

UNDERSTANDING GREEN CONSUMERS: A BIBLIOMETRIC ANALYSIS OF ENVIRONMENTAL ATTITUDE AND GREEN PURCHASE BEHAVIOR

Prawita Megatama¹, Retno Widowati², Siti Dyah Handayani³

¹Department of Management, prawitamegatama60@gmail.com, Universitas Muhammadiyah Yogyakarta

²Department of Management, retno.widowati@umy.ac.id, Universitas Muhammadiyah Yogyakarta

³Department of Management, siti_dyah@umy.ac.id, Universitas Muhammadiyah Yogyakarta

ABSTRACT

This study conducts a bibliometric analysis of research on green purchase behavior from 2017 to 2023, utilizing data from the Scopus database. A total of 355 articles were selected and analyzed to identify trends in consumer behavior towards environmentally friendly purchases. The findings reveal a significant increase in publications, with a peak anticipated in 2023, indicating a growing interest in the intersection of consumer behavior and environmental sustainability. Key contributors to the field include prolific authors and journals, with China emerging as the leading country in terms of published research. The analysis highlights the critical role of positive environmental attitudes in fostering pro-environmental behaviors, such as the purchase of green products. Additionally, the study identifies factors influencing this relationship, including perceived consumer effectiveness and the need for effective educational strategies. The results underscore the importance of understanding consumer motivations and behaviors to inform marketing strategies and enhance sustainability initiatives. This research contributes to the literature by providing a comprehensive overview of the current state of green purchase behavior research and suggesting avenues for future inquiry.

Keywords: Environmental Attitude, Green Purchase Behavior, Consumer Behavior

1. INTRODUCTION

The growing global awareness of environmental issues has spurred increased pressure on businesses to adopt sustainable practices (Kahraman & Kazançoğlu, 2019). As communities worldwide grapple with the consequences of environmental degradation, consumers are increasingly demanding environmentally responsible products and brands. This shift in consumer behavior has resulted in a surge in demand for eco-friendly goods, driving market changes. To effectively communicate their sustainability commitments, businesses must go beyond superficial marketing efforts and implement genuine eco-friendly practices throughout their entire value chain (Kazmi et al., 2021).

Environmental attitudes have been established as a significant predictor of individuals' ecological behavior (Saleki et al., 2019). Environmental attitudes, encompassing both affective and cognitive dimensions, reflects individuals' sentiments and beliefs towards environmental protection (Jung et al., 2014). Extensive research supports the notion that environmental attitudes is a strong determinant of pro-environmental behaviors. Ottman (2017) have demonstrated that individuals with positive environmental attitudes are more likely to engage in environmentally conscious actions, such as modifying their consumption patterns and investing in green products.

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). Green purchase behavior is distinguished by the acquisition of eco-friendly items, driven by the aspiration to save the ecological environment for future generations (Han, 2020).

Cobo (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).

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 335 green purchase behavior publications from 2017 to 2023. Utilizing VOSviewer as a methodological framework, this analysis unveils the underlying research themes within this domain, thereby guiding future research directions.

2. 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 424 documents by searching: (TITLE-ABS-KEY ("environmental attitude") AND TITLE-ABS-KEY (green AND purchase AND behavior) OR TITLE-ABS-KEY (sustainable AND behavior) OR TITLE-ABS-KEY (sustainable AND consumption) OR TITLE-ABS-KEY (green AND consumption)) then becomes 355 documents by filtering on Document Type , Publication Stage, Source Type, and Language: (TITLE-ABS-KEY ("environmental attitude") AND TITLE-ABS-KEY (green AND purchase AND behavior) OR TITLE-ABS-KEY (sustainable AND behavior) OR TITLE-ABS-KEY (sustainable AND consumption) OR TITLE-ABS-KEY (green AND consumption)) 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")). Furthermore, 355 documents obtained from the Scopus database were stored in CSV format and then processed using VOSviewer. See [Figure 1](#).

3. RESULTS AND DISCUSSION

3.1 Performance Analysis

Performance analysis evaluates the contributions of research elements to a specific subject (Cobo et al., 2011a). The characteristic of bibliometric investigations is the descriptive analysis (Donthu et al., 2021). Performance analysis is commonly included in reviews, even those that do not involve science mapping. This is because it is a standard practice in reviews to present the performance of various research components, such as authors, institutions, countries, and journals, in the field. This analysis is similar to the background or profile of participants that is typically presented in empirical research, but with a more analytical approach.

Research on green purchase behavior is interesting and important to discuss further. [Figure 2](#) shows that the research trend in green purchase behavior is still growing, this shows researchers and students remain optimistic that green purchase behavior theory and research is receiving sufficient focus in academic circles.

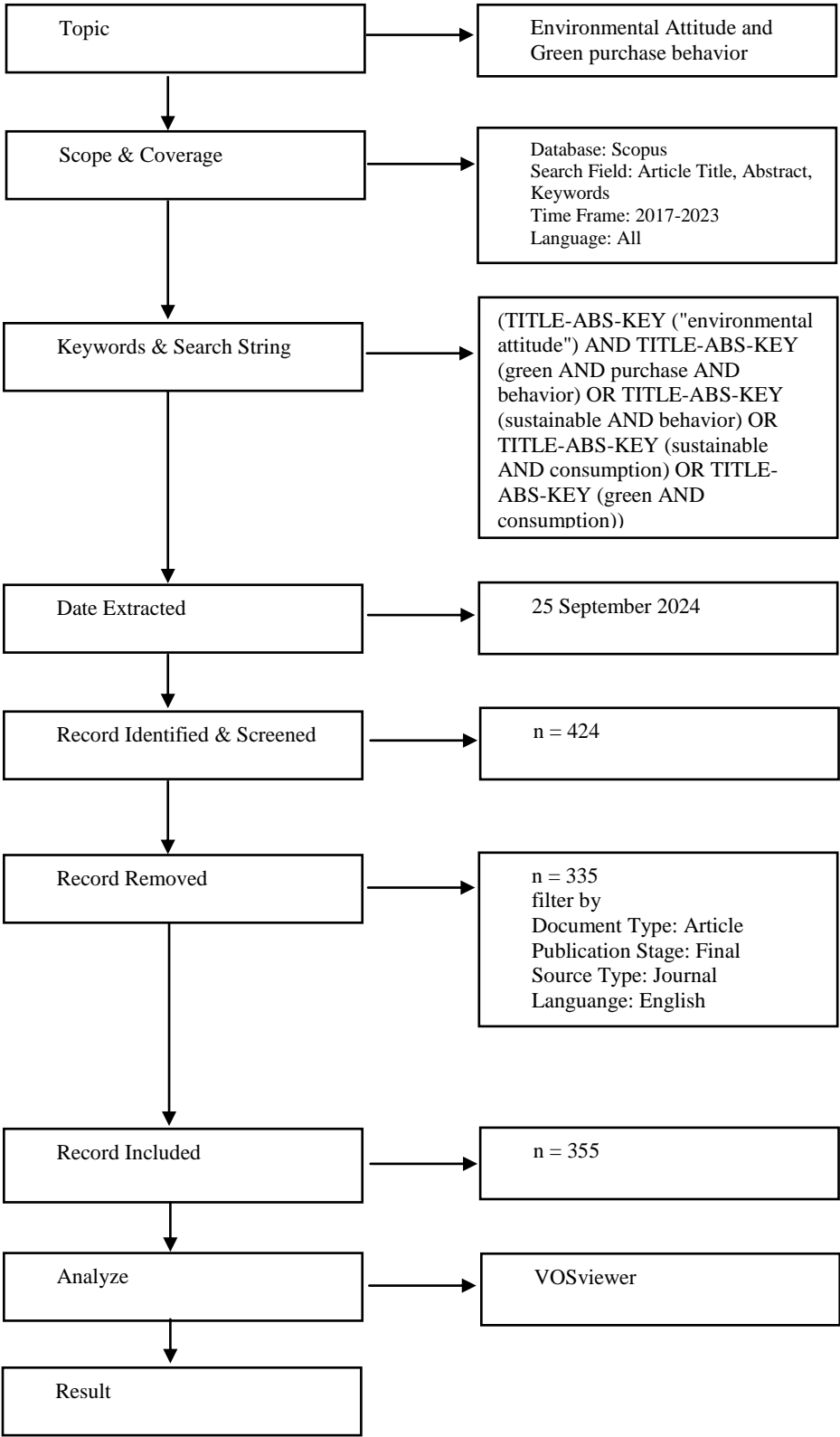


Figure 1 Study method

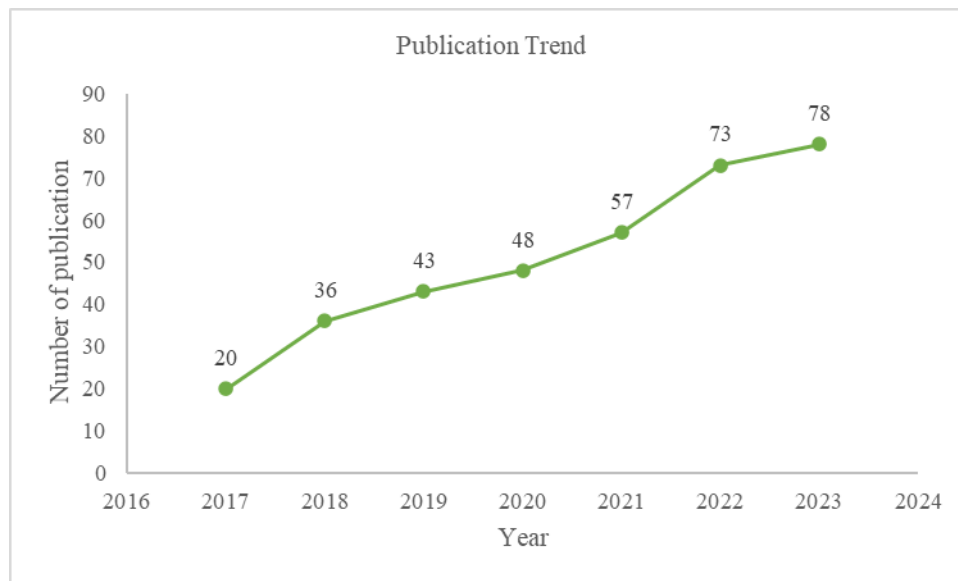


Figure 2 Publication Trend

The most productive author is Kaiser, Florian G. The most productive country based on the number of published articles is China. The most cited article is "A fresh look at understanding Green consumer behavior among young urban Indian consumers through the lens of Theory of Planned Behavior" with 296 citations. The most productive journal source was Sustainability Switzerland with 50 documents.

3.2 Science Mapping

Science mapping analyzes the connections among different elements of research, as demonstrated by studies conducted by (Baker et al., 2021). The analysis focuses on the intellectual exchanges and structural relationships among the elements involved in the research. 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).

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 3](#) presents a network map of keyword co-occurrences based on author keywords as the unit of analysis. 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.

Based on the total link strength depicted in [Figure 3](#) from VOSviewer, there are keywords with the highest total link strength, namely environmental attitude, environmental knowledge, pro-environmental behavior, and environmental concern. Based on [figure 3](#), environmental attitude has a relationship with environmental knowledge, pro-environmental behavior, environmental concern. Numerous studies in pro-environmental literature have asserted that environmental mindset is a significant predictor of environmental behavior. Environmental attitude are positive or negative evaluations of the impacts of pro-environmental behaviour (Carfora et al., 2019). Environmental attitudes comprise a set of personal beliefs and emotions on individual behaviors and environmental concerns(Onurlubaş, 2019).

Environmental knowledge encompasses the information an individual possesses to identify and validate environmental issues, hence empowering the consumer to translate this knowledge into impactful action. Environmental knowledge encompasses consumers' assessment of and response to consumption behaviors

and their environmental impacts, together with the desire for eco-friendly products (Haryanto, 2014). Environmental knowledge influences environmental attitudes and behaviors (Kollmuss & Agyeman, 2010).

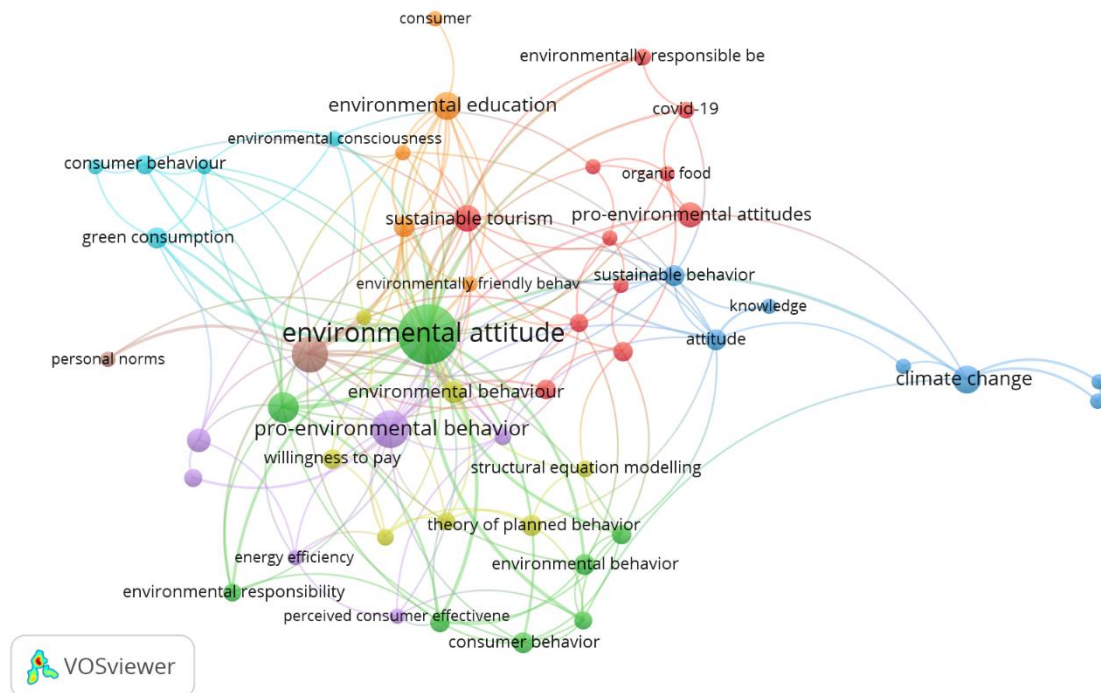


Figure 3 Keyword co-occurrence network

Ecological concern refers to public knowledge of environmental issues, sometimes evidenced by the acquisition of environmentally sustainable products (Dhir et al., 2021). Ecological concern refers to the extent to which consumers are aware of environmental challenges, endorse initiatives to tackle them, or express a willingness to make individual environmental contributions (Zaremozhzabieh et al., 2021). Multiple research indicates that ecological concern significantly and positively affects green attitudes (Dhir et al., 2021).

The widely recognized definition of pro-environmental conduct is intentional action that mitigates adverse effects on the environment (Kollmuss & Agyeman, 2010). Numerous research in pro-environmental literature have asserted that environmental attitude is a significant predictor of environmental behavior (Taufique et al., 2017).

3.3 Article analysis

We obtained 424 documents from the Scopus database search results, filtered them down to 355 documents, and processed them using the VOSviewer. This section will analyse 5 articles that have received the most citations from 2017 to 2023.

Table 3.1 Article analysis

No	Author	Findings	Implication
1	(Taufique & Vaithianathan, 2018)	Positive Attitude Toward the Environment: The study reveals that consumers' attitudes toward the environment are strongly positively related to their pro-environmental behavior. This indicates that when young consumers have a favorable view of environmental issues, they are more likely to engage in ecologically conscious consumer behavior (ECCB). Influence of Perceived Consumer Effectiveness (PCE): The research	Emphasizing Positive Attitudes: Marketers should focus on creating and promoting positive attitudes towards eco-friendly products. This can be achieved through educational campaigns that highlight the benefits of green products, not only for the environment but also for personal health and well-being. By fostering a favorable perception, marketers can enhance consumer engagement and encourage pro-environmental

		<p>highlights that young consumers believe their individual efforts can contribute to environmental protection. A strong positive influence of PCE on ECCB suggests that when consumers feel effective in making a difference, they are more inclined to purchase eco-friendly products.</p> <p>Limited Role of Subjective Norms: Unlike findings from other studies in developed and developing countries, the research indicates that subjective norms (social pressures to conform) do not significantly influence the behavioral intentions of young urban Indian consumers. This suggests that social influence may not be as strong a motivator in this context as previously thought.</p> <p>Application of the Theory of Planned Behavior (TPB): The study applies the TPB framework to understand the factors influencing ECCB among educated young urban consumers. It emphasizes that attitudes and perceived consumer effectiveness are critical predictors of pro-environmental behavior, while subjective norms play a lesser role.</p> <p>Importance of Educated Young Consumers: The research underscores the significance of targeting educated young consumers, who represent a substantial portion of the population and are more likely to be concerned about environmental issues. Understanding their behavior is crucial for developing effective marketing strategies.</p> <p>Need for Communication Strategies: The authors recommend that marketers and environmentalists develop communication plans that effectively convey the benefits of eco-friendly products and pro-environmental consumption. This could help enhance consumers' attitudes toward the environment and encourage more sustainable purchasing behaviors.</p>	<p>purchasing behavior.</p> <p>Addressing Perceived Consumer Effectiveness: Since perceived consumer effectiveness significantly influences ecologically conscious consumer behavior, marketers should communicate how individual purchasing decisions can contribute to broader environmental goals. Campaigns that illustrate the impact of collective consumer actions on sustainability can empower consumers and motivate them to choose green products.</p> <p>Rethinking Social Norms: Given that subjective norms did not show a significant influence in this study, marketers may need to reconsider how they leverage social influence in their strategies. Instead of relying heavily on peer pressure or social expectations, marketers could focus on building communities around sustainability that encourage shared values and collective action among consumers.</p> <p>Targeting Educated Young Consumers: The study emphasizes the importance of targeting educated young consumers, who are more likely to be environmentally conscious. Marketers should tailor their messages and product offerings to resonate with this demographic, considering their unique values, preferences, and consumption patterns.</p> <p>Sustainable Marketing Strategies: The findings suggest that developing sustainable marketing strategies that align with the values and behaviors of young urban consumers is crucial. This includes transparency in sourcing, production processes, and the environmental impact of products, which can enhance brand loyalty and trust among eco-conscious consumers.</p>
2	(Paço & Lavrador, 2017)	<p>Lack of Significant Differences: The study found no significant differences in attitudes and behaviors towards energy conservation between students with higher levels of environmental knowledge (EK) and those with lower levels. This led to the rejection of the initial hypothesis that higher EK would correlate with more positive attitudes towards energy conservation.</p> <p>Weak Relationships: The relationship</p>	<p>Need for Improved Models: The authors recommend the application of advanced analytical models, such as Structural Equations Modelling (SEM), in future research to better evaluate the interconnections between environmental knowledge, attitudes, and behaviors. This could help clarify the dynamics at play and provide more accurate insights.</p> <p>Access to Environmental</p>

		<p>between environmental knowledge and attitudes was not verified, and the connection between knowledge and behavior was only weak. This suggests that having more environmental knowledge does not necessarily lead to more positive attitudes or behaviors regarding energy saving.</p> <p>Demographic Variations: The research identified that males, older students, and those studying in fields such as Engineering and Social and Human Sciences exhibited higher levels of environmental knowledge. Interestingly, female students demonstrated the greatest awareness regarding environmental issues, despite the overall lack of knowledge about energy-saving practices among students.</p> <p>Complex Interconnections: The study highlighted that the relationships among knowledge, attitudes, and behaviors are not as linear as previously assumed. Various factors, including socio-demographic and cultural contexts, may influence these relationships, indicating a need for more nuanced models to understand them.</p>	<p>Information: There is a call for further investigation into how students access and engage with environmental information in their educational institutions. Understanding this access could help identify gaps in knowledge and awareness that may affect attitudes and behaviors.</p> <p>Broader Research Scope: The authors suggest that extending the study to include a larger and more diverse sample across different institutions or countries could yield significant insights into the generalizability of the findings and the factors influencing environmental knowledge and behaviors.</p> <p>Educational Implications: The findings imply that educational programs may need to be re-evaluated to ensure they effectively translate environmental knowledge into positive attitudes and behaviors. This could involve enhancing the way environmental issues are taught and communicated to students.</p>
3	(Dhir et al., 2021)	<p>Attitude-Behaviour Gap: The study identifies a significant attitude-behaviour gap among consumers regarding green apparel. While consumers express concern for the environment, this concern does not always translate into actual purchasing behavior.</p> <p>Mediating Factors: The research highlights the mediating roles of green trust, environmental concern, and environmental attitude in influencing the attitude-behaviour gap. Although these factors were significant, they exhibited a weak influence on reducing the gap, indicating that other factors may also play a crucial role.</p> <p>Demographic Influences: The study confirmed the moderating effects of age and gender on the relationship between environmental knowledge and environmental concern. This suggests that different demographic groups may respond differently to environmental messaging and initiatives.</p> <p>Cultural Insights: The study provides insights into the green apparel buying behavior of Japanese consumers, noting cultural differences that may affect pro-environmental behavior. For instance, Japanese consumers may prioritize</p>	<p>Expansion of Theoretical Frameworks: The study contributes to the literature by applying the Knowledge-Attitude-Behaviour (KAB) and Attitude-Behaviour-Context (ABC) theories in the context of green apparel. This broadens the theoretical insights available in this area and encourages future research to explore these frameworks further.</p> <p>Marketing Strategies: Marketers can leverage the findings to develop targeted campaigns that enhance environmental knowledge among consumers. By increasing awareness of the benefits of green apparel, marketers can help bridge the attitude-behaviour gap and encourage more sustainable purchasing decisions.</p> <p>Policy Recommendations: Policymakers are encouraged to implement educational initiatives aimed at improving consumers' environmental knowledge. This could include social media campaigns, workshops, and community programs that inform consumers about the environmental impact of their</p>

		health-related benefits and show a tendency to avoid risk in their decision-making processes	purchasing choices.
4	(Lin & Niu, 2018)	<p>Environmental Knowledge Alone is Insufficient: While environmental knowledge is important for influencing environmental attitudes and consumption behavior, it is not enough on its own to drive significant changes in consumer actions. Many consumers who are highly concerned about the environment may still lack adequate environmental knowledge.</p> <p>Influence of Environmental Consciousness and Social Norms: The study found that environmental consciousness and social norms significantly impact consumers' environmental attitudes. These factors, along with environmental knowledge, collectively encourage green purchasing intentions and behaviors.</p> <p>Structural Equation Modeling Results: The analysis showed that various hypotheses regarding the relationships between environmental knowledge, consciousness, social norms, and purchasing behavior were supported. Specifically, environmental consciousness had a strong positive effect on environmental attitudes, which in turn influenced purchasing intentions and behaviors.</p> <p>Need for Broader Research: The authors suggest that future research should expand to include more external and internal factors affecting green consumption and involve a more diverse sample across different countries to enhance the generalizability of the findings.</p>	<p>Marketing Strategies: Marketers should focus on highlighting the individual benefits of green products, such as health, safety, and convenience, rather than solely emphasizing environmental appeals. This approach can help align consumer interests with environmental goals, making green products more attractive to a broader audience.</p> <p>Consumer Education: There is a need for enhanced consumer education programs that not only provide environmental knowledge but also foster a sense of responsibility and social norms related to environmental protection. This can help bridge the gap between awareness and action, encouraging consumers to adopt greener purchasing behaviors.</p> <p>Role of Social Norms: Understanding the influence of social norms on consumer behavior can help in designing campaigns that leverage peer influence and community engagement. By creating a culture of sustainability, businesses and organizations can encourage more consumers to participate in green consumption.</p> <p>Policy Development: Policymakers can use these findings to develop initiatives that promote environmental education and awareness, particularly in schools and communities. Policies that support the dissemination of environmental knowledge can lead to improved consumer attitudes and behaviors towards green products.</p>
5	(Trivedi et al., 2018)	<p>Media Influence: The study highlights that media plays a significant role in shaping environmental attitudes. It suggests that both traditional and digital media can effectively raise awareness and concern about environmental issues, which in turn influences consumer behavior towards green purchasing.</p> <p>Environmental Attitudes: The research identifies two dimensions of environmental attitudes: inward environmental attitude (IEA) and outward environmental attitude (OEA). Both types of attitudes positively impact</p>	<p>Marketing Strategies: The findings suggest that marketers should leverage media channels to effectively communicate the benefits of green products. By highlighting environmental issues and the positive impact of consumer choices, companies can enhance consumer awareness and encourage green purchasing behaviors.</p> <p>Public Policy Development: Policymakers can use the insights from this research to design initiatives that promote</p>

	<p>green purchase behavior, indicating that consumers who are more aware and concerned about environmental issues are more likely to engage in sustainable purchasing.</p> <p>Perceived Consumer Effectiveness (PCE): The study finds that perceived consumer effectiveness, or the belief that individual actions can contribute to environmental protection, significantly affects green purchasing behavior. Consumers who feel that their choices matter are more inclined to buy green products.</p> <p>Ecological Concern: The level of ecological concern among consumers is shown to be a critical factor influencing their intention to purchase environmentally friendly products. Higher ecological concern correlates with a greater likelihood of engaging in green purchasing behaviors.</p> <p>Structural Equation Modeling: The research employs structural equation modeling to analyze the relationships between media influence, environmental attitudes, and green purchasing behavior, providing a robust framework for understanding these dynamics.</p> <p>Demographic Insights: The study also notes demographic factors, such as education and income levels, which may influence green purchasing behavior, suggesting that more educated and higher-income individuals are more likely to engage in environmentally friendly purchasing practices</p>	<p>environmental awareness through media. By supporting campaigns that highlight ecological concerns and the importance of sustainable practices, governments can foster a culture of environmental responsibility among consumers.</p> <p>Consumer Education: The study emphasizes the need for educational programs that enhance ecological concern and understanding of green products. By providing consumers with information about the environmental impact of their purchases, organizations can help shift attitudes towards more sustainable behaviors.</p> <p>Corporate Social Responsibility (CSR): Companies should consider integrating sustainability into their core business strategies and communicate these efforts through media. Demonstrating a commitment to environmental issues can enhance brand loyalty and attract environmentally conscious consumers.</p>
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The relationship between environmental attitudes and green purchase behavior is explored through various studies, highlighting several key findings:

1. **Positive Attitude and Pro-Environmental Behavior:** Research indicates that consumers' attitudes toward the environment are strongly positively related to their pro-environmental behavior. When young consumers hold a favorable view of environmental issues, they are more likely to engage in ecologically conscious consumer behavior (ECCB).
2. **Influence of Environmental Consciousness:** Environmental consciousness significantly impacts consumers' environmental attitudes. Studies show that higher levels of environmental consciousness lead to more positive environmental attitudes, which in turn influence purchasing intentions and behaviors.
3. **Role of Perceived Consumer Effectiveness (PCE):** The belief that individual efforts can contribute to environmental protection plays a crucial role. When consumers feel effective in making a difference, they are more inclined to purchase eco-friendly products. This suggests that PCE acts as a mediator between environmental attitudes and actual purchasing behavior.
4. **Complex Interconnections:** The relationship between environmental knowledge, attitudes, and behaviors is not linear. Various factors, including socio-demographic and cultural contexts, influence these relationships. For instance, while environmental knowledge is important, it alone does not drive significant changes in consumer actions. Many consumers may express concern for the environment without translating that concern into actual purchasing behavior, indicating an attitude-behavior gap.
5. **Need for Enhanced Consumer Education:** Effective consumer education programs that foster a sense of responsibility and social norms related to environmental protection can bridge the gap between

awareness and action. This can encourage consumers to adopt greener purchasing behaviors, thereby aligning their attitudes with their actions.

4. 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 355 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 source with the highest number of publications. Consumer behavior research on environmental attitudes and green purchase behavior is increasing, with a peak expected in 2023. The most prolific author is Florian G. Kaiser. China is the most prolific country in terms of published articles. The most referenced article is "A Fresh Look at Understanding Green Consumer Behavior Among Young Urban Indian Consumers Through the Lens of Theory of Planned Behavior," which has received 296 citations. Sustainability Switzerland was the most prolific journal source, with 50 papers.

Pro-environmental behaviors, including green purchase behavior, are generally associated with positive environmental attitudes; factors such as perceived consumer effectiveness, environmental consciousness, and the need for effective education and communication strategies influence this relationship.

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