Towards A Sustainable Future: A Bibliometric Analysis of Green Purchase Behavior Research

BY

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Abstract
This research delves into the ever-evolving landscape of green purchase behavior through a comprehensive analysis of scholarly articles published in the Scopus database (2017-2023). Leveraging performance analysis and scientific mapping techniques facilitated by Biblioshiny and VOSviewer, this study unveils the intellectual terrain of this domain. It identifies the most prolific authors, highly cited works, and emerging research themes. By analyzing keyword co-occurrence, co-authorship, and bibliographic coupling patterns, the research sheds light on the evolving focus within the field. Interestingly, the year 2023 witnessed a surge in publication volume, suggesting a growing academic interest in green consumerism. Green purchase behavior research is increasingly delving into the complexities of food consumption and its environmental implications. Food has emerged as a critical area of focus in green purchase behavior research. Furthermore, the analysis reveals China, the USA, and India as leading contributors to this field. While limited to the Scopus database, this exploration provides valuable insights into impactful research and future research directions across disciplines. Identifying key researchers and their geographical distribution offers a valuable resource for scholars worldwide, fostering further collaboration and propelling the field towards a future enriched by sustainable consumption practices.

Keywords: Green purchase behavior, Food, Biblioshiny, VOSviewer

INTRODUCTION

Today, increasing concerns about global warming, pollution threats, as well as increasing consumer awareness of environmental issues, and responsible supply chains are putting pressure on businesses to act responsibly towards the environment (Kahraman & Kazançoğlu, 2019). Communities from various countries who are aware of environmental involvement in business practices have voiced concern about the degradation that occurs in the environment. Consumers also show their desire to change consumption patterns so they are able to protect the environment from damage that can be caused (Kazmi et al., 2021). Consumers are reactively looking for environmentally friendly products and brands (Panda et al., 2020). Concern for environmental protection so that it is not degraded and consuming environmentally friendly products which are often called green products are important characteristics of contemporary consumer behavior. To express green values in brand communication channels, and focus on core elements such as truly eco-friendly manufacturing processes. Advertising campaigns should not only focus on words such as "eco-friendly", "green", and "friendly to the earth" (Kazmi et al., 2021).

(Dangelico & Vocalelli, 2017) argue that the increasing global concern regarding climate change and ecological sustainability is compelling corporations and industries to confront the difficult task of integrating ecological considerations into their business operations and strategy. This encompasses the operational domains of the corporation or industry, such as manufacturing, design, research and development, and marketing. The marketing function is crucial in ensuring the widespread adoption of green products and services, as their development alone is insufficient for creating a sustainable environment. Hence, the marketing function plays a crucial role in establishing a green market by effectively conveying the advantages of sustainable products. Many individuals in the 21st century view the color green as a popular and influential symbol of sustainability, with celebrities and fashionistas actively embracing this trend and incorporating it into their personal identities. Although some consumers may have environmental concerns and prioritize green features, these factors are rarely at the top of their buying list. Instead, they tend to prioritize attributes such as flavor, safety, attractiveness, and ease of finding the product. Green customers can be categorized based on their lifestyle,

level of commitment, interests, motivations, and purchasing methods. The influence wielded by customers and those who shape their decision-making is increasing. The consumer's perception of the products and the company's ecological footprint is now a pivotal factor in their decision to make environmentally conscious choices. Understanding the deeply rooted social and environmental values and beliefs of marketing consumers is essential. It is important to create products and services that successfully meet their expectations for convenience, quality, and affordability while also minimizing any negative impact on the environment throughout the entire lifespan of the product. Examining the purchasing habits of consumers who prioritize environmentally sustainable products reveals a discrepancy between their positive perceptions of eco-friendly products and their actual purchasing behavior. This disparity is impacted by a range of psychological and social factors (Joshi & Rahman, 2015) including awareness of environmentally friendly products, the absence of certification standards and eco-labels, labeling and advertising, understanding of environmental concerns, personal values associated with consumption, curiosity, and desire for novelty, psychological advantages, potential for recycling, government and green non-governmental organization subsidies, and peer opinion or personal factors. These elements will have a substantial influence on customer decision-making. Understanding the behavior of environmentally concerned consumers is critical for the reasons listed above.

Green products are items that have a reduced negative impact on the ecological environment, including land, water, and air (Mazar & Zhong, 2010). Green products play a role in safeguarding the environment by eliminating or minimizing waste, pollution, and pollutants (Sharma et al., 2023). Green consumption refers to an individual's conscious and deliberate awareness of the ecological impact when buying, using, and disposing of things (Riva et al., 2022). Green purchase behavior refers to socially conscious conduct that involves making environmentally friendly purchases. This behavior is linked to a future-oriented mindset and has overall benefits for society (Shao et al., 2022). GPB is distinguished by the acquisition of eco-friendly items, driven by the aspiration to save the ecological environment for future generations (Han, 2020).

This study leverages performance analysis and scientific mapping techniques to investigate a dataset of articles retrieved from the Scopus database. By delving into scientific production, prolific authors, highly cited works, research foci, productive countries, keyword co-occurrence patterns, thematic landscapes, and author collaboration networks, the study offers a comprehensive review of 444 green purchase behavior publications from 2017 to 2023. Utilizing Biblioshiny and VOSviewer as a methodological framework, this analysis unveils the underlying research themes within this domain, thereby guiding future research directions.

MATERIALS AND METHODS

This study focuses on examining the latest research trends over the past decade using bibliometric indicators that conceptualize data on green purchase behavior. The Scopus database search engine searched publications from 2017 to 2023 to identify extensive literature on green purchase behavior.

The authors have selected a publication collection period from 2017 onwards. This period was due to a high and steady increase in the number of publications compared to the previous period. The growing popularity of the topic of green purchase behavior from 2013 to 2016 led to an increase in publications.

This study investigates research papers on green purchasing practices included in Scopus-indexed journals due to their extensive coverage of high-quality journals, the reliability of the research information, stringent indexing, and a high number of citations (Lasda Bergman, 2012). This study specifically concentrates on foreign journals obtained from the paid Scopus database through the use of the search engine. The journal search is restricted to identifying the highest value associated with green purchasing behavior within the specified publication timeframe. The authors collated the papers that had the highest number of publications from 2017 to 2023.

Initial search identified 1181 documents by searching: "(TITLE-ABS-KEY (green) OR TITLE-ABS-KEY (purchase) OR TITLE-ABS-KEY (behavior) OR TITLE-ABS-KEY (green AND purchase) AND TITLE-ABS-KEY (green AND purchase AND behavior)) AND PUBYEAR > 2016 AND PUBYEAR < 2024" then becomes 444 documents by filtering on Document Type, Publication Stage, Source Type, Language, and Open Access: "(TITLE-ABS-KEY (green) OR TITLE-ABS-KEY (purchase) OR TITLE-ABS-KEY (behavior) OR TITLE-ABS-KEY (green AND purchase) AND TITLE-ABS-KEY (green AND purchase AND behavior)) AND PUBYEAR > 2016 AND PUBYEAR < 2024 AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (OA, "all"))". Furthermore, 444 documents obtained from the Scopus database were stored in CSV format and then processed using Biblioshiny (Aria & Cuccurullo, 2017) and VOSviewer.

This study uses a bibliometric approach. (Cobo et al., 2011b) state that bibliometric analysis is commonly employed to quantitatively evaluate academic output, and it is increasingly being utilized for practice-based research. Bibliometric methods are specifically employed to examine and measure information and texts, particularly in extensive datasets. Bibliometrics employs two primary methodologies: performance analysis and science mapping. The former refers to the methodology used to assess the performance and influence of scientific entities such as researchers, governments, and universities based on bibliographic data. The science mapping approach is utilized to visually represent

the structural and dynamic components of scientific study as well as to indicate the cognitive organization of a research field (Cobo et al., 2011a).
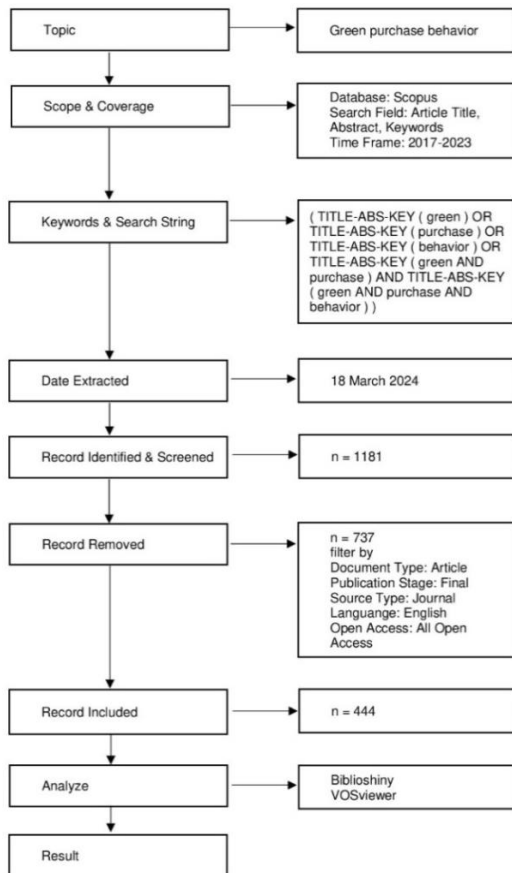

Figure 1. Study Method

RESULTS AND DISCUSSION

Performance Analysis

Performance analysis assesses the impact of individual study components on a certain topic (Cobo et al., 2011a). The characteristic of bibliometric investigations is the descriptive analysis (Donthu, Reinartz, et al., 2021). Performance analysis is a regular component of evaluations, even if they do not pertain to science mapping. This is because it is customary in reviews to showcase the performance of different research elements, such as authors, institutions, countries, and journals, on the subject. This analysis is similar to the background or profile of participants that is typically presented in empirical research but with a more analytical approach.

Most annual production

Research on green purchase behavior is interesting and important to discuss further. Figure 2 shows that the least number of publications occurred in 2017, namely only 16 publications. Then the most publications occurred in 2023, namely 115 publications. Figure 2 shows that the research trend in green purchase behavior is still growing. Researchers and students are optimistic that green purchase behavior theory and research are gaining adequate attention in academic circles.
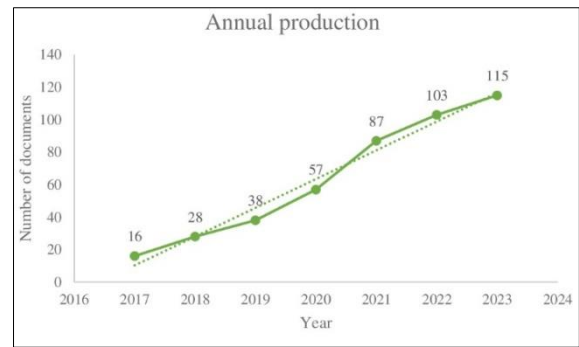

Figure 2 Most annual production

Most cited papers

Citation rates show the impact of green purchase behavior on science and other fields. The top 10 most-cited papers on green purchase behavior are shown in Table 1. Here are the details for the five most cited papers based on Scopus search results: "Why do people buy organic food? The moderating role of environmental concerns and trust" which has been cited 195 times and is the most frequently cited paper cited from 2017-2023. The present study aims to investigate potential correlations between motivations (intrinsic and extrinsic), attitude, and purchasing behavior regarding organic food. Second, "Causality analysis of media influence on environmental attitude, intention and behaviors leading to green purchasing" which has been cited 188 times. This study offers a thorough explanation of the process that results in the development of environmentally friendly behavior. It considers the influence of media and attitudes towards eco-friendly packaging, as well as ecological concern and perceived consumer effectiveness. The study presents a concise framework that assesses the main factors that influence environmental attitudes, which are categorized into inward and outward orientations.

Third, "Organic food purchases in an emerging market: The influence of consumers' personal factors and green marketing practices of food stores" which has been cited 162 times. The goal of this study is to investigate how customers' personal and situational characteristics influence their attitude and purchasing behavior toward organic meat. Fourth, "How the COVID-19 pandemic is changing online food shopping human behaviour in Italy" which has been cited 141 times. The objective of this study is to examine the impact of a group of explanatory factors on the level of satisfaction with the experience of purchasing food online. Fifth, "Trust to Go Green: An Exploration of Consumer Intentions for Eco-friendly Convenience Food" which has been cited 137 times. This study aims to contribute to the continuing discussion on the determinants that impact customer purchase intention. More precisely, it concentrates on veggies that undergo little processing and are marked with integrated pest management criteria. The investigation explicitly examines the impact of consumer trust on their intention to purchase these products. Based on Table 1, it shows that Tandon is an important author in the current research. However, this does not rule out the possibility that other authors will become references in current and future purchase behavior research.

**Table 1** Most Cited Green Purchase Behavior Papers

Author	Title	Country	Year	Cite by
Tandon, A., Dhir, A., Kaur, P., Kushwah, S., Salo, J.	Why do people buy organic food? The moderating role of environmental concerns and trust	India	2020	195
Trivedi, R.H., Patel, J.D., Acharya, N.	Causality analysis of media influence on environmental attitude, intention and behaviors leading to green purchasing	India	2018	188
Nguyen, H.V., Nguyen, N., Nguyen, B.K., Lobo, A., Vu, P.A.	Organic food purchases in an emerging market: The influence of consumers' personal factors and green marketing practices of food stores	Vietnam	2019	162
Alaimo, L.S., Fiore, M., Galati, A.	How the COVID-19 pandemic is changing online food shopping human behaviour in Italy	Italy	2020	141
Ricci, E.C., Banterle, A., Stranieri, S.	Trust to Go Green: An Exploration of Consumer Intentions for Eco-friendly Convenience Food	Italy	2018	137
Chen, C.-C., Chen, C.-W., Tung, Y.-C.	Exploring the consumer behavior of intention to purchase green products in Belt and Road countries: An empirical analysis	Belt and Road Countries	2018	124
Nguyen, T.T.H., Yang, Z., Nguyen, N., Johnson, L.W., Cao, T.K.	Greenwash and green purchase intention: The mediating role of green skepticism	Vietnam	2019	123
Naderi, I., Van Steenburg, E.	Me first, then the environment: young Millennials as green consumers	USA	2018	121
Mohiuddin, M., Al Mamun, A., Syed, F.A., Masud, M.M., Su, Z.	Environmental knowledge, awareness, and business school students' intentions to purchase green vehicles in emerging countries	Malaysia	2018	119
Mishal, A., Dubey, R., Gupta, O.K., Luo, Z.	Dynamics of environmental consciousness and green purchase behaviour: an empirical study	India	2017	113

Source: Biblioshiny

Most productive authors

Figure 3 displays data from authors who have published on the topic of green purchase behavior. Based on this information it can be analyzed that the most productive writer on green purchase behavior is Hanshen Chen from Chung Shan Medical University Hospital, Taichung, Taiwan. The most topic contributions are community participation, green product, and environmental attitudes. Second, Douglas E. Levy from Massachusetts General, Boston, United States. The most topic contributions are presenteeism, health promotion, and workplace. Third, Jessica L. Mccurley from San Diego State University, San Diego, United States. The most topic contributions are caregivers, quality of life, and stroke rehabilitation. Fourth, Anne N. Thorndike from Massachusetts General Hospital, Boston, United States. The most topic contributions are obesity, farmers' markets, grocery stores. Fifth, Amandeep Dhir from Universitetet i Agder, Kristiansand, Norway. The most topic contributions are technology acceptance model, mobile payment, and e-learning. Sixth, Maria Fekete-Farkas from Hungarian University of Agriculture and Life Sciences, Godollo, Hungary. The most topic contributions are social media, online reviews, and brand community. Seventh, Emily D. Gelsomin from Massachusetts General Hospital, Boston, United States. The most topic contributions are presenteeism, health promotion, and workplace. Eighth, Md Nekmahmud from Hungarian University of Agriculture and Life Sciences, Godollo, Hungary. The most topic contributions are community participation, green product, and environmental attitudes. Nineth, Saqib Ali from COMSATS University Islamabad, Sahiwal Campus, Sahiwal, Pakistan. The most topic contributions are community participation, green product, and environmental attitudes. Tenth, Tara Boelsen-Robinson from Deakin University, Geelong, Australia. The most topic contributions are school lunch, canteen, and nutrition policy. Based on Figure 3, it appears that Chen is an important author in the current research. However, this does not rule out the possibility that other authors will become references in current and future purchase behavior research.

This study does not exclude the possibility of exploring other authors.
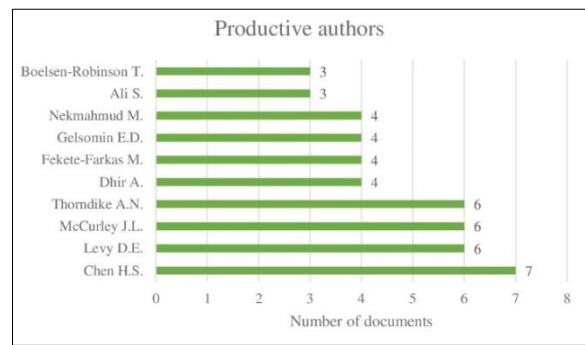
Figure 3 Most productive authors

Most productive countries

Figure 4 describes the distribution of 1506 contributed papers on the topic of green purchase behavior based on the country of origin of the researchers. China topped the list with 346 publications with a total of 1966 citations. The USA has 154 paper publications with a total of 778 citations. India published 82 papers with a total of 253 citations. Indonesia has 67 papers and a total of 158 citations. Malaysia has 66 papers and a total of 134 citations. Furthermore, Italy published 55 papers, and Pakistan 44 papers. Australia and Brazil have 43 papers, and finally, the UK has 43 papers. Based on the analysis, the top 10 countries with a total of 942 published papers show that these countries have published more than 60% of the total green purchase behavior papers. According to Figure 4, China is an important country in current research. However, this does not rule out the possibility of other countries becoming references in current and future purchase behavior research.
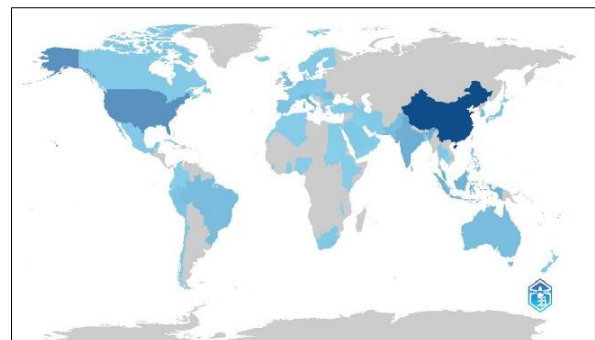
Figure 4. Most productive countries

Most publications subject

Figure 5 explains that environmental science tops the list with 218 published papers, followed by social science with 207 published papers. Furthermore, energy has 161 papers, computer science has 108 papers, and business management and accounting have 107 papers. It is clear that the top five publication subjects have contributed more than 50% of the papers on green purchase behavior. According to Figure 5, environmental science is an important subject area in current research. However, this does not rule out the possibility of other subject areas, such as energy and engineering, becoming subject areas of purchase behavior research in the future.

Figure 5. Publications subject

Science Mapping

Science mapping analyzes the connections among different elements of research, as demonstrated by studies conducted by (Baker et al., 2021). The analysis centers on the cognitive interactions and organizational connections among the components included in the investigation. The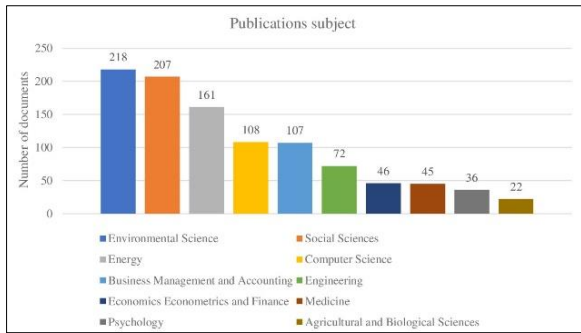 methods utilized for science mapping encompass citation analysis, co-citation analysis, bibliographic coupling, co-word analysis, and co-authorship analysis. When network analysis is integrated with these methodologies, it becomes a valuable tool for illustrating the bibliometric structure and intellectual structure of the study field (Kent Baker et al., 2020). This study employs both co-word analysis (keyword co-occurrence), co-authorship analysis, and bibliometric coupling.

Keyword co-occurrence analysis

A keyword co-occurrence network analysis was performed to determine the frequency of the keyword's usage in published articles on green purchase behavior. This approach enables us to discern study subjects and themes that researchers frequently associate with. We conducted a network analysis of keyword co-occurrences using the VOSviewer software. This software generates a map based on text-mining techniques, which determines the links between keywords by measuring the distance between various terms (Laudano et al., 2018). The shorter the space between those terms, the more potent the relationship (Dolhey, 2019). Figure 6 presents a network map of keyword co-occurrences based on author keywords as the unit of analysis. Of the 1408 keywords, 34 were found to meet the threshold with a minimum of six keyword occurrences. The 34 keywords are purchase intention with 64 occurrences, sustainability with 40 occurrences, consumer behavior with 37 occurrences, green purchase intention with 36 occurrences, green marketing with 31 occurrences, green products with 27 occurrences, sustainable consumption with 27 occurrences, theory of planned behavior with 26 occurrences, environmental concern with 23 occurrences, green consumption with 23 occurrences, green purchase behavior with 21 occurrences, theory of planned behavior with 17 occurrences, green product with 15 occurrences, attitude with 12 occurrences, green purchase behavior with 10 occurrences, organic food with 10 occurrences, pro-environmental behavior with 10 occurrences, structural equation modeling with 10 occurrences, green advertising with 9 occurrences, social media with 9 occurrences, willingness to pay with 9 occurrences, environment with 8

occurrences, environmental knowledge with 8 occurrences, green food with 8 occurrences, circular economy with 7 occurrences, environmental awareness with 7 occurrences, sem with 7 occurrences, tpb with 7 occurrences, consumer behavior with 6 occurrences, corporate social responsibility with 6 occurrences, covid-19 with 6 occurrences, electric vehicles with 6 occurrences, green purchases with 6 occurrences, and greenwashing with 6 occurrences. This map illustrates the interconnection between terms, represented by lines. These lines demonstrate the simultaneous presence of one keyword and another in multiple papers within the utilized dataset.
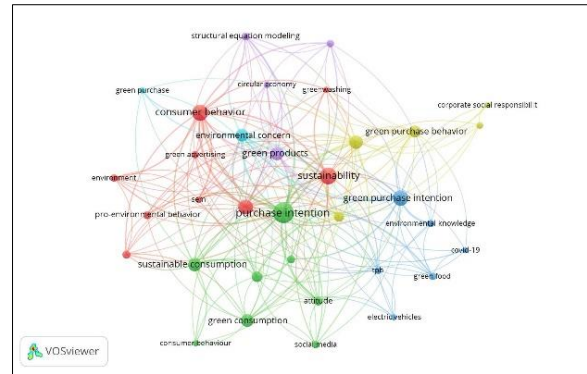
Figure 6. Keyword co-occurrence network

Based on Figure 7, green purchase behavior has a relationship with the theory of planned behavior, green purchase intention, environmental knowledge, corporate social responsibility, sustainability, greenwashing, green product, covid-19, willingness to pay, green products, environmental concern, purchase intention, green marketing, structural equation modeling, attitude, and sustainability. Next, we'll explore the connections between green purchase behavior and the theory of planned behavior, green purchase behavior and green purchase intention, and green purchase behavior and environmental understanding.

Green behavior does not always result in Green Purchase Behavior, as mentioned above (Mishal et al., 2017). Research conducted in collectivist settings has shown that purchase decisions are influenced by social influence, previous green shopping behavior, and environmental standards (Lee, 2009). Research has shown that green purchase behavior is influenced by lifestyle, values, norms, beliefs, and green self-identity (Ahn et al., 2012). The Theory of Planned Behavior (Ajzen, 1991) effectively elucidates the green purchase behavior, asserting that attitude, subjective norm, and perceived behavioral control collectively impact purchase intentions, which subsequently influence purchasing behavior. Due to the presence of environmental contamination, the topic of sustainability has been prominent (Quoquab et al., 2019). According to (Yatish & Rahman, 2016), GPB plays a significant role in promoting environmental sustainability due to its characteristics such as biodegradability, recyclability, and reduced environmental effects. GPB, or green purchase behavior, is the term used to describe customers' decisions to buy environmentally friendly products based on their concern for the environment (Mohamed M. Mostafa, 2007).

The theoretical basis for studying consumer attitudes and behavior in social psychology research can be traced back to the consumer value expectancy behavior model. This model was subsequently refined and expanded into the theory of reasoned action (TRA) and finally the theory of planned behavior (TPB) (Mishal et al., 2017). The theory of planned behavior conduct, proposed by (Ajzen, 1991), offers a valuable conceptual framework for addressing the intricacies of human social interaction. This theory encompasses key ideas in the social and behavioral sciences and provides precise definitions of these concepts, enabling the prediction and comprehension of specific behaviors within specific circumstances. Behavioral intention is often accurately predicted by attitudes towards behavior, subjective norms, and perceived control over action. In turn, this intention, combined with perceived behavioral control, can explain most of the variation in behavior. According (Ricci et al., 2018) theory of planned behavior examines the factors that influence particular human behaviors, assessing the significance of the intention to engage in the behavior and its underlying causes.

Green purchase intention refers to the consumer's expressed willingness to purchase environmentally friendly items for the benefit of the environment. The consumer's motivation to purchase green products drives this willingness (Dagher & Itani, 2014). Consumers are interested not only in the ecological quality of a product but also in the environmental implications that come with purchasing such things (Jaiswal & Kant, 2018). The theory of reasoned action (TRA) posits that an individual's attitude typically has an impact on a person's behavior (Limbu et al., 2012) but this influence is mediated by purpose. Therefore, when an individual has a positive attitude towards a brand, it leads to an intention to purchase. This intention then mediates the actual purchase of a product or service (Mishal et al., 2017). The impact of social factors on the adoption of environmentally friendly practices is significant worldwide (Cheah & Phau, 2011), leading to a growing preference for green products and an increase in green consumption (Peattie, 2001).

Environmental knowledge refers to an individual's understanding of the basic principles, underlying connections, and environmental obligations that contribute to sustainable development. Research conducted by (Taufique et al., 2016) has shown that a person's environmental knowledge has a significant impact on environmental challenges. Therefore, consumers who possess environmental knowledge are well-informed and aware of ecological concerns, which influences their intention to purchase green items (P. Wang et al., 2014). Based on (Zahan et al., 2020) found that environmental knowledge significantly and positively influences attitude and perceived behavioral control. It found that attitude and perceived behavioral control significantly influence green purchase intention. It found that green purchase intention significantly influences green purchase behavior.

Figure 7. Keyword green purchase behavior

Co-authorship analysis

Co-authorship analysis investigates the interactions between scholars within a specific study domain. Co-authorship is a structured approach to intellectual collaboration among researchers (Cisneros et al., 2018). Understanding the dynamics of scholarly interactions is critical, particularly given the numerous author attributes such as institutional affiliations and countries of origin. The prevalence of collaboration among scholars has increased as a result of the escalating complexity of research procedures and theories (Acedo et al., 2006). Collaborations among scholars can enhance research by incorporating diverse perspectives and expertise, resulting in improved clarity and deeper insights (Tahamtan et al., 2016). Here, academics who interact build a network referred to as "invisible collages," which can contribute to the advancement of research endeavors (CRANE, 1977). For instance, the study can provide valuable information about concentrated research conducted by scholars from a certain geographical area. Scholars in underrepresented locations can utilize these insights to bolster and invigorate fresh research.

The analysis also allows for the mapping of collaborations over different time periods, which enables scholars to examine the progression of intellectual development in relation to collaboration networks. Furthermore, it offers aspiring academics vital insights to develop connections and engage in collaborations with renowned and influential scholars in their respective study domains (Donthu, Kumar, et al., 2021).

Figure 8 presents a network map of co-authorship analysis based on organizations as the unit of analysis. We found that 68 of the 1077 organizations met the threshold with at least one document and at least seventy citations. Next, the top five organizations will be presented based on the number of citations. Optentia Research Focus Area, North-West University, South Africa with 276 citations. Department of Economics and Management, University of Helsinki, Finland, with 195 citations. Department of Psychosocial Science, University of Bergen, Norway, with 195 citations. Norwegian School of Hotel Management, University of Stavanger, Norway, with 195 citations. NTPC School of Business, India, with 195 citations. Based on the five organizations with the most citations, it appears that Optentia Research Focus Area is

an important organization in current research. However, this does not rule out the possibility of other organizations becoming references in current and future purchase behavior research.
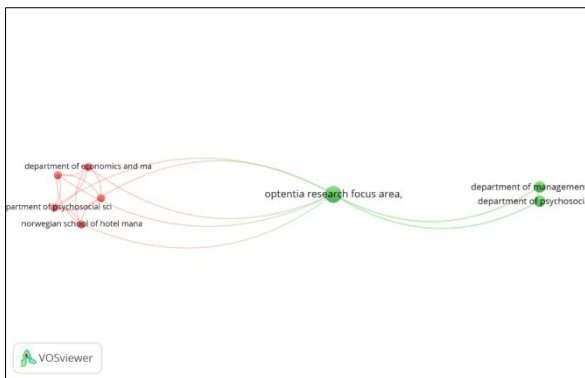

Figure 8. Co-authorship network

Bibliometric coupling analysis

Bibliographic coupling is a scientific mapping technique that assumes that two articles that have common references are likewise related in their content (Weinberg, 1974). The analysis focuses on categorizing publications into theme clusters based on common references and is most effective when utilized within a defined timeframe (Zupic & Čater, 2015). In this approach, theme clusters are created by considering the citing publications. As a result, current and specialized publications have the opportunity to receive exposure through bibliographic coupling, which is different from co-citation analysis. Bibliographic coupling is well-suited for business academics who want to explore a wide range of issues and their most recent advancements. The analysis can thus offer a depiction of the current state of the research topic (Donthu, Kumar, et al., 2021).

Figure 8 presents a network map of bibliometric coupling analysis based on documents as the unit of analysis. We found that 35 of the 444 documents met the threshold with at least fifty citations. Table 2 shows 10 documents out of a total of 35 documents based on the highest citations. Table 2 divides the 10 documents into several clusters, with Alaimo (2020), Nguyen (2019), Ricci (2018), Tandon (2020), Trivedi (2018), and Chen (2018) in cluster 1. Cluster 2 contains Mohiuddin (2018) and Nguyen (2019). Cluster 3 contains Naderi (2018) and Mishal (2017). Based on the 10 documents with the most citations, it appears that the theme of food is a significant issue in current research. However, this does not rule out the possibility that other themes such as green vehicles (electric cars, electric motorbikes, etc.) and green household appliances (green air conditioners, green refrigerators, etc.) will become the focus of future purchasing behavior research.

Table 2 Ten documents based higher citations

| No	Authors	Hightlight	Sources	Citations
1	Tandon A.; Dhir A.; Kaur P.; Kushwah S.; Salo J. (2020)	Organic Food	Journal of Retailing and Consumer Services	195
2	Trivedi R.H.; Patel J.D.; Acharya N. (2018)	Media Influence	Journal of Cleaner Production	188
3	Nguyen H.V.; Nguyen N.; Nguyen B.K.; Lobo A.; Vu P.A. (2019)	Organic Food	International Journal of Environmental Research and Public Health	162
4	Alaimo L.S.; Fiore M.; Galati A. (2020)	Online Food Shopping	Sustainability (Switzerland)	141
5	Ricci E.C.; Banterle A.; Stranieri S. (2018)	Eco-friendly Convenience Food	Ecological Economics	137
6	Chen C.-C.; Chen C.-W.; Tung Y.-C. (2018)	Green Appliances	Sustainability (Switzerland)	124
7	Nguyen T.T.H.; Yang Z.; Nguyen N.; Johnson L.W.; Cao T.K. (2019)	Green Vegetables	Sustainability (Switzerland)	123
8	Naderi I.; Van Steenburg E. (2018)	Millennials	Young Consumers	121
9	Mohiuddin M.; Al Mamun A.; Syed F.A.; Masud M.M.; Su Z. (2018)	Green Vehicles	Sustainability (Switzerland)	119
10	Mishal A.; Dubey R.; Gupta O.K.; Luo Z. (2017)	Environmental Consciousness	International Journal of Climate Change Strategies and Management	113

Source: VOSviewer
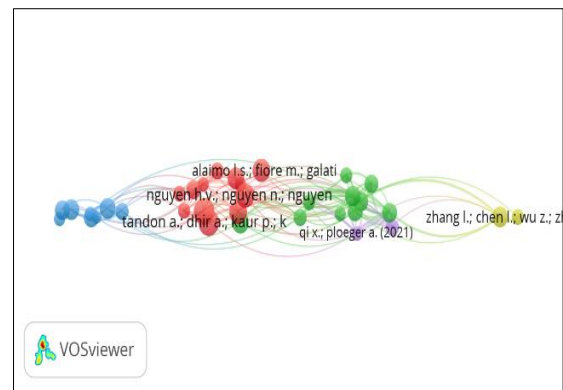
Figure 9. Bibliometric coupling network

CONCLUSION

This study does a bibliometric analysis of published studies on green purchase behavior from 2017 to 2023. From the Scopus database, a grand total of 444 articles were chosen. This study examines the year-to-year patterns in publications regarding consumer behavior towards environmentally friendly purchases. The analysis reveals the articles with the highest number of citations, the authors with the highest productivity, the nations with the highest productivity, and the subjects with the highest number of publications. The study of consumer behavior towards green purchase behavior is increasing and is expected to reach its highest point in 2023.

The most widely cited research in the green purchase behavior literature analyzes potential associations between motivations (intrinsic and extrinsic), attitude, and buying behavior towards organic food (Tandon et al., 2020). The most productive author on green purchase behavior is Hanshen Chen from Chung Shan Medical University Hospital, Taichung, Taiwan. Furthermore, China is the country with the most publications regarding green purchasse behavior. Then, the most widely published areas in the green purchase behavior literature is environmental science.

Based on the keyword co-occurrence analysis, it was found that green purchase behavior is related to the theory of planned behavior, green purchase intention, environmental knowledge, corporate social responsibility, sustainability, greenwashing, green product, covid-19, willingness to pay, green products, environmental concern, purchase intention, green marketing, structural equation modeling, attitude, and sustainability. Analysis of co-authorship based on the

organization as the unit of analysis found that Optentia Research Focus Area is an important organization in current research. Bibliometric coupling analysis based on documents as the unit of analysis found that food is an important theme in current research.

There are several implications of this analysis that contribute to the study of green purchase behavior. First, the results published annually and the most cited papers are drawing increasing interest in the topic of green purchase behavior. The diverse subject matter of this publication focuses on green purchase behavior factors, values, attitudes, and green purchase intentions. Furthermore, the author's examination of the literature on green consumer behavior allows students to pinpoint studies that support future research endeavors. Similarly, an examination of publications by country reveals a worldwide fascination with the subject of green purchase behavior. Third, keyword co-occurrence analysis enables researchers to effectively pinpoint a specific research area related to green purchase behavior. The paper's keywords may indicate its primary objective, while the frequency of these keywords signifies the progression of the research issue on green purchase behavior and the geographical context in which the study was carried out. Fourth, co-authorship analysis enables prospective researchers to discover the interactions or social relationships between authors and their affiliates, as well as their equal impact on the development of green purchase behavior research. Fifth, bibliographic coupling analysis allows prospective researchers to find relationships between cited publications to understand the periodic or recent development of themes in green purchase behavior research.

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