



SYSTEMATIC LITERATURE REVIEW

Consumer Behavior and Sustainability: What We Know Still Need to Know

Comportamento do Consumidor e Sustentabilidade: o que Sabemos e o que Precisamos Saber

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ABSTRACT | Purpose: To highlight the major motor theme and the author's contribution, amongst other indicators about consumer behavior and sustainability. **Methodology/approach:** Systematic Literature Review. To select the papers to be included, we retrieved all articles from the Scopus and Web of Science (WoS) databases about subject. By means of bibliometric review we identified motor theme and conducted the review on papers of motor theme. **Originality/Relevance:** This work compiles previous research about consumer behavior and sustainability and theories used, accessing motor themes and gaps not being addressed in previous studies, being a valuable reference for researchers who intend to contribute with this research area. **Key findings:** This work shows motor themes in consumer behavior and sustainability, the most productive/influential documents, authors and potential areas of research related with consumer behavior and sustainability. The work aims to support researchers in responding to the challenges of sustainability and consumer behavior. **Theoretical/methodological contributions:** This paper aims to serve as a basis for further research in sustainability and consumer behavior. This study contributes to overall understanding of the knowledge structure consumer behavior and sustainability motor themes based on quantitative and graphical knowledge mapping analyses in consumer behavior and sustainability and suggestions for future research.

Keywords | Consumer behavior, Sustainability, Sustainable consumption, Systematic Literature Review, Bibliometric Analysis, Environmental sustainability.

RESUMO | Objetivo: Destacar o principal tema motor e a contribuição do autor, entre outros indicadores sobre comportamento do consumidor e sustentabilidade. **Metodologia/abordagem:** Revisão Sistemática da Literatura. Para selecionar os artigos sobre comportamento do consumidor e sustentabilidade a serem avaliados, recuperamos todos os artigos das bases de dados Scopus e *Web of Science* (WoS). Em seguida, conduzimos uma revisão bibliométrica identificando o tema motor e conduzimos a revisão em artigos sobre o tema motor. **Originalidade/Relevância:** Este trabalho compila pesquisas anteriores sobre comportamento do consumidor e sustentabilidade e teorias utilizadas, acessando temas motores e lacunas não abordadas em estudos anteriores, sendo uma referência valiosa para pesquisadores

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que pretendem contribuir com esta área de pesquisa. **Principais descobertas:** Este trabalho mostra temas motores no comportamento do consumidor e sustentabilidade, os documentos mais produtivos/influentes, autores e áreas potenciais de pesquisa relacionadas ao comportamento do consumidor e sustentabilidade. O trabalho visa apoiar os pesquisadores na resposta aos desafios da sustentabilidade e do comportamento do consumidor. **Contribuições teóricas/metodológicas:** Este artigo visa servir de base para futuras pesquisas em sustentabilidade e comportamento do consumidor. Este estudo contribui para a compreensão geral da estrutura de conhecimento do comportamento do consumidor e temas motores de sustentabilidade com base em análises quantitativas e gráficas de mapeamento de conhecimento em comportamento do consumidor e sustentabilidade e sugestões para pesquisas futuras.

Palavras-chave | Comportamento do consumidor, Consumo sustentável, Revisão sistemática da literatura, Análise bibliométrica, Sustentabilidade ambiental

1. INTRODUÇÃO

Evaluating the progress of Agenda 2030, the United Nations has released a special edition of its sustainable development goals report, showing alerts about the impacts of the climate crisis, the war in Ukraine, a weak global economy, and the lingering effects of the COVID-19 pandemic that uncovers weaknesses and hind progress towards the Sustainable Development Goals (SDG). It also points out areas that need urgent action to rescue the SDGs and deliver meaningful progress for people and the planet by 2030. Especially about responsible production and consumption (goal 12), the report states that “reporting has increased on corporate sustainability and public procurement policies but has fallen when it comes to sustainable consumption and monitoring sustainable tourism” (United Nations, 2023).

Consumption is a cornerstone of sustainability alongside post-consumption behavior, even with a need for a shared understanding of what sustainable consumption means in marketing and consumer research. Usually, sustainable consumption is treated as the purchase and use of environmentally friendly products. However, this notion is too narrow, as consumer consumption sustainability involves various forms of manifestation, including purchases of environmentally friendly products, fair trade products, orientation towards shared consumption of products, as well as following a more modest and less materialistic consumption lifestyle considering donation and renting behavior (Champniss et al., 2016; Krastevich & Smokova, 2021; S. H. Lee & Huang, 2021).

Extant research paints an unclear picture of the translation of sustainability values into purchase behavior; researchers have found that while consumers are positive towards sustainability, this attitude does not translate into action (Johnstone & Lindh, 2022), what becomes known as the attitude-behavior gap, was subjected to extensive research, but still remains as a challenge to motivate sustainable consumption to the present day (Kilian & Mann, 2020; Pristl et al., 2021). One of the most urgent and current issues is the challenge of achieving the sustainable development of our societies. Sustainable consumption is a form of consumption that meets the needs of the present without compromising the ability of future generations to meet their own (United Nations, 2015). On behalf of consumers, this means incorporating issues related to ecological, social, and economic issues and redefining consumer behavior practices. That's why numerous sustainable development advocates (including marketers of sustainable products or services and public policy agents) are concerned with motivating consumers to more sustainable consumption (Pristl et al., 2021), redefining consumer behavior practices.

To identify the state of present studies, we conducted this work as a systematic literature review (SLR) associated with the bibliometric study, aiming to understand (RQ1) what are the promising research themes (or motor themes as bibliometrics states) about sustainable consumer behavior. (RQ2) What theoretical approaches are used in the articles that constitute the motor themes in sustainable consumer behavior? (RQ3) What are the limitations in prior literature and the avenues of future research on sustainable consumer behavior?



RQ1 is addressed through Bibliometrix, a well-known software that helps cluster the databases of articles and uncover themes. To answer RQ2, the theories, models, and variables discussed in past studies are examined. Lastly, RQ3 is addressed by reviewing the existing gaps and limitations in the sustainable consumption behavior literature and proposing directions for future research. The main motivations for conducting an SLR of prior sustainable consumer behavior studies are as follows: First, SLR helps synthesize the research in a scientific, replicable, and transparent (Behera et al., 2019; Sahu et al., 2020). Second, it offers a critical analysis of the previous studies, enabling scholars to identify the future scope of work in a given field (Bhatt et al., 2020; Sahu et al., 2020; Seth et al., 2020). Third, various journals have published sustainability-related studies with different aims, scope, and target audience. This is because the progression of knowledge in management-related fields has led to increased interdisciplinary, fragmented, and interdependent research in social sciences. Therefore, conducting an SLR instead of other narrative reviews is necessary to compel scholars to focus on specific journals, authors, or other narrow criteria (Sahu et al., 2020). This SLR study is limited in the scope of sustainable consumer behavior only, even though most related studies are published in the marketing domain.

2. LITERATURE REVIEW

Sustainability is one of the critical topics for organizations since they may adapt their long-term strategies to meet changing societal demands, including environmental and social aspects in their product offerings (Dimitrova et al., 2022). Knowing the causes and consequences of conscious, sustainable consumer behavior is a prerequisite for implementing successful marketing strategies and practices of sustainable consumption (Krastevich & Smokova, 2021), achieving goal 12 of GDN. It is crucial to remember that consumer behavior will be the result of cognitive, emotional, and motivational processes and that it will be influenced and even conditioned by several circumstantial factors, starting with the notion that altering individual consumption patterns calls for more sustainable consumer behavior (Dimitrova et al., 2022). Aligned with these thoughts, we first define sustainable consumption; next, we review articles empirically based without any base theory and show some theoretical perspectives used to explain intentions and actual behavior. The theory represents a set of different interlinked definitions, measures, and opinions that jointly convey a systematic viewpoint for explaining a given phenomenon, and it supports the testing and validation of the relationships of the phenomenon (Sahu et al., 2020).

2.1. Sustainable consumption

Sustainable consumption presupposes a holistic approach, more than purchasing and consuming environmentally friendly products. It corresponds to a change in lifestyle (e.g., refraining from hyper-consumption), future orientation, and responsibility to the next generations, meaning that sustainable consumption brings together crucial issues, such as meeting needs, enhancing the quality of life, improving resource efficiency, increasing the use of renewable energy sources, minimizing waste, taking a life cycle perspective and taking into account the equity dimension (Dimitrova et al., 2022). Sustainable consumption behavior is a set of deliberate and effective actions of consumers that result in their quality of life, taking care of the environment and resources for future generations (Dimitrova et al., 2022). Under this system, businesses must find ways to re-use, repair, refurbish, and recycle (MacArthur, 2013), becoming part of a circular economy, that is, “a regenerative system in which resource input and waste, emission, and energy leakage are minimized by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling.” (Geissdoerfer et al., 2017).

According to Gupta and Singh, sustainable consumer behavior occurs (and could be empirically studied, respectively) in the following areas: a) Responsible purchasing – considering the purchase of goods and the use of

services that do not harm the environment, as well as the behavior that leads to the purchases of such products; b) Responsible usage – refers to sustainable and responsible ways of consuming, as the use behavior affects the environment in terms of the ways and habits of using the purchased products, and resources, respectively; c) Responsible maintenance – refers to the maintenance of purchased and used products in good conditions through regular inspections and repairs, to extend the life of the product; d) Responsible disposal – covers disposal (if possible, recycling), as well as the activities of consumers after the disposal of the product. This area is essential because it covers activities for the proper treatment of household waste and waste from activities outside the home; e) Responsible social activity – includes consumer relations and activities related to supporting petitions, joining environmental organizations, supporting public policies, environmental discussions, donations for ecological conservation and recycling (Gupta & Singh, 2020), these areas can be better understood as being a three-stage process involving the acquisition, use, and disposal of various goods/services (Piligrimienė et al., 2021) - Figure 1 shows a framework that makes these points visual.

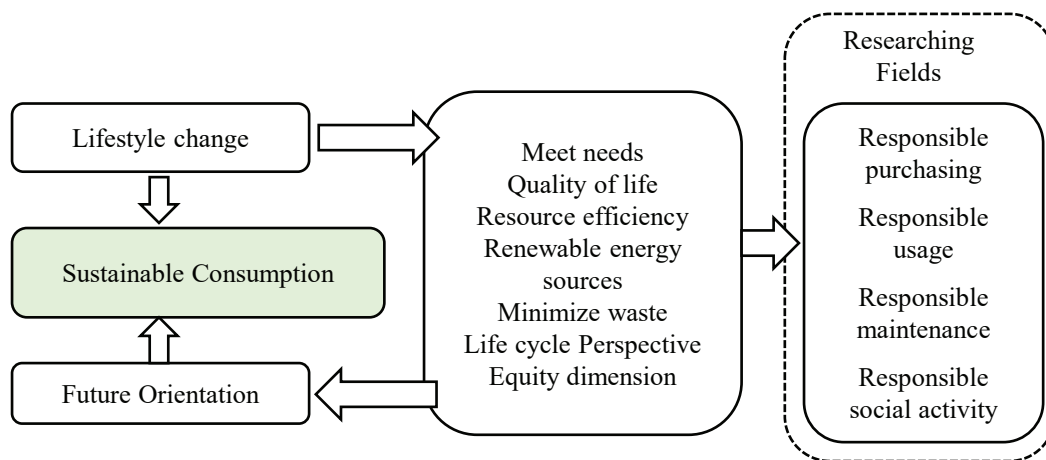


Figure 1. Sustainable consumption framework and fields of research

For consumers, all the areas mentioned above mean different ways to consume ‘sustainably’ (Krastevich & Smokova, 2021). For example, green purchasing behavior has been described as the purchase of products that are recyclable or not harmful to Consumers can see the environment as an effort to protect the environment while believing that they will receive other direct benefits (Mutum et al., 2021). Since green consumption refers to minimizing the negative environmental impact of individual behavior while purchasing, using, or disposing of products, it is related to ethical and sustainable consumption (Carrington et al., 2020). As green consumption is conducive to the balance between satisfying individual needs and protecting the environment, It can alleviate the problems of climate warming and environmental deterioration and promote the sustainability of the earth’s resources. That’s why the terms “green consumption” and “ethical consumption” are used in literature interchangeably with “sustainable consumption”.

2.2. Empirical and segmentation works

It is important to consider consumers’ heterogeneity while studying sustainable behaviors since consumers differ in many aspects, such as the importance they attach to sustainability or the type of sustainable behaviors they perform. Identifying consumer segments with common needs and characteristics is essential for developing effective communication strategies for sustainable consumption (Piligrimienė et al., 2021).



Segmentation helps to identify the different subsets of customers with similar needs, characteristics, or behaviors and then propose unique offerings for target segments. First attempts to segment the market based on sustainable consumption usually employed sociodemographic segmentation criteria, such as gender, age, income, or education. Still, such segmentation lacks explanatory power and fails to provide more precise insights into the underlying factors of so-called sustainable consumers (Piligrimienė et al., 2021). Therefore, research on sustainability-based segmentation shifted its focus from demographic and geographic to psychographic and behavioral segmentation. Some attempts to segment the green market regarding values, concerns, lifestyle, attitudes, and behaviors (Balderjahn et al., 2018; Coşkun & Yetkin Özbük, 2019; Sarti et al., 2018).

As one can see, segmentation may group individuals with similar attitudes and behaviors. Still, it needs to explain why they are identical, and in this sense, it is less helpful in overcoming the challenges observed by the UN-associated objective 12. Establishing the origin of the behavior is necessary to create behavioral changes, which can be done if we observe robust theoretical models.

2.3. Theories used

As shown in Table 7, many researchers were based on the theory of planned behavior. This is not the first work to notice that since Alagarsamy et al. (2021) state that most researches are based on TBP, and some of them only measure behavioral intentions and not the actual individual behavior of sustainable consumption (Alagarsamy et al., 2021). TPB is, in fact, an extension of the theory of reasoned action (TRA) that relates attitudes, perceived social norms, and extended with perceived behavioral control (Ajzen, 1991) to intentions, implying in an individual's motivation for making a conscious decision to perform a behavior after thorough consideration of available information. Attitudes refer to the degree to which an individual has a favorable or unfavorable evaluation of a behavior, resulting from the positive or negative behavioral beliefs held about undertaking a particular behavior, weighted by the perceived evaluation of associated outcomes from such behavior. Social norms are related to the perceived social pressure of significant others to perform or not perform the behavior guiding individuals' consumption behaviors (S. H. Lee & Huang, 2021). However, TPB is prone to various limitations, and its ability to predict and generalize consumer behavior has been questioned by many scholars (Gilal et al., 2019; Hagger et al., 2002; Sahu et al., 2020).

The theory of (un)planned behavior contrasts existing models of consumer behavior, emphasizing the ability of retailers to influence consumer behavior by (un)consciously building trust in online intermediaries such as influencers. This implies that consumer behavior may not be linear or rational, as suggested. Based on TPB, this theory addresses the intention-behavior gap towards an action-value chain (Johnstone & Lindh, 2022).

Seminal theories on reasoning and values, such as expectancy-value theory (Cohen et al., 1972), theory of explanation based decision making (TEDM) (Hastie & Pennington, 1995), and reasons theory (Cohen et al., 1972; Westaby & Fishbein, 1996), suggest that beliefs or values are a strong predictor of reasons (Deci et al., 2017). Consumption value theory tries to explain consumers' decisions by combining various components of consumer value models based on the assumption that consumer decisions are influenced by five different consumption values: functional, emotional, social, conditional, and epistemic values, and consumer identity is closely related to consumption values. (Mutum et al., 2021, p. 828).

Behavioral Reasoning Theory (BRT) also suggests that beliefs or values differ from reasons; that is, reasons represent a narrow chain of thoughts than beliefs or values that describe people's behavior (Sahu et al., 2020). BRT can be considered an advancement of seminal technology acceptance theories such as TPB. BRT determines the linkage between beliefs or values, reasons (for and against), global motives (attitude, subjective norm, and perceived behavioral control), intentions, and user behavior measures. BRT is related to other behavioral



theories, but it offers various advantages or merits compared to them (Sahu et al., 2020). First, BRT includes two measures — reasons for and reasons against, that provide a better explanation of the human decision-making phenomenon. Reasons for and against are not just the opposite, but these are two critically different perspectives that influence user intentions and actual behavior, considering both doing and not doing the expected behavior. Second, the measures of reasons for and against are context-specific, providing rich contextual information. Third, BRT provides additional cognitive routes through reasons (for and against) to better understand human behavior and decision-making processes. Fourth, BRT has highlighted the critical role of values or beliefs in predicting reasons, intentions, and user behavior. These advantages are further strengthened by a review of prior BRT studies, which suggests that BRT-based models better explain the variance of the dependent variable than other behavioral theories. (Claudy et al., 2015; Sahu et al., 2020)

Social Identity Theory (SIT) proposes that our behavior is influenced by a psychological commitment to groups, where specific social groups (formal or informal) indicate specific social identities shared by collections of similar individuals on salient dimensions. These social identities combine with our more stable personal identity to form our self-concept. The sister theory of SIT, self-categorization theory (SCT), proposes that group membership occurs when psychologically committing to that group will remove social ambiguity. The chosen group presents the individual with a clearer view of how to act within the social environment at that moment and by the group identity, thus further improving the ‘positive distinctiveness’ of the group and the individual’s position. Once one accepts one’s membership of the social group, one strives to become the perfect – prototypical – member of that group by enacting behaviors congruent with the social identity and supportive of the group (Chamniss et al., 2016, p. 318). Behavior–identity congruence is the extent to which a behavior supports and adds to the group’s positive distinctiveness. So, more remarkable behavior–identity congruence will be associated with increased behavior displays as group members strive to deliver the behavior to improve the group’s positive distinctiveness and status. This effect is expected even in novel groups, as the minimal group paradigm demonstrates that individuals work to strengthen positive distinctiveness as soon as a group is created (Chamniss et al., 2016).

The resulting behaviors do not depend on the individual’s prior attitudes or values, which a behavior both supports and adds to the group’s positive distinctiveness. So, more remarkable behavior–identity congruence will be associated with increased behavior displays as group members strive to deliver the behavior to improve the group’s positive distinctiveness and status. This effect is expected even in novel groups, as the minimal group paradigm demonstrates that individuals work to strengthen positive distinctiveness as soon as a group is created. Notably, for SIT, the resulting behaviors do not depend on the individual’s prior attitudes or values (Chamniss et al., 2016, p. 319).

Structuration theory follows a sociological-contextual approach and acknowledges the duality of the problem, i.e., the role of consumers’ knowledge to make sense of and direct their daily activities and the industry’s role in mitigating climate change. This theory proposes that consumers are active agents of change and rely on their knowledge of a phenomenon to monitor their behavior and the context surrounding them to understand their behavior better. This theory refers to society as a structure with pertinent rules and regulations that consumers must abide by daily (Marx-Pienaar & Erasmus, 2014). Figure 2 shows the theoretical framework, and it became clear that, at least within this thematic map, the choice was to study why people do what they do and not how to change what they do, which seems to be the call of the UN.

2.4. Exogenous variables used

In essence, theory represents a set of different interlinked variable definitions that jointly convey a systematic viewpoint for explaining a phenomenon. Further, it supports the testing and validation of the relationships of the phenomenon (Sahu et al., 2020); in other words, theories propose relationships between variables. TPB, for instance, relates attitude, behavioral control, and social norms with intentions and intentions with behavior. However, complex problems must be addressed with complex models, looking for different sets of variables and establishing new roles to envision the solution. Next, we present some variables in addition to the theory's expression to advance knowledge. Sometimes, aside from new variables, we found different roles that had been tested recently. Notice that unusual here refers to variables/roles not established by seminal theory.

Some researchers look for different results considering different countries of origin of respondents (Bartels & Reinders, 2016; Jan 2022; S. H. Lee & Huang, 2021; Zhang et al., 2022). For example, S. H. Lee and Huang (2021) found a more substantial positive impact on US consumers than Chinese consumers of perceived compatibility with intentions of sustainable behavior. Another interesting result can be seen in Jan (2022), where Malaysian consumers' focus on environmental impact is significant in explaining sustainable intentions while perceived behavioral control is not, but in Turkey, perceived behavioral control is substantial, while environmental impact is not. These differences, commonly attributed to some differences in cultural aspects, indicate that cultural factors need to be planned at the beginning of the investigation, becoming part of the research protocol. We will review this point in the opportunities section for future research.

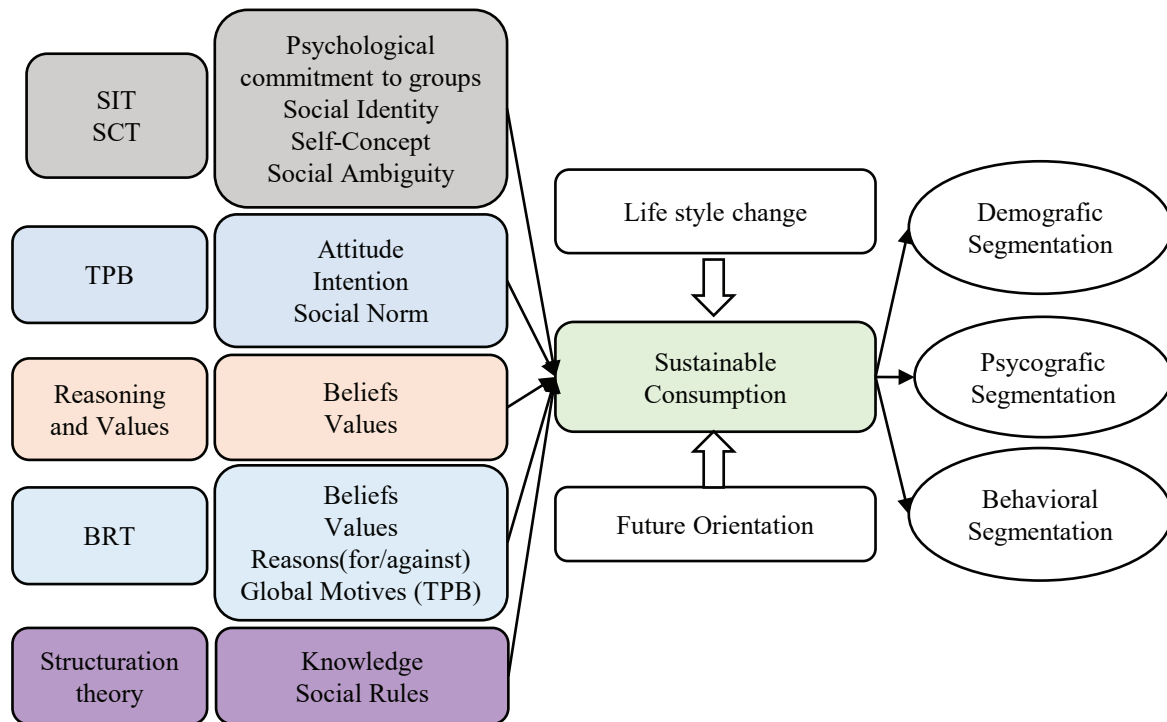


Figure 2. Theories and variables used (SIT = Social Identity Theory; SCT = Self Categorization Theory; TPB = Theory of Planned Behavior; BRT = Behavioral reasoning Theory)



Concerning the TPB, prior knowledge of sustainability positively affected attitudes, perceptions, and intentions (McKeown & Shearer, 2019), and celebrities play an important role in spreading knowledge. Repeated and increased exposure to sustainable concepts within sustainability communities will lead to a prevailing norm predisposing to sustainable practice. Increased participation in electronic word-of-mouth, recommendations, referrals, asking questions, and giving responses on online community forums are considered an initial measure of the success of celebrities in stimulating consumer demand for institutional change. From here, three variables can be quantitatively tested since McKeown & Shearer's work was qualitative. Knowledge about sustainability, celebrity congruence (with sustainability), and consumer engagement, indicated by the use of likes/loves/comments—the symbolic indicators of the social injunctive (McKeown & Shearer, 2019). Consumer engagement in the context of sustainable behavior can also be treated as a psychological state that can explain a specific behavior in different stages of consumption (acquisition, use, and disposal) and other environments (at home and work) (Pilgrimienè et al., 2021). The engagement construct has five dimensions: enthusiasm, attention, absorption, interaction, and identification (So et al., 2014). Enthusiasm is the excitement of an individual and an interest in the object of engagement. Attention reflects the user's attention and concentration on the object of engagement. Absorption represents the concentration in an activity. Interaction involves the exchange of ideas, thoughts, and feelings about the object of engagement. Identification represents an individual's perception of themselves as a member of an organization or brand community, i.e., the identification of the individual with the object of engagement (Pilgrimienè et al., 2021). Used by (Pilgrimienè et al.) to segment consumers, it is a different construct from McKeown and Shearer (2019) that used likes and other interactions in social media.

Religiosity influences consumption behavior, as stated by research built on belief congruence theory, which clarifies that it is easy to alter the influence of religious beliefs on disposal behavior through emotions (guilt or shame). Consumer's religiosity influences their sustainable behaviors and can provide a compensatory mechanism for religious consumers to address the adverse effect resulting from good purchases and belief-behavior inconsistency, which shows the importance of emotions in consumption situations that can be laden with negative affect (Minton & Geiger-Oneto, 2020; Newton et al., 2018). These effects persist whether beliefs are central to core values (as with intrinsic religiosity) or based on social values and external image appearance (as with extrinsic religiosity). In other words, when belief congruence theory is applied to consumption behavior, researchers need to incorporate the underlying emotional drivers and consumers' desire for identity congruence (Minton & Geiger-Oneto, 2020, p. 589).

Pro-environmental self-identity (PESI) refers to the self-obligation of consumers to act in their daily lives in ways that can protect the environment; it is symbolically expressive and shaped by mainstream socio-cultural forces. The term PESI is generally used to refer to a person morally bound to an action, which consequently makes that person feel content. Consumers who score high on PESI scales prefer to describe themselves as a "recycler" rather than say "I recycle" and tend to consider sustainable behavior an obligation. It is important to note that self-identity is often deep-rooted and complex to change, making consumption patterns consistent. There are some discussions about how PESI influences sustainable behavior - for example, as a direct antecedent of sustainable behavior (Mutum et al., 2021; Thorbjørnsen et al., 2007; Whitmarsh & O'Neill, 2010); or if PESI mediates the relationship between values and behavior (Gatersleben et al., 2012; van der Werff et al., 2013), or if values mediate PESI relationship with behaviors (Gatersleben et al., 2012).

Promoting sustainability supports alternative consumption patterns, increasing consumers' knowledge and awareness of environmental and social problems, changing consumption and purchase behaviors, and enhancing the acceptance level of sustainable consumption (Dimitrova et al., 2022). Environmental knowledge about environmental issues refers to individuals' information on the relevant environmental concepts,



environmental problems, and the ecological effects of consumption and production. Some researchers agree that environmental knowledge does not directly influence behavior but modifies attitudes and intentions (Dimitrova et al., 2022; Kollmuss & Agyeman, 2002; Vainio & Paloniemi, 2014).

Digital literacy refers to using digital tools to identify, access, manage, integrate, evaluate, analyze, and synthesize digital information and use it to construct new knowledge. The definition suggests that digital literacy is a set of skills required in digital environments, becoming critical in promoting changes in individual attitudes and behaviors. Digital literacy consists of three dimensions: technical, cognitive, and social-emotional. The technical dimension involves the technical and operational skills to use technology for learning or working. The mental dimension is related to critical thinking ability in searching and evaluating digital information. The social-emotional dimension is associated with using the Internet responsibly for communicating or socializing (Hu & Meng, 2023). As digital literacy represents a way for individuals to acquire knowledge, and knowledge reflects on attitudes and intentions, it is a crucial factor in spreading the idea of sustainable behavior.

Convenience is the ease of accessing a [circular] product. This variable should be distinct from perceived behavioral control, which is the act's ease or difficulty. In product categorization, convenience is a product purchased with minimum effort and time spent (Jan, 2022).

As per the discussion above, there are numerous theoretical perspectives, with many variables added to models and analyses. Research that addresses the intention-behavior gap is still needed. Figure 1 shows a diagram that resumes the works, theories, and constructs used.

3. METHOD

The bibliometric analysis technique is used to analyze bibliographic data, one of the most critical measures for evaluating scientific production (Singh & Bashar, 2021). We considered the Web of Science database and articles from top-quality journals were collected to analyze research trends, main topics addressed, most influential contributors, and articles in the D.T. and marketing research areas. The rationale behind taking the Web of Science data is to provide meticulous quality work and offer normalized keywords used to patronize keywords given by authors.

Bibliometric analysis clarifies the current state of research and helps explore the possible areas for knowledge expansion (Ahmi, 2022; Singh & Bashar, 2021) as we focus on SDG 12, and considering that it is closely related to other SDGs such as goal zero hunger (2), good health and well-being (3), quality education (4), clean water and sanitation (6), affordable and clean energy (7), decent work and economic growth (8), industry, innovation and infrastructure (9), sustainable cities and communities (11), climate action (13), life below water (14) and life on land (15) (Alagarsamy et al., 2021). It should be noted that the terms sustainable, green, pro-environmental, and eco-friendly were often used interchangeably in past literature (Mutum et al., 2021). we chose the keywords sustain*; Green; Respons* were used with “or” connector, then we used “consumer behavior” with connector “and” to ensure comprehensive coverage of literature in the field of sustainability and consumer behavior. Only research articles written in English were considered for further analysis.

The keyword search resulted in 256 articles. Then, we read all abstracts to ensure that articles were about sustainability and consumer behavior with empirical data. Those articles that did not fit the criteria were removed (Figure 2 illustrates the process). The application of exclusion criteria and careful analysis by authors found only 240 articles suitable for this study and further explored the relationship between sustainability and consumer behavior.

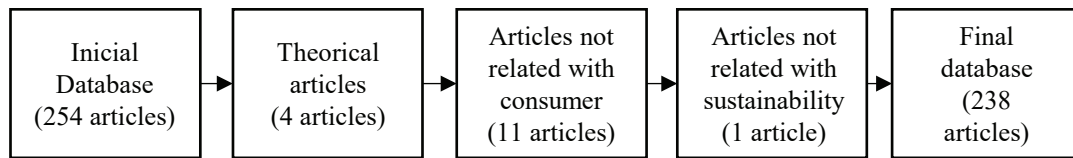


Figure 2. Exclusion criteria

For statistical analysis, we used Biblioshiny, one of the most comprehensive bibliometric tools, to help in data visualization about the crucial aspects of the field of research. Biblioshiny is a web interface that allows users to upload their dataset and carry out various analyses, such as best author, best documents, keyword analysis, and emerging sources, including scientific mapping and gauging the evolution of the area and subarea of research. It is a widely used tool for preparing and visualizing network maps for cocitation and cooccurrence analysis from the terms extracted from the literature in consideration. We also used Open Refine to complete information about the year of publication for those articles tagged with “early access” and to patronize the keywords informed by authors, as suggested by the literature (Ahmi, 2022; Aria & Cuccurullo, 2017). We opt for standardizing theory names by their acronyms – for example: “Theory of planned behavior” became “TPB”; we also opt to use singular words instead of plural ones – for example: “consumers” was changed by “consumer”. After these database adjustments, we proceeded with bibliometrics to analyze the data. Our focus was identifying the main themes of research and articles related to them, using these themes to conduct the literature review, and identifying new research opportunities.

Using our database, we found 13.763 articles that were cited. We included in Table 6 the 24 most recurrent references, removing references related to methodology research. TPB—The theory of planned behavior is the theoretical basis of works, with 48 citations, and Ajzen’s previous work, “Understanding attitudes and predicting social behavior,” has 21 citations. Stern (2000) received 13 citations, and Swartz (1992), with 11 citations, is another important work, to cite a few.

From here, we can devise the thematic map obtained to organize this literature review. Figure 2 represents theme in 4 quadrants, being a) “Niche Themes” (themes that are sparsely present in a database or that still have not evolved enough (“Values, consumers and segmentation”; “Planned behavior, purchase, and intentions”; “antecedents, consumer, pro-environmental behavior”); b) “Emerging or Declining Themes” that brings themes that were trend topics and are declining in presence or themes that are increasing the presence, but had not evolved yet (“willingness to pay, market, energy”) - in our database these themes are declining one: “willingness to pay, market, energy”- since as shown in Figure 3 “market” appears only in the beginning of period considered; c) “Basic themes” are those essential themes needing development (“Consumption, behavior, and choice”; Impact, CSR and Perceptions” and “sustainable consumption, green and model”). Finally, “Motor Themes” are those themes that are well-developed and essential for research, as they keep the subject on the move (“attitudes, intention, and products”). Motor themes will structure the literature review and future research in the following two sections.



Table 6. Most cited references

Citations	First Author	Year	Title
48	AJZEN I	1991	The theory of planned behavior
24	VERMEIR I	2006	Sustainable food consumption: Exploring the consumer “attitude–behavioral intention” gap
21	ICEK AJZEN	1980	Understanding attitudes and predicting social behavior
16	YOUNG W	2010	Sustainable consumption: green consumer behavior when purchasing products
15	LAROCHE M	2001	Targeting consumers who are willing to pay more for environmentally friendly products
15	ROBERTS JA	1996	Green consumers in the 1990s: Profile and implications for advertising
14	DIAMANTOPOULOS A	2003	Can socio-demographics still play a role in profiling green consumers? A review of the evidence and an empirical investigation
14	STRAUGHAN RD	1999	Environmental segmentation alternatives: a look at green consumer behavior in the new millennium
14	TANNER C	2003	Promoting sustainable consumption: Determinants of green purchases by Swiss consumers
13	CARRIGAN M	2001	The myth of the ethical consumer–do ethics matter in purchase behavior?
13	DE PELSMACKER P	2005	Do consumers care about ethics? Willingness to pay for fair-trade coffee
13	STERN PC	2000	New environmental theories: toward a coherent theory of environmentally significant behavior
12	CARRINGTON MJ	2010	Why ethical consumers don’t walk their talk: Towards a framework for understanding the gap between the ethical purchase intentions and actual buying behavior of ethically minded consumers
12	DUNLAP RE	2000	New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale
12	ELLEN PS	1991	The role of perceived consumer effectiveness in motivating environmentally conscious behaviors
12	STEG L	2009	Encouraging pro-environmental behavior: An integrative Review and research agenda
12	WHITMARSH L	2010	Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours
11	GILG A	2005	Green consumption or sustainable lifestyles? Identifying the sustainable consumer
11	KOLLMUSS ANJA	2002	Mind the gap: why do people act environmentally, and what are the barriers to pro-environmental behavior?
11	SCHWARTZ SH	1992	Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries
11	VERMEIR I	2008	Sustainable food consumption among young adults in Belgium: Theory of planned behavior and the role of confidence and values
10	PICKETT-BAKER J	2008	Pro-environmental products: marketing influence on consumer purchase decision
10	PROTHERO A	2011	Sustainable consumption: Opportunities for consumer research and public policy
10	SZMIGIN I	2009	The conscious consumer: taking a flexible approach to ethical behavior

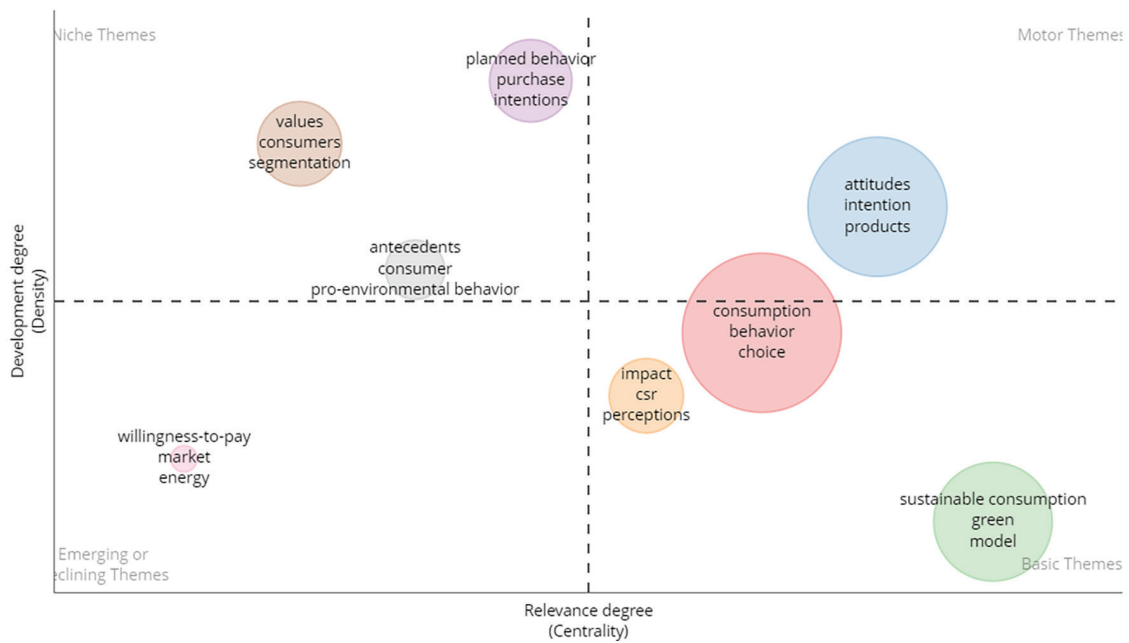


Figure 2. Thematic Map

It is worth noting that the terms “attitudes, intention, and products” are those presented by Biblioshiny but are not the only ones involved in this cluster. Table xx presents the articles that fell into this cluster.

Table 7. Articles in Motor Theme Cluster

Article	Theory	MultiCountry?
Bartels & Reinders (2016)	Social Identity Theory	Yes (6 at all)
Chamniss et al. (2016)	Social Identity Theory Self-categorization theory	No (though it was an online experiment)
Le & Kieu (2019)	Theory of marketing ethics TRA	No (Vietnam)
McKeown & Shearer (2019)	Institutional theory TPB Celebrities congruency theory Consumer engagement	It needs to be clearly stated, but it's most likely EUA.
Liu et al. (2020)	None However, alternative giving is defined as a generalized concept concerning nonreciprocal and nonmonetary consumer exchange behaviors, actions, or practices occurring in a free marketplace (online or offline).	No - EUA
Minton & Geiger-Oneto (2020)	Belief-congruence theory.	No - EUA
Alagarsamy et al. (2021)	theory of planned behavior social cognitive theory	No - India
Krastevich and Smokova (2021)	Consciousness for sustainable consumption	No - Bulgaria
Lee and Huang (2021)	TRA - theory of reasoned action	Yes (EUA and China)
Mutum et al. (2021)	Consumption Value Theory	No - Malaysia
Pilgrimienė et al. (2021)	None	No - Lithuania



Article	Theory	MultiCountry?
Pristl, A.-C., Kilian, S., & Mann, A. (2021).	TPB; Goal Framing Behavior self-efficacy theory	No - Germany
Dimitrova, T., Ilieva, I., & Angelova, M. (2022).	TBP	No - Bulgaria
Fani, V., Mazzoli, V., & Acuti, D. (2022).	Conspicuous consumption	No - Italy
Jan, M. T. (2022).	TBP	Yes - Malaysia and Turkey
Johnstone, L., & Lindh, C. (2022).	Theory of (un)planned behavior	Yes – European countries
Willett, J., Saunders, C., Hackney, F., & Hill, K. (2022).	Value-action	No - UK
Hu, X., & Meng, H. (2023).	social cognitive theory Self-regulatory theory.	No - China
Zhang et al. (2022)	TBP Religiosity (islamism)	Yes – Malaysia and Pakistan

4. RESULTS AND FUTURE RESEARCH DIRECTION

From now on, it is possible to realize that sustainability brings some blind spots that researchers may address. In the next paragraphs, we will explain the opportunities we suggest by looking at theoretical and methodological aspects that have yet to be studied. After that, we will discuss and reinforce the opportunities suggested in the articles reviewed.

Considering the plethora of possible behaviors that can be held under the sustainability umbrella, like consumption of organic food and fair trade consumption (Bartels & Reinders, 2016); donation behavior (Champniss et al., 2016); eco-buy, eco-boycott, recycle, CSR-boycott (Le & Kieu, 2019; Minton & Geiger-Oneto, 2020); alternative giving (Liu et al., 2020); Purchase (Alagarsamy et al., 2021; Fani et al., 2022; Hu & Meng, 2023; Jan, 2022; Johnstone & Lindh, 2022; Minton & Geiger-Oneto, 2020; Mutum et al., 2021; Zhang et al., 2022); Renting (S. H. Lee & Huang, 2021) it is interesting to conducting an meta-analysis comparing the effect size of different antecedents. The contributions would be: (1) clarify if some core theory are better in explaining sustainable behavior (overall), (2) clarify if the kind of sustainable behavior being accounted are prone to be better explained by some theory in particular, (3) considering accountability done by countries to UN about GDN and human development index it would be possible to delineate why some studies present different effects from others; (4) Moreover, Hu and Meng (2023), in their work has controlled for demographic data, and found some significant effects, although not commented by authors it is of interest to note that the effect, while significant, has magnitudes much lower than other variables, meaning that it is possible that demographic data is irrelevant, or at most, a proxy for other psychological aspects of sustainable consumption, configuring a good opportunity for meta-analysis study to clarify the demographic issue (Hu & Meng, 2023).

Adding new theoretical perspectives could be promising for new studies; for example, including past behavior, as shown by Bagozzi (1981), explaining better intentions and behaviors is possible. When repeated often, behaviors can create heuristics and habits, which alter behavior standards (E. Lee et al., 2020), reducing the so-called intention-behavior gap. Researchers who intend to conduct this kind of research can investigate if sustainable behavior needs more repetition to become a habit compared to other behaviors, which triggers are efficient and which are not, and if public policies can simulate triggers or if demographics alter triggers.

It would be worth investigating materialism/egoism as a key aspect of social values among users and non-users of sustainable services to gauge the changes in perceived value during the adoption of services, which may also



significantly influence sustainability. Materialism has not always been regarded as problematic by researchers, and some researchers state that everybody is, to some extent, materialistic consumption may not necessarily be bad. Studying the degree to which being materialist reduces sustainable consumption (Dimitrova et al., 2022; S. H. Lee & Huang, 2021). As the social dimension of behavior is present in TRA/TPB, consumption value theory, social cognitive theory, and other behavior theories, it would be valuable to present how materialism/egoism and collectivism/individualism affect attitudes, intentions, and sustainable behavior. It would be interesting to use these materialism/egoism and collectivism/individualism as moderators of social dimension effects, in other words, how cultural characteristics affect the social dimension of theories used to explain sustainability behavior.

It is essential to know if young people care less about sustainability issues because they still need to conquer some lifestyles compared to old ones. Or perhaps aging made people less materialistic or egoistic (Dimitrova et al., 2022). Studies investigating the interaction of age, egoism, materialism, and country development index would significantly contribute to the theory. It is probably not age itself that shapes individual behavior; instead, age, to some extent, is a proxy for other contextual variables. This rationale can be extended to sex, educational level, incoming, and other demographic characteristics.

Environmental concern moderates the relationship between environmental cues and intention to buy when the problem is high. It would be interesting to investigate factors influencing environmental concern formation - significantly what increases the concern permanently (Fani et al., 2022). Visual elements may be employed to make sustainability representation more/less explicit. Consequently, the effect of such visual cues could be different from those of textual signs. Future studies could evaluate the symbols companies can use to represent a sustainable product without compromising its aesthetics or improving its attractiveness (Fani et al., 2022). The reluctance of young adult consumers to buy products with sustainability symbols emphasizes that fashion represents a way to express one's desired self and shape one's image. However, the effect can be different for utilitarian products. Further studies could investigate how eco-friendly symbols can affect the purchase of convenience goods that consumers buy often and easily without much thought (Fani et al., 2022). Other important contributions would be: (1) investigating why adults perceive sustainability as being against the desired self or why symbols used to represent sustainability compromise aesthetic; (2) Fani et al. state that the presence of sustainability cue increases the perceived proximity and perceived proximity decreases intention to buy, but the scale reported by Fani et al. are expressed from positive to negative, meaning that the higher the evaluation, less proximity was perceived, resulting in positive effect, meaning that the presence of sustainability cue brings bad perceptions, and they do not perceive proximity. The scale used can be an issue; otherwise, a deeper investigation is needed to understand why it happens.

Researchers may consider collecting data from religious differences (Jan 2022) and investigate to which extent they affect intentions and behavior, aside from other country characteristics discussed. Finally, general religious beliefs were taken as a moderator. Still, future studies could employ intrinsic or extrinsic religiosity (Minton & Geiger-Oneto, 2020) as a moderator to broaden the examination of the research phenomena. Similarly, personality traits are potential moderators in understanding consumer behavior. Therefore, future studies should integrate these moderators in the TPB framework (and others' theoretical perspectives) to measure how they affect individuals' pro-environmental attitudes and green purchase intentions (Zhang et al., 2022).

UN alerts that changes in behavior are desired and necessary to reduce resource consumption. As Figure 2 shows, none of the studies that make up the main themes addressed changing attitudes, intentions, or behaviors. Society should benefit from this kind of study, as governments would create a set of laws to stimulate changes in consumers' behavior and companies' practices. Companies would think about procedures and products oriented by these studies, as consumers would consume with certainty about their contribution to the global future.



5. CONCLUSION

Based on the bibliometric classification of themes found in databases collected from top journals, we draw on consistent SLR covering motor themes of the subject, answering RQ1. Next, we show the most cited references that can help beginners account for a solid understanding of the knowledge roots of sustainable consumption.

RQ2 was about theories applied to studies. To define sustainable consumption and associate it with theories, we proposed two frameworks: one that visually indicates its aspects and the other that shows which theories apply. Looking for both frameworks can help researchers identify and choose new theories to be covered.

RQ3 was about future research opportunities. Carefully reading papers forming the central theme brought future study opportunities, which can be used by expert researchers and also for novices to enhance our understanding of these critical subjects.

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