

How does green marketing on social media affect consumers' green purchase intention? Based on the perspective of greenwash and green brand image

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Abstract. As the demand for green consumption increases, brands carry out green marketing activities through social media more and more frequently, which will lead to two distinct effects -- the green brand image and greenwash perceived by consumers. We believe that greenwash, as a negative effect caused by the explosive growth of green marketing on social media, may be inhibited by the positive brand image created by the brand's own green marketing, thus affecting consumers' expected environmental consequences (i.e. green perceived value and green perceived risk), and thus enhancing their green purchase intention. The empirical results of 351 questionnaires show that green brand image can weaken consumers' perception of greenwashing, improve consumers' perceived value of green, reduce their perceived risk of green, and enhance their green purchase intention. Meanwhile, compared with green brand image, greenwash has less influence on green purchase intention. Therefore, we suggest that brands trust the effect of social media green marketing and control the quality of related activities to prevent a large number of low-quality marketing activities from causing the generalization of greenwash.

Keywords: green product; social media; greenwash; green brand image; green perceived value.

1. Introduction

Due to resource depletion and environmental pollution all over the world, green consumption is constantly mentioned as the most effective method. In recent decades, resource depletion and environmental pollution have received global attention, and green consumption is regarded as the most effective way to alleviate the situation. Global consumer demand for sustainable products and behaviors has increased [1], and brand marketing related to environmental protection has grown along the trend, with 90% of multinational brands have made statements about their support for environmental protection on social media [2]. This kind of green marketing on social media is greenwash a common phenomenon. According to China Advertising Market Trends 2019, released by CCTV Market Research (CTR), enterprises' allocation of social media advertising budgets reached 53 percent in 2019. Brands must be aware of the importance of green marketing through social media to their own green development. The research of green marketing through social media is indispensable to the field of green consumption.

However, the status quo of social media green marketing is not optimistic. In the process of industrial transformation for sustainable development goals, enterprises will face strong financial pressure, technical difficulties, time costs and so on. Therefore, many companies mislead consumers to win a green reputation by issuing ambiguous green statements that do not actually meet their environmental commitments, which is regarded as corporate greenwash behavior [3]. The explosive growth of social media is accompanied by the abuse of environmental statements by brands. The original purpose of enterprises to establish a green brand image is to increase the green suspicion of some consumers, which leads to the perception of greenwash among consumers [4]. Moreover, most consumers lack the ability to judge the credibility of environmental protection statements, and there is a strong green confusion. This widespread perception of green bleaching makes some consumers tend to avoid all green brands, which is not conducive to the development of the green industry.

Consumer greenwash of social media green marketing for the entire industry has been established and cannot be solved by the actions of one company. This study considers whether enterprises can alleviate such negative effects through the positive guidance of social media green marketing. Because the different green marketing methods of social media will establish consumers' perception of the brand in completely different directions -- green brand image and greenwash. Although different behaviors of brands may lead to such differences, in fact, for the same social media green promotion, consumers with different personalities will also lead to such completely different results [5]. If enterprises are not sure whether their social media green marketing can really improve consumers' green purchase intention, they will have concerns when choosing this marketing method, which is not conducive to the development of green consumption.

Therefore, this study raises two questions: First, can social media green marketing improve consumers' green purchase intention? The greenwash caused by the external environment and the green brand image created by the enterprise's own behavior are taken into consideration. Second, will the negative impact of green bleaching, as a result of the explosive growth of green marketing on social media, be inhibited by the positive image of green brand created by the brand's own green marketing?

This study believes that for green marketing on social media, consumers will establish two different perceptions for different reasons -- green brand image and green bleaching, thus affecting consumers' expected environmental consequences and thus their green purchase intention. At the same time, greenwash may be inhibited by the positive brand image associated with green. In this study, the expected environmental consequences of consumers are divided into possible benefits and damages, namely green perceived value, and green perceived risk.

Based on SOR model, this study builds a model to explore the difference in the influence of different perceptions (green brand image and greenwash) created by social media green marketing on consumers' green purchase intention. And the mediating effect of consumers' expected environmental consequences in this effect is also discussed.

2. research status and hypothetical development

2.1 Green marketing on social media

Due to the severe situation of environmental problems and the rapid popularization of the Internet, green consumption and social media have become two new research trends in the 21st century. What both have in common is that they increase consumer engagement with the brand and change the perspective of corporate marketing. Unfortunately, many businesses still haven't quite figured out how to successfully combine these two areas. It is meaningful for both theory and practice to cross-study the two fields.

From the perspective of social media, based on its advantages such as interactivity, convenience, and timeliness of information, it is found that social media information can help increase consumers' purchase intention through research on its influence on consumer behavior. For example, social media interaction encourages consumers to be directly influenced by their peers [6]. In terms of its impact on green consumption behavior, social media, as a social tool in the new era, can provide a more effective way to convey the benefits of adopting green and environmentally friendly consumption habits to individual life and the overall society [7]. The analysis of "green consumption + social media" literature finds that most studies focus on the advantages of social media green marketing, that is, enterprises can use social media to carry out green marketing activities to improve their performance [8]. However, the fact that large-scale social media green marketing campaigns lead to a skeptical attitude toward all related campaigns has not been taken into account by the study.

Enterprises are more and more inclined to build a "green image" and transform it into the actual value of enterprises. Green marketing of social media plays a key role in shaping the green brand

image of enterprises [9]. However, the explosive growth of green marketing on social media will also bring related negative effects, such as green bleaching caused by consumers' green suspicion, which is not considered at the same time. Therefore, this study takes into consideration both the green brand image created by the long-term behavior of a single enterprise and the greenwashing caused by the overall environment, which complements the relevant research gap.

2.2 The Stimuli Organism Response Model

According to SOR model, Mehrabian and other scholars think the external aspects act as stimuli that affect the individual's internal feelings and drive the individual to react [10]. Reasons for using SOR model in this study: First, SOR model has been widely used in the field of green marketing to study consumer behavior, and is suitable for green consumption. For example, in the context of the COVID-19 epidemic, the degree of consumer familiarity drives consumers' organic product purchase behavior through perceived value [11]. Or combine cognitive and emotional variables to build a model affecting consumers' willingness to buy green food. Furthermore, considering that anticipated environmental consequences can affect consumer behavior as consumer emotion, the mediating effect is discussed. Therefore, this study proposes a research model based on SOR model.

2.3 Greenwash

Greenwash refers to the ways in which a brand misleads consumers to believe that the brand has environmental benefits on the company's behavior or products, but in fact the environmental performance has not been achieved [4]. Greenwash in this study refers to the extent to which consumers believe that companies have greenwashed their products from the perspective of consumers. The explosive growth of green marketing on social media has led to uneven quality of such activities. Excessive and low-quality related activities have raised some consumers' doubts about the overall green quality, thus lowering their expectations on the environmental benefits of related green products. Moreover, studies have proved that the perception of greenwash will have a positive impact on the daily perceived risks of consumers [12]. As customers pay more attention to the environment, their environment-related perceived risks may also be affected. At the same time, If consumers cannot make clear whether the brand's green claims are reliable, "greenwashing" can have a serious negative impact on the actual effect of green marketing across the industry, especially in terms of consumers' purchase intentions. Therefore, the hypothesis is proposed:

H1a-b: Greenwash has a negative effect on green purchase intention(a) and green perceived value(b).

H1c: Greenwash has a positive effect on green perceived risk.

2.4 Green brand image

Brand image refers to a set of ideas and impressions held by customers on a certain brand. When it is related to the environment or green aspects, the beliefs and impressions will be regarded as the green brand image [13]. Based on the social identity theory, the higher the consumer's identification with the brand, the more likely they are to buy the brand in the future. Green brand image can improve customers' green trust and satisfaction with products and influence the overall green attitude of products [14]. Consumers will evaluate their future behavior from the previous performance. Green brand image, as the concrete expression of the enterprise's long-term environmental protection behavior, will inevitably improve consumers' expectations of the future environment when using the brand's products. Therefore, hypothesized that:

H2a-b: green brand image has a positive effect on green purchase intention(a) and green perceived value(b).

H2c: green brand image has a negative effect on green perceived risk.

Green brand image positively affects consumers' loyalty to and trust in brands, while consumer loyalty is negatively correlated with greenwash [15]. Therefore, we speculate that better green brand image can weaken consumers' perception of greenwash. From another perspective, as a product feature, green brand image can provide more green information for products and reduce the greenwash caused by information asymmetry. The hypothesized that:

H2d: green brand image has a negative effect on greenwash.

2.5 Green perceived value

Chen defines green perceived value as overall evaluation of consumers based on environmental and sustainable expectations of a product or service [16]. The purchasing intention of consumers is the possibility that consumers are willing to make purchases after being awakened by stimulus factors. The higher the practical value consumers feel, the stronger the purchase intention may be, and the greater the probability of purchasing behaviour. Green perceived value reflects the green attribute of a product from the perspective of value, which will inevitably improve consumers' purchase intention for green products. Therefore hypothesized:

H3: green perceived value has a positive effect on green purchase intention.

2.6 Green perceived risk

Green perceived risk is defined as the consumer's expectation that the purchase behavior may lead to environmental risk problems after purchasing a product [16]. Perceived risk is the consumer's estimation of the improper consequences caused by the wrong decision. The higher the perceived risk, the higher the uncertainty of consumers' purchase decision. If consumers perceive a product or brand as high risk, the brand or product will lose consumers' trust, and there is a strong correlation between this negative consumer sentiment and purchasing behavior. As the expected negative environmental consequences of consumers, green perceived risk will inevitably restrain consumption behavior. Therefore, the hypothesis is proposed:

H4: green perceived risk has a negative effect on green purchase intention.

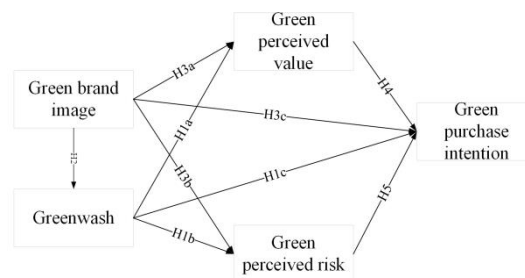


Figure 1. Research model.

3. Model testing and data analysis

3.1 Participator

Chinese consumers were included in the survey. We selected the study samples using convenience sampling technique, it suitable for this study. We collected key data from participants by distributing questionnaires online and offline. The data collection period is temporarily between July and September 2022. Eliminate distracting options and fill out the questionnaire in less than 100 seconds, and add screening questions. To eliminate non-response bias, we informed respondents of their research objectives and ensured confidentiality. A total of 451 questionnaires

were collected, and 325 were valid, with an effective rate of 72%. There were 124 males and 201 females. 21.8% had bachelor degree or less, 62.8% had bachelor degree, and 15.4% had master degree or above. Those with a monthly income of less than 5,000 (49%), 5,000 to 17,000 (26.5%), and more than 17,000 (24.5%).

3.2 Questionnaire design

All variables in the model proposed in this paper were measured using the multi-item scale verified in previous studies, and appropriate adjustments were made in conjunction with this study to construct a complete structured questionnaire. ① The greenwash scale refers to the research results of Hameed scholars and is modified in combination with this study [17]. For example, "I think the green marketing activities of social media are cheating me with unclear green statements"; (2) For the measurement of green brand image, referring to the questionnaire of Chen in 2010 [13], the measurement items such as "After reading the green marketing advertisement on social media, I think this brand is considered to be the best benchmark for sustainable development" are modified. (3) The scale of green perceived risk refers to the measurement item of Chen and Chang in 2012 [16], and the specific operation is "I think the environmental design of the products using this marketing campaign may not work." ; (4) The scale of green perceived value mainly refers to the research of Patterson and Spreng, and is actually expressed as "I think it is more beneficial to the environment than other products." [18] ; ⑤ As for the scale of green purchase intention, this study was modified by referring to Nguyen and combining with the research theme [19], such as "I am happy to buy this product because it is a sustainable product".

We conducted a preliminary experiment on 136 samples, after which two measures GBI1 and GPR3 were deleted. The final questionnaire is divided into two parts: the first part is about the basic situation of the sample population, including four questions. The second part is the body of the questionnaire: greenwash, green brand image, environmental protection knowledge, green perceived value, green perceived risk, green purchase intention, 6 variables, a total of 28 measurement items. Hypotheses were tested on a Likert scale, ranging from 1(strongly disagree) to 7(strongly agree).

4. Result

4.1 Reliability and validity

We uses AMOS software to test all constructs, using maximum likelihood for analysis. Measurement models were used to assess reliability and validity. The results of factor loading, composite reliability (CR), mean variance extraction (AVE), and Cronbach alpha (CA) scores for standardized items were used to test validity and reliability. The results showed that they were all higher than the threshold (see Table 1). The convergent validity is described as the square root of AVE, and the square root of AVE of each variable in the analysis is greater than the square correlation of the variable, and the validity is supported (see Table 2).

Table 1. Reliability and validity.

Construct	Std. factor Loadings	CR (>0.6)	AVE (>0.5)	CA (>0.7)
Greenwash (GW)	0.804	0.8981	0.6382	0.94
	0.818			
	0.813			
	0.797			
	0.761			
Green brand image (GBI)	0.851	0.8805	0.6485	0.931
	0.777			
	0.782			
	0.809			
Green perceived value (GPV)	0.771	0.9094	0.6678	0.947
	0.814			
	0.826			
	0.848			
	0.825			
Green perceived risk (GPR)	0.773	0.8241	0.54	0.919
	0.742			
	0.745			
	0.676			
Green purchase intention (GPI)	0.729	0.7623	0.5174	0.942
	0.758			
	0.668			

Table 2. Discriminant validity of measurement model (n =365).

Constructs	Mean	SD	GW	GBI	GPV	GPR	GPI
Greenwash (GW)	4.572	3.342	0.6382				
Green brand image (GBI)	4.971	2.346	0.133	0.6485			
Green perceived value (GPV)	4.609	3.021	0.152	0.128	0.6678		
Green perceived risk (GPR)	3.944	2.984	0.168	0.129	0.137	0.54	
Green purchase intention (GPI)	4.541	2.81	0.168	0.142	0.151	0.154	0.5174

The square root of AVE is shown in bold.

4.2 Common Method Variance Assessment

We used Harman single factor test, and the first one was 48.5%. The model was poorly fitted by single factor model (CMIN/DF = 14.929, GFI = 0.367, CFI =0.45, IFI=0.452, RMSEA = 0.196). Therefore, the common method variance in the sample data is not considered to be a serious problem. We evaluated the multicollinearity by calculating the variance inflation factor (VIF). The results showed that the VIF values were all less than 3, so it was concluded that there was no multicollinearity problem in this dataset.

4.3 Hypothesis testing

According to the results of structural equation model (SEM), CMIN/DF=1.918; RMSEA =0.053; GFI=0.906, CFI=0.976; The results showed that all data were consistent with the recommended level. From the perspective of greenwashing, greenwash had significant negative effects on green perceived value (H1b: $\beta = -0.365$, $p < 0.001$) and green purchase intention (H1a: $\beta = 0.076$, $p <$

0.001), and had significant negative effects on green perceived risk (H1c: $\beta = 0.584$, $p < 0.001$) was statistically positive. In green brand image, green brand image negatively affected greenwash (H2d: $\beta = -0.525$, $p < 0.001$) and green perceived risk (H2c: $\beta = -0.337$, $p < 0.001$), and significantly increased green purchase intention (H2a: $\beta = 0.390$, $p < 0.001$) and green perceived value (H2b: $\beta = 0.467$, $p < 0.001$). From the perspective of consumers' expected environmental consequences, green perceived value positively affected consumers' green purchase intention (H3: $\beta = 0.191$, $p < 0.001$), and green perceived risk was significantly negatively correlated with green purchase intention (H4: $\beta = -0.151$, $p = 0.028 < 0.005$). In summary, the results show that hypotheses 1-8 are all valid in the model.

Table 3. Path coefficient.

Hypotheses	X	→	Y	Standardized coefficient	S.E.	Z(CR)	p	Supported
H1a	GW	→	GPI	-0.240	0.076	-3.734	***	Yes
H1b	GW	→	GPV	-0.365	0.063	-6.781	***	Yes
H1c	GW	→	GPR	0.584	0.060	10.315	***	Yes
H2a	GBI	→	GPI	0.390	0.064	6.796	***	Yes
H2b	GBI	→	GPV	0.467	0.059	8.724	***	Yes
H2c	GBI	→	GPR	-0.337	0.049	-6.955	***	Yes
H2d	GBI	→	GW	-0.525	0.054	-9.227	***	Yes
H3	GPV	→	GPI	0.191	0.055	3.484	***	Yes
H4	GPR	→	GPI	-0.151	0.077	-2.196	0.028	Yes

Note: GW: Greenwash; GBI: Green brand image; GPV: Green perceived value; GPR: Green perceived value; GPI: Green purchase intention; *** $p < 0.001$.

4.4 mediating effect

The mediating effect was tested by Bootstrap method with 5000 times of sampling. It can be seen from the data in Table 4 that 0 is not included between the lower limit and upper limit of 95% confidence interval of the hypothetical path, indicating significant mediation effect.

Table 4. Mediating effect.

X	Intermediary	Y	Point estimate (Indirect effect)	Bootstrapping (Bias-corrected percentile 95% CI)		Supported
				Lower	Upper	
GBI	GPV	GPI	0.2433	0.1690	0.3326	Yes
GW	GPR	GPI	-0.2780	-0.3740	-0.1820	Yes

Note: GW: Greenwash; GBI: Green brand image; GPV: Green perceived value; GPR: Green perceived value; GPI: Green purchase intention.

5. Discussion

Green marketing on social media can affect consumers in completely different directions. This study explores the influence mechanism of social media green marketing on consumers' green purchase intention, and the influence of the green brand image created by enterprises on the overall industry environment caused by greenwashing. The empirical study solves the two research problems proposed.

First of all, from the negative impact of social media green marketing, greenwash brought by marketing activities can have a significant negative impact on consumers' green perceived value and green purchase intention. It is confirmed that explosive green marketing can not necessarily

promote the development of green consumption. If the green impact activities of the whole industry are not controlled, the overall expectation of consumers' environmental benefits will be reduced (that is, the green perceived risk will be increased and the green perceived value will be reduced), and the mediating role of the green perceived risk in its influence on the green purchase intention is emphasized. Perhaps the inhibition of greenwashing on purchase intention can be reduced by controlling consumers' green perception risk.

Secondly, from the positive impact of social media green marketing, green brand image, as the result of long-term green marketing shaping of enterprises, plays a positive role in green perceived value and green purchase intention, reducing the risk of green perceived value, and green perceived value plays an intermediary role in purchase intention. From the perspective of the value, the average value of consumers' green purchase intention is 4.541, and the positive impact of green brand image is significantly greater than the negative impact of green bleaching, indicating that green marketing on social media can still promote green consumption as long as the quality is controlled.

It also proves that green brand image can reduce consumers greenwash. The explosive growth of green marketing has made some consumers have a greenwash perception of the overall green market, but the long-term green brand image built by the brand can restrain this negative impact. This may be because the loyalty brought by the green brand image and the product information provided as a product feature can mitigate the green suspicion of consumers to a large extent.

6. Research significance and prospect

6.1 Research significance

This study extends the cross-research between social media and green marketing, and based on the SOR model, explains the influence mechanism of green marketing on social media to stimulate consumers to increase their purchase intention of green products, and confirms the mediating effect of expected environmental consequences.

The results of this paper provide several enlightenments for the current research: First of all, previous studies paid more attention to the positive impact of green marketing on social media, while ignoring the negative impact brought by explosive growth. In this study, both consumers' greenwash caused by green marketing on social media as a whole and the green brand image created by green marketing on social media as an individual enterprise were considered. The influence mechanism of social media green marketing (both negative and positive) on consumers' green purchase intention is constructed, which is an effective supplement to social media green marketing.

Secondly, it confirms a major innovation point of this study: the inevitable negative effect of the explosive growth of green marketing on social media as a whole is something that cannot be solved by the behavior of a single enterprise, but is it possible to be mitigated by the long-term behavior of a single enterprise (i.e., shaping its green brand image)? Different from other studies that have confirmed the relationship between greenwash and green brand image, most of the previous studies only confirmed that consumers' perception of greenwash in the same marketing activity will affect the green brand image. However, the questionnaire in this study measured that the green brand image created by the enterprise can affect consumers' mentality of greenwash in the whole green marketing activity. This complements research gaps and shapes confidence for specific business activities.

In addition, from the perspective of mediation, it is confirmed that green perceived risk plays a partial mediating role in greenwashing and green purchase intention. It may be possible to reduce consumers' green perceived risk through changes in the external environment, to reduce part of the negative effects brought by greenwashing. At the same time, it emphasizes the important

intermediary role of green perceived value as green brand image to enhance consumers' green purchase intention. In the field of brand marketing, it emphasizes the necessity of value.

The study also has practical implications for practitioners involved. First, in the process of green marketing on social media, the brand should try to avoid large-scale and low-quality marketing, which will only bring consumers greenwash and fail to achieve the green brand image that the brand wants to build. Secondly, in the marketing process, the marketing method should emphasize the green value provided by the brand, reduce the green risk, and pay attention to the dissemination of more accurate information. Finally, from the perspective of supervision, large-scale green marketing activities on social media need more effective supervision. Poor marketing is not only a blow to the product, but also a distrust of the whole green consumer market.

6.2 Research limitations and prospects

First, the data source of the questionnaire is limited to China and adopts the form of convenient sampling, which may limit the generality of the conclusions in other regions. Secondly, in the process of questionnaire design in this study, in order to ensure the control variables, the questionnaires for all subjects were made of uniform green marketing materials, without considering the influence of different marketing quality on the results. Future studies may consider the influence of different green marketing scheme designs on this mechanism. Finally, this study mainly considers the inhibition of green brand image created by enterprises' long-term behaviors on greenwash, but does not consider whether there is a short-term solution. Future research can explore whether there are other behaviors of enterprises that can inhibit greenwash.

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