

DRIVING E-COMMERCE BRAND ATTACHMENT THROUGH GREEN PACKAGING: AN EMPIRICAL INVESTIGATION

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ABSTRACT

With the rapid development of e-commerce, online shopping has become an indispensable part of people's lives and unprecedentedly stimulates a paradoxical phenomenon—packaging pollution versus environmental protection. Therefore, it is necessary to discover a new relationship between green packaging and product brand from the consumer's perspective in e-commerce. To address this issue, this paper proposes a theoretical framework to examine the impact of green packaging on brand attachment in e-commerce and identify the multiple mediation effects of perceived value, brand attitude, and trust. Study respondents comprising a total of 257 online consumers in China were observed, and the data analysis was executed via structural equation modeling. The results indicate that green packaging has a positive effect on perceived value and brand attitude, both of which can directly influence brand attachment and indirectly influence brand attachment positively through trust. Furthermore, by employing a bootstrapping method to confirm the mediation effect, it was found that perceived value and brand attitude can directly or indirectly mediate the positive relationship between green packaging and brand attachment. Therefore, this study implies that online merchants should pay considerable attention to the role of green packaging in brand attachment and formulate their green marketing plans based on the viewpoint of consumers.

Keywords: Online shopping; Green packaging; Brand attachment; Multiple mediation effect; E-commerce

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1. Introduction

The rapid development of the express industry, coupled with the boom of e-commerce and online shopping, has produced substantial packaging waste and generated increasingly alarming environmental problems. Nevertheless, the prosperity of the express delivery industry for e-commerce has heavily promoted the well-being of the packaging industry. According to statistics obtained from the State Post Office, China's national express industry consumed more than 50 billion express waybills, 5.3 billion woven bags, 24.5 billion plastic bags, 5.7 billion envelopes, 14.3 billion packaging boxes, and 43 billion meters of tape in 2018. Such consumption has resulted in an enormous environmental problem that has received increasing criticism in practice; however, little attention has been paid to it in e-commerce research [Chen et al. 2019].

In essence, packaging in e-commerce not only plays the role of shielding products in the transportation process but is also crucial for the potential promotion of consumption. Therefore, the selection and use of green materials for online shopping packaging are important to protect and transport products and facilitate communication between products and consumers. Therefore, it is necessary to change the express packaging and promote the use of green packaging, which would lead to the transformation from express delivery to green logistics [Russo & Comi 2016]. Furthermore, e-commerce companies have realized that brand strategy is the key to successfully realizing the active development and enhancement of an e-commerce brand, which must be distinct in the face of fierce competition. Park et al. [2010] demonstrate that attachment to a brand is an important indicator that accurately reflects the extent of a consumer's emotional link to or fondness toward a brand. It is becoming increasingly difficult to obtain continuous brand loyalty. Therefore, the question of how to strengthen consumers' brand attachment and enhance the association between consumers and brands to promote consumers' brand loyalty is becoming increasingly important.

Environmental issues have attracted attention in business research gradually [Bose & Luo 2011; Chen & Chang 2013]. The startling fact that the recycling rate of packaging is far below 100% [Chen 2017] has highlighted the conflict between business development and environmental protection. Whereas companies may prioritize the cost and attractiveness of packaging, consumers worry about plastic bottle waste and therefore pay attention to nongreen packaging and its impact on the environment [Chen et al. 2015]. This conflicting view has triggered a brand attachment problem that needs to be solved in both practice and theory. Many scholars have confirmed that green logistics has a positive impact on companies' environmental, economic, and social performance [Zhu et al. 2007; Lai et al. 2012; Geng et al. 2017]. Green packaging, which is a critical part of green logistics, has an inestimable influence on e-commerce companies and consumers [Rokka & Uusitalo 2010].

The government has implemented policies and regulations on green packaging to relieve environmental deterioration [Aoqing & Zhenhua 2016]. However, they are merely used to restrain third-party logistics companies. The efficacy of these policies is not quintessential. Moreover, logistics companies that choose green packaging face a relatively high cost as a result of the governmental policies. Consequently, these companies have to implement a higher pricing strategy. This action stops e-retailers from turning to external logistics companies; they have to pack and deliver the products themselves instead. As a result, the environmental issue of e-commerce packaging has not been solved despite the implementation of a series of government policies. Against this background, motivated by the substantial waste and low recycling rate of packaging by e-commerce companies, as well as the huge potential of brands in e-commerce, the aim of this study is to explore the relationship between packaging and brand in the context of e-commerce and the environment.

From the perspective of consumers, this study is an early effort to examine green packaging as a consumer demand. A comprehensive literature review found that previous studies mainly focus on the benefits and trends of green product packaging [Scott & Vigar-Ellis 2014; Molina-Besch & Henrik Pålsson 2015; Arnaud 2017]; the in-depth interpretation of green packaging and its association with consumers' perceptions and the brand effect in e-commerce has not been studied thoughtfully. A summary of past studies on green packaging (see Appendix A) reveals that there is a paucity of research on the relationship between packaging and brand. Our study fills this gap by first introducing the cognition of the variables into the e-commerce context to investigate the driving of green packaging on e-commerce brand attachment. In e-commerce, we conjecture that consumers' understanding of products stems from the visual information obtained through the network interface and, more importantly, the critical visual presentation of offline packaging. We further posit that e-commerce brand attachment driven by packaging will play a pivotal role in influencing the behavioral intention of online shopping consumers. As such, the research question that drives this study is formulated as follows: How does green packaging influence consumers' brand attachment in e-commerce?

To address this research question, this study attempts to empirically test the impact of green packaging on brand attachment through the intermediary roles of brand attitude, perceived value, and trust. The value-belief-norm (VBN) theory and the cognition-affect-behavior (CAB) theory of attitude are used to understand the question.

This study contributes to the systematic provision of a theoretical foundation related to packaging, perceived value, brand attitude, trust, and brand attachment in the context of e-commerce and sustainable development. Multiple mediation effects are tested to analyze the influence mechanisms, which compensates for the limitations of previous studies. This study acknowledges the significance of green packaging in online shopping brand attachment and facilitates e-commerce firms' formulation of green packaging strategies.

The remainder of this paper is organized as follows. Section 2 presents the literature review and theoretical foundation. Section 3 proposes the research framework and constructs the hypotheses. Section 4 comprises the methodology and the measurement of the constructs. Section 5 analyzes the empirical results. Section 6 discusses the results and their implications. Section 7 draws the conclusions, offers suggestions, discusses the study limitations, and suggests directions for future research.

2. Literature Review and Theoretical Foundation

In line with the research objective, this section is composed of two parts. The first part explores the constructs (variables) that are specifically relevant to green packaging and can influence consumers' brand attachment in e-commerce. We summarize five concepts from the previous literature: green packaging, perceived value, brand attitude, trust, and brand attachment. The second part enables an in-depth understanding of the study's theoretical foundation to demonstrate the relationship between green packaging and brand attachment from the perspective of consumers in the e-commerce context. The conceptual framework we developed is an integration of the VBN theory and the CAB theory of attitude.

2.1. The Essential Aspects of Green Packaging

2.1.1. Green Packaging

Packaging plays an important role in the protection of products, improvement of logistical efficiency, and promotion of sales [Singh & Pandey 2018]. Thus, it is an indispensable part of commodity circulation. The following definition is found in the literature: "Green packaging or ecological packaging or environmentally friendly packaging is packaging that is completely made by natural plants, can be recycled or second-used, is prone to degradation and promotes sustainable development, even during its whole life-cycle; it is harmless to the environment and to the health of both the human body and livestock" [Zhang & Zhao 2012]. The extant research on packaging has focused primarily on advancing the understanding of the essential functions of packaging, such as labeling, feature, and size, in consumers' choices and decisions [Trivedi et al. 2018]. However, the scarcity of studies in e-commerce research has shed light on environmental protection packaging as a substitute for the least harmful impact on the environment [Rokka & Uusitalo 2010; Steenis et al. 2017]. Therefore, in an effort to extend this line of research, this study posits that the environmental pollution caused by packaging can be regarded as an indicator of green packaging, which is an interesting area of research [Delia 2010].

With reference to the literature and the regulations for packaging standards, green packaging is defined in this study as packaging that does not pollute the ecological environment, poses no harm to human health, can be recycled and reused, and promotes sustainable development. To explore consumers' brand attachment through green packaging, we have conducted a review of the literature and identified a wide range of constructs that directly or indirectly affect e-commerce consumer behavior. A summary of the recent research on green packaging from the top 10 databases (e.g. Emerald, Science Direct, EBSCOhost, ACM Digital Library, IEEE, JSTOR, ProQuest, Sage, Wiley online, and Springer link) is provided in Appendix A. This literature has extensively examined green packaging in a variety of contexts, including as an environmental threat, as well as in regard to ecological economics, consumer behavior, resource wastage, and marketing. The main theories that have been applied include random utility theory, the theory of reasoned action, and the theory of planned behavior. These studies that have implemented the survey or experiment methodology mainly address issues such as how to identify the cues that consumers use to recognize packaging as 'environmentally friendly' [Singh & Pandey 2018; Herbes et al. 2020; Prakash et al. 2019] and what affects consumers' willingness to pay for green packaging [Hao et al. 2018; Wensing et al. 2020; Wang et al. 2020]. Thus, the role of green packaging as an independent variable in the e-commerce context remains unknown.

2.1.2. Perceived Value

Perceived value is based on equity theory, which holds that consumers evaluate the ratio of their outcomes/inputs to those of service providers [Oliver & Desarbo 1988]. Previous studies have explored perceived value and defined it as the overall evaluation of the net contribution of a product or service based on a consumer's assessment [Bolton & Drew 1991; Patterson & Spreng 1997]. Consumers can gain value experience from products or services because they reap the benefits of the products or differentiate these benefits from those of alternative products and services [Agrawal et al. 2015]. In general, a company's outstanding product value can distinguish its products from its competitors' [Kim et al. 2008]. Moreover, the consumer's perceived value of a product or service

plays a crucial role in his or her value experience and evaluation of the product, as well as in the maintenance of the long-term relationship between the buyer and seller [Agrawal et al. 2015; Zboja et al. 2016]. In the context of rising environmental concerns and online shopping, we refer to the concept of perceived value as “a consumer’s overall appraisal of the net benefit of a product or service between what is received and what is given based on the consumer’s environmental desires, sustainable expectations, and green needs” [Patterson & Spreng 1997].

2.1.3. Brand Attitude

Attitude is described as one’s preference or internal assessment of an object, such as a product or brand [Sallam & Wahid 2012]. The attitude toward a brand, or brand attitude, is mostly defined as “the degree to which a person has favorable or unfavorable evaluations of the brand” [Smith et al. 2007]. Dillon et al. [2001] argued that consumers’ brand attitudes, which consist of cognitive and emotional factors, are related to their willingness to purchase. As the most important predictor of a consumer’s intention when he or she is choosing a brand or product in any shopping situation, brand attitude is able to act as a previous evaluation [Medina-Molina et al. 2021]. The following view of brand attitude, which is somewhat unlike that promoted in the available literature, is adopted here: “a person’s attitude towards a brand conveys an overall evaluation that can be derived from multiple information sources including both online and offline experiences with the brand” [Gabisch & Gwebu 2011].

2.1.4. Trust

Trust also refers to the degree to which one is willing to count on another based on the expectation of the other’s ability, reliability, and kindness [Chen & Chang 2013]. It consists of three beliefs—namely, integrity, kindness, and ability [Rotter & Julian 1971]. Ganesan [1994] further argued that trust is the willingness to rely on the wishes of another group based on the expectations generated by group competence, reliability, and kindness. This paper integrates the environmental protection context and the basis of credibility, and it refers to trust as the recognition and evaluation of environmental performance [Chen 2010]. This research proposes a notion of trust and defines it as “a willingness to depend on a product or service on the basis of the belief or expectation that results from its credibility, benevolence, and ability regarding environmental performance” [Chen 2010].

2.1.5. Brand Attachment

Schultz et al. [1989] defined attachment from the perspective of social cognition and self-concept. They emphasized that attachment is not a characteristic of individual consumers or consuming objects but an intersection or combination of the two. Thomson et al. [2005] stated that brand attachment is “a unique emotional bond” between consumers and brands. Certain divergences from the concept of brand attachment continue to exist in previous research. Escalas [2004] mentioned that brand attachment reflects consumers’ feelings and dependence on the brand. It can describe different aspects of the emotional relationship between consumers and brands, such as the persistence of the relationship, the refinement of values, and the expression of personal identity. Park et al. [2010] indicated that brand attachment is a cognitive and emotional link between the consumer and the brand, which includes two basic elements: (1) brand–self connection and (2) cognitive and emotional ties. The intensity of these elements can determine whether consumers are willing to purchase certain brands [Park et al. 2006]. As the brand becomes a part of a consumer’s life, it can lay the emotional foundation for feelings, self-connection, commitment, trust, and intimacy. In summary, brand attachment in this study refers to “the strength of the emotional link that connects the consumer and the brand, involving feelings toward the brand” [Japutra et al. 2018].

2.2. Theoretical Foundation

2.2.1. VBN Theory

The VBN theory is employed to provide an extensive understanding of consumers’ pro-environmental behavior, especially concerning environmental protection norms [Steg et al. 2005]. The VBN theory states that after integrating the value theory of psychology, activation theory of norm, and new environmental paradigm theory, the formation of environmental behavior can be explained by the interactions between values, beliefs, and norms [Stem et al. 1999]. This theory includes three factors: (1) value context, which includes biospheric, altruistic, and egoistic values; (2) belief context, including the perception of causation and the attribution of responsibility; and (3) norm context, which reflects people’s sense of obligation to act pro-environmentally [Stem et al. 1999]. We have chosen the VBN theory as an underlying theoretical foundation to marry the links of perceived value, trust, and brand attachment in the context of e-commerce and sustainable development. In an e-commerce environment, consumers’ adoption of product brand identification information is a three-step process. First, consumers gain their own perceptions of environmental pollution and perceived value through their experiences with green packaging; then, they generate their environmental responsibility and trust in green brands. Finally, they form personal criteria for environmental protection and develop brand attachment to green brands.

2.2.2. The CAB Theory of Attitude

The tripartite model of attitude incorporates three components—cognition, affect, and behavior [Aaldereen-Smeets et al. 2012]—of which there are several similar deformations. This study draws on the CAB theory of

attitude [Lavidge & Steiner 1961] to clarify the relationship between brand attitude, perceived value, and brand attachment. The theory proposes that a consumer’s attitude is formulated through three dimensional and psychological stages: (1) the cognitive stage, which constructs a consumer’s awareness and knowledge; (2) the affective stage, which constructs a consumer’s affection and belief; and (3) the behavior stage, which constructs a consumer’s purchase intentions. Consequently, this study posits that perceived value and brand attitude evaluate consumers’ brand attachments in the cognitive stage and locates trust and brand attachment in the emotional stage. Laforet [2011] tested the relationship between packaging and brand and confirmed that green packaging can convey positive brand information and affect brand personality, consumers’ brand attitudes, and purchase intentions [Chen 2017]. As one of the green brand business strategies, green packaging can reflect brand personality and influence consumers’ perceived values and brand attitudes, resulting in an increase in consumers’ trust in and attachment to product brands.

3. Literature Review and Theoretical Foundation

In this section, we present our research model and the theoretical arguments for our hypotheses. Based on this theoretical foundation, we define the differences and links between concepts that include green packaging, perceived value, brand attitude, trust, and brand attachment. Moreover, synergizing the theories of the VBN theory and the CAB theory of attitude, we present the relevant hypotheses and the research model of this study.

While others have investigated the characteristics and functions of packaging to expand their conceptual spectrum, this paper focuses on investigating e-commerce brand attachment in reaction to green packaging. This study conjectures that green packaging has a positive impact on brand attachment and that the relationship is mediated by brand attitude, perceived value, and trust. The research framework identifies a seven-stage path analytic model with green packaging as the antecedent variable; brand attachment as the outcome variable; and brand attitude, perceived value, and trust as the three partial mediators. Figure 1 presents the proposed research model.

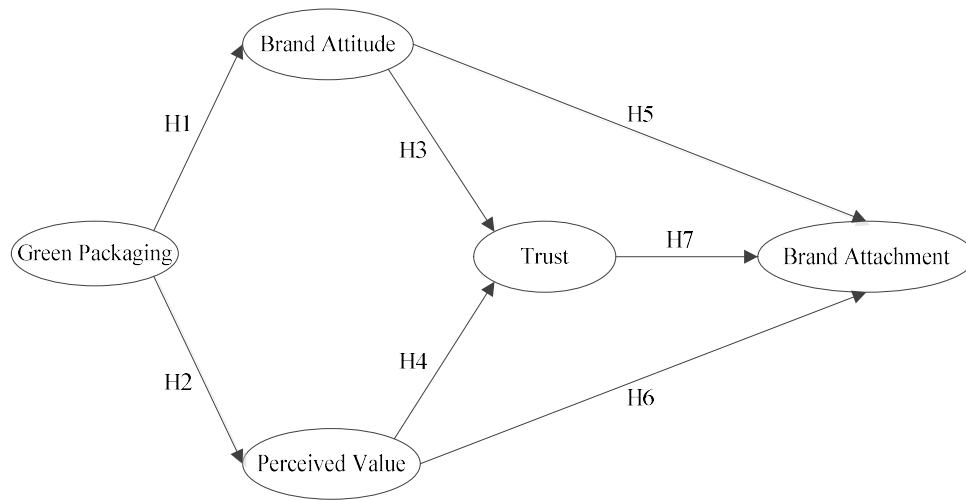


Figure 1: The Proposed Research Model

3.1. The Positive Effect of Green Packaging on Brand Attitude

Given the increasing attention that is being paid to environmental pollution caused by packaging waste, consumers are aware of the impact of green packaging on environmental protection. Online shopping consumers take environmental issues into account while gaining further awareness of environmental protection; consequently, consumers have a positive attitude toward these environmental brands [Lafferty 2002]. Many empirical studies have shown that consumers’ attitudes toward environmental protection are partly dependent on their moral constraints [Guagnano et al. 1995; Jansson et al. 2010]. They actively support the environmental protection behavior that is advocated by enterprises or countries if they have strong convictions regarding such issues [Hartmann & Apaolaza-Ibáñez 2012].

The norm activation theory states that human behavior is influenced by external norms, which can activate individual norms and result in pro-social or altruistic behavior. The latter implies that individual environmental protection behavior is triggered [Joireman et al. 2011]. Moreover, the norm activation theory submits that the existence of two prerequisites—namely, responsibility consciousness and consequence consciousness—can activate

individual norms. In addition, the extant research indicates that when individuals make decisions to purchase online, they make a pro-environment choice and consider the sustainability of product packaging if they are bound by their sense of responsibility. In online shopping, responsibility for the living environment easily facilitates the acceptance of products with green packaging and the consumer's willingness to pay the additional cost of green packaging [Ellen & Steg 2015]. The current study posits that online consumers believe that green packaging is eco-friendly and thus generates a positive attitude toward green brands. Thus, the following hypothesis is proposed:

H1: *Green packaging is positively associated with brand attitude.*

3.2. The Positive Effect of Green Packaging on Perceived Value

Consumers' environmental awareness of new products comes mostly from packaging. Scholars have discussed the important role of packaging information in consumer decision-making [Klein 2002]. Packaging can affect an online consumer's perception of the product's interior appearance, taste, feeling, smell, and sound, and it has a significant influence on the purchase decision [Underwood et al. 2001]. Delia [2010] considered that the degree of environmental pollution caused by packaging can be used as an indicator of the environmental friendliness of the packaging.

Sustainable packaging continues to draw attention given that online consumers are increasingly concerned about environmental issues [Smallbone 2005]. In addition, when e-retailers take green action, such action improves cost-effectiveness and eco-friendliness while increasing the consumers' perceived value of sustainable development [Hua et al. 2016]. As an eco-friendly strategy, green packaging can display its functional value when consumers have contact with such packaging and transmit its environmental protection concept, thereby increasing the perceived value to consumers [Spack et al. 2012; Trivedi et al. 2018]. In summary, we propose the following hypothesis:

H2: *Green packaging is positively associated with perceived value.*

3.3. The Positive Effect of Brand Attitude on Trust

According to the CAB theory of attitude, consumers do not trust certain products when companies attach misleading and confusing environmental information to the packaging or misinterpret the environmental value of the products themselves [Lam et al. 2004]. The formation of consumers' trust in a brand is determined by brand attitudes, which are subject to brand experience, including direct impact (e.g., trial or use), indirect impact (e.g., advertising), and brand contact [Ballester & Alemán 2001].

Brand attitudes have been shown to possibly affect consumers' trust in brands. Thus, a positive relationship may exist between brand attitudes and consumers' trust [Flavián et al. 2005; Aldebei et al. 2015]. Accordingly, a conciliatory attitude toward a green brand strengthens a consumer's willingness to rely on the brand based on his or her belief or expectation of the green brand's reputation, benevolence, and environmental performance ability. Therefore, the present study implies that brand attitude has a positive impact on trust, and the following hypothesis is thus proposed:

H3: *Brand attitude is positively associated with trust.*

3.4. The Positive Effect of Perceived Value on Trust

In addition to the main function of protecting products, packaging can be used as a medium of communication between manufacturers and users. Singh and Pandey [2018] indicated that packaging is a silent salesman. This notion was supported by Connolly and Davison [1996], who stated that packaging is the first impression of the product that consumers obtain before the purchase decision is made [Braun et al. 2015].

According to the primacy effect theory, consumers' initial impressions and expectations of products often come from their perceptions of the packaging because it is the first thing that reaches the consumers [Hammond 2011]. In light of the VBN theory, a high level of perceived value can improve the degree of trust in purchasing products [Sirdeshmukh & Sabol 2002], which leads to a positive correlation between perceived value and consumers' trust [Kassim & Abdullah 2015]. It is believed that perceived value is an important part of a long-term consumer relationship and that it plays an important role in influencing consumers' trust [Fakharyan et al. 2014]. Thus, we argue that online consumers' perceived value of packaging positively affects their trust in products, and we thus propose the following hypothesis:

H4: *Perceived value is positively associated with trust.*

3.5. The Positive Effect of Brand Attitude on Brand Attachment

Due to the few internal clues and the high identification cost of online green brands, online shopping consumers cannot fully perceive their functional value within a short time frame [Abimbola et al. 2012]. Therefore, consumers have to consider the functional value of the brand with the assistance of other people's evaluations. As the brand becomes a part of consumers' lives, it lays the emotional foundation for self-connection, commitment, trust, and intimacy, thereby establishing a solid consumer-brand relationship [Dolbec & Chebat 2013]. The product personality that is endowed by green brands enables consumers to establish strong social and emotional connections

with the brands while they fully express their social responsibility vis-à-vis environmental protection. This emotional comfort and satisfaction provide the consumer with a positive brand attitude [Orús et al. 2017]. The sense of satisfaction must be maintained at a certain level to ensure that the customer will purchase the product in the future [He et al. 2016]. With regard to continuous purchase behavior, consumers have an emotional connection with a product and form an attachment to the green brand based on a positive brand attitude. Thus, this study argues that brand attitude positively affects brand attachment, and the following hypothesis is therefore proposed:

H5: *Brand attitude is positively associated with brand attachment.*

3.6. The Positive Effect of Perceived Value on Brand Attachment

Consumers' subjective judgments are often based on incomplete information. Accordingly, perceived value, as a signal of customers' product recognition, affects their purchasing intention [Kardes & Cronley 2004]. Packaging is one of the information sources that customers can obtain from the manufacturer, which can produce certain associations between consumers and products or brands. Moreover, perceived value can affect consumers' brand recognition, which reflects their brand association [Tein 2007].

Perceived value is based on a set of attributes related to the perception of product value. It can improve the perceived connection between online consumers and specific brands and can generate positive word of mouth [Ashton et al. 2010]. When the perceived value of green packaging conforms to the consumers' concept of environmental protection, they will have a strong brand attachment. In addition, Barreda et al. [2013] found that perceived value is positively correlated with emotion-based brand attachment. Therefore, we argue that perceived value has a positive impact on brand attachment, and we propose the following hypothesis:

H6: *Perceived value is positively associated with brand attachment.*

3.7. The Positive Effect of Trust on Brand Attachment

In the previous literature, it was assumed that consumers' trust is a key determinant of their purchase intentions [Schlosser et al. 2006]. When online consumers trust sellers, there is a high chance that they will make the purchase. Therefore, consumers' trust is a prerequisite for their purchasing intentions [Heijden et al. 2003]. Furthermore, trust in a brand implies that consumers have a high probability or desire to develop an emotional bond with this brand.

Lee [2005] maintains that an e-commerce consumer's trust can enhance his or her belief in the customer-brand relationship. By introducing the brand into the e-commerce context, we draw on the VBN theory and propose that in the context of environmental management and online shopping, online consumers with green awareness support environmental protection products to reduce the adverse impact of nongreen packaging on the environment, thereby reducing their anxiety about unknown environmental variables [Moon 2007]. Consequently, consumers will become increasingly attached to the green brands they trust. Accordingly, this study argues that consumers' trust has a positive impact on brand attachment, and the following hypothesis is therefore proposed:

H7: *Trust is positively associated with brand attachment.*

4. Methodology and Measurement

4.1. Data Collection and Sample

This study employs a self-reported questionnaire survey to test the proposed research framework and hypotheses. As China has a comparatively developed e-commerce industry, we selected Chinese online shoppers as our research objects. We published the questionnaire on various Chinese SNS (Social Networking Services) platforms. Users of prevalent social media websites (e.g., Qzone, WeChat, and Weibo) who had online shopping experiences were selected as the random representative sample.

To improve the reliability and accuracy of the questionnaire, the survey was performed in two rounds. A pretest was conducted in the first round to collect experts' opinions on the questionnaire. We received 45 validated responses from 60 researchers in the field of e-commerce. Based on the feedback from the pretest, the invalid questions were deleted. The revised questionnaire was distributed in the second round. Given that understanding the relevant concepts surveyed was difficult for nonintellectuals—that is, those below the secondary school level—the research targeted consumers who had considerable knowledge of the definition of green products and green brands or who had exhibited green purchasing behaviors. The sample primarily comprised educated adults who were able to easily understand and reasonably compare and evaluate the green context. Duarte et al. [2018] and Hao et al. [2019] indicated that the majority of the samples were the 18–27-year-old age group and argued their study reflected customer perception of online shopping. Furthermore, according to the China Internet Network Information Center (CNNIC), students represent the primary user group of social network applications and online shopping. Thus, our research target mainly consists of students in a bid to reflect the real consumer group of online shopping.

In total, 315 questionnaires were obtained. There were 21 respondents under the age of 18 and 37 responses that contained invalid data. Thus, 257 valid responses were collected for further empirical analysis. The respondents included 142 women, representing 55% of all the participants, 92.6% of whom held at least a bachelor's degree.

Table 1 shows that the majority of the respondents (75.88%) were between the ages of 21 and 30. The participants had diverse occupational identities, which could be categorized as follows: education/training/institution (5.45%), information technology/e-commerce (2.72%), manufacturing (3.50%), student (67.32%), accounting/auditing (4.67%), service industry (7.00%), and other (9.34%). Moreover, the frequency of the respondents' online shopping was distributed as follows: 0 times/week (15.28%), 1 to 2 times/week (68.52%), 3 to 4 times/week (10.56%), 5 to 6 times/week (1.85%), and more than 6 times/week (3.70%).

Table 1: Descriptive Statistics of the Sample

Statistical category	Sample characteristics	Frequency	Percent
Gender	Male	115	44.75%
	Female	142	55.25%
Age	Under or equal to 20	26	10.12%
	21 to 30	195	75.88%
	31 to 40	16	6.22%
	Over or equal to 41	20	7.78%
	Education/ training /institution	14	5.45%
Job Position	Information technology/e-commerce	7	2.72%
	Manufacturing industry	9	3.50%
	Student	173	67.32%
	Accounting/auditing	12	4.67%
	Service industry	18	7.00%
	Others	24	9.34%
Online Shopping Frequency	0 time/week	39	15.28%
	1-2 times/week	176	68.52%
	3-4 times/week	27	10.65%
	5-6 times/week	5	1.85%
	More than 6 times/week	10	3.70%

4.2. Measurement of the Constructs

The items in the questionnaire were measured by a five-point Likert scale ranging from 1 to 5, representing “strongly disagree” to “strongly agree”. The variables were mainly derived from previous research to measure each construct: green packaging, perceived value, brand attitude, trust, and brand attachment. The respondents were asked to name a specific green product that the most impressive for them. They were then asked to regard this product as the focal object when completing the questionnaire. The definitions and measurements of the constructs are listed in Appendix B. As presented in Figure 2, the Pearson correlation was analyzed to test the relationships between the five variables.

We controlled several variables that might have influenced the dependent variable—that is, gender, age, job position, and online shopping frequency (time). These variables were verified to significantly influence consumers' brand attachment [Dolbec & Chebat 2013]. After controlling for these variables, we were better able to estimate the effect of green packaging, perceived value, brand attitude, and trust on brand attachment.

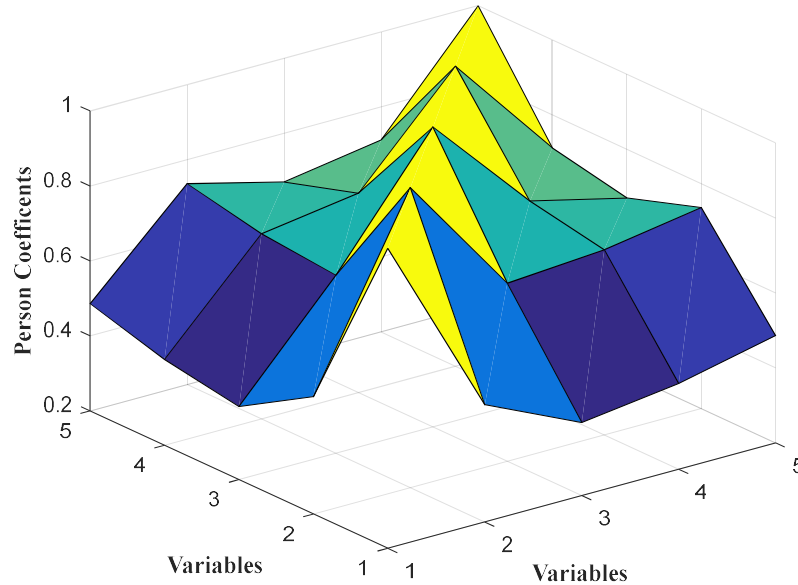


Figure 2: Person Correlation

(Note: Variables 1-4 are, respectively, the green packaging, perceived value, brand attitude, and trust; and variable 5 is the dependent variable-brand attachment.)

5. Empirical Results

SEM was utilized to investigate the hypotheses and research framework. First, we used SPSS 23.0 to test the validity and reliability of the sample data. SmartPLS 3.0 software was then applied to estimate the empirical results. Second, common method bias and multiple mediation effect tests were conducted. The PLS variance-based approach imposing fewer restrictions on distribution and sample size [Chandra & Kumar 2018] can be utilized in researching a complex relationship that contains both direct and indirect influences [Alolayyan et al. 2020]. The results are analyzed and presented below.

5.1. Results of the Measurement Model

Table 2 presents the convergent validity and reliability of the 19 items that were measured based on the five constructs. The factor loadings of each item were larger than 0.7, which is above the recommended level of 0.5. The Cronbach’s α coefficients of the constructs were more than 0.7, and the overall Cronbach’s α value was 0.936, showing good internal consistency in the questionnaire [Putcha 2008; Borg 2010]. The convergent validity and reliability indicated that the Kaiser–Meyer–Olkin values were over an index of 0.7, which is acceptable for factor analysis. The Bartlett test of sphericity and P-value are significant in statistics. The validity of the measurement is measured based on composite reliability (CR) and average variance extracted (AVE). As shown in Table 2, the AVE values of all the constructs were higher than 0.5. The CR values were above the recommended level of 0.7. The results confirmed the convergent validity of the measurement model. Moreover, we tested the discriminant validity via the AVE–SV comparison, which is recommended as a clearly superior method [Voorhees et al. 2016]. The AVE–SV method compares the AVE estimate for each construct to the shared variance (i.e., squared correlation). In other words, if a construct’s square root of AVE is greater than its correlation coefficients with all other constructs, the discriminant validity of the constructs is acceptable [Fu et al. 2020]. As shown in Table 3, the square roots of all the constructs’ AVEs were significantly larger than their correlations with other constructs, indicating an adequate discriminant validity of the measurement. Therefore, the reliability and validity of the research were confirmed as acceptable.

Table 3 shows the mean, standard deviation, and correlation coefficients of each variable. All factors were correlated at a 1% significance level. Green packaging is positively correlated with the intermediary variables (brand attitude, perceived value, and trust) and outcome variables (brand attachment). The results of the correlation analysis showed that the relationship between the variables was in accordance with the previous theoretical expectations, which provided clear evidence for the verification of the hypothesis.

Table 2: Convergent Validity and Reliability

Construct	Items	Factor Loading	Cronbach's α	KMO	CR	AVE
GP	GP1	0.749	0.736	0.744	0.849	0.652
	GP2	0.835				
	GP3	0.794				
PV	PV1	0.842	0.841	0.858	0.893	0.677
	PV2	0.872				
	PV3	0.725				
	PV4	0.844				
BA	BA1	0.872	0.795	0.808	0.880	0.710
	BA2	0.776				
	BA3	0.876				
T	T1	0.850	0.903	0.905	0.928	0.721
	T2	0.840				
	T3	0.848				
	T4	0.887				
	T5	0.819				
A	A1	0.868	0.891	0.894	0.924	0.753
	A2	0.883				
	A3	0.900				
	A4	0.820				

Cronbach's alpha: 0.936 KMO: 0.930 Bartlett sphericity test approximation χ^2 : 2840.848 df: 171 P: 0.000

Note: GP: Green packaging, PV: Perceived value, BA: Brand attitude, T: Trust, A: Brand attachment.

Table 3: The Square Root of AVE (shown as bold at diagonal) and Factor Correlation Coefficients

Variable	GP	PV	BA	T	A
GP	0.808				
PV	0.513**	0.823			
BA	0.395**	0.675**	0.842		
T	0.429**	0.694**	0.732**	0.849	
A	0.486**	0.736**	0.670**	0.712**	0.868
Mean	2.9799	3.7847	3.6204	3.7630	3.6817
Standard Deviation	1.0050	0.9285	0.8810	0.8176	0.8392

Note: **: $P < 0.01$, GP: Green packaging, PV: Perceived value, BA: Brand attitude, T: Trust, A: Brand attachment.

5.2. Common Method Bias

To avoid common method bias, we implemented both procedural and statistical strategies in this study. First, we employed procedural remedies to eliminate the source of method bias to the greatest extent possible through program control [Lindell & Whitney 2001; Podsakoff et al. 2003]. During the research design phase, we fully adhered to the principle of anonymity and confidentiality when the questionnaires were recovered. Any difficult or unclear questions were deleted during the pretest period. We also reduced the surface validity of the test items and did not arrange the items in order of variables. To further prove that there was no serious concern with regard to common method bias in this study, we introduced a method factor and evaluated the common method bias, as recommended by Liang et al. [2007]. As Appendix C shows, most method factor loadings were not significant. The average substantially explained variable of all indicators was 0.861. The average method-based variance was 0.011. The ratio of substantive variance to method variance was about 78:1. In summary, common method bias was not significant in this study.

5.3. Results of the Structural Model

We used R-square to demonstrate the explanatory power of the variables. The R-square of brand attitude was 0.319, perceived value was 0.211, trust was 0.656, and brand attachment was 0.779. All of them were acceptable. Figure 3 presents the path significance, standardized path coefficient, and variance explained (R^2) for each construct, and all met the recommended standards. Table 4 and Figure 3 show the structural model results, which indicate that green packaging positively affected brand attitude ($\beta = 0.776$, $p < 0.001$) and perceived value ($\beta = 0.997$, $p < 0.001$). We found that brand attitude had a significant positive relationship with trust ($\beta = 0.710$, $p < 0.001$) and had no significant relationship with brand attachment ($\beta = 0.067$, $p > 0.05$). Perceived value was positively and significantly

associated with trust ($\beta = 0.230, p < 0.01$) and brand attachment ($\beta = 0.223, p < 0.001$). In addition, the positive effect of trust on brand attachment was significant ($\beta = 0.674, p < 0.001$). Five paths, including green packaging to brand attitude and perceived value, brand attitude to trust, and trust and perceived value to brand attachment, were found to be significant at the level of $P < 0.001$. The path of perceived value to trust was tested to be significant with a level of $P < 0.01$. This indicates that green packaging was positively associated with brand attitude and perceived value. Moreover, brand attitude and perceived value had a positive influence on trust. Brand attachment was positively affected by trust and perceived value. Nonetheless, an insignificant path coefficient was uncovered between brand attitude and brand attachment with a value lower than 2, thus implying that H5 was not supported. In addition, this study indicates the possible mediating effects of perceived value and trust. Therefore, all the proposed hypotheses were supported except for H5.

Table 4: The Results of the Structural Model

Hypothesis	Path	β	T values	Results
H1	GP -> BA	0.776 ***	5.386	Supported
H2	GP -> PV	0.997 ***	5.425	Supported
H3	BA -> T	0.710 ***	6.575	Supported
H4	PV -> T	0.230 **	2.895	Supported
H5	BA -> A	0.067	1.024	Not supported
H6	PV -> A	0.223 ***	3.546	Supported
H7	T -> A	0.674 ***	3.878	Supported

Note: ***: $P < 0.001$; **: $P < 0.01$, GP: Green packaging, PV: Perceived value, BA: Brand attitude, T: Trust, A: Brand attachment.

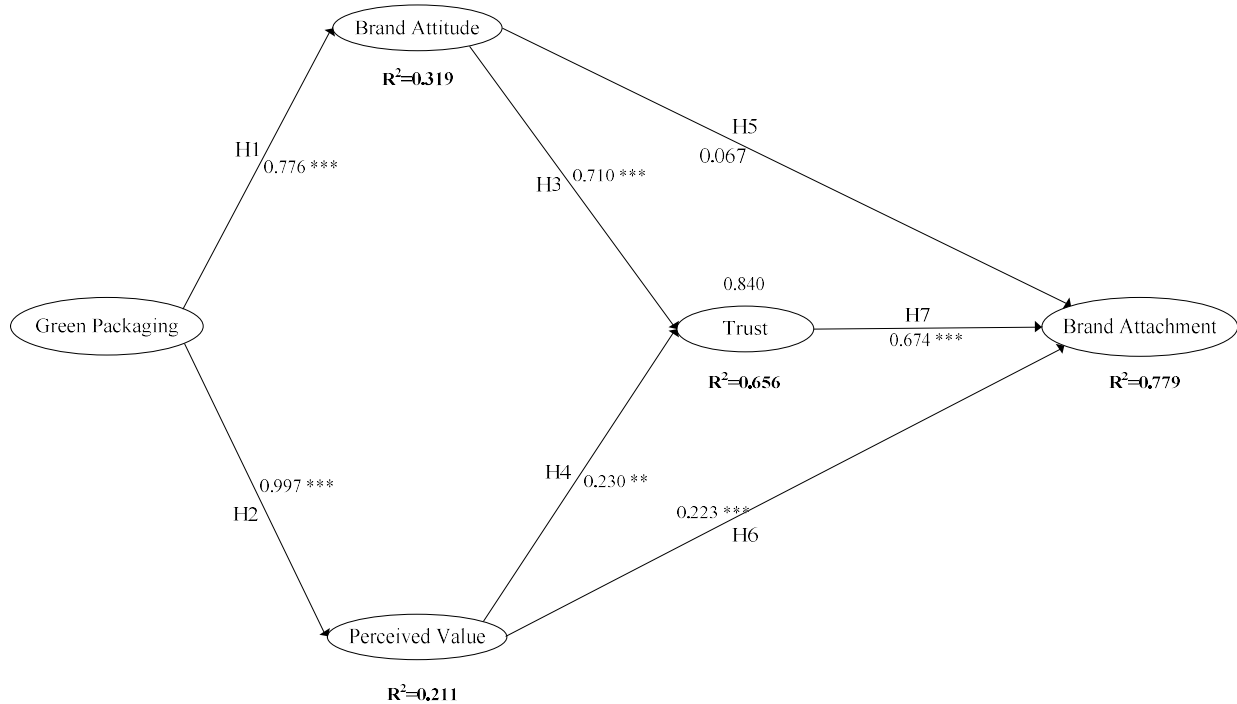


Figure 3: The Results of the Full Model (Note: ***: $P < 0.001$; **: $P < 0.01$.)

5.4. Results of the Multiple Mediation Effect

This study used bias-corrected and accelerated bootstrapping with SmartPLS 3.0 to develop a multiple mediation effect model and integrate the mediation effects. According to Henseler's model fitness criteria, we select the standardized residual mean root (SRMR) of the composite model when using the PLS algorithm. If the SRMR value is less than 0.1, the model has good fitness [Fassott et al. 2016]. The results showed that $SRMR = 0.074$, confirming the good adaptability of the model. However, based on the intermediary analysis program proposed by Zhao et al. and the multiple intermediary test method proposed by Hayes, the bootstrapping intermediary variable test was performed [Zhao et al. 2010; Hayes 2013]. When using the method of repeated sampling, 3,000

bootstrapping samples were randomly sampled from the original data (N = 257), and an approximate sampling distribution was generated. The median effect interval of 95% was estimated as 2.5% and 97.5%. If the bias-corrected bootstrapping confidence interval is under 95% and excludes 0 and the P-value is less than 0.05, the specific direct effect test is significant in the multiple direct or indirect (mediating) research model test [Shrout & Bolger 2002].

The results of direct effect, specific mediation effect test, total mediation effect, and total effect analysis are shown in Appendix D. The effect tests of the blackened parts—that is, GP → T, GP → A, BA → A, GP → BA → A, and GP → T → A—did not reach the test standard, and the previous hypothesis was rejected. In multiple direct and mediating research models, GP (green packaging) was used as the antecedent variable, and BA (brand attachment), PV (perceived value), and T (trust) were used as the mediating variables. Table 5 presents the results of the analysis.

The comprehensive analysis of the mediation effect is shown in Table 5: (1) GP explained 25.6% of the BA potential variables; GP explained 44.1% of the PV potential variables; GP explained 75.5% of the T potential variables through BA and PV; and GP explained 86.2% of the A potential variable through BA, PV, and T, indicating that the model explained the potential variables well. Additionally, two paths (GP → T and GP → A) determined whether GP had a direct effect on T and A. The direct effect of GP on T and A was insignificant, thus indicating that only an indirect effect existed from GP to T and from GP to A. This result is consistent with the previous hypothesis. (2) The estimates of GP → BA → T and GP → PV → T multiple mediation effects were 0.191 and 0.196, respectively. The bias-corrected bootstrap confidence intervals under 95% confidence were 0.121–0.276 and 0.114–0.289, respectively. The confidence intervals did not contain 0, and all P values were less than 0.05. This indicates that the parallel mediation effect was significant. A parallel mediation effect existed in the process of GP mediating T through BA and PV. (3) The estimated values of GP → BA → T → A and GP → PV → T → A were 0.106 and 0.109, respectively. The bias-corrected bootstrap confidence intervals under 95% confidence were 0.061–0.170 and 0.056–0.181, respectively. The confidence intervals did not contain 0, and all P values were less than 0.05, showing that the specific mediation effect in the two paths was significant and that GP had a serial mediation effect on A through BA, PV, and T. (4) Three types of mediation effect models exist: parallel, serial, and compound multiple intermediary. The estimated values of the mediation effects on two paths (GP → BA → T and GP → PV → T) in the parallel multiple mediation model were close, and the same situation existed in the serial multiple mediation model (GP → BA → T → A and GP → PV → T → A). Therefore, the mediating effects of BA and PV as mediating variables in the process from GP to T and from GP to A were significant and similar.

Table 5: Effect Analysis among Variables

Latent variable	BA	PV	T			A		
	Direct effect	Direct effect	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect	Total effect
GP	0.395	0.532	0.064	0.365	0.429	0.088	0.400	0.488
BA	--	--	0.483	--	0.483	0.048	0.270	0.318
PV	--	--	0.367	--	0.367	0.317	0.204	0.521
T	--	--	--	--	--	0.557	--	0.557
Explaining	25.6%	44.1%	75.5%			86.2%		

Note: Numbers are standardized results. GP: Green packaging, PV: Perceived value, BA: Brand attitude, T: Trust, A: Brand attachment.

6. Discussion and Implications

6.1. Key Findings

This study develops a research framework to identify and validate the impact of green packaging on online consumers' brand attitudes and perceived value and explores the consumers' emotional attachments to brands. The empirical results show that green packaging has a positive impact on consumers' brand attitudes and perceived value and that brand attitude and perceived value have a positive impact on brand attachment under the mediation of trust. Therefore, the positive impact of green packaging on brand attitude and perceived value will enhance consumers' trust and lead to stronger online brand attachment.

Consumers purchase green products not only for their inherent functions but also to support environmental protection that promotes recycling and waste reduction. Therefore, green packaging will positively influence brand attitude. As a part of products and brands, packaging expresses brand attributes and brand value. Eco-friendly packaging can convey the vision of environmental protection, thereby enhancing the perceived value of green consumers. Thus, green packaging can enhance consumers' perceived value of products or brands because consumers' first impression of new products comes from the packaging. In keeping with the primacy effect theory,

we find that green packaging can convey a signal of environmental protection and thus enhance consumers' attitudes toward products or brands and perceived value. This study emphasizes the mediation roles of brand attitude and perceived value. Both have direct impacts on brand attachment and indirect impacts on brand attachment through trust. The impact of brand attitude on brand attachment was found to be statistically insignificant. The symbolism of brand attitude and the fear of environmental deterioration weaken the attachment to the brand. In addition, we found that positive brand attitude and high perceived value can improve consumer confidence in products or brands. In essence, if consumers have a high level of trust in products or brands, this increases their attachment to the products or brands.

6.2. Implications for Theory

This research has several theoretical implications. First, to date, research on green packaging has mostly centered on the understanding of its concepts, eco-friendliness, costs, benefits, and so on [Lise Magnier & Dominique Crié 2015; Hao et al. 2019]. Unlike previous studies that focus on ecological economics [Wensing et al. 2020], our study taps into the research on green packaging in the e-commerce context, which is a novel and enlightening perspective. The findings suggest that green packaging has become increasingly paramount in e-commerce. It is a critical concept that will engender consumers' brand attitude and perceived value in the ever-evolving context of express delivery thus facilitating the development and sustainability of e-commerce firms. As consumers progressively fathom the pivotal value of green packaging vis-à-vis eco-environmental protection, we believe that this study presents a complementary understanding of the growing body of knowledge of green packaging and that it contributes theoretically by setting the foundation for future research in the e-commerce field.

Second, a previous study on green packaging has examined its adoption from the consumer's perspective, applying well-founded theories, such as the theory of planned behavior and the theory of reasoned action [Rokka & Uusitalo 2010; Wang et al. 2021]. This research ushers the concepts of green packaging and brand attachment into e-commerce research that is grounded on the VBN theory and the CAB theory of attitude. This is an early attempt to extend the application of the two theories into the research on e-commerce brand attachment through green packaging. We find that the VBN and CAB theories are superior in regard to presenting different dimensions or stages for examining the influence mechanism and providing a novel understanding of the complex interrelationships among the researched variables, which is conducive to conducting detailed and thorough research. The theoretical frameworks of the above theories have been successfully verified through the empirical analysis in the paper. Consequently, the validated model of our paper offers a fine-grained perspective for future research to identify and empirically gauge the relationships between packaging and brand in the e-commerce context.

Third, as there is a paucity of research on the relationship between green packaging and brand attachment, this study has explored a potentially fruitful path of study in the paradigm of the eco-environmental e-commerce artifact [Delia 2010; Chen 2017]. Although the results show that green packaging cannot directly affect brand attachment, this research investigates the indirect factors that can influence the aforementioned relationship, such as brand attitude, perceived value, and trust. We extend the literature on green packaging by exploring crucial mediators that holistically influence trust; these include brand attitude and perceived value. Therefore, our study fills this gap by introducing several mediating variables in understanding the impact of green packaging on e-commerce brand attachment.

Finally, the study illustrates a mixed mediation effect structure, that includes both parallel and serial mediation effects. Previous empirical studies of green packaging have lost sight of the distinction between its intermediary roles [Borishade et al. 2015] and have merely performed one simple mediation effect test [Vansteelandt & Daniel 2017]. However, this research conducts multiple mediation effect tests. The results indicate that the relationship between green packaging and brand attachment can be mediated directly by brand attitude and perceived value or indirectly by trust. Hence, this study has laid the multiple mediation effect groundwork for future research in different areas.

6.3. Implications for Practice

The empirical findings also have several practical implications. First, this study confirms that green packaging can improve consumers' attitudes and their perceived value of green brands, thereby directly and/or indirectly increasing consumers' attachment to green brands in e-commerce. Online businesses are advised to devise and implement a green packaging strategy to enhance consumers' attachment to their products or brands. Second, green companies that play a leading role in environmental protection should devote more effort to enhancing consumers' brand attitude and perceived value. Given that brand attitude and perceived value have a sufficient intermediary effect, enterprises can strengthen consumers' attachment to green brands by enhancing their brand attitudes and perceived value—for example, by implementing a quantitative evaluation mechanism, a community answering service, and a post-sales value-added service. Third, the intermediary effect of trust in this study was found to be significant. Enterprises can focus on the development of consumers' trust and the establishment of a good corporate

reputation by enhancing consumers' attachment to products or brands. Fourth, several direct or indirect (mediation) research models were used to test the significance of the mediation effect. The mediation effect between green packaging and brand attachment through perceived value is more powerful than that of brand attitude. Therefore, online businesses should devote full attention to adding the perceived value of products or brands for consumers. For example, online businesses can attract brand publicity so that consumers can perceive the substantial value of the products and brands rather than focusing on the evaluation of post-sales.

7. Conclusion and Future Research

Although environmental problems are widespread, consumers pay considerable attention to green products and green brands. Green packaging can help enhance the value of green brands and solve environmental problems at the same time. Online businesses should avoid the overuse of packaging in light of environmental protection. Although online businesses are committed to improving the functional benefits of green products, they cannot ignore the brand value or damage caused by packaging. The majority of online businesses encounter the challenge of balancing environmental protection and profitability. Therefore, it is vital to resolve the conflict between the implementation of eco-friendly product packaging and the promotion of products. This study suggests that online businesses should focus on brand positioning rather than attracting consumers through excessive packaging. Green products are positioned to protect the environment and to provide other similar functional benefits vis-à-vis environmental issues. Therefore, we recommend that green brand marketing initiatives are better off starting from the core values of green consumers and focusing on the underlying value of the brand.

This study has some inevitable limitations. Because the questionnaire was mainly distributed to and completed by members of the young generation, it may not fully represent the population of all potential online consumers. Additionally, consumers' understanding of green packaging may vary across product types. Therefore, it is suggested that future research be conducted to examine green packaging problems for a variety of product types and in different cultural settings. To ensure scientific rigor and relevance, we call for future research to leverage different methodological approaches, such as experimental designs, to further fathom and test the phases of green packaging.

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Appendix

Appendix A: Summary of Recent Green Packaging Studies

Author (year)	Threat Context	Theory Applied	Modified Variables	Research Design	Major Findings
Hao et al. (2018)	Eco-friendliness threat	Social consumption behaviors	Green packaging, willingness to pay, influential factors	Survey	Environment, green packaging quality, commodity, and packaging price affect consumers' willingness to pay
Wensing et al. (2020)	Ecological economics	Random utility theory	Bio-based packaging, pro-environmental behavior, green nudge, values, beliefs, ecological worldview, social norms	1:Experiment 2:Survey	The strongest effects are generated when the nudging strategy matches the characteristic of consumers' cognitive style
Singh and Pandey (2018)	Consumer behavior	Theory of consumption values, customer value creation framework	Willingness to pay, price premium, green packaging	Survey	It is revealed six factors that influenced buyers' willingness to pay a price premium for green packaging
Wang et al. (2020)	Waste of resources	The theory of planned behavior (TPB)	Attitude, subjective norm, perceived behavioral control, moral norm, awareness of consequences, convenience, usage intention, usage behavior	Survey	Usage intention and perceived behavioral control have a significant positive effect on the usage behavior of recyclable express packaging
Prakash et al. (2019)	Environmental concern	Attitude-behavior model	Attitude, environmental concern, health concern, purchase intention	Survey	It is indicated that these values (egoistic and altruistic) do influence purchase intention for products with eco-friendly packaging
Meherishi et al. (2019)	Circular economy	Institutional theory, stakeholder theory and the ecological modernization theory	Sustainable packaging in supply chain management	Systematic literature review	Sustainable packaging in supply chain management (SPSCM) trends are aligned to circular economy concepts but have not adequately considered the interaction of the product with its packaging system
Lise Magnier and Dominique Crié (2015)	Issue for industrials and retailers	The contamination theory	Packaging eco-friendliness, perceived benefits, perceived costs, perceived sacrifice	In-depth and ZMET interviews	Consumers' responses to the perception of eco-designed packaging are presented and perceived benefits and perceived sacrifices are revealed
Rokka and Uusitalo (2008)	Marketing	The theory of reasoned action and the theory of planned behavior	Packaging, brand, price and convenience	Choice-based conjoint analysis	Consumers differ in their preferences for packaging, brand, price and convenience of use of daily products
Herbes et al. (2019)	Sustainable consumption	Cue utilization theory	Environmentally friendly packaging, labeling, information, material	Interviews	Consumers in our study relied predominantly on labels on the packaging, followed by their own evaluation of the packaging material
Testa et al. (2020)	Circular economy	The theory of planned behavior	Environmental concern, other pro-environmental behaviors, greenwashing, information seeking, consumer innovativeness, purchasing of circular packaging	Survey	Individual IS plays an important role in helping consumers to understand the circular features of packaging and to make purchasing decisions coherent with personal beliefs and past behaviors

Appendix B: Construct Measures

Constructs	Items
Green packaging [Trivedi et al. 2018]	GP1: You notice the recyclable sign on the express package.
	GP2: You think the express packing of this product is environmentally friendly.
	GP3: You can quickly distinguish between recyclable and non-recyclable packaging
Perceived value [Patterson & Spreng 1997; Chen & Chang 2012]	PV1: This green packaging's environmental performance meets your expectations.
	PV2: You think this green packaging has more environmental concerns than other packages.
	PV3: You prefer this green packaging because it is environmentally friendly.
	PV4: You prefer this green packaging because it has more environmental benefits than other packages.
Brand attitude [Chen 2017; Dillon et al. 2001; Gabisch & Gwebu 2011]	BA1: You prefer the brand because it is environmentally friendly.
	BA2: You favor the brand because of its environmental concerns.
	BA3: You think the brand is valuable because of its environmental performance.
Trust [Rousseau et al. 1998; Chen & Chang 2012]	T1: You feel that this green brand's environmental reputation is generally reliable.
	T2: You feel that this green brand's environmental performance is generally dependable.
	T3: You feel that this green brand's environmental claims are generally trustworthy.
	T4: This green brand's environmental concern meets your expectations.
	T5: This green brand keeps promises and commitments for environmental protection.
Brand attachment [Escalas 2004; Japutra et al. 2018]	A1: The brand's eco-friendliness makes you feel strongly passionate about it.
	A2: The brand's environmental concern makes you feel strongly passionate about it.
	A3: The brand's environmental performance makes you crave for it.
	A4: The brand's extraordinary environmental features make you willing to pay for it.

Appendix C: Common Method Bias Analysis

Construct	Indicator	Substantive Factor Loading (R1)	R1 ²	Method Factor Loading (R2)	R2 ²
Green packaging	GP1	0.752**	0.729	-0.050	0.002
	GP2	0.845**	0.657	0.034	0.014
	GP3	0.814**	0.745	0.046	0.005
	PV1	0.827**	0.532	-0.039	0.047
Perceived value	PV2	0.916**	0.837	0.012	0.001
	PV3	0.785**	0.587	0.007	0.000
	PV4	0.872**	0.691	0.056	0.000
Brand attitude	BA1	0.920**	0.805	0.105	0.020
	BA2	0.815**	0.537	0.025	0.010
	BA3	0.896**	0.712	-0.135	0.001
Trust	T1	0.879**	0.706	0.072	0.000
	T2	0.883**	0.790	0.081	0.064
	T3	0.895**	0.797	-0.066	0.005
	T4	0.901**	0.821	0.079**	0.018
	T5	0.836**	0.515	0.005	0.091
Brand attachment	A1	0.877**	0.650	0.032	0.000
	A2	0.857**	0.497	-0.201**	0.026
	A3	0.935**	0.865	0.114*	0.001
	A4	0.850**	0.615	0.027	0.032
Average		0.861	0.689	0.011	0.018

Note: **: P<0.01; *: P<0.05, GP: Green packaging, PV: Perceived value, BA: Brand attitude, T: Trust, A: Brand attachment.

Appendix D: Mediation Effects

Effect	Estimate	SD	Confidence Intervals		P Values
			2.5%	97.5%	
Direct Effect					
GP -> BA	0.395	0.060	0.273	0.503	0.000
GP -> PV	0.532	0.049	0.433	0.624	0.000
GP -> T	0.064	0.055	-0.043	0.173	0.240
GP -> A	0.088	0.054	-0.022	0.191	0.104
BA -> T	0.483	0.072	0.342	0.625	0.000
PV -> T	0.367	0.075	0.216	0.517	0.000
BA -> A	0.048	0.066	-0.086	0.176	0.463
PV -> A	0.317	0.067	0.179	0.442	0.000
T -> A	0.557	0.082	0.405	0.719	0.000
Specific Mediation Effect Test					
GP -> BA -> A	0.019	0.027	-0.033	0.075	0.483
GP -> PV -> A	0.169	0.038	0.094	0.247	0.000
BA -> T -> A	0.269	0.057	0.168	0.397	0.000
GP -> BA -> T -> A	0.106	0.028	0.061	0.170	0.000
GP -> T -> A	0.035	0.032	-0.025	0.101	0.268
PV -> T -> A	0.205	0.056	0.110	0.328	0.000
GP -> PV -> T -> A	0.109	0.031	0.056	0.181	0.001
GP -> BA -> T	0.191	0.041	0.121	0.276	0.000
GP -> PV -> T	0.196	0.043	0.114	0.289	0.000
Total Mediation Effect					
GP -> A	0.403	0.041	0.323	0.486	0.000
GP -> T	0.386	0.047	0.298	0.482	0.000
BA -> A	0.269	0.057	0.168	0.397	0.000
PV -> A	0.205	0.056	0.110	0.328	0.000
Total Effect Analysis					
GP -> BA	0.395	0.060	0.273	0.503	0.000
GP -> PV	0.532	0.049	0.433	0.624	0.000
GP -> T	0.429	0.064	0.301	0.555	0.000
GP -> A	0.488	0.055	0.379	0.593	0.000
BA -> T	0.483	0.072	0.342	0.625	0.000
PV -> T	0.367	0.075	0.216	0.517	0.000
BA -> A	0.318	0.068	0.179	0.453	0.000
PV -> A	0.521	0.062	0.396	0.639	0.000
T -> A	0.557	0.082	0.405	0.719	0.000

Note: Numbers are standardized results. GP: Green packaging, PV: Perceived value, BA: Brand attitude, T: Trust, A: Brand attachment.