Article

The Influence of Brand Greenwashing on EV Purchase Intention: The Moderating Role of Consumer Innovativeness and Peer Brand Attitude

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Abstract: In the context of new energy Electric Vehicles (EVs), certain car manufacturers engage in deceptive behaviors known as “greenwashing”, including activities such as “subsidy cheating”, “exaggerating carbon reduction claims”, and “selective disclosure of environmental information”. These behaviors have a negative impact on industry progress. While previous studies suggest that consumers’ perceptions of greenwashing towards individual brands extend to the industry as a whole and influence their overall purchase intentions, there remains a gap in understanding how these behaviors specifically affect consumers’ willingness to purchase EVs. To address this gap and enrich the literature on the relationship between greenwashing and consumer choice, this study uses ABC attitude theory and experimental methods to investigate the impact of greenwashing in the EV sector on consumers’ vehicle preferences in three experiments. The results show that consumers’ perceptions of greenwashing in one EV brand negatively influence their purchase intentions towards other brands, mediated by a general skepticism towards environmental claims in the industry. In addition, consumers’ innovativeness and attitudes towards other brands play a negative moderating role in this relationship. The research findings provide comprehensive insights into the complex impact of brand greenwashing on consumer behavior within the EV industry.

Keywords: greenwashing perception; green skepticism; consumer innovativeness; brand attitudes; purchase intention

1. Introduction

“Lucid waters and lush mountains are invaluable assets”. With the continuous progress of ecological civilization construction, the public’s awareness of environmental protection has gradually increased, and consumers have taken environmental efforts into consideration in their daily purchase intentions [1]. In order to cater to consumers’ environmental concept, many firms try to carry out greenwashing activities to gain a competitive advantage [2]. Specifically, greenwashing includes firms showing their achievements in environmental protection to the public while ignoring environmental pollution or exaggerating environmental behaviors [3]. This kind of greenwashing behavior can mislead or deceive consumers through false environmental publicity, resulting in improved corporate reputation [4]. Consumers psychologically discriminate with respect to whether firms carry out false publicity and cover up real environmental information, and their cognition and judgment on the authenticity and reliability of firms’ environmental behaviors can be called greenwashing perception [5].

Research has shown that corporate greenwashing practices contribute to consumer skepticism and distrust, consequently exerting a negative influence on corporate value, including reputational damage [4] and decreased corporate financial [6] and stock performance [7]. In addition to their impact on individual firms, the adverse effects of greenwashing behavior can extend to the entire industry. Studies have found that consumers’
perception of greenwashing by a particular brand diminishes their propensity to purchase green products from other brands within the same industry [8] and even jeopardizes the overall development of the industry [9].

As a strategic emerging industry associated with environmental sustainability, new energy vehicles have been the subject of active governmental initiatives. Among these, pure electric vehicles (EVs) have been identified by China as a potential avenue for transforming the automotive sector. At the same time, there has been a growing recognition of the importance of environmental issues, which has led to electric vehicles, which produce no emissions, becoming a key focus in consumer research into their purchase intentions. Therefore, this study primarily seeks to understand the purchase intentions of consumers who are particularly interested in pure electric vehicles. Existing research highlights the significant impact of consumer environmental awareness on the purchase intention of EVs [10–12]. Therefore, the presence of a series of greenwashing behaviors such as “subsidy cheating”, “exaggerated carbon reduction claims”, and “selective disclosure of environmental information” by some brands in the EV industry undoubtedly affects the purchase intention of consumers who choose EVs due to environmental concerns. However, existing research on factors influencing purchase intentions with respect to EVs primarily focuses on functional aspects, safety considerations, and purchase subsidy policies [13–16].

Based on this, our study aims to investigate the following three questions concerning brand greenwashing behavior in the EV industry: (1) Does the greenwashing behavior exhibited by a specific brand of EV impact consumers’ purchase intention towards other brands within the industry? (2) If such an impact exists, what are the underlying mechanisms driving this relationship? (3) If consumers become cognizant of the negative perceptions generated by certain brand greenwashing behaviors, what proactive strategies can other brands employ to effectively counteract these adverse effects?

Our research enriches the existing literature on greenwashing perception and consumer behavior by shedding light on the relationship and mediating pathways between consumer greenwashing perception and purchase intention. Moreover, we provide insights into why consumers, despite harboring high levels of green skepticism, still choose to purchase EVs. Additionally, our findings offer theoretical guidance for non-greenwashing brands in the EV industry on effectively mitigating the negative impact of greenwashing information from other brands.

The rest of this paper is structured as follows. Section 2 presents a literature review, which includes the theoretical foundation and hypothesis generation. Section 3 details the research design, including four experiments, with a preliminary experiment. Section 4 presents the research conclusions, contributions, limitations of the study, and suggestions for future research directions.

2. Literature Review

2.1. Theoretical Foundation

“Spillover effect” refers to the impact of policies, technologies, or economic activities in a specific domain extending to other domains. This extension can be either positive or negative and may be unexpected or anticipated. In the context of consumer behavior, a “spillover effect” refers to the phenomenon where the characteristics or actions of one entity influence other entities that have some form of relationship with or share common attributes with the first entity but not necessarily exhibiting the same characteristics or behaviors [17]. Research has found that corporate environmental actions can generate positive spillover effects on industry chains and society through aspects such as technological innovation, brand influence, and policy promotion. Therefore, the spillover effect of a company’s environmental actions can be defined as the negative impact (e.g., reduced purchase intention) of one brand’s environmentally friendly actions on other brands in the same industry that provide green products or services [8]. Furthermore, all EV brands are interconnected in consumers’ perceptions, i.e., consumers employ a single brand as a
benchmark to assess other brands within the same industry, consequently influencing their purchase intention towards other brands of EV, regardless of whether they are greenwashing brands or non-greenwashing brands. Consequently, the disingenuous environmental claims made by a specific brand operating in the EV industry could propagate adverse repercussions that extend to other brands operating within the same industry.

To better understand the dissemination mechanism of greenwashing behavior, we employed the ABC attitude model. This model is commonly used in attitude research and provides a useful framework for understanding how attitudes lead to behaviors [18]. The ABC attitude theory divides attitudes into the following three components: affective (emotional responses to the object), behavioral (tendencies toward the object), and cognitive (evaluations of the object) factors [19]. Cognitive factors encompass an individual’s knowledge, beliefs, thoughts, and so on about the object, while affective factors involve an individual’s feelings and emotional responses to the object [20]. Behavioral factors pertain to an individual’s inclinations and choices regarding behavior toward the object. These factors interact with each other, forming an individual’s attitude toward the object and, concurrently, shaping the individual’s behavior [21]. In the ABC theory, cognition, emotion, and behavior mutually influence each other, constituting a dynamic, interactive attitude system that affects the formation and change of an individual’s attitudes [22]. In other words, consumers’ attitudes towards a product are not solely determined by their beliefs about that product but also by their overall subjective evaluation. In this context, “attitude” refers to the subjective assessment of an object (e.g., perception of a specific product or brand), which provides insights for interpreting and predicting human behavior [22]. Martinez (2007) noted that consumers form affective preferences for products based on existing cognition, which then influence behavior, emphasizing the mediating role of affective responses in decision making [23]. Consequently, the ABC model of attitudes has been applied in the field of consumer behavior [24].

2.2. Greenwashing Perceptions and Purchase Intention

Greenwashing, a combination of “green” and “whitewashing”, refers to the deceptive environmental claims and embellishment practices of businesses. It was first introduced by environmentalist Jay Westerveld in 1986 and is defined as “the practice of making unsubstantiated or misleading claims about the environmental benefits of a product, service, technology, or company” [25]. Early research predominantly viewed greenwashing from a marketing perspective, depicting it as a strategic approach employed by environmentally conscious businesses to gain market share [1]. Corporate greenwashing is the dissemination of false environmental information by companies as a means to restore public relations or establish a positive public image, and it involves the manipulation and camouflaging of genuine and false information as core tactics [26]. Subsequent scholars began defining corporate greenwashing from an information communication standpoint. Some consider it an information management strategy whereby companies selectively and tendentiously convey their messages, promoting positive information while concealing negative aspects to shape their green and environmentally friendly image [27]. It involves the crossroads of concealing poor environmental performance and actively promoting environmental initiatives [28]. Similarly, symbolic management theory defines corporate greenwashing as a behavior whereby companies engage in superficial environmental marketing without substantive environmental efforts [29], characterized by selective disclosure of environmental information [30]. In the context of consumer perspectives on corporate greenwashing, the concept of greenwashing perception becomes crucial. Greenwashing perception refers to consumers’ psychological discernment of whether companies engage in deceptive advertising and conceal genuine environmental information. It also represents consumers’ cognitive assessment and judgment of the authenticity and reliability of a company’s environmental behavior [5]. Green purchase intention refers to consumers’ willingness to purchase sustainable and environmentally friendly products, reflecting their readiness to buy products or services from companies with environmental reputations [31].
Existing research indicates that when faced with corporate green environmental information, some consumers perceive the claimed green environmental behaviors or environmentally friendly attributes of products as mere marketing strategies, leading them to distrust the green information and believe that the company is engaged in greenwashing [32]. When consumers perceive corporate greenwashing behavior, they no longer rely on the brand and its products [30], viewing the brand as profit-driven and lacking in social responsibility [33], which results in negative consumer effects [34]. Moreover, in the era of big data information, negative greenwashing information about a brand can easily spread widely, drawing consumers’ attention and vigilance towards greenwashing. People tend to pay more attention to negative information than positive information [35,36] because negative information carries more evaluative judgment. Therefore, once consumers perceive greenwashing in a particular brand, they may infer that other brands within the industry are also engaged in greenwashing, reducing their purchase intention towards other green brands within the industry [36].

If a brand fails to fulfill its energy- or environmentally related commitments, consumers’ identification and purchase intention towards that brand will decrease [37], leading to distrust towards non-greenwashing brands within the industry and a reduced purchase intention towards their products [38]. This indicates that consumers no longer wish to establish trust with the brand [38] and become more cautious in future encounters with similar green products and may even discourage others from purchasing products from the same brand [39]. Therefore, this study makes the following hypothesis:

**H1.** Consumers’ greenwashing perception of a brand of EV negatively affects purchasing intention with respect to other brands in the industry.

### 2.3. Green Skepticism and Purchase Intention

The original meaning of “skepticism” is to consider, reflect, and deliberate, while consumer skepticism refers to the tendency of consumers to distrust marketers and their marketing behavior, encompassing concepts such as sarcasm, doubt, and mistrust [40]. Green skepticism refers specifically to consumers’ skepticism towards green products or advertisements related to product greenness, representing a manifestation of skepticism within the domain of green consumption [41]. Consumers with a certain degree of green skepticism tend to believe that companies promote or produce green products for utilitarian motives. They are more prone to question the commercial motives behind green products or corresponding green advertisements and harbor doubts about the authenticity of environmental claims. In China, despite many companies claiming active participation in environmental protection, actual instances of environmental pollution persist. Such “greenwashing” behaviors further intensify consumers’ skepticism towards companies’ environmental claims, making it challenging for consumers to be persuaded by the environmental effectiveness of green products. They may even develop a lower sense of value perception towards green products or companies, perceiving them as providing misleading and exaggerated information regarding the green attributes or environmental health attributes of the products [42].

Greenwashing perception results in lower perceived value and increased distrust [43]. When companies promote their corporate social responsibility, consumers may develop a tendency of skepticism, perceiving it as a means to conceal certain matters [44]. This skepticism is particularly prominent when companies claim to implement environmental practices but fail to take any concrete actions. Consumers can often discern this discrepancy and demonstrate skepticism towards their environmental behavior, known as green skepticism [44]. As the incidence of corporate greenwashing increases, doubts regarding companies’ green claims also grow [45]. Current research on green skepticism indicates that the influence of intrinsic motives on green skepticism should consider the impact of greenwashing behavior, as greenwashing behavior can affect green skepticism [38]. When
consumers perceive greenwashing in a specific brand of EV, they develop green skepticism towards the entire EV industry. Therefore, this study makes the following hypothesis:

**H2.** Consumers’ greenwashing perception in a brand of EV will positively influence their green skepticism towards the entire EV industry.

The occurrence of greenwashing behaviors creates an illusion of greater environmental friendliness for companies, prompting consumers to engage in further contemplation when faced with information about corporate environmental practices and green products and services. As consumers perceive instances of greenwashing, their trust in green products diminishes, subsequently reducing their willingness to purchase similar green products [5]. When consumer green skepticism reaches a certain level, even individuals with a strong sense of environmental responsibility fail to fulfill their commitment to green consumption and to engage in green consumer behaviors. Consequently, when consumers perceive greenwashing behaviors in a specific brand of EV, they develop skepticism towards the environmental attributes of other brands of EV, leading to a decrease in their purchase intention.

Green skepticism is associated with a negative attitude towards the claimed environmentally friendly image of green products [46]. Leonidou et al. (2017) examined the antecedents and consequences of green skepticism using attribution theory and found a direct negative relationship between green skepticism and future purchase intention [38]. It has also been suggested that green skepticism influences purchase intention through the mediating mechanisms of environmental concern and subjective environmental knowledge. In addition to reducing purchase intention, green skepticism also leads to negative evaluations of green products by consumers. Based on these considerations, the following hypotheses are proposed:

**H3.** Consumers’ green skepticism of the industry negatively affects consumer purchase intention towards other EV brands.

**H4.** Consumers’ green skepticism of the industry mediates and strengthens the relationship between consumers’ greenwashing perception of a brand of EV and their purchase intention towards other brands.

### 2.4. The Moderating Effect of Consumer Innovativeness

Consumer innovativeness is an inherent personality trait that drives individuals to actively embrace change and try new things. Midgley et al. (1978) defined consumer innovativeness as “the extent to which individuals make innovative decisions independently without communicating their experiences to others” and further classified it into the following two types: actual innovativeness and innate innovativeness [47]. Actual innovativeness emphasizes the adoption of innovative products by consumers and refers to the degree to which individuals adopt innovative products earlier than others in their social environment [48]. Innate innovativeness highlights the innate ability of individuals for innovation and is considered an enduring personal trait [49]. It focuses on the inclination of consumers to experience or try new things, which, to some extent, exists in all individuals and is seen as an inclusive personality trait [50, 51]. Considering the research focus on EVs, this study adopts the concept of actual innovativeness, defined as the tendency of consumers to adopt a specific new product, namely the inclination of consumers to adopt new things.

Consumer innovativeness is an intrinsic inclination of consumers to pursue new information, stimuli, and experiences. It reflects the degree to which consumers are more willing than others in their social network to adopt new things at an earlier stage, effectively explaining their varied responses to the adoption of new products [52]. Studies have found that consumers with higher innovativeness exhibit a greater willingness to adopt new products compared to other consumers [53]. They are also more adept at learning and
operating new things and perceiving their utility, in addition to showing a propensity to use them. For instance, highly innovative consumers tend to adopt bike-sharing services at an earlier stage [33]. Moreover, highly innovative consumers perceive lower risks and have higher purchase intentions [54]. For example, when it comes to online fresh food purchases, highly innovative consumers perceive less risk and, thus, demonstrate a reduced decrease in purchase intentions compared to less innovative consumers. As a nascent industry [55], EVs incorporate highly innovative technologies such as lithium batteries and advanced electronic devices. They represent innovative products in the early adoption stage. Consumers with high innovativeness are more likely to adopt EVs earlier than others, gaining a sense of achievement, fulfillment, self-value affirmation, and recognition for being trendsetters. Simultaneously, they have a reduced perception of green risks associated with EVs, leading to positive attitudes and intentions toward purchasing them. Thus, this study proposes the following hypothesis:

H5. Consumer innovativeness moderates the relationship between greenwashing perception and EV purchase intention, indicating that highly innovative consumers are capable of attenuating the negative influence of greenwashing perception on their purchase intention.

2.5. The Moderating Effect of Brand Attitude

Ajzen and Fishbein defined brand attitude as a consumer’s enduring positive or negative reaction tendency towards a specific brand. According to the ABC attitude theory, attitudes are formed through the combined influence of affect, behavior, and cognition. Brand attitude, in turn, represents the evaluation of consumers’ affective, behavioral, and cognitive responses towards a brand. Thus, the ABC attitude theory can be employed to expound on the formation of brand attitudes and the factors influencing them. In accordance with the ABC theory, attitudes do not invariably translate into expected behaviors. Behavior is contingent upon a range of situational factors [22], and these contextual elements can either facilitate or restrain individual behavior, potentially serving as moderating variables between attitudes and behaviors [56]. Consequently, it becomes imperative to consider the situational factors that may either facilitate or hinder consumer purchase behaviors. These situational variables, as described by Barr, include unique circumstances in the behavioral context, individual characteristics, personal knowledge, and past experiences [57]. Accumulating brand knowledge and firsthand experiences with a brand’s offerings play a pivotal role in shaping consumer brand attitudes. Furthermore, research by Balzer and Sulsky (1992) suggests that brand attitudes lead to selective attention and biased information processing, causing consumers to overlook negative information that contradicts their positive brand perceptions [58].

Maintaining a long-term positive attitude towards a brand can effectively enhance marketing efficiency [59], increase brand profitability, elevate product value, and weaken negative word of mouth [60], among other benefits. This phenomenon is akin to the “halo effect” observed in psychology, which refers to the tendency to form a favorable (or unfavorable) impression of a person or object based on one aspect, leading to a subjective belief that other aspects of that person or object are also positive (or negative). For instance, when someone notices another person dressed appropriately, they may use mental heuristics to infer that the person is good [61]. Similarly, consumers may form positive judgments and exhibit elevated brand attitudes, choosing to trust a brand’s environmental claims if they find the brand’s performance in other dimensions satisfactory. Typically, consumers with higher brand attitudes exhibit greater resistance to negative brand information compared to those with lower brand attitudes. Consumers with high brand attitudes may engage in biased assimilation and demonstrate higher resistance to counter-attitudinal information that could lead to opposing attitudes [62]. Moreover, Nguyen’s research (2019) has highlighted that green skepticism can modulate the relationship between consumers’ green perception and their intention to purchase eco-friendly products through consumers’ attitudes [42]. In the context of EVs, consumers with varying brand attitudes exhibit varying degrees
of resistance to the industry’s green perception. In comparison to consumers with lower brand attitudes, those with higher brand attitudes are more prone to resist the negative impact of green perception on their purchase behavior. Therefore, the following hypothesis is proposed:

**H6.** Consumer brand attitudes negatively moderate the relationship between green skepticism towards the entire EV industry and the purchase intention of other EV brands.

Based on theoretical foundations and hypothetical derivation, this study focuses on exploring the pathway through which greenwashing of EV brands influences purchase intention. In this research framework, green skepticism is introduced as a mediating variable, while consumer innovativeness and brand attitudes are considered as moderating variables. The research framework is shown in Figure 1.

![Figure 1. Theoretical model.](image)

### 3. Research Method

#### 3.1. Research Design Framework

This paper investigates these hypotheses across four studies (one pilot test and three formal experiments). The pilot test validates the experimental manipulation’s activation of greenwashing perception among participants. Experiment 1 aims to illustrate both the main and mediating effects of industry-wide skepticism of the sector. Experiment two tests the moderating influence of consumer innovativeness, while experiment three explores how consumers’ attitudes towards alternative brands moderate these effects. The detailed research designs are outlined in Table 1.

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<thead>
<tr>
<th>Study</th>
<th>Research Objectives</th>
<th>Research Design</th>
<th>Research Subjects</th>
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<tbody>
<tr>
<td>Pilot test</td>
<td>Testing whether participants’ perception of ‘green attractiveness’ is activated—textual description</td>
<td>Preference for purchasing EVs</td>
<td>Experimental location: automobile sales center in a certain city</td>
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<td></td>
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<td>Participants: intending car buyers</td>
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<td>Sample size: 30</td>
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<tr>
<td>Experiment 1</td>
<td>Testing Hypothesis 1: Consumers’ perception of ‘green attractiveness’ of one brand of EV will influence their willingness to purchase other brands of EV</td>
<td>One-factor (stimulus: presence of green attractiveness information vs. absence of green attractiveness information) between-group experimental design</td>
<td>Experimental location: a university in southwest China</td>
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<td>Participants: graduating third-year graduate students</td>
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<td>Sample size: 210</td>
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### Table 1. Cont.

<table>
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<tr>
<th>Study</th>
<th>Research Objectives</th>
<th>Research Design</th>
<th>Research Subjects</th>
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<tr>
<td>Experiment 2</td>
<td>Testing the matching effect and underlying mechanisms of green attractiveness perception, consumer innovativeness, and consumer willingness to purchase EVs, i.e., testing H1, H2, H3, H4, and H5</td>
<td>Two-factor 2 (stimulus: presence of green attractiveness vs. absence of green attractiveness) × 2 (consumer innovativeness: high vs. low) between-group factorial design</td>
<td>Experimental location: a university in southwest China Participants: MBA students Sample size: 95</td>
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<td>Experiment 3</td>
<td>Testing all hypotheses</td>
<td>Two-factor 2 (stimulus: presence of green attractiveness vs. absence of green attractiveness) × 2 (consumer brand attitude: positive vs. negative) between-group factorial design</td>
<td>Experimental location: online survey platform Questionnaire Star Participants: consumers planning to purchase EVs Sample size: 268</td>
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### 3.2. Pre-Experiment

Before the formal experiment, a pilot study was conducted to ensure the validity of the main experimental materials and verify the successful activation of consumers’ perception of eco-friendly cues. Three virtual brands of EV, labeled as A, B, and C, were set up. Brand C represents an EV brand with eco-friendly cues, brand B represents a traditional automobile brand, and brand A represents other EV brands.

#### 3.2.1. Experimental Material Development

In the preliminary stage, we curated a collection of advertising materials on EVs from online sources and print media to develop stimuli for the experimental settings. To refine these materials semantically, a focus group of five doctoral candidates in marketing was convened. Their expertise was instrumental in enhancing the initial set of advertisements. Building on this foundation, a second focus group comprising five doctoral candidates in business administration engaged in a thorough discussion to fine-tune the advertising content. This meticulous, multi-stage process culminated in the successful creation of stimuli for two distinct experimental scenarios. The detailed advertising content is presented as follows:

The content provided to the control group was as follows:

“EV can reduce greenhouse gas emissions, decrease energy consumption, and lower energy reserve risks. The development of EV not only actively responds to the national call for energy conservation and emission reduction but also safeguards national energy security and grid stability. Therefore, it has received strong promotion from government authorities”.

The content provided to the experimental group was as follows:

“EV can reduce greenhouse gas emissions, decrease energy consumption, and lower energy reserve risks. The development of EV not only actively responds to the national call for energy conservation and emission reduction but also safeguards national energy security and grid stability. Therefore, it has received strong promotion from government authorities. However, in the development of the 'ClearGreen' brand of EV, there are issues such as improper handling of power batteries, resulting in extensive water pollution, exaggeration of the level of cleanliness, and fraudulent government subsidies”.

#### 3.2.2. Pre-Experiment Design and Procedure

Regarding the selection of experimental materials, first, 30 consumer subjects (\(M_{\text{age}} = 34.1, SD = 8.227; 76.6\% \text{ male}\) were randomly interviewed at a car dealership. Then, the first 15 interviewees were informed about the study on consumer car purchase preferences and were provided with information about the eco-friendly cues of brand C’s
EV. Only the latter 15 interviewees were informed about the study on consumer car purchase preferences, without any mention of the eco-friendly cues. Finally, the interviewees were asked about their purchase preferences for brand A and B automobiles, and a small gift was presented at the end of the interview.

3.2.3. Pre-Experiment Results

The experimental results showed that in the experiment without the stimulation of greenwashing cues, the proportion of participants expressing willingness to purchase brand A's EV was 73.3%. In contrast, in the experiment with the stimulation of greenwashing cues, the proportion decreased to 46.6%, resulting in a decline of 13.3% ($\chi^2(1) = 3.394, p = 0.065$). The test results indicated a significant difference in participants’ perception of greenwashing cues between different groups, confirming the successful manipulation of the experimental materials.

3.3. Study 1

Study 1 aimed to examine the influence of consumers’ perception of greenwashing on their willingness to purchase other brands of EV.

3.3.1. Experimental Procedure

We employed a between-group experimental design with a single factor as the independent variable (cue stimulus: greenwashing information vs. non-greenwashing information). The experimental procedure was conducted within a university setting and involved a cohort of 140 participants, all of whom were third-year graduate students participating in experiment 1 ($M_{age} = 24.66, SD = 1.371; 69.2\%$ female). Random assignment was used to allocate these participants to two distinct classrooms, where they were presented with the experimental materials that had been validated during the pilot study.

In classroom 1, the researchers initiated the session by elucidating the study’s overarching purpose, which entailed an investigation into consumer preferences for car acquisitions. Subsequently, participants were furnished with the control group materials stemming from the pilot study. They were then directed to complete a purchase preference questionnaire, gauging their inclinations toward brand A’s EV and brand B’s conventional automobiles. Subsequent to this initial phase, participants were exposed to the experimental group materials derived from the pilot study and, once again, instructed to complete the purchase preference questionnaire for brand A and brand B vehicles.

In classroom 2, the researchers also explained the purpose of the study as investigating car purchase preferences. The participants were presented with the experimental group materials from the pilot study and completed the car purchase preference questionnaire.

3.3.2. Experimental Results

A total of 210 valid questionnaires were collected, and all data in this study were analyzed using SPSS 25.0 software. By analyzing the consumers’ car purchase preference questionnaires, the spillover effect of greenwashing perception was examined. The investigation sought to ascertain whether a noteworthy distinction existed between consumers exposed to greenwashing cues and those who were not subjected to such stimuli. Chi-square statistical tests were used to compare the percentages of participants in different groups selecting different options for EVs.

The results revealed that in classroom 1, initially, among participants who were not exposed to greenwashing cues, 57.0% (53/70) chose brand A’s EV. However, after being informed about the greenwashing behaviors of EVs, the percentage of participants selecting brand A’s EV decreased to 43.0% (40/70), representing a reduction of 14.0% ($\chi^2(1) = 5.413, p = 0.020$; see Figure 2a). In classroom 2, the percentage of participants selecting brand A’s EV decreased to 41.1% (37/70), representing a reduction of 15.9% ($\chi^2(1) = 7.964, p = 0.005$; see Figure 2b). Hence, the perception of greenwashing cues for a specific brand of EV significantly reduced participants’ willingness to purchase other brands of EV. Thus, H1 is supported.
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3.3.3. Discussion

In experiment 1, we conducted on-site trials to preliminarily assess the potential influence of consumers’ perceptions of greenwashing by a specific EV brand on their propensity to purchase other EV brands. However, this initial experiment did not explore the underlying mechanisms of this influence, nor did it examine the potential moderating effect of consumer innovativeness on this relationship.

To fill these gaps, experiment 2 was designed with a more robust research framework. It aimed to elucidate the mediating pathways through which perceived greenwashing affects purchase intentions and to evaluate the moderating influence of consumer innovativeness on these pathways. These additional analyses are intended to offer a more holistic view, enhancing our understanding of consumer green purchasing intentions within the EV market.

3.4. Study 2

Study 2 aimed to validate the matching effect between greenwashing perception, consumer innovativeness, and consumers’ willingness to purchase EVs, as well as the underlying mechanism of intrinsic green skepticism as a mediator.

3.4.1. Experimental Procedure

Study 2 utilized a 2 (cue stimulus: greenwashing vs. non-greenwashing) \(\times\) 2 (consumer innovativeness: high innovativeness vs. low innovativeness) between-group factorial design to test the hypotheses. The experiment was conducted in a classroom at a university, with a total of 98 MBA students participating in the study (M_age = 30.82, SD = 4.85; 36.7% female). Similarly, experiment 2 used three virtual brands of new energy vehicles from the pre-test, namely brand A, brand B, and brand C. Brand C represents a new...
energy vehicle brand that exhibits greenwashing behavior, brand B represents a traditional
car brand, and brand A represents another new energy vehicle brand. Prior to the start
of the experiment, the participants were randomly assigned to two experimental groups,
namely group X and group Y (N_greenwashing cue stimulus = 49, N_non-greenwashing
cue stimulus = 49). In group X, the researchers presented the participants with the control
group materials from the pilot study, then administered the questionnaire. In group Y, the
researchers presented the participants with the experimental group materials from the pilot
study, then administered the questionnaire.

To ensure the reliability and validity of the measurements, the study primarily relied
on established and validated scales to design and modify the questionnaires. Actual
measurements were rated using a Likert 7-point scale, ranging from “1” (strongly disagree)
to “7” (strongly agree).

Consumer innovativeness (CI): The adopted scale was based on the work of Lao et al.
(2013) [63]. It included the following three items: “I enjoy trying new and innovative
products”, “I enjoy reading various information and news about new products”, and “I
enjoy learning and understanding the changes and features of new products”.

Purchase intention(PI): The scale was adapted from Bagozzi et al. (2001) [64]. It
consisted of the following three items: “I am willing to purchase brand A’s EV”, “I intend
to purchase brand A’s EV”, and “I prefer EVs over traditional automobiles”.

Green skepticism (GS): The scale was based on the scale used by Luo et al. (2020) [65].
It included the following three items: “The environmental claims of EVs are driven by
self-interest”, “I do not believe in the environmental claims made by the EV industry”, and
“The environmental benefits of EVs are exaggerated by the industry”.

To further ensure the questionnaire’s effectiveness, a subset of non-expert students
filled out the questionnaire, and adjustments were made accordingly to finalize the ques-
tionnaire. After collecting the questionnaires from both groups, consumer innovativeness
was divided into high and low groups using the median split method. Thus, group A was
divided into groups A1 (high consumer innovativeness—non-greenwashing cue stimulus)
and A2 (low consumer innovativeness—non-greenwashing cue stimulus). Group B was
divided into groups B1 (high consumer innovativeness—greenwashing cue stimulus) and
B2 (low consumer innovativeness—greenwashing cue stimulus). After removing invalid
questionnaires, a total of 95 valid questionnaires were obtained.

3.4.2. Experimental Results

Reliability and validity of the questionnaires. he reliability results indicated that the
Cronbach’s α coefficient for the green skepticism scale was 0.655, that for the willingness
to purchase an EV scale was 0.859, and that for the consumer innovativeness scale was 0.778. All
of these coefficients were above 0.6, indicating good internal consistency among the items.
The validity results demonstrated that the average variance extracted (AVE) for all latent
variables exceeded 0.5. Additionally, the standardized factor loadings for the items were all
above 0.5, and the composite reliability (CR) values were all above 0.7. These findings suggest
that the measurement scales used in this study exhibited high convergent validity.

Direct effect testing. One-way ANOVA results indicated that compared to consumers
exposed to greenwashing cues, consumers without greenwashing cue stimuli showed
a higher willingness to purchase brand A’s EV. Specifically, the absence of greenwash-
ing cue stimuli (M_non-greenwashing = 5.619, SD = 1.336) generated more positive
purchase intentions for brand A’s EV compared to the presence of greenwashing cue
stimuli (M_greenwashing = 4.116, SD = 1.033), showing a significant effect (F = 51.589,

p = 0.000). This finding provides further validation for Hypothesis 1. Furthermore,
the absence of greenwashing cue stimuli (M_non-greenwashing = 3.504, SD = 1.023)
etic stronger green skepticism compared to the presence of greenwashing cue stimuli
(M_greenwashing = 4.756, SD = 0.981), showing a significant effect (F = 38.394, p = 0.000).
This supports Hypothesis 2, confirming that the presence of greenwashing cues leads to
reduced green skepticism.
To further examine the mediating effect of green skepticism between the perceived greenwashing of brand C and the willingness to purchase brand A’s EV, a mediation analysis was conducted using the bootstrap method proposed by Hayes (2013). Process SPSS 25.0 software was utilized, selecting Model 4, with 5000 bootstrapping samples at a 95% confidence interval [66]. The results indicated that green skepticism towards the entire EV industry negatively influenced consumers’ willingness to purchase brand A’s EV (β = −0.401, p < 0.001). Furthermore, the mediating effect of green skepticism in the relationship between the greenwashing behavior of brand C and the willingness to purchase brand A’s EV was significant (indirect effect = −0.482, 95% CI [−0.8293, −0.2147], not including 0) (see Table 2). Therefore, Hypotheses 3 and 4 are supported.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Effect</th>
<th>SE</th>
<th>LLCI</th>
<th>ULCI</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct effect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3: GS → PI</td>
<td>−1.021</td>
<td>0.229</td>
<td>−1.476</td>
<td>−0.566</td>
<td>Supported</td>
</tr>
<tr>
<td>Indirect effect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4: GWP → GS → PI</td>
<td>−0.482</td>
<td>0.155</td>
<td>−0.829</td>
<td>−0.215</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Moderation effect analysis. The moderation effect was tested using multiple regression analysis. Specifically, the analysis treated perceived greenwashing as a dummy variable (1 = perceived greenwashing, 0 = no perceived greenwashing). Consumer innovativeness was centered, and both innovativeness and its interaction with perceived greenwashing were included as predictors in the model, with purchase intention for new energy vehicles as the dependent variable. The results of the regression analysis indicated a significant moderating effect of consumer innovativeness (F(1, 97) = 13.066, p < 0.001).

To further understand the moderating effect of consumer innovativeness, the sample was divided into high- and low-involvement groups based on one standard deviation above and below the mean of innovativeness, respectively. Simple effects analysis was conducted separately for these two groups. In the low-innovativeness group, consumers who perceived greenwashing in other brands of new energy vehicles (M = 3.49, SD = 1.12) showed significantly lower purchase intention compared to those who did not perceive greenwashing (M = 4.84, SD = 1.37) (F = 0.084, p < 0.01). However, in the high-innovativeness group, there was no significant difference in purchase intention between consumers who perceived greenwashing (M = 5.07, SD = 0.68) and those who did not perceive greenwashing (M = 5.19, SD = 1.04) in other brands of new energy vehicles (F = 0.007, p = 0.451 > 0.1). Thus, when consumer innovativeness is high, there is evidence of an innovation blurring effect; even if consumers perceive greenwashing in brand C’s new energy vehicles, it does not decrease their purchase intention for brand A (see Figure 3). Therefore, Hypothesis 5 is validated.

Figure 3. Moderation effect of consumer innovativeness.
3.4.3. Discussion

In experiment 2, we conducted a field experiment to investigate how consumers’ perceptions of greenwashing behavior in one brand of new energy vehicles influence their purchase intention towards other brands of new energy vehicles. We found that consumers’ general skepticism towards the industry’s green practices mediated this influence process. In addition, consumers’ level of innovativeness significantly moderates this effect; for consumers with low innovativeness, skepticism towards the industry significantly reduces their purchase intention for other brands of new energy vehicles. In contrast, for consumers with higher innovativeness, this skepticism does not affect their purchase intention, demonstrating an innovation blurring effect. However, the potential moderating role of consumers’ brand attitudes was not considered in experiment 2. Given that both experiments 1 and 2 used a single offline student sample, we planned to conduct a more extensive online experiment in experiment 3 using the Questionnaire Star platform to increase the external validity of the study and to test the moderating effect of consumer brand attitudes.

3.5. Study 3

The purpose of experiment 3 was to examine the moderating effect of consumer brand attitudes and further rigorously test all hypotheses to enhance the robustness of empirical findings.

3.5.1. Experimental Procedure

Experiment 3 was an online study conducted using the Questionnaire Star platform. Electronic questionnaires were distributed in provinces such as Hunan, Guangdong, Yunnan, Shandong, Liaoning, etc. During the survey, participants who completed the questionnaire in full received an RMB 3 red-envelope reward. A total of 300 questionnaires were distributed, and 268 valid responses were obtained after excluding samples that did not meet the criteria, were completed too quickly, or contained inconsistent answers.

To control for participants’ brand attitudes and ensure that they formed genuine brand attitudes towards the experimental materials, two authentic brands were used. Additionally, the greenwashing brand was created from the fictional brand “ClearGreen” to ensure that participants’ prior purchasing experiences or existing brand attitudes would not interfere with the study.

To assist in determining high and low brand attitudes towards EV brands, 50 respondents were randomly interviewed. Based on the rankings of the top-ten EV brands on the 2023 Maigoo Brand Ranking website, respondents were asked to choose their preferred EV brands based on the dimensions of reliability, popularity, and attractiveness. The results showed that BYD ranked highly, being perceived as the most trustworthy brand with the highest brand attitude. On the other hand, AITO (AITO) was positioned at the bottom of the list, indicating the lowest brand attitude. Therefore, BYD was chosen to represent high brand attitudes towards EVs, while AITO was selected to represent low brand attitudes. To ensure the effectiveness of the experimental manipulation of brand attitudes, an online questionnaire survey was conducted. The brand attitude scale was adapted from the research scale developed by Aaker and Jacobson (2001) [67] and included the following four items: “I like the BYD/AITO brand”, “I find the BYD/AITO brand attractive to me”, “I hold a positive attitude towards the BYD/AITO brand”, and “I have a favorable overall impression of the BYD/AITO brand”. Ultimately, 108 valid questionnaires were collected for BYD, and 110 valid questionnaires were collected for AITO. The results indicated that both the BYD and AITO scales exhibited good internal consistency (α_BYD = 0.79, α_AITO = 0.76). The brand attitude towards BYD (M_BYD = 5.06, SD = 1.26) was significantly higher than the brand attitude towards AITO (M_AITO = 3.77, SD = 1.31) (F = 2.74, p = 0.009). The two brands chosen for the study demonstrated successful control over brand attitudes.
3.5.2. Experimental Results

To assess the willingness to purchase non-greenwashing brand EVs as the dependent variable, a two-group analysis of variance (ANOVA) was conducted, with one group receiving greenwashing cue stimulus from the “ClearGreen” brand and the other group not receiving it. The results of the one-way ANOVA revealed a significant difference between the two groups. The group exposed to the greenwashing cue stimulus showed a significantly lower willingness to purchase non-greenwashing brand EVs compared to the group without the greenwashing cue stimulus (M_non-greenwashing = 4.91, M_greenwashing = 3.53, F = 4.64, p = 0.003). This finding validates the presence of the spillover effect of greenwashing perception. Hence, we have once again confirmed Hypothesis 1.

This study employed SPSS 26.0 for hierarchical regression analysis in order to further explore causal relationships between variables, with the objective of validating the theoretical model and research hypotheses proposed earlier. As illustrated in Table 3, Model 1 indicates that the greenwashing behavior of a brand has a significantly positive influence on purchase intention towards the overall green practices in the EV industry (β = −0.600, p < 0.001), thereby confirming H2 (Table 3—M1).

Table 3. The results of hierarchical regression analysis.

<table>
<thead>
<tr>
<th>Variable</th>
<th>GS</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M1</td>
<td>M2</td>
</tr>
<tr>
<td>GWP</td>
<td>−0.600 *** (0.150)</td>
<td>−0.571 *** (0.139)</td>
</tr>
<tr>
<td>GS</td>
<td>0.027 (0.150)</td>
<td>0.110 (0.139)</td>
</tr>
<tr>
<td>Gender</td>
<td>0.008 (0.063)</td>
<td>0.038 (0.058)</td>
</tr>
<tr>
<td>Age</td>
<td>0.011 (0.045)</td>
<td>−0.083 (0.061)</td>
</tr>
<tr>
<td>Education</td>
<td>0.061 (0.066)</td>
<td>0.086 (0.056)</td>
</tr>
<tr>
<td>Income</td>
<td>0.368 (0.066)</td>
<td>0.346 (0.056)</td>
</tr>
<tr>
<td>R²</td>
<td>24.442 ***</td>
<td>22.198 ***</td>
</tr>
<tr>
<td>Adj R²</td>
<td>0.353</td>
<td>0.330</td>
</tr>
</tbody>
</table>

***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

In addition, this study employed the three-step mediation analysis proposed by Baron and Kenny to examine the mediating effect of green skepticism in the EV industry. First, a linear regression analysis was conducted, with the willingness to purchase non-greenwashing brand EV as the dependent variable and the greenwashing behavior of the “ClearGreen” brand as the independent variable (1 = with greenwashing cue; 0 = without greenwashing cue). The results indicated that the greenwashing behavior of the brand had a significant negative impact on the willingness to purchase non-greenwashing brand EVs (β = −0.571, p < 0.001), confirming Hypothesis 1 once again (Table 3—M2). Subsequently, we conducted a linear regression analysis to examine the relationship between consumer skepticism towards green practices in the new energy vehicle industry and purchase intention towards non-greenwashing brand new energy vehicles. The results indicate that consumer skepticism towards the industry’s green practices has a negative influence on consumers’ purchase intention towards another brand of new energy vehicles (β = −0.558, p < 0.001), confirming Hypothesis 3 (see detailed results in Table 3—M3).

Finally, a linear regression analysis was conducted using greenwashing behavior of “greenwashed” brand vehicles and consumer skepticism towards green practices in the
new energy vehicle industry as independent variables and purchase intention towards non-greenwashing brand new energy vehicles as the dependent variable. The results demonstrate that consumer skepticism towards the new energy vehicle industry significantly mediates the relationship between a brand’s greenwashing behavior and purchase intention towards non-greenwashing brand new energy vehicles \((\beta = -0.336, p < 0.001)\), thereby confirming Hypothesis 4 (Table 3—M4).

Finally, we examined the moderating effect of non-greenwashing brand attitude on the relationship between green skepticism towards the EV industry and the willingness to purchase non-greenwashing brand EVs. A linear regression analysis was conducted, with the willingness to purchase non-greenwashing brand EVs as the dependent variable and green skepticism and non-greenwashing brand attitude as the independent variables. The results revealed a significant interaction effect between green skepticism and non-greenwashing brand attitude \((\beta = 0.131, p < 0.055)\). Furthermore, the separate linear regression analyses for each brand attitude group indicated the following. In the low brand attitude group, green skepticism had a negative impact on the willingness to purchase non-greenwashing brand EVs \((\beta = -0.512, p < 0.001)\); however, in the high brand attitude group, green skepticism did not have a significant effect on the willingness to purchase non-greenwashing brand EVs \((\beta = 0.105, p < 0.199)\). This suggests that the influence of green skepticism on the willingness to purchase non-greenwashing brand EVs depends on the consumer’s brand attitude. Hence, Hypothesis 6 is supported.

3.5.3. Discussion

In the third stage of this study, we conducted a comprehensive validation of all hypotheses through an online experimental design (Table 4). In contrast to the offline experiments conducted in the first two stages, experiment 3 sought to address limitations in sample selection by broadening participant diversity through online platforms, thereby enhancing the study’s representativeness and generalizability.

<table>
<thead>
<tr>
<th>Study</th>
<th>Hypothesis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment 1</td>
<td>H1: Consumers’ greenwashing perception of a brand of EV negatively affects purchasing intention with respect to other brands in the industry.</td>
<td>H1: ✔</td>
</tr>
<tr>
<td></td>
<td>H2: Consumers’ greenwashing perception in a brand of EV will positively influence their green skepticism towards the entire EV industry.</td>
<td>H2: ✔</td>
</tr>
<tr>
<td></td>
<td>H3: Consumers’ green skepticism of the industry negatively affects consumer purchase intention towards other EV brands.</td>
<td>H3: ✔</td>
</tr>
<tr>
<td></td>
<td>H4: Consumers’ green skepticism of the industry mediates and strengthens the relationship between consumers’ greenwashing perception of a brand of EV and their purchase intention towards other brands.</td>
<td>H4: ✔</td>
</tr>
<tr>
<td></td>
<td>H5: Consumer innovativeness moderates the relationship between greenwashing perception and EV purchase intention, indicating that highly innovative consumers are capable of attenuating the negative influence of greenwashing perception on their purchase intention.</td>
<td>H5: ✔</td>
</tr>
<tr>
<td>Experiment 2</td>
<td>H1: Consumers’ greenwashing perception of a brand of EV negatively affects purchasing intention with respect to other brands in the industry.</td>
<td>H1: ✔</td>
</tr>
<tr>
<td></td>
<td>H2: Consumers’ greenwashing perception in a brand of EV will positively influence their green skepticism towards the entire EV industry.</td>
<td>H2: ✔</td>
</tr>
<tr>
<td></td>
<td>H3: Consumers’ green skepticism of the industry negatively affects consumer purchase intention towards other EV brands.</td>
<td>H3: ✔</td>
</tr>
<tr>
<td></td>
<td>H4: Consumers’ green skepticism of the industry mediates and strengthens the relationship between consumers’ greenwashing perception of a brand of EV and their purchase intention towards other brands.</td>
<td>H4: ✔</td>
</tr>
<tr>
<td></td>
<td>H5: Consumer innovativeness moderates the relationship between greenwashing perception and EV purchase intention, indicating that highly innovative consumers are capable of attenuating the negative influence of greenwashing perception on their purchase intention.</td>
<td>H5: ✔</td>
</tr>
<tr>
<td>Experiment 3</td>
<td>H1: Consumers’ greenwashing perception of a brand of EV negatively affects purchasing intention with respect to other brands in the industry.</td>
<td>H1: ✔</td>
</tr>
<tr>
<td></td>
<td>H2: Consumers’ greenwashing perception in a brand of EV will positively influence their green skepticism towards the entire EV industry.</td>
<td>H2: ✔</td>
</tr>
<tr>
<td></td>
<td>H3: Consumers’ green skepticism of the industry negatively affects consumer purchase intention towards other EV brands.</td>
<td>H3: ✔</td>
</tr>
</tbody>
</table>

Table 4. Summary of hypothesis testing results.
Table 4. Cont.

<table>
<thead>
<tr>
<th>Study</th>
<th>Hypothesis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment 3</td>
<td>H4: Consumers’ green skepticism of the industry mediates and strengthens the relationship between consumers’ greenwashing perception of a brand of EV and their purchase intention towards other brands.</td>
<td>✔</td>
</tr>
<tr>
<td></td>
<td>H5: Consumer innovativeness moderates the relationship between greenwashing perception and EV purchase intention, indicating that highly innovative consumers are capable of attenuating the negative influence of greenwashing perception on their purchase intention.</td>
<td>✔</td>
</tr>
<tr>
<td></td>
<td>H6: Consumer brand attitudes negatively moderate the relationship between green skepticism towards the entire EV industry and the purchase intention of other EV brands.</td>
<td>✔</td>
</tr>
</tbody>
</table>

4. Research Conclusions and Implication

4.1. Conclusion

This study primarily delves into the influence of greenwashing behaviors in the EV industry on consumer preferences for automotive purchases. Rooted in the ABC attitude theory, the research integrates the mediating role of green skepticism and the moderating effects of brand attitudes and consumer innovation, investigating the impact of a specific brand’s greenwashing activities within the EV sector on consumers’ intention to purchase vehicles from other brands. Through a series of three experiments, the following research findings have been unveiled. First, consumers’ green perception of a particular brand’s EV significantly adversely affects their intent to purchase vehicles from other brands. Secondly, consumers’ green skepticism towards the overall EV industry amplifies the relationship between a brand’s greenwashing behavior and consumers’ willingness to purchase vehicles from other brands. Thirdly, consumer innovation negatively moderates the relationship between consumers’ green perception of a specific brand’s EV and their intent to purchase vehicles from other brands. Fourthly, consumers’ brand attitudes towards other brands negatively interact with green skepticism in the EV industry, influencing their intent to purchase vehicles from other brands.

This study contributes to the enrichment and expansion of the existing body of literature within the domains of green perception and consumer decision making and has significant implications for the advancement of the EV industry. The research results regarding greenwashing behaviors in the EV industry can be generalized to broader categories of green products due to their shared green attributes. In general, consumers tend to associate the green attributes of such products with health and a high-quality lifestyle. However, when consumers perceive greenwashing behavior associated with a green product, they become suspicious of the overall green and environmental performance of the entire industry, resulting in heightened caution when selecting green products in subsequent purchases.

4.2. Theoretical Implications

First, this study enriches the research on the relationship between greenwashing perception and consumer behavior, consistent with the findings of Nyilasy et al. (2014) [37]. With the increase in global environmental issues and heightened consumer environmental awareness, consumers are placing more emphasis on environmentally friendly products and services (Leonidou and Skarmeas, 2017) [38]. Through exposure to television news, online searches, and social media engagement, consumers become aware of the improper behaviors of certain companies in the development of EVs, which negatively impact consumer behavior and hinder purchase intentions (Chen and Deng, 2016) [39]. This study reveals that consumers’ perception of greenwashing behavior by one brand in the EV industry adversely affects their willingness to purchase other brands of EV, laying a foundation for future research on the relationship between greenwashing perception and consumer behavior.

Secondly, this study uncovers the causal relationship and pathways between consumer greenwashing perception and purchase intentions. The research findings demonstrate that
consumers’ perception of greenwashing behavior by one brand in the EV industry enhances their skepticism toward the entire industry’s environmental claims, subsequently reducing their purchase intentions for other brands of EV. The improper greenwashing behavior of a single company not only impacts its own product sales but also negatively affects other brands within the industry. This study contributes to the understanding of the outcomes of improper greenwashing behavior in the industry and provides a new explanation for the mechanism governing the relationship between industry-level greenwashing behavior and consumer responses.

Thirdly, it explains the reasons why consumers still choose to purchase EVs in high green skepticism scenarios. The research on the moderating effect of consumer innovation on purchase intentions for EVs is limited. This study constructed an empirical model to examine the moderating effect of consumer innovation, finding that consumer innovation can mitigate the negative impact of green skepticism on purchase intentions. This finding contributes to our understanding of why consumers maintain purchase intentions for EVs even after perceiving greenwashing behavior and highlights the importance of innovation acceptance in the development of emerging industries.

Fourth, this study provides theoretical guidance for non-greenwashing brands of EV to counter the negative impact of greenwashing information from other brands. Existing research on constraints for companies’ greenwashing behavior mainly focuses on government regulation and social forces [30,33], neglecting the contributions that brands themselves can make in addressing the spillover effects of greenwashing within the industry.

4.3. Practical Implications

First, this research underscores that greenwashing behaviors by a brand may trigger spillover effects, potentially significantly impacting the entire EV industry and its brands (including those engaged in greenwashing and those that are not). Specifically, once the greenwashing practices of a brand are exposed or widely disseminated, they can, to some extent, influence consumers’ perceptions of the entire EV industry, leading consumers to generalize such brands’ greenwashing behavior to the entire sector. In such circumstances, for brands not involved in greenwashing practices, adopting a low-profile strategy (even considering temporarily suspending advertisements claiming environmental contributions) may be a prudent approach. This is because consumer trust in the environmental reputation of EVs becomes uncertain, and existing marketing communications may lose effectiveness. Therefore, businesses should contemplate safeguarding brand reputation and enhancing credibility to address potential spillover effects.

Secondly, the empirical evidence of this study shows that the greenwashing behavior of one brand in the EV industry significantly impacts the purchase intentions of other non-greenwashing brands. This implies that the sales of one brand’s EV are not only influenced by its own consumers but also by the actions of competing brands within the industry. Therefore, for EV manufacturers not involved in greenwashing practices, merely ensuring the authenticity of their environmental claims is insufficient to maintain or expand their existing customer base because their purchase intent is likely to be influenced by the brands of their competitors within the same industry. However, this study validates that a positive brand attitude can effectively shield against the negative impact of greenwashing information from other brands. Hence, establishing a robust brand attitude will contribute to a competitive advantage for businesses in the market. Brand managers should particularly emphasize the cultivation and enhancement of brand attitudes in their day-to-day marketing activities, ensuring the creation of a trustworthy and memorable brand image to effectively counteract the potential adverse effects of greenwashing information from other brands. Through these efforts, companies can better maintain customer loyalty, establish sustainable customer relationships, and stand out in a highly competitive market.

Finally, the positive moderating effect of consumer innovation on the spillover effect of greenwashing provides a new solution for non-greenwashing brands to counter the negative impact of greenwashing information. Consumers with higher levels of innovation
tend to be young and well-educated and have higher household incomes. They possess strong self-judgment abilities and are less susceptible to external information interference. Therefore, when greenwashing information emerges within the industry, managers can implement differentiated marketing strategies targeting this consumer segment, continuing to promote the environmental and innovative values of EVs. Additionally, this segment of consumers has an inherent inclination to pursue new information, stimuli, and experiences. Therefore, automotive companies should enhance consumers’ purchasing and usage of EVs by applying new technologies, designs, and other methods to make them more innovative and fashionable and at the forefront of social trends. By incorporating novelty, fashionability, and trendiness, companies can strengthen consumers’ desire to purchase and use EVs.

4.4. Limitations and Future Research

There are still some shortcomings associated with this study. Firstly, it would be beneficial to distinguish between the long-term and short-term effects of greenwashing perceptions on purchase intentions in future research. This could help us gain a deeper understanding of the nuances of consumer purchasing behavior. Secondly, it is important to acknowledge the limitations of our experimental context. Our current approach may not have fully captured the nuances of how differences in various greenwashing behaviors could affect study outcomes. In future research, we will endeavor to design experiments more meticulously to reflect the specific impacts of different types of greenwashing behaviors on consumer perceptions and purchase intentions.

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