



Is greenwashing impacting on green brand trust and purchase intentions? Mediating role of environmental knowledge

Nicoleta Isac^{1,2} · Asad Javed³ · Radulescu Magdalena^{4,5,9} · Irina Daniela L. Cismasu⁶ · Zahid Yousaf⁷ · Razvan Sorin Serbu⁸

Received: 15 July 2023 / Accepted: 12 December 2023
© The Author(s), under exclusive licence to Springer Nature B.V. 2024

Abstract

Organizations want to enhance sales via improved purchases. Therefore, they want higher purchase intentions. With the current green marketing wave, stakeholders need green facilitations from the organizations. In the current era of heightened awareness toward environmental issues, stakeholders are demanding green initiatives from organizations. Consequently, organizations are striving to earn the trust of environmentally conscious consumers. However, certain entities engage in the deceptive practice of greenwashing, attempting to falsely present themselves as environmentally friendly. This research seeks to inspect the influence of the greenwashing on customer purchase intentions. Additionally, it explores mediation role of the green brand trust and the regulating influence of customers' environmental knowledge in this relationship. Data for the study were collected across all four provinces of Pakistan, employing standardized scales for measurement. The results indicate that greenwashing has an adverse effect on purchase intentions. Furthermore, the deceptive practice of greenwashing diminishes green brand trust, leading to a decline in customers' purchase intentions. The research also emphasizes that the association between greenwashing and purchase intentions is intensified by higher levels of environmental knowledge among consumers. This study contributes a distinctive perspective to existing literature, offering insights into ways organizations can enhance customers' purchase intentions and consequently drive higher sales.

Keywords Greenwashing · Purchase intentions · Green brand trust · Environmental knowledge

1 Introduction

For better financial performance, organizations strive to improve their customer-base (Phillips et al., 2019). They aim to stimulate stronger purchasing intentions among clients to achieve this objective. One of the key trends currently shaping the market is the emergence of green marketing (Nozari et al., 2021; Tsai et al., 2020), where companies work to satisfy the expanding market for products and services that are advantageous to

Extended author information available on the last page of the article

the environment (according to Freitas Netto et al., 2020). To cater to stakeholders who prioritize sustainability, organizations must now provide green facilitations in order to fulfill their demands (Sahoo et al., 2023). Organizations employ a range of strategies to earn the trust of environmentally conscious clients (Hameed, Hyder, Imran, & Shafiq, 2021). However, some companies resort to the dishonest practice of ‘greenwashing,’ where they create an appearance of being environmentally friendly while making only superficial changes to their business practices (Elia, 2019). Greenwashing allows businesses to capitalize on the current trend of green marketing without genuinely addressing their environmental impact (Peattie & Crane, 2005; Vos, 2009). Consequently, businesses face the challenging endeavor of building trust with an increasingly discerning and critical segment of environmentally conscious customers. According to Tuan (2018) and Zsóka et al. (2013), customers’ opinion of a firm’s commitment to sustainability is significantly shaped by their level of environmental awareness. Customers with a higher understanding of environmental issues are better equipped to evaluate an organization’s green claims accurately. Their knowledge enables them to make informed decisions and identify instances of greenwashing by recognizing sustainable practices and environmental challenges (Naderer & Oprea, 2021). Therefore, an individual’s level of environmental expertise significantly influences their perception of an organization’s environmental credibility.

Although previous research has demonstrated a connection between customer purchase intents and greenwashing (see, for example, Akturan, 2018; Zhang et al., 2018), there may still be a knowledge gap about the underlying mechanisms or processes by which greenwashing affects consumers’ purchasing intentions. A comprehensive model involving greenwashing, purchasing intentions, green brand trust, and environmental knowledge is lacking in existing researches. Empirical research that explicitly examine the mediating function of environmental knowledge in the relationships among greenwashing, sustainable brand trust, and purchase intentions is notably lacking. There is a clear need for additional empirical research to delve into these relationships and offer insights into the underlying mechanisms, especially considering the relevance of the topic within the domain of green marketing. Similarly, there is little empirical study examining how environmental knowledge modifies the association between purchase intentions and greenwashing. Examining how consumer environmental knowledge interacts with greenwashing and its repercussions on purchase intentions can help fill this void in the literature.

Another research gap stems from the scarcity of studies on the topic of greenwashing in the context of Pakistan. Existing studies often focus on specific samples, such as students or particular geographical areas. This study adopts a consumer-centric perspective, incorporating samples from major cities across the country, making it a unique contribution to the existing body of research. Our comprehension of the complex linkages between greenwashing, trust in green brands, environmental awareness, and purchasing intentions might be improved by filling up these gaps throughout the literature.

The study’s goals are to find out how greenwashing affects customers’ intentions to make purchases, based on the previous discussion of research gaps. By investigating this relationship, it seeks to offer insightful information about the effects of misleading green marketing techniques. The study also looks at the mediation role of green brand trust, which links purchase intentions to greenwashing. Consumer confidence in a company’s green brand is a reflection of their trust in the company’s environmental statements and practices. Additionally, the study explores the moderating influence of the customer environmental knowledge by examining how customers’ environmental consciousness affects the relationship between purchase intention and greenwashing. The belief is that

heightened environmental awareness acts as a protective factor, mitigating the harm caused by greenwashing to consumers.

The research addresses the following questions:

- A. Do purchase intentions and greenwashing have a connection?
- B. Is there a mediating role for green brand credibility in the relationship between purchase intentions and greenwashing?
- C. Does environmental knowledge enhance or weaken the link among greenwashing and purchase intentions?

For better understanding, the manuscript is divided into different sections. The introduction presents the research gaps and background of the study, which is followed by the literature review section that demonstrates the definitions and relationships of different variables. This section is followed by the research methodology section that explains how the research questions are answered. The next section is about the analysis of data and results. An analysis of the findings is presented in the concluding section.

2 Review of literature

The following is a comprehensive literature review provided in detail.

2.1 Greenwashing

As the Nemes et al. (2022), "greenwashing" refers to the intentional deception and manipulation of consumers through the fabrication of information on an organization's environmental measures and their consequences. Consumers are now increasingly aware of environmentally friendly goods and services due to the transition from domestic to international markets (Tran et al., 2022). They now favor goods that cause the least amount of harm to both people and the environment. Companies have adopted environmentally friendly practices and procedures as a result of the shift in consumer demands (Horne, 2009). Consumers give businesses with a good reputation for being environmentally conscious high marks, and the global demand for eco-friendly products has experienced a remarkable surge (Pickett-Baker & Ozaki, 2008). The first characteristic, which entails a break from honesty, is referred to as an essential characteristic. This aspect of greenwashing, according to Lyon and Montgomery (2015), TerraChoice (2010), and Parguel et al. (2015), has to do with the deceptive tactics and claims put forward by companies. The use of diverse strategies and techniques to deceive or confuse people is the communication feature, the second characteristic (Boncinelli et al., 2023). This component focuses on the personalities and strategies that businesses employ to mislead customers through their communications and marketing initiatives. A variety of factors that are crucial to the market and consumer behavior may be impacted by greenwashing. Such variables include purchase behavior (Hameed, Hyder, Imran, & Shafiq, 2021), consumers' trust (Wang et al., 2020a, 2020b), green risk (Chen & Chang, 2013), consumer perception (Aji & Sutikno, 2015), consumer purchasing behavior (Martínez et al., 2020; Saini, 2013), company's brand reputation (Ioannou, Kassinis, & Papagiannakis, 2022), regulatory compliance (Laufer, 2003), investor confidence (Delmas & Burbano, 2011), and repercussions on industry standards (Mateo-Márquez et al., 2022).

2.2 Greenwashing and purchase intentions

Understanding how firms manage their environmental practices has become more important thanks to the idea of ‘greenwashing.’ Social and environmental activists have expressed worry about the dishonest business practices of some firms (Laufer, 2003). These businesses deceive customers by portraying themselves as environmentally friendly and making exaggerated claims about their goods (Baum, 2012). This method is referred to as “greenwashing” in the industry. According to research, greenwashing is not sustainable in the long run, despite the fact that businesses may benefit from it in the short term (Polonsky et al., 2010). Moreover, research has shown that greenwashing improves green skepticism and decreases green purchase intention (Leonidou & Skarmeas, 2017). A consumer purchasing intention, which denotes their propensity to purchase a specific good or service, is a crucial component in predicting their actual consumer behavior. Customers’ degree of trust decreases when they believe businesses are using greenwashing tactics (Javed & Mukhtiyar, 2013; Wang et al., 2020a, 2020b). Additionally, customers are misled by the greenwashing promises that are presented (Akturan, 2018). In summary, it is evident that greenwashing leads to skepticism, erodes consumer trust, generates negative publicity, diminishes perceived value, conflicts with ethical considerations, and undermines brand loyalty. The cumulative impact of these factors substantially reduces purchase intentions, making consumers less inclined to purchase products from brands engaged in deceptive green marketing practices. Consequently, consumers become wary and begin to avoid such products as a protective measure against potential deception. This underscores a clear negative correlation between the perception of greenwashing and purchasing intention. Formulated based on these observations, the first hypothesis of the study is:

H1 Purchasing intentions and greenwashing have a bad relationship.

2.3 Mediating role of green brand trust

According to Bashir et al. (2020), the idea of green brand-trust is defined as the consumer’s readiness to rely on a certain product because they believe it to be dependable, kind, and environmentally friendly. Trust, which encompasses benevolence, ability, and integrity, refers to the expectation that the words, statements, or promises of another party can be relied upon (Chen & Dhillon, 2003). Greenwashing and green brand trust have a complicated but still closely associated relationship (Li & Sun, 2022). By undermining the validity of corporate environmental claims, greenwashing erodes customer trust (Ha et al., 2022). Customers lose faith in a brand and become less convinced by its eco-friendly claims when they believe that it is participating in greenwashing tactics (Kahraman & Kazançoğlu, 2019). Thus, greenwashing has an adverse influence on green brand trust (More, 2019). On the contrary, consumer trust plays a pivotal role in shaping long-term consumer behavior (Hong & Cho, 2011). Consequently, customer trust has a substantial impact on purchasing intentions (Chen, 2012). Existing literature strongly supports the idea that buyer trust is a fundamental factor influencing customer purchase intentions (as observed in studies such as Hsu et al., 2015; Maia, Lunardi, Dolci, & D’Avila, 2020). Numerous investigations (e.g., Firman et al., 2021; Ganguly, Dash, & Cyr, 2009; Harris & Goode, 2010; Yu et al., 2021) consistently affirm that customer trust significantly shapes purchase intentions, highlighting its crucial role in consumer decision-making. These results suggest that green brand

credibility acts as a mediating factor in the relationship among purchase intentions and greenwashing. The theory put forth is:

H2 The association between purchase intentions and greenwashing is mediated by green brand trust, which reduces the former's effect.

2.4 Moderating role of environmental knowledge

According to Suki (2013), environmental knowledge is a type of general expertise and understanding involving an awareness of ecosystems, environmental safety, and the natural world. This notion of environmental knowledge highlights its association with the purpose of the knowledge and the environmental aspects reflected in the acquired knowledge itself. Consumers can distinguish between ecologically friendly products and those connected to greenwashing with the help of higher levels of environmental understanding (Urbański & Ul Haque, 2020). Greenwashing has an impact on consumers' intents to make purchases since they are more inclined to critically analyze green promises if they have more environmental information (Szabo & Webster, 2021). Moreover, consumers' ability to discern greenwashing techniques is enhanced by environmental awareness, leading to a less detrimental impact on their trust and purchase intentions (Urbański & Ul Haque, 2020). Individuals with a higher level of knowledge about environmental issues tend to rely more on credible information sources, such as eco-labels or certifications, when making purchasing decisions (Taufique et al., 2017). The following hypothesis has been developed in light of these factors:

H3 Knowledge the environment moderates the link between greenwashing and purchase intentions in a way that further dampens the association at high levels of environmental awareness.

Theoretical framework showing the relationships among the variables along with hypotheses of the study is shown below (Fig. 1):

3 Methodology

Data were obtained using the cross-sectional approach once and at an appropriate time. The listing of the participating SMEs for the sample was received from the Small and Medium-Sized Enterprises Authority (SMEDA). Data were collected from Lahore, Faisalabad, Karachi, Quetta, Peshawar, Abbottabad, and Mansehra, covering all the important SMEs' hubs in all the four provinces of the country. In the current research, an online survey technique was employed for the data gathering from the managers and owners of SMEs operating in in Pakistan. For the study, Pakistan was targeted because addressing the issue of greenwashing is highly relevant for Pakistan as it has a large and growing consumer market. With a population exceeding 260 million people, Pakistan represents a substantial consumer base. Gaining insights into consumer behavior, particularly regarding green products and greenwashing, is crucial for businesses seeking to access this market. Additionally, Pakistan, akin to numerous other developing countries, confronts environmental challenges such as resource depletion, pollution, and climate change. As environmental concerns escalate, consumers are growing more

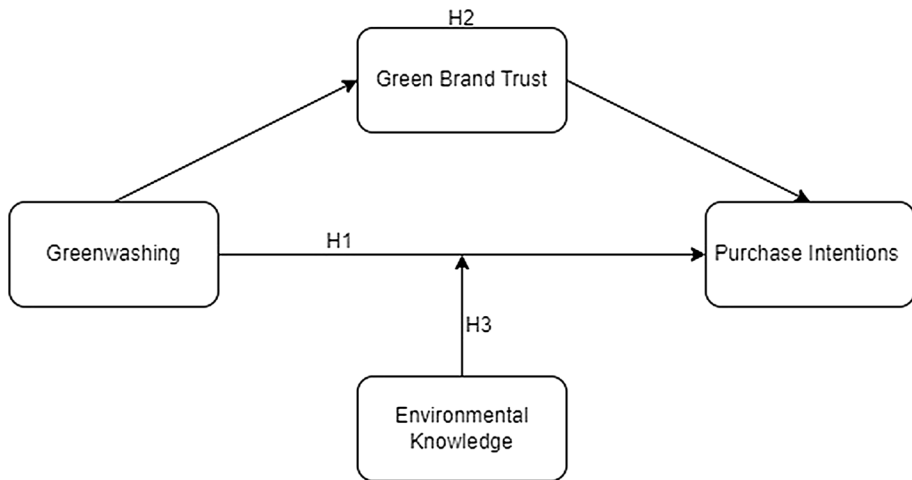


Fig. 1 Conceptual framework

conscious of environmental issues and displaying a heightened interest in eco-friendly products. Conducting study in Pakistan will also result in growing sustainable and eco-friendly business practices trend in the country. In addition to all these, research on greenwashing in Pakistan can have policy implications. Findings from such studies can inform regulations and policies related to advertising standards, eco-labeling, and corporate social responsibility, leading to more informed and effective policies to protect consumers from deceptive green marketing practices. Thus, Pakistan is a relevant environment for conducting this research.

A convenience sampling of 685 was chosen for the gathering of data, and 545 gave their explicit consent to participate in this study. Those participants that were willing to participate in this survey study were given an information sheet, which included the assurance of secrecy, a statement outlining the objective of the research, and details about the important aspects of the current investigation. Data were gathered twice with a one-month gap between rounds. First, data on the demographic variables, including age, gender, work experience and education, were acquired. In the second round of data collection, information on the intermediary, moderator, and outcome variable was collected. In total, 467 completed responses were gathered over the course of a 3-month data collection period. The data analysis involved utilizing SPSS 25.0 and AMOS 25.0 for structural equation modeling of SMEs. Overall, 35.42% of the respondents were female, while 64.58% of the participants were men. The median age of the responders was 35.

3.1 Measurements

The study employed standardized scales derived from prior research (refer to Appendix A) to assess the variables. To confirm the accuracy and dependability of the study items, a five-point Likert scale was employed, with 1 denoting strongly disagree and 5 denoting strongly agree.

3.2 Greenwashing

The greenwashing is measured through 5-items scale, adapted from Yousaf et al. (2023). This variable evaluates measures used to examine the presence and scope of false and misleading environmental claims made by businesses include content analysis, consumer surveys, compliance assessments and stakeholder engagement. These measurements offer information on customer views and awareness besides analyzing the accuracy and authenticity of greenwashing practices. The example question is ‘*When there are exaggerated facts in ads, I dislike such products.*’

3.2.1 Environmental knowledge

To measure environmental knowledge 5 items scale was used which is adapted from Amin and Tarun (2019). This construct helps in assessing people’s comprehension, awareness, and knowledge about environmental issues, sustainability ideas, and ecological procedures. The question item is ‘*I know about sustainable waste management practices.*’

3.2.2 Green brand trust

A scale with five elements was modified from a prior study by Bashir et al. (2020) to gauge green brand trust. This variable evaluates brands’ environmental determination, credibility, and trustworthiness in terms of how consumers perceive them. The example item is ‘*The brand consistently delivers on its environmental promises and initiatives.*’

3.2.3 Purchase intentions

To measure purchase intentions, 4 items scale was used which is adapted from Lee and Youn (2021). This construct measures the expressed propensity and willingness to buy a product and engage in particular buying behavior. The question item is ‘*The brand’s environmental initiatives positively influence my decision to buy its products and services.*’

4 Analysis

This research used different statistical tools in order to abstract results from the data. This includes conducting CFA and EFA, correlation, and regression analysis. Detail is given as under:

4.1 Measurement model

The data were analyzed using SPSS 25 software. Utilizing the method suggested by Fornell and Lacker (1981), the discriminant validity was evaluated. Table 1 displays the results of AVE, factor loading (FL), and Cronbach alpha (CA). The findings displayed in Table 1 demonstrate the effective attainment of both convergent and discriminant

Table 1 Discriminant and convergent validity

	Items	FL	CA	CR	AVE
Green-washing	05	0.73–0.84	0.84	0.94	0.76
Green-brand-trust	05	0.72–0.89	0.82	0.96	0.72
Environmental-knowledge	05	0.74–0.86	0.86	0.98	0.78
Purchase-intention	04	0.78–0.84	0.88	0.92	0.74

validity, as seen by the CR (Composite-Reliability) and Average Variation-Extracted values, both of which were higher than expected. Interestingly, both the CR value and the AVE value were higher than 0.50.

Table 2 uses CFA to evaluate the fitness of the model. The validity of the constructs was assessed using CFA in line with Joerskog and Sorbom (1996). The data were analyzed, and the model fit was assessed using modeling of structural equations. The CFA had sufficient scores ($\chi^2 = 1068.35$, $df = 475$; $\chi^2/df = 2.249$; RMSEA = 0.05; CFI = 0.93; GFI = 0.92), indicating an acceptable fit, according to the findings of applying the 4-factor model to the data.

In Table 3, the correlation coefficients, standard deviations, and mean values were displayed. The Variance Inflation Factor (VIF) scores were observed to be below the threshold value of 10.0, signifying the absence of concerns related to multi-collinearity.

The research hypotheses were scrutinized through structural equation modeling, and the outcomes displayed in Table 4 reveal that greenwashing has a significant and negative impact on purchase intention ($B = -0.18$, $P < 0.001$). Consequently, H1 finds support in the data.

Using the methodology described by Preacher and Hayes (2008), an analysis was carried out to investigate how green brand trust (GBT) mediates the relationship between purchase intention (PI) and greenwashing (GW). GBT functions as a mediator, according to the indirect impact data (Beta = 0.14, Lower = 0.1869 to Upper = 0.2457). Furthermore, a standard test was conducted to validate the mediating influence of GBT. As a result, the data support hypothesis H2, showing that GBT does, in fact, mediate the link between GW and PI.

According to hypothesis H3, there is a moderating effect of environmental knowledge on the relationship between purchase intention and greenwashing. Multiple moderated regression analysis was used to evaluate hypothesis H3. Step one involved entering control factors such as respondent experience, education, and business age. Greenwashing and environmental knowledge (GW*EK) were added in the second level. GW and EK were included in the mediation process in Step 3, and all of the results shown in Table 5 show that GW and EK had a significant impact on PI. The findings showed a positive and substantial ($p \leq 0.05$) combined effect of $GW \rightarrow PI$ ($B = -0.34$, $p \leq 0.05$) on purchase intention.

Table 2 Summary of CFA results

Models	χ^2	Df	χ^2/df	RMSEA	GFI	CFI
Quad-factor model	1068.35	475	2.24	0.05	0.91	0.93
Tri-factor model	1174.48	390	3.01	0.13	0.84	0.85
Bi-factor model	1245.55	385	3.23	0.18	0.72	0.73
Uni-factor model	1486.41	385	3.86	0.22	0.64	0.65

Table 3 Correlation matrix

Variable(s)	Mean value	SD values	α	1	2	3	4	5	6	7
1 Business age	3.01	0.99	0.79	1						
2 Respondent experience	1.26	0.31	0.79	0.011	1					
3 Respondent education	1.09	0.36	0.82	0.026	0.019	1				
4 Green washing	3.26	0.22	0.87	.105**	0.016	0.022	1			
5 Green brand trust	3.75	0.35	0.84	-0.012	.047*	.024**	-0.018*	1		
6 Environmental knowledge	3.24	0.31	0.86	-0.018	.046*	.180**	-.260**	.162**	1	
7 Purchase intention	1.14	0.22	0.82	0.014	0.005	-0.030	-.347**	.328**	.385**	1

* < Sig. ** < highly sig

Table 4 Impact of green washing on purchase intention

Model detail	Relationship	Beta value	<i>F</i>	<i>T</i>	Sig	Remarks
Model #1	GW → PI	-0.18	14.078	0.137	0.001	Accepted

Table 5 Mediating effect of green brand trust between green washing and purchase intention

Model detail	Data	Boot	SE	Lower	Upper	Sig
GW → GBT → PI	0.1475	0.2645	0.43	0.1869	0.2457	0.0000

Table 6 Moderation analysis

Purchase intention						
Detail	Beta value	<i>T</i> -value	Beta value	<i>T</i> -value	Beta value	<i>T</i> -value
Step-1						
Business age	0.05	0.24	0.05	1.45	0.01	0.23
Respondent experience	0.14	0.28	0.16	0.16	1.03	1.42
Respondent education	0.18	0.32	0.12	0.85	0.05	0.12
Step 2						
GW			0.22*	6.47	-0.32*	3.52
EK			0.26*	5.58	0.28*	4.48
Step 3						
GW*EK					-0.34**	2.27
<i>F</i>		5.17**		18.63*		16.23*
<i>R</i> ²		0.04		0.25		0.24
Change <i>R</i> ²				0.24		0.04

p* < 0.0001, *P* < 0.005 (two tailed) significance level

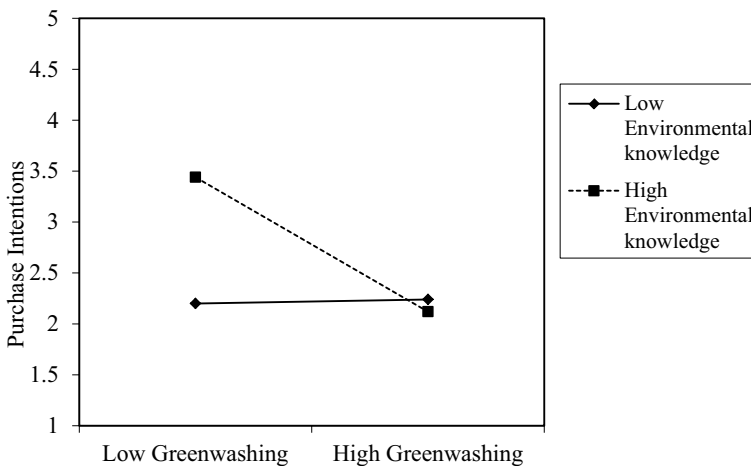


Fig. 2 Mediation analysis

These results support hypothesis H3 by showing that environmental knowledge modifies the connection between GW and PI (Table 6).

The same relationship is visualized as following (Fig. 2):

5 Discussion of results

The suggested model investigates the relationship between environmental knowledge, green brand trust, greenwashing, and purchase intentions.

This study is based upon three hypotheses. H1 shows that greenwashing has a detrimental impact on the willingness of customers to buy. According to the findings of this hypothesis, consumer purchase intentions reduce as greenwashing spreads. This result is consistent with earlier studies (like see: Akturan, 2018; Braga et al., 2019; Zhang et al., 2018) that highlighted the negative influence of greenwashing on consumer behavior. Customers become less motivated to support brands through purchases when they believe businesses are using deceptive green marketing techniques. This highlights the significance of truthful and sincere environmental statements to sustain positive consumer perceptions and purchasing intentions. Additionally, this study H2 demonstrates that greenwashing lowers consumer confidence in green brands, which further discourages them from making a purchase. This hypothesis finding is consistent with the notion that greenwashing reduces consumer confidence in green brands, which in turn has a negative impact on purchase intentions. Customers who learn about greenwashing techniques become skeptical about the validity and sincerity of a brand's environmental promises. As a result, they lack the enthusiasm to engage in purchasing behavior due to their lowered trust. These findings highlight how important it is to build and preserve consumer confidence in sustainability programs with the aim of encouraging beneficial consumer attitudes and intentions toward green brands. The finding also adds to the existing studies of Chen et al. (2013) and Wang et al. (2020a, 2020b). The hypothesis tested in this study, H3, is that increased environmental awareness mitigates the negative relationship between buying intentions and greenwashing. The findings indicate that environmental understanding moderates the relationship between greenwashing and purchase intentions. Increased awareness of environmental issues particularly amplifies the negative impact of greenwashing on consumers' intentions to make purchases. Environmentally conscious consumers are increasingly conscious of sustainable practices and can spot attempts at greenwashing with greater ease. As a result, compared to customers with less environmental understanding, their sensitivity to greenwashing leads to a greater decline in purchase intentions. The third hypothesis in this study investigates how increased environmental knowledge may further mitigate the negative relationship between greenwashing and purchase intentions. The findings indicate that purchasing intentions and greenwashing are influenced by environmental understanding. In particular, a greater awareness of the environment amplifies the negative impact of greenwashing on consumers' intents to buy. Environmentally conscious consumers are more likely to recognize attempts at greenwashing and to be aware of sustainable practices. Because of this, their sensitivity to greenwashing causes a larger reduction in buy intentions than that of customers with less environmental expertise. This emphasizes how important consumer education and awareness campaigns are in empowering individuals to make wise choices and lessen the effects of greenwashing. The main topics of discussion are the detrimental effects of greenwashing on consumers' purchasing intentions and the mediating role of green brand trust. It also emphasizes the moderating role of environmental awareness, demonstrating

that knowledgeable consumers are more likely to be wary of and less likely to support businesses that participate in greenwashing. These results emphasize how important it is for companies to have transparent and honest sustainability programs in order to win over environmentally conscious clients and establish enduring partnerships. It also emphasizes the importance of consumer education in assisting people in comprehending green promises and making informed decisions about their purchases. By tackling these issues, businesses can enhance their standing with the public, gain the trust of consumers, and promote positive purchase intentions among consumers who care about the environment.

6 Conclusions

Through investigating the moderating effect of environmental knowledge and the mediation function of green brand trust, the study sought to determine how customers' purchase intentions were affected by greenwashing. Questionnaire items from earlier research were used to create a measure for the study variables. Information from managers and owners of SMEs in Pakistan's major cities was gathered via an online survey approach. Throughout the three months that the data were being collected, 467 completed replies were received. SMEs' structural equation modeling was done through the data analysis using SPSS 25.0 and AMOS 25.0. To collect data from all four provinces of Pakistan, standardized scales were used. According to the results, buying intentions are negatively impacted by greenwashing. Furthermore, it has been discovered that greenwashing lowers client trust in green brands, which in turn lowers buy intentions. The study also found that increasing levels of knowledge about the environment worsen the unfavorable link between purchasing intentions and greenwashing.

6.1 Theoretical implications

The tested research model contributes to the existing body of knowledge on greenwashing through identifying how it affects consumer behavior and the underlying mechanisms at action. It highlights the importance of customer perceptions of greenwashing on their trust in green brands, which in turn affects their buying intentions. These results provide support to the idea that consumers' views of greenwashing might have a great influence on their decision to make a purchase. With the goal to maintain encouraging consumer attitudes and behaviors, this study highlights the significance of consistency between brand's environmental assurances and its real-world sustainability processes. Secondly, this study demonstrates how customer views of greenwashing affect consumer trust in green brands. The argument supports the idea that trust in green brands mediates the link between greenwashing and purchase intentions. The outcomes recommend that greenwashing reduces consumers' faith in green brands, which in turn decreases their desire to make a purchase. This underlines the significance of trust-building techniques and the necessity for businesses to communicate their commitment to sustainability in an open, trustworthy, and realistic manner. Lastly, the model further emphasizes how crucial environmental awareness is as a moderating aspect, showing that knowledgeable and educated customers are more perceptive to greenwashing and their impact on purchase intentions. The moderating effect of environmental knowledge on the association between greenwashing and purchasing intentions is highlighted by this hypothesis. The results indicate that greater environmental awareness magnifies the adverse effects of greenwashing on the willingness of customers

to buy. It suggests that consumers who are better informed tend to be more discriminating and suspicious of greenwashing techniques, resulting in even lower purchasing intentions when they observe measures in greenwashing. Overall, the theoretical applications of this model help us better comprehend the complicated nature of greenwashing, green brand credibility, environmental knowledge, and how these factors interact to influence customer behavior. By offering insights into how businesses might negotiate these aspects to develop trust, promote legitimate sustainability practices, foster good consumer attitudes, and foster purchasing intents, the model adds to the knowledge on sustainable advertising and consumer psychology.

6.2 Managerial implications

There are numerous real-world applications of this research for managers, marketers, and companies. First, this study investigates the negative effect that greenwashing has on consumers' purchase intentions. The H1 findings recommend that to avoid engaging in greenwashing practices, businesses should prioritize sincere and open environmental actions. This includes making sure that their sustainability statements are supported by factual information and are consistent with the environmental actions they really take. To explain their genuine sustainability practices and foster consumer trust, businesses should engage in effective communication methods. Enhancing consumer confidence and advantageously influencing their purchasing intentions can be achieved through transparent communication and the provision of proof of environmental commitments. Secondly, this research also examines how greenwashing lowers consumer confidence in green brands, which further discourages them from making a purchase. The outcomes recommend that businesses should keep their sustainability commitments and abstain from greenwashing, businesses should put their attention on establishing and retaining trust with customers. This calls for harmonizing internal procedures with public statements and providing verifiable proof of environmental activities. Furthermore, consumer trust can be increased through working with renowned environmental organizations, receiving third-party certifications, and taking part in industry-wide efforts. Lastly, this research investigates how greater environmental knowledge further dampens the inverse link between greenwashing and buying intentions. The results demonstrate that to increase environmental awareness among their target audience, businesses ought to make investments in consumer awareness and training programs. Businesses can work with NGOs, environmental groups, and specialists in the field to develop educational materials and campaigns that spread the word about greenwashing and advance environmental literacy. The practical applications of this paradigm highlight the value of consumer education, authenticity, and openness in combating greenwashing and promoting positive purchasing intentions.

6.3 Limitations and directions for further research

Despite the useful insights that the suggested model offers, there are several constraints that need to be taken into account. First off, the model is based on self-reported information, which might be inaccurate and vulnerable to social desirability bias. To overcome this limitation, future research could use objective metrics and observational techniques. The model also highlights both the direct and indirect impacts of greenwashing, green brand trust, and knowledge of the environment on purchasing intentions; however, additional elements like price sensitivity, product quality, and brand loyalty should be

integrated for a more complete understanding. Additionally, the model overlooks potential nonlinear and interacting effects in preference for a linear relationship between variables. Future research could investigate these complexities while taking into account how cultural and contextual elements affect the way consumers react to greenwashing and green marketing initiatives.

Appendix: A

Variables	Items	Constructs
Greenwashing	GW1	When there are exaggerated facts in ads, I dislike such products
	GW2	If I find any hazy or vague ads, I don't like that product
	GW3	If there is more attention on unimportant environmental benefits, I don't like that product
	GW4	I always assess the actual green products rather than verbal claims only
	GW5	If I found any misleading claim regarding environmentally friendly products, I dislike that product
Environmental knowledge	EK1	I am well aware of climate change and its causes
	EK2	I have knowledge of renewable energy sources and their benefits
	EK3	I know about sustainable waste management practices
	EK4	I have knowledge about the impact of deforestation on ecosystems
	EK5	I admit the importance of water conservation strategies
Green brand trust	GBT1	I have confidence in the accuracy and truthfulness of the brand's environmental claims
	GBT2	The brand consistently follows through on its environmental promises and initiatives
	GBT3	I am of the belief that the brand authentically prioritizes environmental sustainability
	GBT4	I feel confident that the brand's products or services have a positive impact on the environment
	GBT5	I would recommend the brand to others based on its environmental reputation
Purchase intentions	PI1	I am likely to purchase products or services from this brand because of its environmental commitment
	PI2	The brand's environmental initiatives positively influence my decision to buy its products or services
	PI3	The brand's environmental reputation enhances my confidence in the quality of its products or services
	PI4	I am actively seeking out this brand's environmentally sustainable options when making purchasing decisions

Acknowledgements We are thankful to all the respondents who participated in the survey.

Funding This research received no external funding from any national or international agency.

Data availability Data collected during the survey can be made available upon request from the corresponding author.

Declarations

Competing interests Authors have no financial or non-financial interests to disclose that are directly or indirectly related to the work submitted for publication.

References

- Aji, H. M., & Sutikno, B. (2015). The extended consequence of greenwashing: Perceived consumer skepticism. *International Journal of Business and Information*, *10*(4), 433.
- Akturan, U. (2018). How does greenwashing affect green branding equity and purchase intention? An empirical research. *Marketing Intelligence & Planning*, *36*(7), 809–824.
- Amin, S., & Tarun, M. T. (2019). Enhancing green hotel visit intention: Role of green perceived value, perceived consumer effectiveness and environmental knowledge. *International Business Research*, *12*(5), 123–132.
- Bashir, S., Khwaja, M. G., Rashid, Y., Turi, J. A., & Waheed, T. (2020). Green brand benefits and brand outcomes: The mediating role of green brand image. *SAGE Open*, *10*(3), 2158244020953156.
- Baum, L. M. (2012). It's not easy being green... or is it? A content analysis of environmental claims in magazine advertisements from the United States and United Kingdom. *Environmental Communication: A Journal of Nature and Culture*, *6*(4), 423–440.
- Boncinelli, F., Gerini, F., Piracci, G., Bellia, R., & Casini, L. (2023). Effect of executional greenwashing on market share of food products: An empirical study on green-coloured packaging. *Journal of Cleaner Production*, *391*, 136258.
- Braga, S., Martínez, M. P., Correa, C. M., Moura-Leite, R. C., & Da Silva, D. (2019). Greenwashing effect, attitudes, and beliefs in green consumption. *RAUSP Management Journal*, *54*, 226–241.
- Chen, H. (2012). The influence of perceived value and trust on online buying intention. *Journal of Computers*, *7*(7), 1655–1662.
- Chen, S. C., & Dhillon, G. S. (2003). Interpreting dimensions of consumer trust in e-commerce. *Information Technology and Management*, *4*, 303–318.
- Chen, Y. S., & Chang, C. H. (2013). Greenwash and green trust: The mediation effects of green consumer confusion and green perceived risk. *Journal of Business Ethics*, *114*, 489–500.
- de Freitas Netto, S. V., Sobral, M. F. F., Ribeiro, A. R. B., & Soares, G. R. D. L. (2020). Concepts and forms of greenwashing: A systematic review. *Environmental Sciences Europe*, *32*(1), 1–12.
- Delmas, M. A., & Burbano, V. C. (2011). The drivers of greenwashing. *California Management Review*, *54*(1), 64–87.
- Elia, A. (2019). Fashion's destruction of unsold goods: Responsible solutions for an environmentally conscious future. *The Fordham Intellectual Property, Media and Entertainment Law Journal*, *30*, 539.
- Firman, A., Ilyas, G. B., Reza, H. K., Lestari, S. D., & Putra, A. H. P. K. (2021). The mediating role of customer trust on the relationships of celebrity endorsement and e-WOM to instagram purchase intention. *Jurnal Minds: Manajemen Ide Dan Inspirasi*, *8*(1), 107–126.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50.
- Ganguly, B., Dash, S. B., & Cyr, D. (2009). Website characteristics, trust and purchase intention in online stores: An empirical study in the Indian context. *Journal of Information Science & Technology*, *6*(2), 22–44.
- Ha, M. T., Ngan, V. T. K., & Nguyen, P. N. (2022). Greenwash and green brand equity: The mediating role of green brand image, green satisfaction and green trust and the moderating role of information and knowledge. *Business Ethics, the Environment & Responsibility*, *31*(4), 904–922.
- Hameed, I., Hyder, Z., Imran, M., & Shafiq, K. (2021). Greenwash and green purchase behavior: An environmentally sustainable perspective. *Environment, Development and Sustainability*, *23*, 1–22. <https://doi.org/10.1007/s10668-020-01202-1>
- Harris, L. C., & Goode, M. M. (2010). Online servicescapes, trust, and purchase intentions. *Journal of Services Marketing*, *24*(3), 230–243.
- Hong, I. B., & Cho, H. (2011). The impact of consumer trust on attitudinal loyalty and purchase intentions in B₂C e-marketplaces: Intermediary trust vs. seller trust. *International Journal of Information Management*, *31*(5), 469–479.
- Horne, R. E. (2009). Limits to labels: The role of eco-labels in the assessment of product sustainability and routes to sustainable consumption. *International Journal of Consumer Studies*, *33*(2), 175–182.

- Hsu, M. H., Chang, C. M., & Chuang, L. W. (2015). Understanding the determinants of online repeat purchase intention and moderating role of habit: The case of online group-buying in Taiwan. *International Journal of Information Management*, 35(1), 45–56.
- Ioannou, I., Kassinis, G., & Papagiannakis, G. (2022). The impact of perceived greenwashing on customer satisfaction and the contingent role of capability reputation. *Journal of Business Ethics*, 185, 1–15.
- Javed, A., & Mukhtiyar, B. (2013). County-of-origin and purchase intentions of ethnocentric customers. *International Journal of Information, Business and Management*, 5(2), 110–121.
- Joreskog, K. G., & Sorbom, D. (1996). LISREL8: User's reference guide. Mooresville: Scientific Software.
- Kahraman, A., & Kazaçoğlu, İ. (2019). Understanding consumers' purchase intentions toward natural-claimed products: A qualitative research in personal care products. *Business Strategy and the Environment*, 28(6), 1218–1233.
- Laufer, W. S. (2003). Social accountability and corporate greenwashing. *Journal of Business Ethics*, 43, 253–261.
- Lee, J. E., & Youn, S. Y. (2021). Luxury marketing in social media: The role of social distance in a craftsmanship video. *Asia Pacific Journal of Marketing and Logistics*, 33(3), 826–845.
- Leonidou, C. N., & Skarmeas, D. (2017). Gray shades of green: Causes and consequences of green skepticism. *Journal of Business Ethics*, 144, 401–415.
- Li, G., & Sun, X. (2022). The impact of green brand crises on green brand trust: An empirical study. *Sustainability*, 14(2), 611.
- Lyon, T. P., & Montgomery, A. W. (2015). The means and end of greenwash. *Organization & Environment*, 28(2), 223–249.
- Maia, C. R., Lunardi, G. L., Dolci, D., & D'Avila, L. C. (2020). Competitive price and trust as determinants of purchase intention in social commerce. *BAR-Brazilian Administration Review*. <https://doi.org/10.1590/1807-7692bar2019190074>
- Martínez, M. P., Cremasco, C. P., Gabriel Filho, L. R. A., Junior, S. S. B., Bednaski, A. V., Quevedo-Silva, F., & Padgett, R. C. M. L. (2020). Fuzzy inference system to study the behavior of the green consumer facing the perception of greenwashing. *Journal of Cleaner Production*, 242, 116064.
- Mateo-Márquez, A. J., González-González, J. M., & Zamora-Ramírez, C. (2022). An international empirical study of greenwashing and voluntary carbon disclosure. *Journal of Cleaner Production*, 363, 132567.
- More, P. V. (2019). The Impact of Greenwashing on Green Brand Trust from an Indian Perspective. *Asian Journal of Innovation & Policy*, 8(1), 162–179.
- Naderer, B., & Oprea, S. J. (2021). Increasing advertising literacy to unveil disinformation in green advertising. *Environmental Communication*, 15(7), 923–936.
- Nemes, N., Scanlan, S. J., Smith, P., Smith, T., Aronczyk, M., Hill, S., & Stabinsky, D. (2022). An integrated framework to assess greenwashing. *Sustainability*, 14(8), 4431.
- Nozari, H., Szmelter-Jarosz, A., & Ghahremani-Nahr, J. (2021). The ideas of sustainable and green marketing based on the internet of everything—the case of the dairy industry. *Future Internet*, 13(10), 266.
- Parguel, B., Benoit-Moreau, F., & Russell, C. A. (2015). Can evoking nature in advertising mislead consumers? The power of 'executional greenwashing'. *International Journal of Advertising*, 34(1), 107–134.
- Peattie, K., & Crane, A. (2005). Green marketing: Legend, myth, farce or prophesy? *Qualitative Market Research: An International Journal*, 8(4), 357–370.
- Phillips, S., Thai, V. V., & Halim, Z. (2019). Airline value chain capabilities and CSR performance: The connection between CSR leadership and CSR culture with CSR performance, customer satisfaction and financial performance. *The Asian Journal of Shipping and Logistics*, 35(1), 30–40.
- Pickett-Baker, J., & Ozaki, R. (2008). Pro-environmental products: Marketing influence on consumer purchase decision. *Journal of Consumer Marketing*, 25(5), 281–293.
- Polonsky, M. J., Grau, S. L., & Garma, R. (2010). The new greenwash?: Potential marketing problems with carbon offsets. *International Journal of Business Studies: A Publication of the Faculty of Business Administration, Edith Cowan University*, 18(1), 49–54.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavioral Research Methods*, 40(1), 879–891.
- Sahoo, S., Kumar, A., & Upadhyay, A. (2023). How do green knowledge management and green technology innovation impact corporate environmental performance? Understanding the role of green knowledge acquisition. *Business Strategy and the Environment*, 32(1), 551–569.
- Saini, B. (2013). Green marketing and its impact on consumer buying behavior. *International Journal of Engineering Science Invention*, 2(12), 61–64.
- Suki, N. M. (2013). Young consumer ecological behaviour: The effects of environmental knowledge, healthy food, and healthy way of life with the moderation of gender and age. *Management of Environmental Quality: An International Journal*, 24(6), 726–737.

- Szabo, S., & Webster, J. (2021). Perceived greenwashing: The effects of green marketing on environmental and product perceptions. *Journal of Business Ethics*, 171, 719–739.
- Taufique, K. M. R., Vocino, A., & Polonsky, M. J. (2017). The influence of eco-label knowledge and trust on pro-environmental consumer behaviour in an emerging market. *Journal of Strategic Marketing*, 25(7), 511–529.
- TerraChoice. (2010). The sins of greenwashing: Home and family edition. Retrieved from <http://sinsofgreenwashing.org/findings/greenwashing-report-2010/>. Accessed 17 March 2023.
- Tran, K., Nguyen, T., Tran, Y., Nguyen, A., Luu, K., & Nguyen, Y. (2022). Eco-friendly fashion among generation Z: Mixed-methods study on price value image, customer fulfillment, and pro-environmental behavior. *PLoS ONE*, 17(8), e0272789.
- Tsai, P. H., Lin, G. Y., Zheng, Y. L., Chen, Y. C., Chen, P. Z., & Su, Z. C. (2020). Exploring the effect of Starbucks' green marketing on consumers' purchase decisions from consumers' perspective. *Journal of Retailing and Consumer Services*, 56, 102162.
- Tuan, L. T. (2018). Activating tourists' citizenship behavior for the environment: The roles of CSR and frontline employees' citizenship behavior for the environment. *Journal of Sustainable Tourism*, 26(7), 1178–1203.
- Urbański, M., & Ul Haque, A. (2020). Are you environmentally conscious enough to differentiate between greenwashed and sustainable items? A global consumers perspective. *Sustainability*, 12(5), 1786.
- Vos, J. (2009). Actions speak louder than words: Greenwashing in corporate America. *Notre Dame Journal of Law, Ethics and Public Policy*, 23, 673.
- Wang, D., Walker, T., & Barabanov, S. (2020a). A psychological approach to regaining consumer trust after greenwashing: The case of Chinese green consumers. *Journal of Consumer Marketing*, 37(6), 593–603.
- Wang, H., Ma, B., & Bai, R. (2020b). The spillover effect of greenwashing behaviours: An experimental approach. *Marketing Intelligence & Planning*, 38(3), 283–295.
- Yousaf, Z., Palazzo, M., Radulescu, M., & Javed, A. (2023). Unleashing the role of greenwashing in the relationship of environmental sustainability thoughts and environmental performance: Exploring the importance of generative leadership. *Environment Development and Sustainability*. <https://doi.org/10.1007/s10668-023-03473-w>
- Yu, W., Han, X., Ding, L., & He, M. (2021). Organic food corporate image and customer co-developing behavior: The mediating role of consumer trust and purchase intention. *Journal of Retailing and Consumer Services*, 59, 102377.
- Zhang, L., Li, D., Cao, C., & Huang, S. (2018). The influence of greenwashing perception on green purchasing intentions: The mediating role of green word-of-mouth and moderating role of green concern. *Journal of Cleaner Production*, 187, 740–750.
- Zsóka, Á., Szerényi, Z. M., Széchy, A., & Kocsis, T. (2013). Greening due to environmental education? Environmental knowledge, attitudes, consumer behavior and everyday pro-environmental activities of Hungarian high school and university students. *Journal of Cleaner Production*, 48, 126–138.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.

Authors and Affiliations

Nicoleta Isac^{1,2} · Asad Javed³ · Radulescu Magdalena^{4,5,9} · Irina Daniela L. Cismasu⁶ · Zahid Yousaf⁷ · Razvan Sorin Serbu⁸

✉ Radulescu Magdalena
magdalena.radulescu@upit.ro

Nicoleta Isac
nicoleta.isac@izu.edu.tr

Asad Javed
asadjaved@hu.edu.pk

Irina Daniela L. Cismasu
irina.cismasu@cig.ase.ro

Zahid Yousaf
muhammadzahid.yusuf@gmail.com

Razvan Sorin Serbu
razvan.serbu@ulbsibiu.ro

- ¹ Business Administration, Istanbul Sabahattin Zaim University, Istanbul, Turkey
- ² Management and Business Administration, Pitesti University Center, National University of Science and Technology POLITEHNICA Bucharest, Bucharest, Romania
- ³ Department of Management Sciences, Hazara University, Mansehra, Pakistan
- ⁴ Department of Finance, Accounting and Economics, University of Pitesti, Pitesti, Romania
- ⁵ Institute of Doctoral and Post-Doctoral Studies, University Lucian Blaga of Sibiu, Sibiu, Romania
- ⁶ Department of Economic - Financial Analysis, Bucharest University of Economic Studies, Bucharest, Romania
- ⁷ Government College of Management Sciences, Mansehra, Pakistan
- ⁸ Department of Management, Marketing and Business Administration, University Lucian Blaga of Sibiu, Sibiu, Romania
- ⁹ UNEC Research Methods Application Center, Azerbaijan State University of Economics (UNEC), Istiqlaliyyat Str. 6, Baku 1001, Azerbaijan