

A Systematic Literature Review of Quasi-Experimental Studies on Consumer Behavior in the Sustainability Domain

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Abstract

Purpose : This study aimed to examine the literature on consumer behavior quasi-experiments in the sustainability domain and offer insights into how quasi-experiments are currently being used.

Design/Methodology/Approach : After looking through 544 documents using a separate keyword search, a systematic quantitative review was done, and 159 pertinent papers were found from the Web of Science and Scopus databases up to 2021. The utilization of quasi-experiments in industrialized Western nations was the study's main focus, followed by Asian nations, especially China and India. Few research used theoretical frameworks, and the quasi-experimental techniques used are restricted to treatment and control groups and the pre-post test approach.

Findings : The majority of the research in this field, according to the study, has been conducted in developed Western nations, and the quasi-experimental techniques employed are restricted due to the employment of treatment and control groups and the pre-post-test procedure. The survey also discovered that a very small number of studies have used theoretical frameworks. Future research topics are suggested by the study, particularly the utilization of quasi-experiments with samples of women and LGBTI people.

Practical Implications : Given that no studies in the literature have used this sample, the study offers useful guidance for conducting quasi-experiments with female and LGBTI subjects. The review sheds light on how consumer behaviour quasi-experiments are now being used in the sustainability field.

Originality/Value : Given that it is the first review ever written on this subject, it is the first of its type. By offering insights into the current application of quasi-experiments in consumer behavior in the sustainability domain, the study adds to the body of literature and provides new avenues for investigation.

Keywords : quasi-experiments, consumer behavior, sustainability, environment, systematic literature review

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Although effective marketing is the key to the success of organizations, especially in the hyper-competitive world today, in research, the impact of different marketing initiatives on consumer behavior has remained ambiguous (Ouyang et al., 2021). Organizations usually spend large amounts of capital, mainly based on some theoretical propositions made by the marketing department, hoping that it would yield the desired results (Key et al., 2020). However, only in a few cases are these propositions effectively backed up by 'empirical evidence.' On the other hand, although empirical research examined the impact of different marketing activities on varying consumer behavior variables, it is limited, especially in postulating causality (Cialdini, 2009; Hair Jr. & Sarstedt, 2021). Causality is the causal effect of any difference between the potential outcomes of an action per se (Greenland, 2022). In marketing, this would mean the difference among a populous exposed to a marketing activity (treatment group) as opposed to those not exposed to the same (control group). This situation offers an opportunity to identify the cause-and-effect relationship between different marketing initiatives, whereby causality may be established using experimental and quasi-experimental research designs.

Quasi-experimental research designs use non-experimental changes in the key outcome variable, fundamentally imitating experimental environments in which some subjects are subjected to treatment while others are not (Gopalan et al., 2020). In other words, they are not 'experiments' set up, so the assignment to control and treatment groups is effectively not random (Achen, 1986). However, despite this limitation, they allow the study of natural events and use some rules of thumb to control selection since the environment cannot be changed. This requires the researchers to take steps to control for differences between the groups. Heckman (2013) stated that the challenge in this research design is related to identifying and interpreting the parameters. These assumptions impact the causal interpretations derived from the experiment. Thus, causal interpretations need to be carefully made depending on the context, but it could be beneficial to establish causality.

Most studies in the extant literature have been based on self-reported behavior and laboratory experiments (Ilicic & Brennan, 2022). However, unless this self-reported behavior and laboratory experiments (Brečić et al., 2021) are not validated by actual quasi-experiments and field experiments, we cannot know for sure that the knowledge developed by scholars reflects the behaviors consumers display 'in the wild.' In recent years, there has been a slow increase in studies using a quasi-experimental research design (QED), but more research using this methodology is still needed (Gneezy, 2017). Quasi-experiments (Pornpitakpan & Francis, 2000) and field experiments (Roy & Das, 2022) are essential tools for studying consumer behavior (Elhoushy & Lanzini, 2021) in this ever-changing consumer landscape. Most research in business management has adopted the cross-sectional survey methodology where causal inferences cannot be made. Also, cross-disciplinary studies (Lindgreen et al., 2020) have been carried out. Also, with self-reported data, external validity is a concern (Galizzi & Navarro-Martinez, 2019). This focus on the research design stems from a call for more robust research designs to facilitate causal inferences (Baumeister et al., 2007).

One alternate method that is used to answer this call for causal research has been the use of experimental research designs. Several studies have examined consumer behavior using cross-sectional designs. Nevertheless, there has yet to be a systematic review of literature (Premi et al., 2021) on the use of quasi-experimental designs in consumer behavior; because of this, studies in this area have also fragmented, diffusing the research focus thereof. Numerous researchers have called for more research to focus on the behavioral aspects of consumer research, primarily to address the lack of behavioral realism (Morales et al., 2017; Otterbring, 2021). As research designs focus more on fieldwork, more generalization would be possible, and research would gain further credibility (Otterbring et al., 2020). Reviewing the literature is one of the best ways to identify the research theme (Viglia & Dolnicar, 2020). With this structured literature review, we hope to bring more focus to this area of research and provide a more precise direction for future research. In this process, we also included 'sustainability' as a keyword to further limit studies that examined quasi-experimental research in consumer behavior literature revolving around sustainability. This is meaningful because there is an increased focus on sustainability and circular

economy and a push to include sustainability in business research (Meher & Hamato, 2022), especially in marketing. This well-defined focus ensures that this study can contribute to consumer behavior research, sustainability, and sustainable marketing (Tabrizi et al., 2019).

The influence of marketing initiatives on consumer behavior needs to be clarified, and causation is rarely demonstrated in studies, which reduces the validity of marketing theories. Quasi-experimental research designs are necessary to prove causation, but marketing literature only occasionally uses them. The primary data sources have been laboratory experiments and self-reported behavior, and field experiments or quasi-experiments have yet to be used to validate these methodologies. A thorough assessment of the literature on using quasi-experimental designs in consumer behavior, including sustainability, is suggested. With an increased emphasis on sustainability, there is a demand for quasi-experimental research in the literature on consumer behavior. This study focuses on sustainability to advance consumer behavior research, sustainability, and sustainable marketing.

This research is relevant and crucial for several reasons. Firstly, as consumers become more aware of their impact on the environment and actively seek out goods and services consistent with their values, sustainable consumption (Giri et al., 2022) is becoming increasingly important. As a result, there is an expanding body of research on consumer behavior in sustainability (Kulshrestha et al., 2022). However, it is necessary to synthesize and assess these findings to pinpoint major trends and knowledge gaps. Furthermore, quasi-experimental studies, a popular research technique in the social sciences, enable the determination of causal correlations between variables. There are not many systematic reviews, nevertheless, that are devoted to quasi-experimental research on consumer behavior in the sustainability field. A thorough knowledge of the effects of interventions connected to sustainability on consumer behavior might be possible with a systematic evaluation of the literature on the research of this type. Thirdly, evidence-based insights are needed to inform policymakers' and practitioners' responses as there is growing interest in encouraging sustainable consumption. Policymakers and practitioners could benefit from essential insights from a comprehensive evaluation of quasi-experimental studies on consumer behavior in sustainability, enabling them to create more successful interventions to encourage sustainable consumption. In conclusion, a systematic review of the literature on quasi-experimental studies on consumer behavior in the sustainability field is highly pertinent and in demand because it could offer insightful information on the effects of interventions related to sustainability on consumer behavior and serve as a roadmap for the creation of more effective initiatives to encourage sustainable consumption.

This research is significant in several ways; it addresses the call for a systematic review of literature in the area. Secondly, this review is done from a sustainability perspective, possibly laying the groundwork in the process for future research in the area. Today, sustainability is the top priority for all of us as global warming is a real threat to our planet (Intergovernmental Panel on Climate Change, 2022). With all domains now calling for researchers to focus on the consumers' behavioral aspects, reviews on the use of research designs, like quasi-experimental designs, that capture natural behavior are the need of the hour (Otterbring, 2021; Viglia & Dolnicar, 2020). Because of the present gap in the use of quasi-experimental design, we address this concern while adding the sustainability perspective to the same. Specifically, we examine and synthesize literature on consumer behavior in the sustainability area based on quasi-experimental research designs; and we also address some perspectives on sustainability. Further, we examine extant research regarding the research topic, the consumer behavior perspective taken, and the frameworks used. Additionally, we consider aspects like the context of the study and the geographical location. Lastly, based on this review, we recommend future research areas.

Literature Review

Quasi-experimental designs (QED) are also known as ex-post-facto designs since the groups are formed first, and the experiment is carried out after that (Salkind, 2012). In quasi-experimental designs (Yin et al., 2021), the

independent variable in the study occurred in the past. Then the researcher examined the effect of the event on the group. Regression discontinuity, differences-in-differences, instrumental variables two-way fixed effects, among others, are some methods used to establish causality (Collischon, 2021). There is an opportunity to use this research design in marketing. The quasi-experimental design has been used in marketing to understand consumer and firm behavior and outcomes at the market level (Goldfarb et al., 2022). By using quasi-experimental designs in marketing, more generalizable results can be obtained, and the sample can be unbiased and heterogeneous. While the format of randomized controlled trials is mimicked in quasi-experimental studies, allocating subjects to treatment groups is not random. These studies are frequently employed in sustainability to examine how interventions affect consumer behavior. For instance, several quasi-experimental studies have examined how incentives, social norms, and feedback affect consumer behavior in sustainability.

Using a quasi-experimental methodology, Becken and Wilson (2007) investigated the influence of information and feedback on self-drive visitors' trip planning and decision-making process. The findings highlighted the significance of information and feedback in promoting sustainable tourism (Shankar, 2021) by demonstrating that they substantially influence self-drive visitors' trip-planning and decision-making processes. Using a quasi-experimental design, Bertrandias et al. (2012) explored the factors influencing consumers' choices to be environmentally friendly. According to the findings, perceptions of environmental harm and consistency in behavior are the main factors affecting consumers' decisions to adopt environmentally friendly choices. This study emphasizes the significance of behavior consistency and perceived environmental harm in encouraging environmentally friendly decisions.

An investigation into the influence of situational emotions on students' intentions for sustainable purchasing behavior was conducted by Liefänder et al. (2013). The study's quasi-experimental methodology demonstrated that situational emotions significantly influenced the intention to engage in sustainable consumer behavior. This study showed the significance of situational emotions in encouraging sustainable consumer behavior. Similarly, Karlsson and Dolnicar (2016) used a quasi-experimental observational approach to investigate the effect of eco-certification on the sales of tourism services in Iceland. The findings highlighted the significance of eco-certification in promoting sustainable tourism by demonstrating that it has a beneficial impact on the sales of tourism services. Last but not least, Antonschmidt and Lund-Durlacher (2021) used a quasi-experimental method to investigate the influence of context change on hotel guests' food waste reduction behavior. The findings demonstrated the significance of context manipulation in encouraging sustainable behavior among hotel guests and the significant influence of context manipulation on food waste reduction behavior.

In conclusion, quasi-experimental research is used to examine the effects of various interventions on sustainable behavior, including feedback, social norms, incentives, eco-certification, information and feedback, situational emotions, and context manipulation. These studies have emphasized the significance of several elements in encouraging sustainable behavior and can offer practitioners and policymakers insightful information. For each of these designs, the estimates and causal claims are different. The reliability of results depends on the research context and how similar the research conditions are to an experiment. Additionally, validity issues arise from the non-random assignment to groups; but there are ways and means to manage them (Galizzi & Navarro-Martinez, 2019).

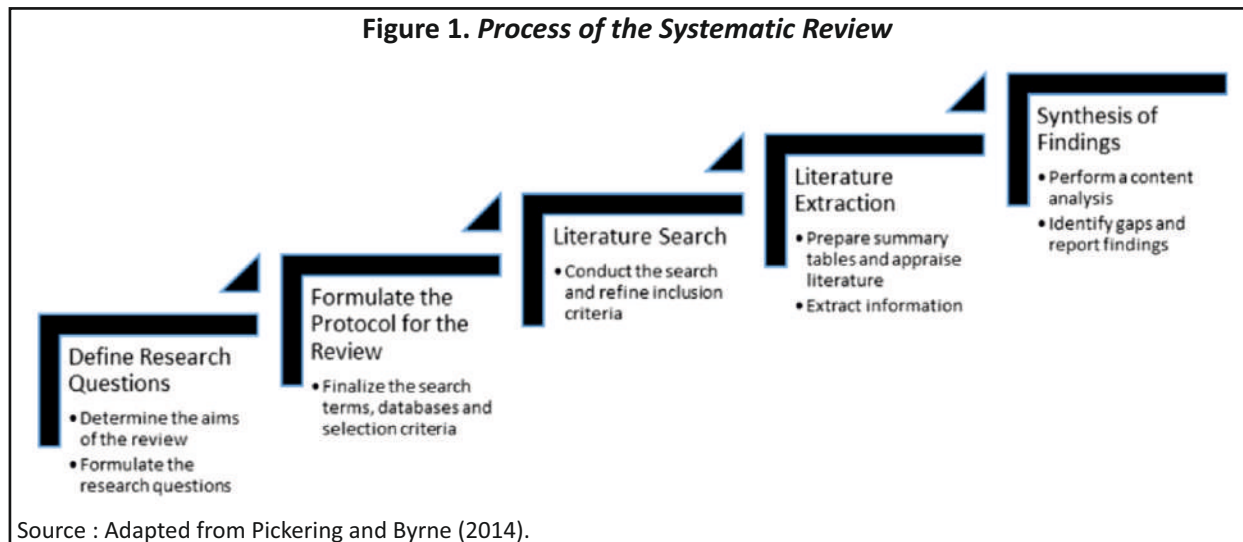
Methodology

Multiple techniques can be used to review literature (Kashif & Udunuwara, 2021); some of the common categories include bibliometric reviews, traditional reviews (Dórea et al., 2022), meta-analyses, and systematic quantitative reviews (Snyder, 2019). In bibliometric review, publications in an area are statistically examined, and the influence of the publication serves as a critical consideration. An exhaustive summary of work in the research

area is conducted in a formal review. In a meta-analysis, statistical analysis is carried out on the research results that have adopted similar research designs. In this study, we adopted a systematic quantitative approach to mapping extant literature on using quasi-experimental designs in consumer behavior (Han & Stoel, 2017) from a sustainability perspective. We carried out a systematic literature search in the Scopus and Web of Science databases. This was followed by an extraction and synthesis of the research in the area. Importantly, since we aimed to examine research using quasi-experimental designs in the domain of consumer behavior with a sustainability perspective, we thought a systematic quantitative approach would be the best fit.

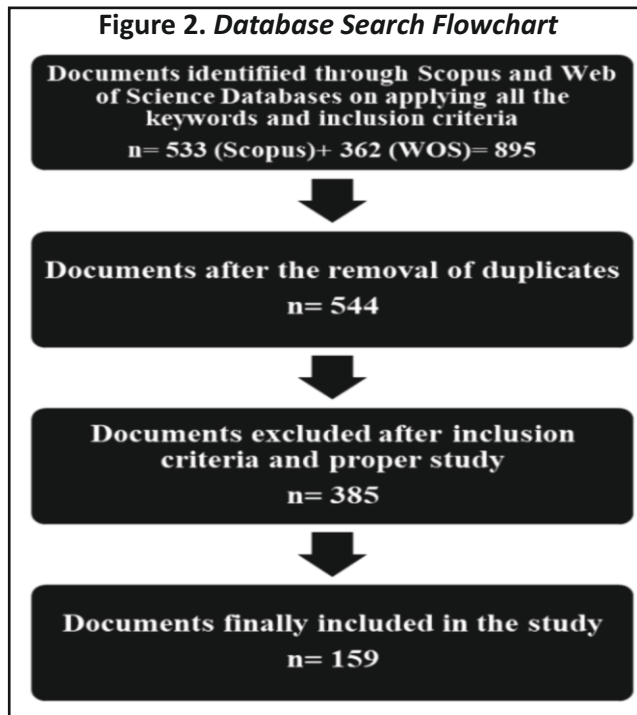
The Process of the Systematic Review

Based on the process recommended by Pickering and Byrne (2014), we used the following process (Figure 1). As the first step, the review aims were set as mentioned in the preceding section. Based on the aims of the research, the protocol of the review was developed. This set the boundaries for the literature search in terms of the search terms used, the inclusion criteria, etc. To examine this, some of the search terms we used included 'quasi-experimental research,' 'consumer behavior,' and 'sustainability.' We used the Scopus and Web of Science databases from a quality of publications perspective. Using both databases ensured a comprehensive search of the literature in the area; usually, such reviews only consider one of the databases. Further, to maintain the quality of the review, we considered only research articles in English in the business management area. Notably, we only applied a specific time frame; however, as of December 2021, we initially retrieved 159 relevant papers published in the area. The reporting flowchart is depicted in Figure 1.



Selection of the Papers for Review

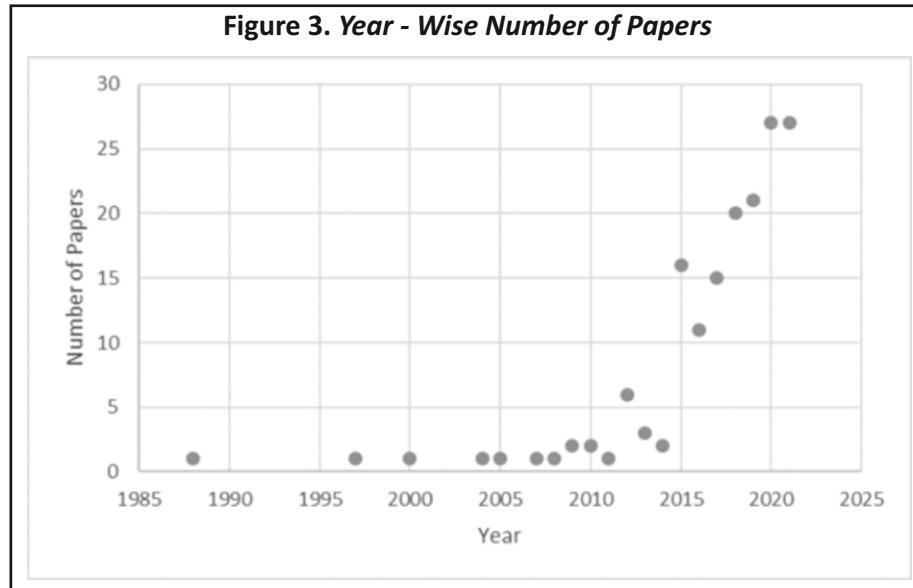
Scopus and Web of Science (WOS) databases were searched to identify relevant papers. The research paper search in both databases (Scopus and WOS) resulted in 895 papers, including all language papers, conference papers, working papers, etc. (Figure 2). The search criteria used in this database for searching relevant papers included the following keywords: “quasi-experiment*,” “consumer,” “customer,” “human,” “public,” “people,” “family,” “household,” “sustainability,” “sustainable,” “renewable,” “green,” “conservation,” “pro-environment,” “climate change,” and “global warming.” Duplicate papers from both databases were removed, and the count



came to 544. There was no lower limit for the year, but 2021 was the last year considered for the relevant papers. After that, the inclusion criteria considered were only English-language peer-reviewed journal papers. After considering this inclusion criterion and reading the abstract of each paper, 385 papers that were not relevant to our theme of quasi-experiment on consumer behavior in the sustainability domain were excluded. In the end, 159 relevant papers were included in this study. For these 159 papers, the data was developed in an Excel sheet. Relevant columns were created to examine each paper on the following parameters: research method used, primary data/secondary data, consumer behavior topic studied, country of study, the continent of study, and sustainability area of study. This data for each paper was studied and compiled, and tables were prepared from this data.

Analysis and Results

A total of 159 original papers (peer-reviewed) on quasi-experiments of consumer behavior in the sustainability domain were studied. Figure 3 provides the chart of the year-wise number of papers. These 159 papers studied consumer behavior, including in journals of different disciplines such as sustainability, psychology, environment, economics, food, health, medicine, tourism, marketing, economics, etc. Most of the papers were published in recent years. In the last five years, in 2021 (27 papers), 2020 (27 papers), 2019 (21 papers), 2018 (20 papers), and 2017 (15 papers) alone, 110 papers were published on this topic. This means that about 70% of the papers were published in the last 5 years; the remaining papers were published from 1988–2017. This reflects that there has been an increased awareness of this topic in recent times. The momentum for this topic started in 2015 when 15 papers were published. It may be due to the Paris Accord on Climate Change in 2015 (United Nations, 2015). The first paper on this topic was published in 1988, which studied social cognition and persuasion to promote energy conservation (Gonzales et al., 1988).



Geographical Distribution of Studies

Consumer behavior in the sustainability field has attracted researchers from varied geographies. Table 1 shows that North America topped with 51 papers (31%); among them, the US alone accounted for 49 papers and Canada for the two remaining papers. Europe accounted for 46 papers (28%), among which Germany topped the list with nine papers, followed by the Netherlands (6) and France (5). Asia accounted for 29 papers (18.1%), among which China accounted for eight, followed by Pakistan, which accounted for four. Africa accounted for only 12 papers (7.5%). The Australian region accounted for only 11 papers (6.87%), among which Australia accounted for six papers, and New Zealand accounted for five papers. The South American continent accounted for 10 papers (6.25%); Brazil accounted for a majority of the six papers.

From Table 2, it can be seen that most papers on this subject were published in environment-related journals (27), followed by sustainability-related journals (16), psychology-related journals (14), health-related journals (11), and marketing-related journals (9). Transport and tourism-related journals, in combination, accounted for 11 papers. Other disciplines like nursing, pharmacy, food, education, business journals, etc., accounted for the remaining papers. The journals in the other category accounted for 24 papers. It shows that the topic of quasi-experiments of consumer behavior in sustainability is discussed across different types of journals.

Table 1. Papers Across the Continent

Continent	Number of Papers
Africa	12
Asia	29
Australia	11
Europe	46
North America	51
South America	10

Table 2. Journal Details and Number of Papers

Discipline	Journal Title	Number of Papers	Discipline Total
Business	<i>Journal of Business Research</i>	4	7
	<i>African Journal of Economic and Management Studies</i>	1	
	<i>Business & Information Systems Engineering</i>	1	
	<i>Business Strategy and The Environment</i>	1	
Ecology	<i>Basic and Applied Ecology</i>	1	3
	<i>Ecological Economics</i>	2	
Education	<i>Journal of Science Teacher Education</i>	1	4
	<i>Environmental Education Research</i>	2	
	<i>Journal of Planning Education and Research</i>	1	
Energy	<i>Energy Policy</i>	1	1
Environment	<i>Environmental and Resource Economics</i>	1	27
	<i>Journal of Environmental Economics and Management</i>	2	
	<i>Worldviews : Environment, Culture, Religion</i>	1	
	<i>Journal of Environmental Management</i>	3	
	<i>International Journal of Environmental Research and Public Health</i>	1	
	<i>Smart and Sustainable Built Environment</i>	1	
	<i>Weather, Climate, and Society</i>	1	
	<i>Waste Management</i>	1	
	<i>Urban Forestry & Urban Greening</i>	1	
	<i>Environmental Research</i>	2	
	<i>Environmental Communication</i>	1	
	<i>Science of the Total Environment</i>	1	
	<i>Environment and Behavior</i>	2	
	<i>International Journal of Conservation Science</i>	1	
	<i>Climate and Development</i>	1	
	<i>Climate Policy</i>	1	
	<i>Curator</i>	1	
	<i>Handbook of Environmental Economics</i>	1	
	<i>International Journal of Disaster Risk Reduction</i>	1	
	<i>Journal of Environmental Studies and Sciences</i>	1	
	<i>Environment Development and Sustainability</i>	2	
Food	<i>British Food Journal</i>	4	7
	<i>Appetite</i>	3	
Health	<i>The Lancet Planetary Health</i>	1	11
	<i>The Lancet Global Health</i>	1	
	<i>JMIR Research Protocols</i>	1	
	<i>Social Work in Health Care</i>	1	
	<i>BMC Public Health</i>	2	
	<i>Public Health Nutrition</i>	1	
	<i>Journal of Public Health Management</i>	1	

	<i>Annual Review of Public Health</i>	1	
	<i>Journal of Epidemiology and Community Health</i>	1	
	<i>Health Care Financing Review</i>	1	
Hospitality	<i>International Journal of Hospitality Management</i>	1	2
	<i>International Journal of Contemporary Hospitality Management</i>	1	
Marketing	<i>Marketing Science</i>	2	8
	<i>European Journal of Marketing</i>	1	
	<i>International Journal of Retail and Distribution Management</i>	1	
	<i>Journal of Nonprofit and Public Sector Marketing</i>	1	
	<i>Sport Marketing Quarterly</i>	1	
	<i>International Review of Retail, Distribution, and Consumer Research</i>	1	
	<i>Journal of Global Fashion Marketing</i>	1	
Medical	<i>Social Science and Medicine</i>	1	5
	<i>American Journal of Preventive Medicine</i>	1	
	<i>BMJ Open</i>	2	
	<i>Curator</i>	1	
Multidisciplinary	<i>PLOS One</i>	3	3
Psychology	<i>Journal of Managerial Psychology</i>	1	14
	<i>Journal of Environmental Psychology</i>	6	
	<i>Psychiatry Research</i>	1	
	<i>Research Methods for Environmental Psychology</i>	1	
	<i>Psychology Research and Behavior Management</i>	1	
	<i>Frontiers in Psychology</i>	1	
	<i>Journal of Social Psychology</i>	1	
	<i>Annual Review of Psychology</i>	1	
	<i>Journal of Applied Social Psychology</i>	1	
Reviews	<i>Campbell Systematic Reviews</i>	1	2
	<i>Systematic Reviews</i>	1	
Science	<i>Proceedings of the National Academy of Sciences of the United States of America</i>	5	10
	<i>Annals of Regional Science</i>	1	
	<i>Philosophical Transactions of the Royal Society B : Biological Sciences</i>	1	
	<i>Conservation Biology</i>	1	
	<i>International Journal of Scientific & Technology Research</i>	1	
	<i>Scientific Data</i>	1	
Tourism	<i>e-Review of Tourism Research</i>	1	5
	<i>Journal of Ecotourism</i>	1	
	<i>Tourism Management</i>	1	
	<i>Journal of Sustainable Tourism</i>	2	
Transport	<i>Transportation</i>	1	6
	<i>Transportation Research Part F : Traffic Psychology and Behaviour</i>	1	
	<i>Transportation Research Part D : Transport and Environment</i>	2	
	<i>Journal of Travel Research</i>	2	

Urban	<i>Journal of Urban Affairs</i>	1	5
	<i>Urban Forestry and Urban Greening</i>	1	
	<i>Landscape and Urban Planning</i>	1	
	<i>Urban Planning</i>	2	
Sustainability	<i>Sustainability (Switzerland)</i>	11	16
	<i>Journal of Cleaner Production</i>	2	
	<i>Journal of Management, Accounting and Sustainability</i>	1	
	<i>Environment, Development, and Sustainability</i>	1	
	<i>Nature Sustainability</i>	1	
Other	<i>Land Use Policy</i>	2	24
	<i>Water (Switzerland)</i>	1	
	<i>Proceedings of the Human Factors and Ergonomics Society</i>	1	
	<i>Review of Policy Research</i>	1	
	<i>Acta Geographica Sinica</i>	1	
	<i>Acta Horticulturae</i>	1	
	<i>International Journal of Behavioral Nutrition and Physical Activity</i>	2	
	<i>Property Management</i>	1	
	<i>World Development</i>	3	
	<i>Landscape Research</i>	1	
	<i>Energy Research & Social Science</i>	1	
	<i>Journal of Agribusiness in Developing and Emerging Economies</i>	1	
	<i>Poverty and Public Policy</i>	1	
	<i>Journal of Systems and Information Technology</i>	1	
	<i>Journal of Design and Built Environment</i>	1	
	<i>Journal of Prevention and Intervention in the Community</i>	2	
	<i>Journal of Economic Behavior and Organization</i>	1	
	<i>Evaluation Review</i>	2	

Under quasi-experiments, different research methods have been used to study consumer behavior in sustainability (Table 3). The most widely used method observed was in the treatment and control group (81), representing about 50.62%, followed by the pre-test/post-test design (33), accounting for about 20.62% of all the research methods. It shows that 71% of the papers utilized these two methods. Factorial designs with different combinations were also

Table 3. Research Methods

Research Method Used	Number of Papers
Intervention-treatment and control group	81
Systematic literature review	4
PSM-DID model	1
Pre-test/post-test design	33
Quasi-experimental causal inference technique	1

2*2 between subject design	4
2 × 2 × 2 research design	2
Difference-in-differences method	7
2*2*3*3 research design	1
2*2*3 between-subjects factorial design	
factorial design	1
Virtual reality game	1
A game-based intervention	1
Meta-analysis	1
Regression discontinuity analysis	1
3*2 factorial design	1
Synthetic control method (SCM)	2
Heckit model/Heckman Selection Model	2
DRM framework	1
Conjoint analysis	1
Laboratory	
quasi-experiment	1
Time-series design	1
Between-subject design	2
One-way between-subject quasi-experimental design	1
Instrumental variable regression	1
Theory	3
Propensity score matching (PSM)	4
Quasi-experimental geospatial interpolation	1

used. Notably, most of the studies used primary data and quantitative research strategies. In the African and the South American continent, only treatment and control groups and pre-post-test research methods are predominantly used in all papers except for the Synthetic control method. Various research methods are used to study these phenomena in Europe and North America.

Although the treatment and control group and pre-post-test research methods are prominently applied in Asia, PSM-DID and DID methods are also used in some papers. Another important aspect was a need for conceptual interlinking with the theories across the extracted papers. All the studies were framed within the positivist paradigm. Out of the total 160 papers, only close to 20 papers have reported applications of theoretical framework. Some of the standard theories included are cognitive metaphor theory, social cognitive theory, approximation theory, attribution theory, equity theory, value-belief-norm theory of environmentalism, self-determination theory, norm activation theory, focus theory of normative conduct, cognition–affect–behavior (C-A-B) paradigm, and discounting behavior theory.

Various topics related to the consumer have been studied in the selected papers for review (Table 4). Economic impact (16 papers) is the most studied topic, followed by consumer behavior (12 papers). The next most studied topic is human well-being (14 papers) and consumer attitude (11 papers). Ten research papers also studied consumer learning/education. Other vital topics include consumer willingness, consumer promotion, and consumer health. Consumer awareness, consumer demand, motivation, knowledge, preferences, and values are the least studied consumer topics in this paper. The above topics are crucial to understanding consumers' responses

Table 4. Consumer Behavior Topic Studied

Consumer Behaviour Topic	Number of Papers
Consumer Attitude	11
Consumer Perception	4
Consumer Awareness	3
Consumer Incentives	4
Consumer Promotion	9
Consumer Beliefs	1
Consumer Intentions/Willingness	8
Consumer Response	5
Consumer Preferences	1
Consumer Reactions	2
Consumer Choice	2
Consumer Values	1
Consumer Learning/Education/Training/Counseling	10
Consumer Behavior	12
Consumer Rewards/Benefits	4
Consumer Self-Reliance	1
Consumption	1
Motivation	2
Knowledge	3
Norms	4
Communication	5
Research Design	5
Demand	2
Human Well-Being/Social Impact	14
Economic Impact	16
Health	10
Community Development	4
Policy	3
Space/Product Design	2
Marketing/Brand	5
Women's Participation in the Environment	1
Others	4

to sustainable practices and products. This also contrasts with the United Nations' Sustainable Development Goals (SDGs) priority. Also, consumer policy and community development are the least studied topics related to society as a whole.

We also observed various problems studied in papers related to consumer behavior (Table 5). Under the category of social problems, problems like human well-being, hypocrisy, social inclusion, ecotourism interpretation, and gender inequality were discussed. The Economics category discussed problems such as low income, food security, tax on gas emissions, poverty alleviation, agricultural productivity, and quality. The Health

Table 5. Problems Studied in the Papers

Social Problems	Economic Problems	Health Problems	Environmental Problems	Others
Human well-being	Agricultural productivity and quality	Undernutrition	Ecosystem	Social media
Social protection programs	Green product incentives	Mental health	Environment consciousness	Policy impact
Social norm nudges	Poverty alleviation	Cardio metabolic health	Room cleaning	Waste management training
Ethnically diverse groups	Willingness to pay	General health	Less waste food	
Water service	Tax on CO2		Urban transportation	
Social capital	Low income		Plate waste at hotels	
Social norms	Financial inclusion		Environment attitude	
Ecotourism interpretation	Food security		Urban environment	
Stereotypes			Waste management	
Gender inequality			Impure altruism	
Risk communications			Heat	
Social inclusion			Greenhouse gas emission	
Hypocrisy			Temperature biases	
Risk communication			Carbon capture and storage	
Environmental consciousness			Garbage	
			Deforestation	
			Office space	
			Forest conservation	
			Illegal dumping of household garbage	
			Litter	
			Information technology	

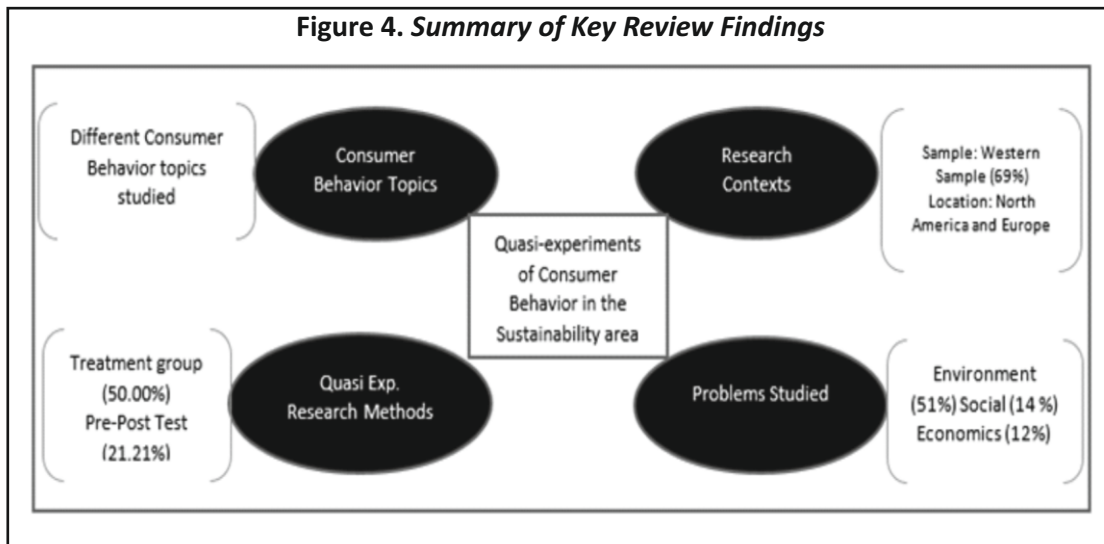
category discussed problems such as general health, mental health, and undernutrition. Notably, the most discussed category was the environment, where problems such as ecosystem, environmental consciousness, food waste (Williams et al., 2012), urban transportation, environmental attitude, greenhouse gas emissions, forest conservation, litter, carbon capture, waste management, etc., were discussed.

Table 6. Top Journals and Number of Papers

Journal Name	Number of Papers
<i>Sustainability (Switzerland)</i>	11
<i>Journal of Environmental Psychology</i>	6
<i>Proceedings of the National Academy of Sciences of the United States of America</i>	5
<i>Journal of Business Research</i>	4
<i>British Food Journal</i>	4
<i>Appetite</i>	3
<i>World Development</i>	3
<i>Journal of Environmental Management</i>	3

Table 7. Sustainability Topic Studied

Sustainability Topic	Number of Papers
Sustainability	32
Social	24
Environment	80
Economics	11
Socio-economic	7
Environmental Economics	2
Theory	3

Figure 4. Summary of Key Review Findings

The journal with the most papers on this topic includes *Sustainability* (Switzerland), with 11 papers (Table 6). This is followed by the *Journal of Environmental Psychology* (6 papers), *Proceedings of the National Academy of Sciences of the United States of America* (5), *Journal of Business Research* (4), and *British Food Journal* (4). The unique point of this topic is that journals study it under different themes, like health, medicine, marketing, food, pharmacy, sustainability, psychology, ecology, etc. The papers published saw varied acceptance in different types of journals. So, as per Table 7, there is less concentration of these topics in a particular journal.

Table 7 shows that the environment (80 papers) is the most discussed topic among the three pillars of sustainability. The next topic discussed is sustainability itself, with 32 papers. The social aspect was discussed in 24 papers, while economics (20 papers) was the least discussed topic, but it was combined with environment and society. Figure 4 provides the summary of key findings from this review. Figure 4 shows the consumer behavior topics, research methods, research context, and sustainability problems studied by the papers.

Discussion and Future Research Directions

This review studied research papers on quasi-experiments of consumer behavior in the sustainability area. The review only considered peer-reviewed papers in English, available in the Scopus and Web of Science (WOS) databases until 2021. The review shows that research on this topic has been more prominent in the North American

region, particularly in the USA and Europe. However, more research on this topic must be conducted in the South American, African, and Australian continents. The possible rationale for the same could be attributed to limited awareness of this topic among researchers in this continent and the availability of papers in native languages. However, if you take the case of journals, there has been a wide distribution of papers across journals of different themes. Research on this topic has been published in journals on different themes like marketing, psychology, medicine, environment, sustainability, pharmacy, nursing, science, tourism, transport, etc. Figure 5 provides the under-research areas and future research agenda. Three main future agendas can be carried out in future research works.

Increased Research Across Continents

Further, through the review, we observed that many aspects of consumer behavior, such as consumer attitude, learning, promotion, perception, beliefs, awareness, choice, preferences, values, response, reactions, rewards, demand, community development, brand loyalty, and communications, were discussed. Nevertheless, they need to be more papers on this topic. More research is required across different geographies regarding consumer behavior toward sustainability. More research can be done in the continents of South America, Africa, Asia, and Australia. Interestingly, there are only three papers on cost-benefit analysis in this field. The first paper estimated the impact of conservation on the ecosystem and poverty, while the second studied a cost-benefit analysis of active travel intervention; the third studied a cost-benefit analysis of the urban landscape. Thus, more research on cost-benefit analysis is likely required to create awareness about sustainable practices.

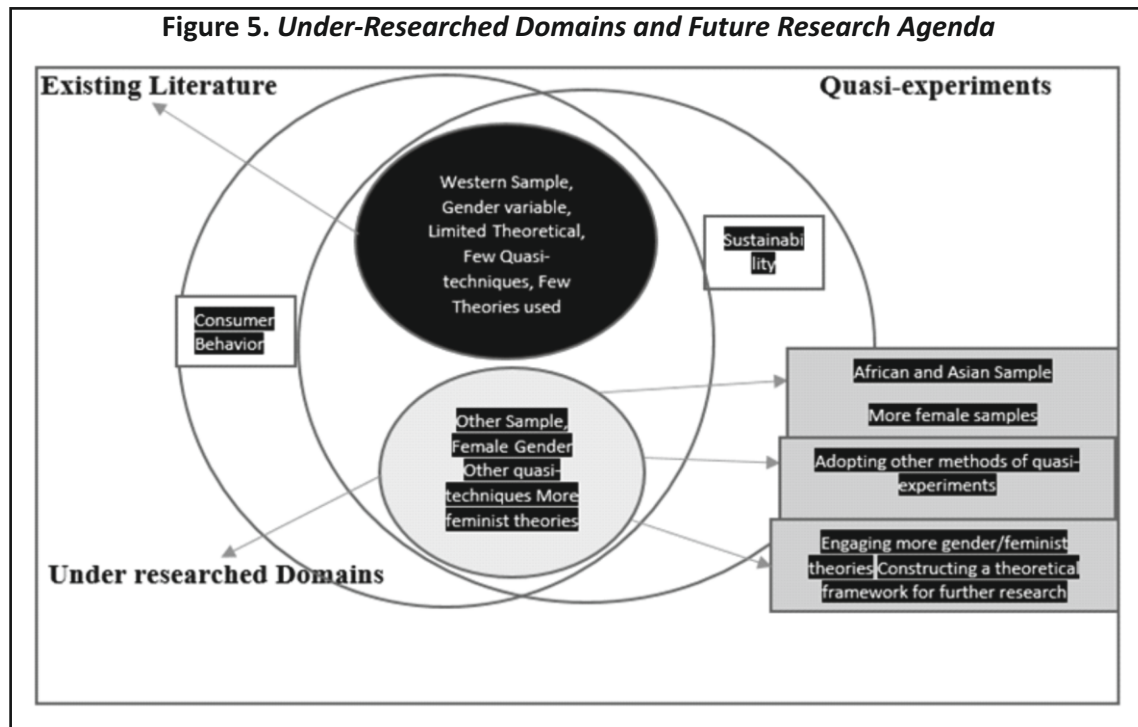
Notably, four papers studied the quasi-experimental methods used in the sustainability context. Two papers explained the importance and procedure of quasi-experiments in effectiveness and implementation research. Only one paper studied the different methods in environmental economics, while another talked about pathways linking greenspace to health. Western samples and settings have characterized the course of these research papers. Nearly 69% sample has been from Western countries. Thus, it may be affirmed that there has been a dearth of studies in the context of developing Asian and African countries. Further, it is essential to note that developing countries' cultures, values, and norms significantly differ. Given this, future research should consider non-Western samples to generalize the findings. Moreover, to attend to cultural pluralism, the intersectional methodology could provide a fillip to consumer behavior studies in the context of developing countries.

Application of More Quasi-Experimental Methods and Theoretical Frameworks

Research methods revolved around quasi-experiments and treatment and control group experiments, whereby pre and post-test designs have been extensively used. Specifically, 73% of the studies have used treatment and control groups and pre-post-test methods to study consumer behavior in sustainability. Only 27% of the studies have used other methods of quasi-experiments. Notably, the synthetic control method, regression discontinuity method, Heckit model, time-series design, DRM framework, and PSM-DID method were limited; thus, more research may be done using these methods. Additionally, an investigation into the theoretical construction of consumer behavior in sustainability is highly warranted to deepen the current understanding of the topic.

Pursuing Cultural Pluralism

The sample size considered for all the studies was a mix of both genders. Moreover, it may be noted that both men and women differ significantly in feelings, behaviors, values, and norms (Baeza et al., 2022; Simon & Nath, 2004). Interestingly, we found that no study specifically focused on women; there were no words such as



female and women. Only one paper studied women's attitudes toward the environment. The papers merely studied gender as one of the variables instead of intensely examining the consequence of complications of gender. Therefore, current research studies have provided an inadequate understanding of how females understand sustainability and its pillars, unlike their male counterparts. These interpretations suggest huge research prospects in spreading and expanding the present knowledge of consumer behavior in the sustainability area. Thus, specific research targeting a particular gender, especially women, could help understand this topic from a different perspective. Also, research on ethical attributes in purchase intentions can be carried out with quasi-experiments (Das et al., 2021). Customer engagement in the case of sustainable products (Kourav & Sharma, 2023) can be studied (Acuti et al., 2019).

The critical role of this study is to find gaps in the present literature on this topic. Figure 5 provides the under-researched domains and future research themes. This study reveals that existing research using quasi-experiments has been limited. Moreover, they have mostly been done in the context of Western countries. No doubt, various aspects of consumer behavior, such as consumer attitude, learning, promotion, perception, beliefs, awareness, choice, preferences, values, response, reactions, rewards, demand, community development, brand loyalty, and communications, are discussed in this paper. However, generalizability can only be achieved if more research is done in the context of developing nations. This study has opened up the gates for more sound research on this topic by identifying this gap.

Conclusion

Quasi-experiments in the domain of consumer behavior in the sustainability area formed the focus of our study. There has been a growing threat to our planet due to global warming. Recently, the UN report on global warming highlighted the need for urgent action on all fronts to mitigate the impact of global warming. Against this background, more ground-breaking research is required to explore consumer behavior in 'sustainability,' using

field and quasi-experiments. Because sensitizing and changing consumer behavior about sustainable practices is the fundamental necessity of this hour, this review tries to understand the present research structure in this area. The search criteria used in this review were limited to keywords, abstract, and title; due to this, only the research papers on quasi-experiments to study consumer behavior in the sustainability area were included. It is recommended that future researchers look to achieve a balance between comprehensiveness and precision when conducting a systematic literature review (Tanwar et al., 2021). Quasi-experiment methods adopted in this paper are mostly treatment and control group-based and pre-post-test-based. Other methods, such as PSM-DID, causal inference, and synthetic control methods, are rarely used. The review shows that quasi-experiments in this field are primarily done in limited geographic areas worldwide. Also, research is done for either male or mixed samples of genders. In the future, female, LGBTI (i.e., lesbian, gay, bisexual, transgender, and intersex) groups can be included for broader perspectives on this topic.

Further research into other demographic attributes such as age, roles, and cultural backgrounds may add to our current understanding of this topic. While the method's systematic nature has made the review process visible, this study must be replicated carefully. The interpretation of the data is subjective and influenced by our biographical origins. Nonetheless, the straightforward reporting practice has allowed for new upgrades and follow-up studies. Despite the limitations, this is among the first studies to systematically review literature in quasi-experiments on consumer behavior in the sustainability area. This review has demonstrated that there has been limited research conducted in this area, and therefore, this study could serve as a groundwork for upcoming research to build upon. Given the growing importance of sustainable measures to mitigate the risk of global warming and other related issues, this study would act as a launch pad for further research in this area.

Managerial and Theoretical Implications

For businesses and organizations looking to encourage sustainable consumer behavior, this study has significant practical consequences. This study can assist managers in designing and implementing successful interventions and marketing strategies (Munshi & Singla, 2022 ; Sharma & Goyal, 2020) that promote sustainable behavior by shedding light on the current application of quasi-experiments in consumer behavior in the sustainability domain. In addition, the study offers useful implications for conducting quasi-experiments on samples of women and LGBTI people, which can assist businesses (Hilal, 2019) and organizations in creating more inclusive and varied sustainability policies.

By offering insights into the current application of quasi-experiments in consumer behavior in the sustainability domain and outlining potential future research areas, this study adds to the body of literature already in existence. The study contributes to the body of literature by exposing the shortcomings of the existing theoretical work and emphasizing the necessity for more advanced research techniques. The study does not develop any new scales or models, but it summarizes the literature's use of quasi-experimental approaches and discusses their drawbacks. The study also recommends that future studies concentrate on creating theoretical frameworks to comprehend the underlying mechanisms and elements that affect sustainable consumer behavior. In order to better comprehend the intricate nature of sustainable consumer behavior, future research should try to construct more thorough and integrated models, according to the study's critical remark on the literature's sparse use of theoretical frameworks.

Limitations of the Study and Scope for Future Research

Although this study offers insightful information about the current use of consumer behavior quasi-experiments in the sustainability domain, there are a number of limitations that should be taken into account. First, the study

excluded alternative research techniques like surveys and case studies in favor of a narrow focus on quasi-experiments. This can restrict the study's scope and leave out significant literature findings. Second, developed Western nations are the study's main emphasis, which is followed by developed Asian nations, especially China and India. The findings' applicability to other areas and nations may be constrained as a result. Third, very few research studies have embraced theoretical frameworks, which may limit our understanding of the underlying mechanisms and variables that affect consumer behavior in the sustainability domain. Finally, the study only found papers in two databases, namely Web of Science and Scopus, and it's possible that it overlooked pertinent papers in other databases. This might reduce how thorough the review is. These limitations should be considered when interpreting the results and proposing future research directions, even if this study offers insightful information about the current use of quasi-experiments in the study of consumer behavior in the sustainability area.

Authors' Contribution

Dr. Yogesh Mahajan conceived the idea of the paper. Sanjay Sharma collected the relevant papers from Scopus and Web of Science databases and sorted them as per our objectives. Dr. Yogesh Mahajan worked on the analysis part. Dr. Natashaa Kaul contributed by segregating the research papers into relevant themes and writing the introduction, research methodology, and conclusion.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

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