods 2013–2015, 2016–2018 and 2019–2021.

4.2 Scientific mapping
Before carrying out the content analysis, the keywords were processed to remove duplicates resulting from the use of plurals, capital letters, separators, accents and synonyms. Thus, 50 keywords were identified.

The analysis of the keywords for each period and their evolution over time is summarized in Figure 4. Based on the methodology proposed by De Solla Price and Gürsey (1975), each period is represented by a circular section, each of which contains the information about the related number of keywords. The arrow starting from a circle and reaching the next one indicates the number of keywords they share. The value in brackets (stability index) points out the percentage of keywords from the first period that are also present in the second. For example, periods 2 and 3 share 31 keywords, with a stability index of 0.94. Oblique arrows
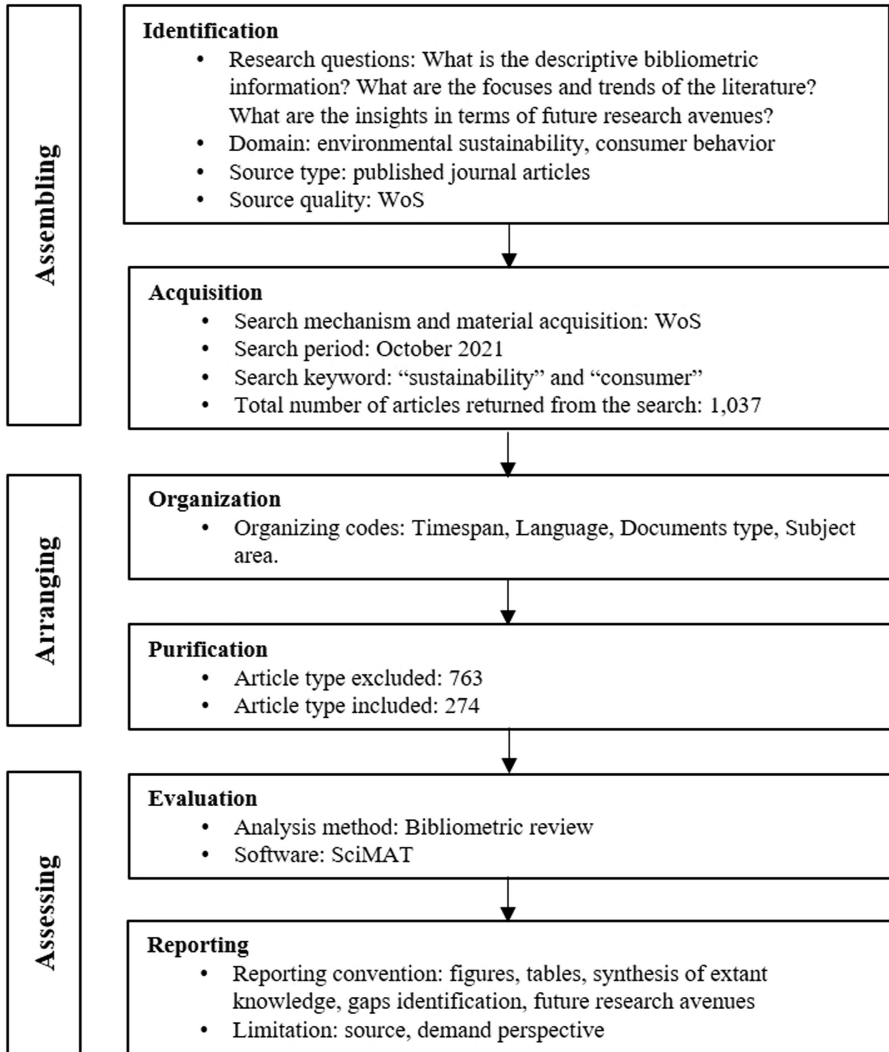
Assembling

Arranging

Assessing

Identification
- Research questions: What is the descriptive bibliometric information? What are the focuses and trends of the literature? What are the insights in terms of future research avenues?
- Domain: environmental sustainability, consumer behavior
- Source type: published journal articles
- Source quality: WoS

Acquisition
- Search mechanism and material acquisition: WoS
- Search period: October 2021
- Search keyword: "sustainability" and "consumer"
- Total number of articles returned from the search: 1,037

Organization
- Organizing codes: Timespan, Language, Documents type, Subject area.

Purification
- Article type excluded: 763
- Article type included: 274

Evaluation
- Analysis method: Bibliometric review
- Software: SciMAT

Reporting
- Reporting convention: figures, tables, synthesis of extant knowledge, gaps identification, future research avenues
- Limitation: source, demand perspective

Figure 4.
Overlapping Map:
Keywords in the
different periods

that "come out" of a circle represent keywords that are not shared with the next period. Oblique arrows pointing to a circle, on the other hand, indicate the number of new keywords that emerge in a period and are not shared with the previous period. The data show that the number of keywords has increased from the first period (1999–2009) to the last (2019–2021), passing from 16 to 50 and confirming the growth and more articulated interest in the topic and its domains of application. The increase in the stability index from 0.81 to 1 also suggests a strengthening of the vocabulary related to research on "sustainability" and "consumers".

Figure 5 exhibits the evolution map of the research topic into the five time periods. The graph highlights the main sub-themes and their interaction over time. An interesting result concerns the growth in the number of issues addressed. If "food" is the only central keyword in the first period, there are more relevant themes in the following periods, some of which have

consolidated over the years. The presence of a keyword in multiple time periods denotes that the theme has gained and maintained interest over time.

The strategic diagrams in Figure 6 deepen the analysis by period and highlight the weight and relevance of each issue. Four categories of themes can be distinguished: (1) the motor themes - which are of utmost importance - (upper right quadrant); (2) basic and transversal themes - relevant but still underdeveloped - (lower right quadrant); (3) emerging or declining themes (lower left quadrant); (4) niche or marginal themes (upper left quadrant). These four categories have been obtained based on two parameters: centrality and density (Callon *et al.*, 1991). Centrality measures the degree of interaction among clusters (or themes), that is, the strength of the link that a theme has with the others (external links). A theme with a high degree of centrality can be considered essential in the development of the entire field of research. Density measures the internal strength of a cluster, that means the strength of the links between the keywords that describe the theme (internal links). Therefore, it is a measure of the degree to which the theme has been developed (Nova-Reyes *et al.*, 2020).

As mentioned, the keyword that appears in the first analysis period is "food", as literature was interested in exploring the determinants of pro-environmental attitude and behaviors (e.g. Hoogland *et al.*, 2005, 2007; Ngo *et al.*, 2009) and the strategies for fostering environmentally friendly practices (e.g. Ger, 1999; Guy, 2009). In addition to food, behaviors related to mobility and domestic energy consumption were also investigated. However, these are still marginal issues.

In the period 2010–2012, the consumer attitude still stirs the attention of academics while the study of real behavior is enriched. "Consumer-behavior" emerges as a motor theme with the highest centrality (93.4), which means strong external links with other networks. Its positioning in the upper right quadrant qualifies it as a mainstream theme and, as Figure 7 shows, it is strongly related with many others.

The pro-environmental behavior appears positively influenced by the level of consumers' knowledge about the sustainable benefits of the product/service (Ahmad *et al.*, 2012). Indeed, the willingness to spend on sustainable products also starts to be investigated. In the case of
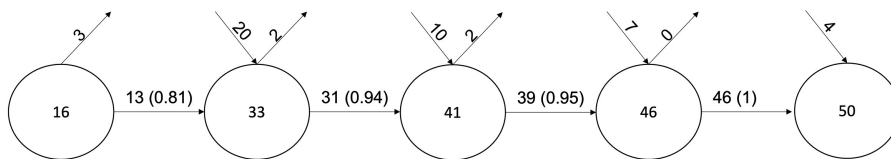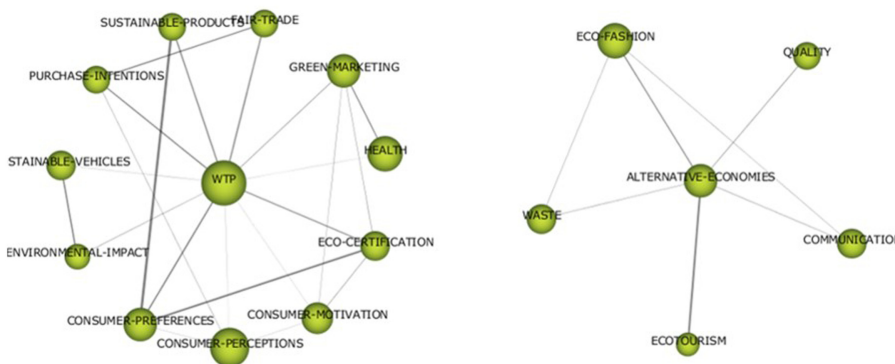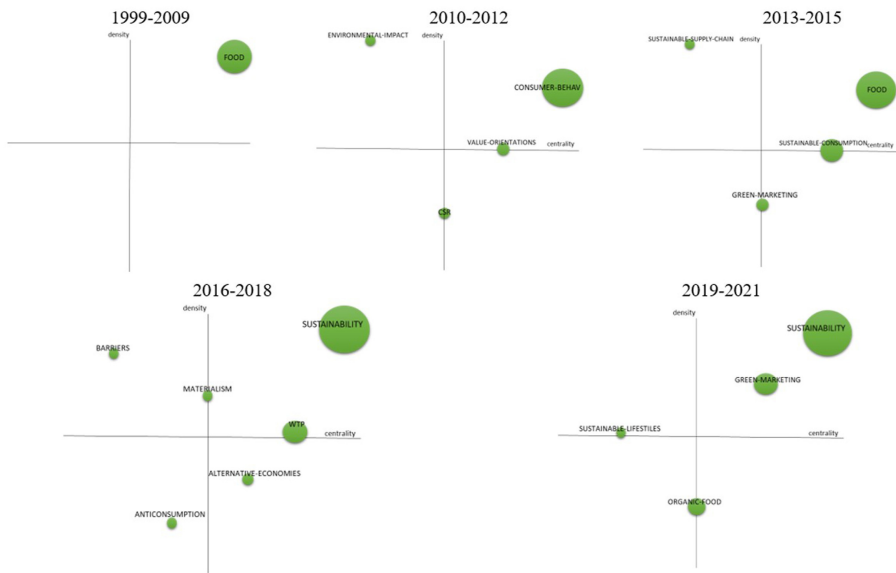

Figure 5.
Evolution map

Figure 6.
Strategic diagrams

Figure 7.
Cluster's network for
"consumer-behavior"

organic products, consumers declare a modest willingness to pay since the pro-social benefit granted does not compensate for the perceived poor quality (Van Doorn and Verhoef, 2011). During this period, clothing is one of the most studied sectors (e.g. Momberg *et al.*, 2012; Ha-Brookshire, 2012; Peterson *et al.*, 2012). The theme of corporate social responsibility (CSR) – and of consumers' response to companies' CSR initiatives – also comes on to the scene although still underdeveloped (e.g. Belz and Schmidt-Riediger, 2010; Huang and Rust, 2011; Svensson and Wagner, 2012).

The relationship between knowledge and behavior continues to be explored in the period 2013–2015. In the textile-clothing sector, Kang *et al.* (2013) demonstrated an indirect effect of consumer knowledge on buying intention; consumers must be aware of the existence of a problem and see a solution in the product/service (Sirieix *et al.*, 2013). In this period, attention to sustainable consumption thrives considerably and emerges as motor/transversal theme, with the highest degree of centrality (93.83) after "food". Specifically, authors investigated the barriers to green consumption (e.g. Gleim *et al.*, 2013; Van Doorn and Verhoef, 2015). The low appeal (and consequent marginal market share) of sustainable products is connected not only to the high price that the demand is unwilling to pay, but also to a number of attributes, such as small size and lower performance compared to traditional products (Olson, 2013). At the end of the period, new elements of investigation came out. The inception of communities of consumers sharing pro-environmental lifestyles allows to overcome some barriers that hinder the development of this sector: mutual support in the consolidation of their convictions and shared purchases make it possible to minimize burdens related to sustainable consumption (Chaudhury and Albinsson, 2015).

The theme of "green-marketing" also takes hold. Martínez (2015) deepened the effect of green image and satisfaction toward green marketing practices on customer loyalty. Similarly, Cho (2015) investigated the effectiveness of different environmental claims in the consumer decision-making process.

In the period 2016–2018, the number of issues continues to increase. Interest remains in the study of the attitude-intentions-behavior relationship, to which new elements of research are

added. The attention to "willingness-to-pay" is consolidated. It is positioned between the central and transversal themes, with a high degree of centrality (100.48) but a low level of density (13.5). This cluster is strongly linked to the "consumer-preference", "purchase-intention", "sustainable-products", "fair-trade" and "eco-certification" issues (Figure 8). Moreover, the theme of "alternative-economies", mainly jointed to ecotourism, eco-fashion and waste management (Figure 7), emerges. In the context of clothing, these themes meet that of circular economy, i.e. the recycling of fabrics/clothes used to produce new ones. According to Vehmas *et al.* (2018) consumers consider the circular garment to be new and not second-hand, with the consequence that the attitude is positive and the purchase intention is high.

The food sector remains one of the most studied. Interest is focused on the relationship between attention to health or ethical consciousness and sustainable food consumption (Ghvanidze *et al.*, 2016; Hoek *et al.*, 2017; Lazzarini *et al.*, 2016; Shin *et al.*, 2017). As the diet impacts on the well-being of both the environment and the individual, determining the drivers of food choice appears to be of primary importance (e.g. Lazzarini *et al.*, 2016; Spendrup *et al.*, 2016; Stranieri *et al.*, 2017). Another central issue connected to food consumption is the reduction of consumption (anti-consumption). This theme is in turn linked to that of recycling. The recycling behavior, if correctly implemented, allows for the achievement of three sustainability objectives: reduction of consumption, waste and environmental impact (Schill and Shaw, 2016).

The clothing sector continues to capture interest, albeit to a lesser extent than food. Fast fashion, ethical clothing, eco-friendly clothing are the most investigated topics (e.g. Han *et al.*, 2017; Matthews and Rothenberg, 2017; Wei *et al.*, 2018; Vehmas *et al.*, 2018). Used clothing buying behavior is less explored. It is a sustainable action that the consumer struggles to approach as it is not associated with sustainability but with a poor individual economic condition and low product quality (Norum and Norton, 2017).

In the last period (2019–2021) the growing awareness of the environmental impact of production and consumption has led to an increasing attention to the green marketing practices: as an emerging theme in the 2013–2015 period it evolves into a motor theme in the 2019–2021. The scrutiny of ways used by companies to communicate sustainability remains high: eco-labels, sustainability labels, ethical claims (e.g. Eldesouky *et al.*, 2020; Herédia-Colaço and do Vale, 2018; Kim *et al.*, 2021). An important communication channel also emerges as line of investigation: social media. Zhao *et al.* (2019) demonstrated the ability of social media and online interpersonal influence to increase the intention to purchase
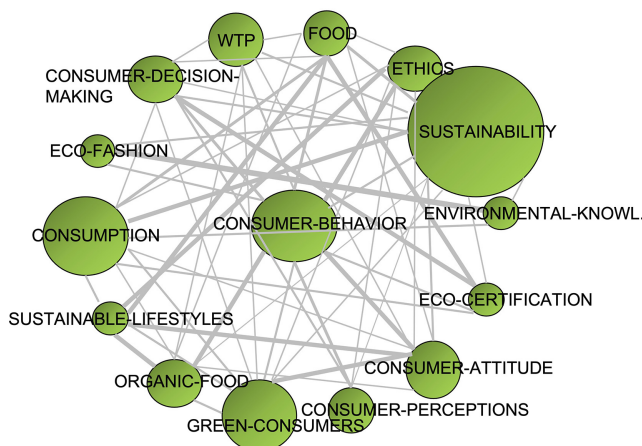
Figure 8.
Cluster's networks for
"WTP" and
"alternative-
economies"

eco-friendly clothing. Similarly, Choudhary *et al.* (2019) showed that intergroup contacts and information disseminated via social media influences sustainable food consumption. Gupta *et al.* (2021), on their side, explored the impact of CSR communication through social media on purchase intention.

5. Limitations of the study, theoretical and practical implications

This study has some limitations related to the use of WoS. Although the search through the citation databases allows to adopt a rigorous and transparent protocol for the identification of relevant articles (Xiao and Watson, 2019), it should also be considered that the information contained therein is updated daily. This causes a constant fluctuation in the number of citations and documents available (Valenzuela-Fernandez *et al.*, 2019).

Furthermore, the study carried out a bibliometric analysis of the literature on environmental sustainability from a demand perspective, placing the consumer at the center of the field of investigation. The topic suggests integrations also from the point of view of the organization, adopting a macro-level perspective that includes the contribution of the company in the conceptual development of sustainable consumption and related practices.

Nonetheless, the manuscript suggests interesting theoretical and practical implications. First of all, this study contributes to enrich the literature on sustainable consumption, identifying the main areas of interest of scholars. If on the one hand this SLR confirms the centrality of key topics such as the appeal of the label or the information needs of consumers, on the other hand it reveals the usefulness of additional aspects that affect consumers' purchasing habits.

Faced with the spread of an increasingly "phygital" dimension of purchasing, which sees the union between physical and digital purchasing space, the study suggests the need to adopt an omnichannel strategy to promote sustainable consumption, helping to increase the green conscience of consumers.

From the point of view of practical implications, the study suggests the adoption of business practices based on the use of new information technologies and social platforms, which improve the interaction between organizations and customers, creating an exchange between peers that flows into the development of more effective product targeting and positioning strategies. In fact, the literature on the field has focused on the impact that the sustainable consumption paradigm has determined on business models, neglecting rather to analyze the factors capable of influencing the customer journey, modifying the behaviors and habits of consumers. In this sense, the study suggests the need to develop new managerial skills, aimed at managing market transformations and interpreting the renewed logic of orientation, choice and purchase of consumers.

In this sense, the "rational" managerial approach is no longer sufficient to generate a transformation of purchasing behavior in a sustainable way; rather the branding and marketing strategies should also consider the cultural context and the emotional needs associated with the purchase. In fact, people need to find pleasure in the consumer journey, feeling connected to a community with the same values, tastes and lifestyles.

Therefore, companies will have to make an effort to personalize products, to improve trust between brand and customer, adopting a vision that is no longer individualistic, but extended to the community, in the awareness that purchasing decisions are based on the quality and price of the product, but above all on the sharing of social values.

6. Discussion, conclusions and future research agenda

Sustainable consumption is a global concern that is receiving the attention of governments, businesses and people. In fact, in the context of the relationship between man and nature, the

issue marks a conjunction between the neglect of human behavior and the profiles of moral responsibility connected with consumption.

Habits related to lifestyle, preferences and purchasing choices are essential to achieve sustainable consumption, while improving the levels of corporate responsibility towards the impacts of business activity. The growing attention consumers pay to the environmental impact of their behavior has led to a greater commitment by companies in the development of sustainability strategies and an increased interest in the topic by the scientific community.

These reasons fuel the importance of conducting a comprehensive analysis of the phenomenon, which sheds light on the gaps in the existing literature, by identifying the main factors and barriers that influence sustainable consumption. More in details, this study shows the results of a bibliometric analysis aimed at describing the state of the art of research on consumer attitudes and behaviors towards environmental sustainability, tracing its evolution over time and identifying possible areas for future research.

First, results show how the sub-themes addressed have risen steadily over the past twenty years. At the beginning, the topic was addressed with a general perspective, focusing on food and consumers' attitude. In recent years, the lines of research have increased and become more specific, reflecting both the institutional commitment codified in the 2030 Agenda and the stricter attention of consumers on sustainability issues. Recycling, sharing and food waste are some of the issues that have received attention. Contextually, food and clothing are the most studied sectors and accused of being two of the major contributors to the Earth's pollution, developing new and more conscious purchasing habits, especially in the new generations, such as the purchase or rental of used clothes. The connectivity of the systems and the hybrid dimension (physical and digital) of the sales channels contribute to building a new value system connected to the product, increasing the points of contact between customers and companies based on the sharing of information and expectations that must flow into strategies corporate (Mele *et al.*, 2021).

In fact, another interesting result is the increasing consumers request for information, which has prompted companies to share their sustainable commitment also through claims and labels on the packaging.

The awareness of consumers towards the socio-environmental initiatives of companies contributes to creating a participatory dialogue between organizations and consumers, helping to increase the social responsibility profiles of companies. Social media and the used clothing sector stand out among the issues that deserve more consideration. In the first case, it would be interesting to deepen the effect of the peers' influence on sustainable behaviors with reference to both the products purchase and consumption and the actions of everyday life (i.e. consumption of water; recycling activities; use of public transport). In fact, social media represent a medium dimension based on dynamic interaction, which allows companies to adapt their strategies by capturing the preferences of consumers expressed through the like, share and comment functions typical of these digital tools.

Finally, bibliometric analysis has revealed some interesting gaps in the literature that can represent interesting avenues for future research. First, E-commerce and product packaging may represent an interesting opportunity for future research. The analysis of the impact of electronic commerce on environmental sustainability is a relevant but little-investigated issue, despite the spread of online shopping resulting from the restrictions due to the coronavirus emergency. The spread of the online sales channel and the related logistics chain certainly has repercussions on the environment, from transport for storage to those of the last mile and returns management. The theme of the link between E-commerce and sustainability could be addressed both from the point of view of the industry and the

consumer. With reference to the consumer study, it is interesting to assess the perception gained about the environmental impact of electronic commerce and the costs associated with online purchases. In other words, does the consumer consider buying online a sustainable behavior? Does the consumer believe that buying online has a negative impact on the environment? Can environmental sustainability be an obstacle or, conversely, a driver to online shopping? Does the consumer not consider the environmental impact of his actions when using the online channel? From the side of the company that uses the E-commerce channel, it is important to understand how to reduce the negative impact of online sales on the environment and how to communicate their actions to customers. Translated into research questions: what can companies do to decrease the impact of online sales? What can be the most effective way to make the consumer understand the company's commitment to the environment?

Product packaging has been extensively examined in literature. Numerous studies focused on the effectiveness of color, shape and textual content, while the material used for packaging is poor in contributions. Knowing the impact of the type of material on variables such as the perception of product sustainability, the perceived quality, the perceived risk and the purchase intention would certainly be a source of information for companies aiming at developing environmental sustainability strategies. Therefore, future research could deepen the role played by sustainable packaging materials and reusable packaging on consumer buying behavior. More specifically, it would be interesting to understand the role played by the packaging material on the consumer's judgment of product sustainability.

Finally, the exploration of the micro-foundations that influence sustainable consumption, from socio-cultural to ethical-religious variables, suggests interesting implications for the definition of business strategies capable of meeting consumer preferences. New research avenues could verify the impact of the management of such information on sustainable production and distribution systems.

A synthetic overview of the paper contribution is proposed in Table 3, which summarizes both the main motor and emerging themes, unexplored topics and areas for future research, outlining potential future research questions.

Mainstream themes
- Attitude-intentions-behavior hierarchy
- Food and clothing as the major contributors to the Earth's pollution
- Recycling, sharing and used clothing fall into the topic of circular economy

Emerging themes
- The "eco" movement spreads: eco-fashion, eco-tourism, eco-certification, eco-friendly clothing
- The analysis of the effectiveness of marketing communication focuses on sustainable claims
- The influence of social media and peers on boosting sustainable shopping behaviors emerges

Unexplored themes
- The impact of electronic commerce on environmental sustainability
- The role of pack in shaping the product sustainability perception

Research questions?
- How to decrease the negative perception associated to second-hand clothing use?
- How to leverage on social media and interpersonal relationships to shape sustainable perceptions and actions?
- Do consumers perceive the actual environmental impact and costs associated to the online purchases?
- Are sustainable pack materials and reusable packaging able to influence consumers' pro-environmental benefits evaluation and consumption choices?

Table 3.
Key findings and future research agenda

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