

Article

Impact of Greenwashing Perception on Consumers' Green Purchasing Intentions: A Moderated Mediation Model

Yongbo Sun and Binbin Shi *

Business School, Beijing Technology and Business University, Beijing 100048, China

* Correspondence: sb990826@163.com

Abstract: When consumers perceive that companies are engaging in greenwashing, this often has many negative impacts on the company, industry, and society. Based on the psychological contract theory, this study constructs a moderated mediation model in an attempt to demonstrate that consumers' greenwashing perception influences their green purchasing intentions and, more importantly, that this influence is mediated by consumers' perceived betrayal and moderated by their sense of environmental responsibility. An online questionnaire was used to distribute 220 questionnaires and regression analysis was conducted using SPSS24.0 and Amos24.0 to test the hypothesis. The results show that consumers' greenwashing perception negatively influences consumers' green purchasing intentions, that perceived betrayal plays a partially mediating role in this influence relationship, and that environmental responsibility reinforces the negative influence of greenwashing perception on green purchasing intentions. This paper enriches the study of the mechanisms of individual consumer psychological effects after consumers perceive corporate greenwashing behaviour, which is of great value to both corporate performance and the sustainable development of the social environment.

Keywords: psychological contract theory; greenwashing perception; green purchasing intentions; perceived betrayal; environmental responsibility; green consumption



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1. Introduction

Since the announcement of the 2020 'double carbon' goal, which refers to China's carbon peaking in 2030 and carbon neutrality in 2060, Chinese consumers have become increasingly concerned about climate change and sustainability, and the green economy is growing in size. More and more companies are realising that transparency in corporate governance and quality management are prerequisites for healthy business development [1], and, therefore, more and more companies are inclined to invest capital in green innovation and green marketing and increasing tendencies toward strategies related to decarbonisation and clean energy [2,3]. However, due to the information gap between companies and consumers, some companies are turning to more 'economical' greenwashing to make them appear environmentally friendly [4] and to increase consumer trust [5] while paying less for environmental protection and, thus, gaining financial benefits [6,7]. This has led to a greater preference for greenwashing in corporate social responsibility and growing consumer scepticism about companies' green claims [8]. Greenwashing is used to describe corporate behaviour that makes misleading statements about the green attributes of its brands or products, as opposed to genuine environmental behaviour [9]. These companies either over-glamorise corporate environmental responsibility [10], conceal information about environmentally responsible behaviour or even fabricate untrue environmentally responsible behaviour [11]. These tactics cause consumers who are inclined to buy environmentally friendly brands or products to develop a preference for such products and purchase them.

At the consumer level, corporate greenwashing negatively affects consumers' willingness to buy green through green word-of-mouth [12]. At the enterprise level, the

proliferation of greenwashing can cause greenwashing in companies up and down the supply chain due to the ‘ripple effect’ between companies, which can be a serious impediment to sustainable socio-economic development [13]. At the social level, the greenwashing behaviour of companies will cause consumers to doubt the green philosophy of the brand and create a sense of distrust [11], which in turn will lead to social trust and moral crisis, shake the whole society’s awareness of environmental protection, increase the transaction costs of the whole society, reduce the efficiency of transactions, and impact on the overall ecological civilisation [14]. Therefore, further exploration of the impact mechanisms of greenwashing is of great value to both corporate performance and the social environment.

In recent years, scholars have shown great interest in the field of corporate greenwashing and have focused on the causes [6,15], hazards [16–18], and governance of greenwashing [19–21]. In relation to the dangers of corporate greenwashing, studies have verified the negative impact of consumers’ greenwashing perception on their green purchasing intentions. The intermediate mechanisms of consumer greenwashing perception on green purchasing intentions have also been explored from the perspectives of green brand loyalty, green brand image [17], and green word of mouth [12]. However, the vast majority of these studies have been conducted from the perspective of enterprises to explore the negative effects of greenwashing, and relatively few studies have been conducted on the intermediate mechanisms of psychological changes in individual consumers. On the one hand, it is important to understand the psychological changes in individual consumers’ greenwashing perception, which can help enterprises to reduce the losses caused by greenwashing behaviour and save their economic performance and brand equity loss; on the other hand, it is valuable for the relevant government departments to implement targeted measures to resolve consumers’ green consumption trust and moral crisis. To enrich the relevant research, this paper extends the study of greenwashing to the field of psychology, based on the classic theory of psychological contract, and introduces the perceived betrayal into the study of the influence of consumers’ greenwashing perception on their green purchasing intentions.

This paper establishes a new framework for the relationship between greenwashing perception and green purchasing intentions, verifies the negative relationship between consumers’ greenwashing perception and green purchasing intentions, and incorporates perceived betrayal and environmental responsibility into the study. At the same time, this paper introduces the psychological contract theory into the field of green marketing, further validating the explanatory logic of the psychological contract theory and, thus, helping companies to alleviate consumers’ withdrawal behaviour from green purchases due to greenwashing perception in a more systematic and targeted manner.

This paper has the following new contributions: First, this paper develops the explanatory logic of psychological contract theory by applying it to the study of consumers’ perceptions of greenwashing and elucidates the process of consumers’ psychological reactions to perceived corporate greenwashing behaviour. Secondly, this paper introduces perceived betrayal into the influence relationship of consumers’ greenwashing perception on their green purchasing intentions, enriching the study of the individual psychological mechanisms in this influence relationship and opening the black box between consumers’ greenwashing perception and their green purchasing intentions. Thirdly, this paper introduces environmental responsibility and verifies the moderating influence of environmental responsibility on the mediating role of perceived betrayal

2. Research Methods and Materials

2.1. Theoretical Background

This study aims to investigate the internal mechanisms by which consumers’ greenwashing perception affects their green purchasing intentions, and to achieve this aim; this paper bases its research framework on the psychological contract theory. Psychological contract theory was originally applied in the field of organisational behaviour to describe the relationship between employees and employers and was developed by organisational

psychologist Professor Argyris. The relationship is based on an implicitly understood or unwritten psychological contract or expectation formed between the two parties [22]. Luo Haicheng introduced the psychological contract into the marketing field and defined it narrowly as the consumer's beliefs and perceptions of the obligations or responsibilities promised by the business [23]. The psychological contract arises from the perceived obligation or responsibility of the reciprocating parties to make a commitment, which leads to the belief that there is a benefit to be gained from the relationship [24]. The psychological contract between reciprocating parties involves both obligations and expectations [25]. When one party fails to meet its obligations or expectations, the contractual relationship between the reciprocating parties is broken, resulting in a psychological contract breach [26]. As a result of the perceived unfairness or mistrust, consumer satisfaction and willingness to participate decreases, and consumers may even withdraw [27].

Psychological contract theory may provide a unique perspective on the intermediate mechanisms at play in explaining changes in consumers' willingness to purchase when stimulated by perceived corporate greenwash behaviour. When a company makes a green marketing campaign, it is committing the consumer to carry out green initiatives. According to the psychological contract theory, a psychological contract is formed between the consumer and the company based on the promise that the consumer will buy the product and the company will take action to protect the environment. When consumers perceive that the company is not actually taking action to protect the environment, that is, when consumers perceive that the company is greenwashing, the reciprocal relationship between the company and the consumer is broken, resulting in a breach of the psychological contract [25,28] and a reduction in the consumer's willingness to buy [29].

The paper is structured as follows, with a review of the relevant literature in the 'Theoretical Foundations and Hypothesis Development' section, in which six hypotheses are presented. The methodology, sample, and data collection, and measurement of the constructs are described in the 'Methodology and Measurement' section. The results of the descriptive statistics, the reliability of the data, and the correlation coefficients between the constructs, and the hypothesis testing are then presented in the 'Empirical Results' section. Finally, the findings, theoretical and managerial implications, limitations, and possible directions for future research are analysed in the 'Conclusions and Implications' section.

2.2. Hypotheses Development

2.2.1. Greenwashing Perception and Perceived Betrayal

Greenwashing is a false marketing practice that causes consumers to form a false impression of a company's environmental practices in the process of advertising and communication to consumers [30]. From a marketing perspective, greenwashing is a marketing practice in which companies do not do anything substantial but actively promote their environmental image; from an information management perspective, greenwashing is an information management strategy in which companies selectively disclose positive green information [31]. Simply put, when a company claims to be environmentally friendly but does not match its words with its actions, we assume that it is practising a false form of green marketing, or 'greenwashing'. Greenwashing Perception (GP) is consumer response to the extent to which green advertising messages are consistent with actual corporate environmental responsibility [32]. In layman's terms, greenwashing perception is a consumer's psychological determination of whether a company is misrepresenting itself and hiding its true environmental message [32].

According to interpersonal theory, a sense of betrayal is a psychological reaction that occurs when an individual is confronted with inappropriate behaviour by others with whom he or she is interacting [33]. In the marketing field, perceived betrayal is used to measure the extent to which consumers believe that the norms of interaction between them and the firm have been intentionally violated by the firm [34]. It has been suggested that consumers' attitudes towards companies are largely influenced by companies' attitudes towards socially responsible behaviour [35].

According to the psychological contract theory, corporate greenwashing is a negative event that is a manifestation of a company's breach of the norms of interaction with consumers and corporate commitment. When consumers perceive that a company's greenwashing behaviour will result in a breach of the psychological contract, this will lead to negative emotions such as distrust of the company and a sense of betrayal [36]. The greater the intensity of consumers' perceived corporate greenwashing behaviour, the stronger their negative emotions, ultimately leading to a stronger sense of perceived betrayal [37]. This paper, therefore, proposes the following hypothesis.

H1. *Consumers' greenwashing perception positively influences their perceived betrayal.*

2.2.2. Perceived Betrayal and Green Purchasing Intentions

When a company makes a green marketing promotion, it is committing the consumer, and this commitment is the psychological contract or psychological attachment [38], which is the emotional or normative force that binds the goals of the company and the consumer together [39]. Green purchasing intentions are the likelihood that a consumer will purchase a specific product because of their environmental attitudes and represent the extent to which a consumer will purchase a product or service from an environmentally friendly company [40]. In this paper, green purchasing intentions refer to the likelihood of consumers purchasing products from greenwashing companies. The academic community has explored the factors influencing green purchasing intentions from both internal and external perspectives. Consumers' environmental attitudes have an impact on their green purchasing behaviour [41,42]. Consumers' perceived social pressure has an impact on their adoption of environmentally friendly consumption behaviour [43,44]. Consumers who have received positive messages from companies exhibit significantly negative behaviour once they find out that companies are involved in or support negative socially responsible behaviour [35]. Consumers' greenwashing perception makes them aware that the greenwashing company has deliberately violated the norms in their relationship, thus, causing perceived betrayal, and when consumers perceive corporate betrayal, they have a lower willingness to repurchase and negative word of mouth [29]. We, therefore, make the following assumptions.

H2. *Consumers' perceived betrayal negatively influences their green purchasing intentions.*

2.2.3. A Mediating Role of Perceived Betrayal in the Relationship between Greenwashing Perception and Green Purchasing Intentions

Trust is the main influential variable in whether consumers will buy green products [45]. With increased education and awareness of environmental pollution, consumers are becoming more aware of the importance of environmental protection and are more likely to buy environmentally friendly products [46,47]. However, due to the asymmetry of information, consumers are not fully aware of the green behaviour of companies, so when companies fail to announce their specific environmental goals and details of their environmental actions promptly, this can lead to suspicion and mistrust [48]. According to psychological contract theory, once consumers realise that a company is adopting false environmental practices, a psychological contract between the consumer and the green bleaching company will be broken [49], resulting in a decrease in satisfaction and even withdrawal behaviour [27]. At the same time, consumers will then be more cautious when making future green purchases, affecting their green purchasing intentions [41]. This is consistent with Wagner's view that when a company does not live up to its social responsibilities as claimed, this breach of the psychological contract will lead to consumers feeling cheated and betrayed, and, thus, retaliating [50]. Therefore, this paper proposes the hypothesis:

H3. *Consumers' greenwashing perception negatively affects their green purchasing intentions.*

H4. *Perceived betrayal mediates the effect of greenwashing perception on green purchasing intentions.*

2.2.4. Environmental Responsibility as a Moderator

The environmental responsibility studied in this paper refers to the sense of responsibility and obligation that individuals are willing to make efforts in the face of ecological and environmental problems [51], rather than the general attitude of consumers' cognitive and emotional evaluation of environmental problems as emphasised by green concerns in existing studies [12], where the former emphasises taking environmental protection as one's responsibility, and the latter emphasises the degree of concern for the environment, and concern for environmental change is not the same as taking environmental protection as one's responsibility. There is a fundamental difference between the two in terms of subjective motivation. It has been shown that environmental values are closely related to consumers' willingness to buy green [52] and that attitudes and subjective norms, as internal influencing factors, can significantly affect consumers' willingness to buy green by influencing their subjective intentions [53]. According to the Feshimoto behavioural intention model, consumers' behavioural intentions are predicted by consumers' attitudes, i.e. individuals tend to practise environmentally friendly behaviours when they believe they should be responsible for environmental pollution and ecological problems [54,55]. At the same time, consumers with a higher sense of environmental responsibility are more likely to detect companies' greenwashing behaviour and, thus, reduce such consumption [40], so the stronger consumers' environmental responsibility, the stronger the negative effect of greenwashing perceptions on their green purchasing intentions [56]. We, therefore, propose the following hypothesis.

H5. *The stronger the environmental responsibility, the greater the negative effect of consumers' greenwashing perception on their green purchasing intentions.*

2.2.5. Moderated-Mediation Effect

Based on the above hypothesis, this paper constructs a moderated mediation model in which environmental responsibility moderates the mediating role of consumers' perceived betrayal in the relationship between greenwashing perception and their green purchasing intentions. Specifically, the stronger the consumer's environmental responsibility, the more likely it is that consumers who perceive a company's greenwashing behaviour will be less likely to purchase green due to perceived betrayal, and the stronger the mediating role of perceived betrayal. Therefore, the following hypothesis is proposed.

H6 Environmental responsibility moderates the mediating role of perceived betrayal in the relationship between greenwashing perception and green purchasing intentions.

This study proposes that greenwashing perception negatively affects green purchasing intentions, while perceived betrayal mediates, and environmental responsibility moderates the relationship. The research framework is shown in Figure 1.

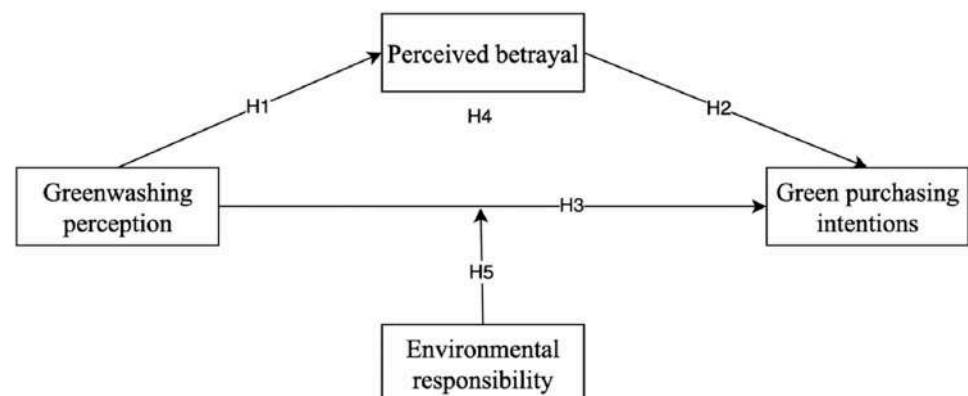


Figure 1. A research model and hypotheses.

3. Research Methods and Materials

3.1. Participants and Data Collection

This paper collects data through a random questionnaire from ordinary adult consumers who have had the experience of green consumption. To exclude the influence of the consumer's knowledge of the industry and the company's identity on the effectiveness of the data collection [57], this paper chooses to use a virtual company as a case study for data collection and to eliminate the influence of the consumer's knowledge of the industry as far as possible, Companies in the fashion and clothing industry, which are generally applicable to all categories of people, have been chosen as case studies for this paper. The questionnaire begins with a short description of a virtual company that actively promotes an environmentally friendly image but does not engage in environmentally friendly behaviour, and the respondents answer questions in the context of that company. The case description is as follows: "Following the Chinese government's "double carbon" target, fast-fashion clothing company H stated that it had kept its carbon emissions within the limits recommended by professional bodies and set a long-term environmental goal for the next 30 years. However, Company H believes that "more data is needed before environmental reform can begin" and has not set specific short-term targets and has never subsequently updated information on the progress or details of its environmental initiatives. Recently, an international environmental organisation investigated the company and found serious pollution control violations, and after being criticised, Company H continued to pay lip service instead of taking action".

The questionnaire was designed with reference to existing research findings to ensure the reliability of the content and structure of the questionnaire, and the reference questions were presented in English, with linguistic experts translating and back-translating to ensure semantic consistency. The specific information on the questionnaire items is mentioned in Section 2.2 In the questionnaire, except for the demographic information questions, all items were scored on a seven-point Likert scale, from '1' to '7' for 'totally disagree' to 'totally agree'. In addition, 27 questionnaires were distributed via the Internet for pre-testing to check for ambiguities in the questions and to revise and improve them before the formal survey was conducted. At the same time, to reduce the influence of social expectation bias, we promised respondents in the formal survey that the questionnaire would be completed anonymously, that its contents would be kept completely confidential and that they would be asked to fill it out honestly and objectively. The official questionnaire was distributed by Changsha Ranxing Information Technology Co., Ltd. (Changsha, China). 220 questionnaires were returned, excluding incomplete and contradictory questionnaires the remaining 204 valid questionnaires, with a questionnaire efficiency rate of 92.7%. The demographic results of the survey data are shown in Table 1.

Table 1. Respondent demographic results.

	Frequency	Percentage
Gender		
Male	109	53.4
Female	95	46.6
Age		
18–25	35	17.2
26–35	114	55.9
36–45	36	17.6
46–55	13	6.4
>55	6	2.9
With or without children		
With	150	73.5
Without	54	26.5
Education level		
Below high school	2	1.0

Table 1. Cont.

	Frequency	Percentage
High school	9	4.4
University undergraduate/college	177	86.8
Postgraduate	16	7.8
Income		
Below 2000 RMB	20	9.8
2000–4000 RMB	33	16.2
4000–6000 RMB	46	22.5
6000–8000 RMB	37	18.1
8000–10,000 RMB	37	18.1
10,000 RMB and above	31	15.2

3.2. Measurement Scale

Greenwashing perception (GP) is consumers' perception and judgment of the authenticity and reliability of a company's environmental practices. We used the metrics of Nyilasy et al. and Chen to measure greenwashing perception using five questions [32,58], namely: "The company omits or hides important information to make green claims sound better than they are", "The company is misleadingly literal about its environmental attributes", "The company is visually or graphically misleading about its environmental attributes", "The company's green claims are vague or unprovable", "The company exaggerates the reality of its green features".

Perceived betrayal (PB) is the degree to which consumers perceive a company's negative behaviour as a belief. Perceived Betrayal is measured by the scale of Gregoire and Fisher through four questions [49]: "I was lied to by the company", "I felt seriously betrayed", "The company has practised deception on me", and "I believe that the company is taking advantage of me".

Environmental responsibility (ER) is the sense of duty and responsibility of an individual willing to make an effort in the face of ecological and environmental problems. According to Stern, Powell, and Ardoin, we designed five statements to measure ER [59]: "I am willing to work to make the environment better", "I am willing to learn about protecting the environment", "I have the ability to help protect the environment", "My actions can influence the health of the environment", and "I can make a difference to the environment".

Green purchasing intentions (GPI) are the likelihood that consumers will purchase a particular product because of their environmental attitudes. We developed four statements to measure it based on research by Nyilasy et al. and Chen and Chang [32,58]: "I would recommend others to buy products from this company", "I am happy to buy products from this company because it cares about the environment", "I am willing to buy other related products from this company because of its environmental performance", and "I am happy to buy products from this company because it is environmentally friendly".

Control variables. Gender, age, with or without children, education level, and income of the respondents were taken as control variables since these factors may affect their greenwashing perception [12]. Gender was measured by a dummy variable, 0 denotes male, 1 female. Age was measured by year and divided into five groups ("1" to "5" denotes 18–25 years old, 26–35 years old, 36–45 years old, 46–55 years old, and over 55 years old, respectively). With or without children was measured by a dummy variable, 0 denotes yes, 1 no. Education level was measured and divided into four groups ("1" to "4", denotes Under high school, High school/junior high school, Undergraduate/college, Graduate (master's or doctorate).). Income was measured by money and divided into six groups ("1" denotes less than 2000 yuan a month, "2" 2000–4000 yuan a month, "3" 4000–6000 yuan a month, "4" 6000–8000 yuan a month, "5" 8000–10,000 yuan a month, "6" over 10,000 yuan a month).

4. Results

4.1. Reliability and Validity

In this paper, the AMOS 24.0 and SPSS 24.0 software were used to test the reliability of the scale. Cronbach's α and composite reliability (CR) are often used to determine the reliability of questionnaires. The results in Table 2 show that the values of Cronbach's α and CR are in the range of 0.758–0.875 and 0.757–0.877, respectively, which are in line with the recommended values (>0.7), indicating that the scale has considerable internal consistency. Secondly, the square root of the average variance extracted (AVE) of a given construct is greater than the correlation between the construct and the other constructs in the model as a criterion to determine the discriminant validity of the scale using Fornell and Larcker's (1981) method. Therefore, these results demonstrate that the scale is reliable and valid and can be analysed in the next step.

Table 2. Results of confirmatory factor analysis.

Constructs	Items	Factor Loadings	Cronbach's α	CR	AVE
GP	4	0.734–0.794	0.811	0.812	0.52
PB	3	0.651–0.829	0.758	0.757	0.51
GPI	4	0.756–0.826	0.875	0.877	0.64
ER	3	0.805–0.839	0.773	0.776	0.536

4.2. Confirmatory Factor Analysis

This paper used AMOS 24 software to conduct a validated factor analysis to test the discriminant validity of the variables for environmental responsibility, greenwashing perception, perceived betrayal, and green purchasing intentions. The results of the analysis are shown in Table 3. The fit of the four-factor model ($\chi^2 = 65.581$, $df = 71$, $\chi^2/df = 0.924$, $RMSEA = 0$, $CFI = 1$, $NFI = 0.946$, $GFI = 0.957$, $AGFI = 0.936$) was significantly better than the other models.

Table 3. Fit indexes of the theoretical model, nested model, and alternative model.

Model	χ^2	df	χ^2/df	RMSEA	CFI	NFI	GFI	AGFI
Four-factors model	65.581	71	0.924	0	1	0.946	0.957	0.936
Three-factors model	137.651	74	1.86	0.065	0.943	0.887	0.897	0.854
Two-factors model	274.768	76	3.615	0.114	0.823	0.773	0.819	0.751
Single-factor model	406.396	77	5.278	0.145	0.706	0.665	0.736	0.64

Note: Four factors: GP, PB, GPI, ER; three factors: GP + PB, GPI, ER; two factors: GP + PB, GPI + ER; single factor: GP + PB + GPI + ER.

4.3. Descriptive Statistical Analysis of Variables

Using SPSS 24.0, this paper presents an analysis of the variables and Table 4 lists the means, standard deviations and correlation coefficients between the variables. As shown in Table 4, green purchasing intentions were significantly negatively correlated with environmental responsibility ($r = -0.301$, $p = 0.01$), greenwashing perception ($r = -0.468$, $p = 0.01$) and perceived betrayal ($r = -0.555$, $p = 0.01$). Perceived betrayal was significantly positively correlated with environmental responsibility ($r = 0.185$, $p = 0.01$) and greenwashing perception ($r = 0.506$, $p = 0.01$). Greenwashing perception was significantly positively correlated with environmental responsibility ($r = 0.168$, $p = 0.05$), indicating that the hypotheses presented in this paper were initially tested.

Table 4. Correlation analysis.

	GP	PB	ER	GPI
GP	0.721			
PB	0.506 **	0.714		
ER	0.168 *	0.185 **	0.732	
GPI	−0.468 **	−0.555 **	−0.301 **	0.800
Mean	5.891	5.758	5.677	1.920
Std. Deviation	0.780	0.844	0.806	0.914

Note: * $p < 0.05$, ** $p < 0.01$. The number bolded on the diagonal is the square root of the arithmetic of AVE.

4.4. Common Method Bias Testing

This study used the Harman one-factor test to determine whether there was common method bias in the data, which assumes that data collected if the variance explained by the first factor is less than 40% does not have common method bias [60]. The results of this paper, through exploratory factor analysis using SPSS, show that the four factors extracted explained a total of 69.196% of the variance, with the first factor accounting for 21.164% of the total variance, which is less than the suggested threshold of 40%, indicating that the issue of common method bias in the data is acceptable.

4.5. Hypothesis Testing

To test the hypothetical model in Figure 1, this paper uses a structural equation modelling approach and the analysis software AMOS 24 to compare the theoretical model, the nested model, and the alternative model to find the best model. Compared to the theoretical model, the nested model removes the direct effect of greenwashing perception on green purchasing intentions, and the alternative model removes the mediating effect of perceived betrayal, with greenwashing perception, perceived betrayal, and environmental responsibility all directly affecting green purchasing intentions. Table 5 shows the test results for each model. Overall, the fit of the theoretical model ($\chi^2 = 41.194$, $df = 41$, $\chi^2/df = 1.005$, $RMSEA = 0.005$, $CFI = 1$, $IFI = 1$, $NFI = 0.959$, $GFI = 0.965$, $AGFI = 0.943$) was better than the other models and met the fit criteria. After comparison, the theoretical model was accepted as the optimal model.

Table 5. The fitting index results of the theoretical model, the nested model, and the alternative model.

Model	χ^2	df	χ^2/df	RMSEA	CFI	IFI	NFI	GFI	AGFI
Theoretical model	41.194	41	1.005	0.005	1	1	0.959	0.965	0.943
Nested model	44.15	42	1.051	0.016	0.998	0.998	0.956	0.962	0.94
Alternative model	50.42	41	1.23	0.034	0.99	0.99	0.95	0.958	0.932

To test the hypotheses proposed in the previous section, this paper uses stepwise regression to test the mediating utility of perceived betrayal and the moderating utility of environmental responsibility. The variables were first centralised, and then interaction terms were constructed: (1) perceived betrayal \times environmental responsibility and (2) greenwashing perception \times environmental responsibility. The specific results are shown in Table 6.

As the results in Table 6 show, greenwashing perception has a significant positive effect on perceived betrayal in column Model 1 ($\beta = 0.548$, $p < 0.001$). Model 2 examined the effect of five control variables on green purchasing intentions. Model 4 examined the effect of perceived betrayal on green purchasing intentions ($\beta = -0.603$, $p < 0.001$). Greenwashing perception has a significant negative effect on green purchasing intentions in column Model 3 ($\beta = -0.558$, $p < 0.001$), while the negative effect of greenwashing perception on green purchasing intentions is weakened by including perceived betrayal in column Model 5 of the regression model, but was still significant ($\beta = -0.31$, $p < 0.001$), indicating that perceived betrayal partially mediated the effect of greenwashing perception

on green purchasing intentions. In addition, the upper and lower limits of the bootstrap 95% confidence intervals for the direct effect of greenwashing perception on green purchasing intentions and the mediating effect of perceived betrayal did not contain 0 (see Table 7), indicating that perceived greenness not only predicted consumers' green purchasing intentions directly but also through the mediating effect of perceived betrayal. The direct effect (−0.3095) and the indirect effect (−0.2487) accounted for 55% and 45% of the total effect (−0.5583), respectively. Therefore, hypotheses H1, H3, and H4 are supported by the research data. Perceived betrayal has a significant negative effect on green purchasing intentions in column M4 ($\beta = -0.603$, $p < 0.001$) and hypothesis H2 is supported by the data.

Table 6. Model hierarchical regression results.

Variables	PB			GPI			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Constant	2.515 ***	2.527 ***	5.418 ***	5.711 ***	6.588 ***	7.426 ***	7.198 ***
Gender	−0.021	−0.056	−0.185	−0.143	−0.195	−0.186	−0.153
Age	0.043	−0.133	−0.092	−0.083	−0.072	−0.05	−0.033
With or without children	0.139	0.028	0.046	0.123	0.111	0.092	0.002
Education level	−0.113	−0.043	0.084	−0.038	0.032	0.034	0.085
Income	0.052	−0.037	−0.013	0.008	0.012	0.023	−0.003
GP	0.535 ***		−0.558 ***		−0.31 ***	−0.293 ***	−0.359 ***
PB				−0.603 ***	−0.465 ***	−0.442 ***	−0.381 ***
ER						−0.203 **	−0.155 *
GP × ER							−0.351 ***
F	11.982 ***	1.124	10.352 ***	15.826 ***	16.797 ***	16.543 ***	17.698 ***
R ²	0.267	0.028	0.24	0.325	0.375	0.404	0.451
ΔR ²	—	—	0.212	—	0.135	0.029	0.047

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 7. The total effect, direct effect, and indirect effect.

Effect	Effect	BootSE	BootLLCI	BootULCI	Relative Effect Values
Total effect	−0.5583	0.0753	−0.7068	−0.4098	
Direct effect	−0.3095	0.0784	−0.4641	−0.1549	55%
Indirect effect	−0.2487	0.0586	−0.372	−0.1429	45%

Model 6 examined the effect of greenwashing perception, perceived betrayal, and environmental responsibility on green purchasing intentions in the absence of an interaction between greenwashing perception and environmental responsibility. Model 7 tested the moderating role of environmental responsibility in the relationship between green purchasing intentions and greenwashing perception and showed that the interaction term “GP × ER” was significant ($\beta = -0.351$, $p < 0.001$), suggesting that environmental responsibility plays a moderating role in the negative effect of greenwashing perception on green purchasing intentions. Therefore, hypothesis H5 was supported. Simple slope analysis was further plotted in this paper (see Figure 2). Moreover, the confidence interval of the mediated test with moderation does not contain 0, indicating that the mediating effect differs at different levels of environmental responsibility ($\beta = -0.2039$, $\text{BootSE} = 0.0541$, $\text{BootLLCI} = -0.3345$, $\text{BootULCI} = -0.1212$), and the results suggest that the more consumers increase with their sense of environmental responsibility, the easier it is for consumers' greenwashing perception to influence their green purchasing intentions through perceived betrayal. H6 was supported.

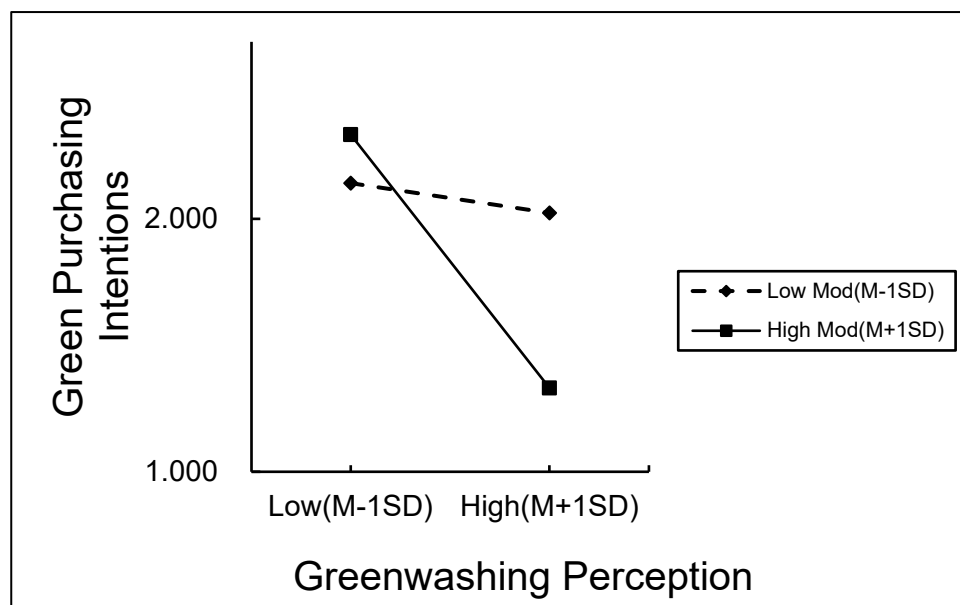


Figure 2. The moderating role of environmental responsibility in the relationship between greenwashing perception and green purchasing intentions.

5. Conclusions and Discussion

5.1. Conclusions

The relationship between greenwashing perception and green purchasing intentions has mostly been studied at the firm level [18], but less attention has been paid to the psychological change mechanisms of consumers after exposure to firms' greening behaviour [61]. Therefore, this paper focuses on the psychological mechanisms when consumers perceive a company's greening behaviour and explores the role of perceived betrayal and environmental responsibility in the influence of greenwashing perception on their green purchasing intentions. Based on psychological contract theory, this paper constructs a moderated mediation model in which greenwashing perception act on green purchasing intentions and regression analysis of the collected questionnaire data was conducted, and the empirical study found that: firstly, greenwashing perception has a significant negative effect on consumers' green purchasing intentions. The higher the degree of greenwashing perception, the lower the green purchasing intentions. Secondly, perceived betrayal plays a partially mediating role in the effect of greenwashing perception on green purchasing intentions. Consumers' reduced willingness to buy green is often due to their perception that the company has betrayed their psychological contract after they have perceived the company's greenwashing behaviour. Thirdly, environmental responsibility plays a moderating role in the effect of greenwashing perception on green purchasing intentions. The more concerned consumers are about the environment and the more committed they are to protecting it, the more likely they are to reduce their willingness to buy green because of perceived corporate greenwashing behaviour. Fourthly, consumers' environmental responsibility moderates the mediating role of perceived betrayal in the relationship between greenwashing perception and green purchasing intentions. The stronger the consumer's environmental responsibility, the more likely greenwashing perception influences consumers' green purchasing intentions through perceived betrayal rather than directly.

5.2. Theoretical Contributions

Firstly, this paper develops psychological contract theory by applying it to the study of consumers' greenwashing perception and verifying the moderating influence of environmental responsibility on the mediating role of perceived betrayal. Psychological contract theory is the belief that the non-fulfilment of commitments by one of the reciprocating parties will result in a psychological contract breach and hence withdrawal behaviour [29].

This paper verifies through empirical analysis that this relationship can be influenced by the consumer's subjective psychological evaluation (i.e., environmental responsibility in this paper) of that commitment. This study treats the greenwashing perception as the motivating event of psychological contract breach and considers the effect of perceived betrayal on green purchasing intentions as the result of psychological contract breach. This paper elucidates the process of consumers' psychological responses to perceived corporate greenwashing behaviour and develops the explanatory logic of psychological contract theory.

Secondly, this paper introduces the perceived betrayal into the process of consumers' greenwashing perception of their green purchasing intentions. It enriches the study of the mechanisms of individual consumer psychological effects after consumers perceive corporate greenwashing behaviour and provide a new perspective for exploring the factors influencing consumers' green purchasing intentions. Mistrust is the main factor influencing consumers' active choice of green products [44]. This paper focuses its research horizon on the individual psychological mechanism of action after consumers perceive a company's greenwashing behaviour [31,61] rather than at the company level [5,18] and provides theoretical support to alleviate the negative evaluation and withdrawal behaviour of consumers due to the greenwash behaviour of companies at the root.

Finally, the paper introduces the sense of environmental responsibility to verify the moderating role of environmental responsibility in the relationship between greenwashing perception and green purchasing intentions and confirms that consumers with different levels of environmental responsibility have different degrees of influence on their green purchasing intentions when they perceive greenwashing behaviour [44]. The negative effect of greenwashing perception on green purchasing intentions is negatively moderated by consumers' environmental responsibility [56], i.e., the stronger the consumer's environmental responsibility, the stronger the effect of greenwashing perception on green purchasing intentions, and the weaker the opposite.

5.3. Managerial Implications

Firstly, consumers' greenwashing perception negatively influences consumers' green purchasing intentions, and companies should fulfil their environmental commitments and disclose details in a timely manner. With the advent of the self-media era, the information gap between companies and consumers is becoming smaller and smaller, and the possibility of companies taking advantage of the information gap to speculate for financial gain is diminishing. Managers should recognise that greenwashing can bring short-term benefits but is not sustainable. Therefore, companies should reduce the incidence of greenwashing and take a pragmatic approach to corporate environmental responsibility.

Secondly, perceived betrayal partially mediates the negative relationship between greenwashing perception and green purchasing intentions. Therefore, to reduce economic losses and restore corporate image, companies should take timely measures to mitigate the perceived betrayal after consumers perceive the company's greening behaviour, such as introducing third-party organisations or the general public to monitor the company, and promptly announcing details of its environmental practices, to reduce the stigma in consumers' minds and, thus, reduce the impact on the company's performance.

Finally, environmental responsibility plays a moderating role in the negative impact of perceived betrayal and greenwashing perception on green purchasing intentions. This means that consumers with higher environmental responsibility have weaker green purchasing intentions when they perceive a company's greenwashing behaviour, which also means that the stronger the consumer's environmental responsibility, the greater the cost of a company's greenwashing behaviour after being perceived by the consumer. Therefore, to combat corporate greenwashing, the government and NGOs should step up their efforts to promote environmental protection, arouse public concern for the environment, and raise consumers' sense of environmental responsibility.

5.4. Limitations and Future Research

This study is limited to the effect of consumers' greenwashing perception on their green purchasing intentions after they perceive that the company is greenwashing. Future research could extend the scope of the study to include the impact of consumers' greenwashing perception on the green purchasing intentions of other companies or products in the industry or even on consumers' overall willingness to consume green. Secondly, in this paper, the questionnaire was distributed to consumers, and all variables were measured in the same period, which has certain limitations in the verification of the causal and moderating relationships of each variable, and future research could consider the form of an experimental method for measurement. Finally, future research could expand the research perspective to compare different cultures in different countries and could divide people into different groups, such as the sensitive type and the tonal type, to study the different effects of the perception of bleached green on the willingness to buy green and the perceived betrayal.

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