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Enhancing Environmental Awareness for Sustainable Retail: Analysis of the Buy-Online-and-Return-in-Store Policy Adoption Using Theory of Planned Behavior

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Abstract: This study explores the context of buy-online-and-return-in-store (BORS) policy from an environmental perspective and conducts a comprehensive analysis through the theory of planned behavior (TPB). Adding environmental awareness and awareness of consequences provides a new perspective on how sustainable practices can be enhanced through an omni-channel retail strategy. Survey responses from 405 participants were analyzed using structural equation modeling. Results show that attitudes, subjective norms, and perceived behavioral control are key determinants of practical BORS policy. The study found that environmental awareness significantly influenced BORS adoption directly and indirectly by enhancing perceived behavioral control, whereas consequence awareness primarily affected adoption by shaping consumer attitudes. Compared with consumers who choose to return online, consumers who prefer in-store returns show higher environmental awareness, highlighting the environmental advantages of BORS. In addition, the BORS policy improves overall shopping satisfaction by integrating the convenient process of online purchases and offline returns, allowing consumers to switch freely between different channels. These findings provide valuable insights for retailers and policymakers seeking to promote sustainable consumer behavior to effectively promote the importance of sustainable retail practices.

Keywords: buy-online-and-return-in-store policy; omni-channel strategy; environmental awareness; theory of planned behavior; sustainable consumption; consumer behavior

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1. Introduction

The omni-channel strategy plays a vital role in the retail industry by integrating online and offline sales and service channels to enhance customer satisfaction and increase retail store sales [1,2]. This strategy is critical for meeting modern consumer demand and improving retail efficiency [3,4]. A key component of this strategy is the buy-online-and-return-in-store (BORS) policy, which enables consumers to purchase products online and return them in store [5]. The BORS policy promotes the possibility of consumers returning to stores and repeat purchases [6]. BORS policies reduce costs and environmental impact by reducing reverse logistics transportation and packaging of returned products, demonstrating the potential of retailers in sustainable development [7].

From an omni-channel perspective, the BORS policy facilitates consumers' seamless transition between different channels by integrating online purchases with offline returns. Lee and Ma [8] found that consumers consider both product availability and the service quality of offline stores when choosing offline stores on online platforms, suggesting that consumers tend to evaluate various factors across both online and offline stores in their decision-making process. Additionally, Rodríguez-Terrico et al. [9] emphasized that

smooth channel-switching significantly enhances consumer shopping experiences, making consumers more willing to positively evaluate and recommend brands. Therefore, the BORS policy meets consumers' expectations for integrated online and offline channels, improving their overall shopping experience and brand loyalty through the convenience of switching between online purchases and offline returns.

From an environmental perspective, traditional online return processes require additional packaging, transportation, and waiting time, which consumes more materials. The use of plastic and cardboard boxes, combined with improper recycling (incineration or landfilling), can exacerbate environmental impacts [10]. The increase in returned products has resulted in sellers requiring more resources to handle returns, including processes for reuse, repair, remanufacturing, recycling, and scrap [11]. Conversely, the BORS policy offers distinct environmental advantages. First, it reduces the waiting time for long-distance shipping returns and reduces the number of reverse logistics shipments [12]. Second, consumers return goods directly to physical stores, which can significantly reduce the transportation distance and frequency, reducing energy consumption and greenhouse gas emissions [13]. Third, it encourages more effective inventory management and resource utilization to reduce the waste of resources caused by excessive packaging and transportation, reducing the burden on the environment [14]. McKinsey [15] pointed out that among the various cross-channel services, more than half of the Chinese consumers surveyed were interested in and wanted to try BORS. Retailers such as Uniqlo and Decathlon have launched BORS policies to meet consumers' return and exchange needs. Despite these advances, the adoption of the BORS policy in China is in its infancy [16]. Addressing how to encourage consumers to embrace BORS and foster sustainable consumption behaviors hinges on understanding and bolstering their willingness to use the policy.

Sustainable consumption is considered a key goal in the global sustainable development agenda, and its importance has been increasingly recognized and emphasized in recent years [17]. Promoting sustainable consumption requires technological advancements and changes in consumer behavior and awareness [3]. Maduku [18] pointed out that information dissemination alone is difficult to promote consumers' sustainable consumption intentions, especially when they do not fully understand the possible negative consequences of related behaviors (environmental degradation or increased health risks). Improving consumer consequences awareness is crucial to influencing their behavioral intentions [19]. Therefore, informing consumers about the environmental and social benefits of using BORS policies can help motivate them to adopt the policy and promote sustainable consumption behaviors.

Existing research on sustainable consumption has mainly focused on choosing environmentally friendly products [20–22], enhancing consumer awareness and behavior [23], and implementing technological solutions [24]. However, the potential of BORS policies in augmenting sustainable consumption through their environmental attributes remains underexplored. The BORS policy can play a significant role in reducing carbon emissions and resource waste, directly mitigating environmental burdens [7]. Additionally, the policy encourages consumers to return goods locally, which improves efficiency and reduces energy consumption and emissions during transportation. Thus, the BORS policy promotes environmental protection and the efficient use of resources, supporting broader practices of sustainable consumption. Nevertheless, the environmental attributes of the BORS policies have not been adequately investigated. A significant gap persists in understanding how these policies influence sustainable consumer behaviors. Although existing research focuses mainly on how BORS policies affect retailers' profitability and supply chain operations [5,12,25], such policies play an important role in driving consumption. Moreover, the environmental advantages of sustainable practices in retail remain largely unknown. This study aims to fill this research gap by investigating consumers' intentions to use BORS policies and how this intention promotes sustainable consumption behavior.

This study investigates how environmental concerns shape consumers' intentions to adopt the BORS policy. Researchers frequently employ environmental and consequence

awareness within the theory of planned behavior (TPB) to examine pro-environmental behaviors as crucial socio-environmental factors. Hong et al. [26] considered environmental factors as altruistic elements in the TPB, discussing consumer behavior toward purchasing green products. Kumar [27] treated environmental factors as intrinsic variables within the TPB model to effectively explain consumers' green purchasing behavior. This study sought to expand the TPB model by including environmental and consequence awareness for a more in-depth individual-level analysis. Environmental awareness emphasizes cultivating individuals' behaviors toward environmental protection, while awareness of consequences refers to individuals' cognition of the potential outcomes of their actions. Adopting this approach broadens our understanding of the factors that influence BORS usage intentions, particularly in terms of environmental awareness, and offers a new perspective on how consumers consider environmental factors in their decisions to return or exchange products.

Given the growing societal emphasis on sustainable consumption [28], this study examines the environmental attributes of the BORS policy and explores how consumers' intention to adopt the policy impacts sustainable consumption behavior. By investigating consumers' behavioral intentions in the context of the BORS policy's environmental attributes, this study offers a novel perspective and highlights the crucial role of omni-channel integration in enhancing the shopping experience while reducing environmental impact. The BORS policy not only provides consumers with a convenient and efficient shopping experience but also contributes positively to sustainable development. These findings offer valuable insights for future policy formulation and market strategies aimed at promoting sustainable consumption behaviors.

The remainder of this paper is organized as follows. Section 2 presents a review of the literature related to the BORS policy and the extended TPB model. Section 3 introduces the research hypotheses and theoretical framework, and Section 4 describes the research methodology. Subsequently, Section 5 explains the analysis results, and Section 6 discusses the study's theoretical contributions and practical implications. Finally, Section 7 presents the conclusions, limitations, and future research directions.

2. Literature Review

2.1. BORS Policy

BORS is an omni-channel retail strategy that allows customers to order items online and return them to the nearest store [14]. This strategy embodies a "customer first" culture and reflects the retailer's emphasis on customer service. Within this consumer-first culture, retail stores are willing to accept consumer return requests [6]. The BORS strategy integrates online and offline channels while also increasing consumer satisfaction and reducing reverse logistics costs [29].

Previous research on BORS policies primarily focuses on exploring the economic benefits generated by their implementation from the perspective of each member of the supply chain [5,12,30,31]. Fares et al. [31] identified 21 internal and external operating factors that interact with the BORS strategy through a SWOT analysis. Xu et al. [25] further suggested that the BORS policy could be used as an effective sales strategy for livestream shopping. However, the effectiveness of the BORS policy hinges on consumers' comprehension and utilization, given their role as primary users. Therefore, it is crucial to understand the intention to use the BORS policy from a consumer perspective. Applying the stimulus-organism-response theory, Xie et al. [14] explored how reward fulfillment and customer service dimensions of channel integration within BORS influence customer satisfaction and behavioral intentions across different channels. Nevertheless, there is a relative lack of research on how consumers use the BORS policy.

Timoumi et al. [32] analyzed 50 empirical retail studies from the past 20 years, revealing that the effective integration of online and offline channels can significantly enhance consumers' cross-channel purchasing behavior. In this context, the BORS policy, as a key

omni-channel strategy, improves consumer satisfaction by creating a seamless shopping and return process, enabling consumers to switch effortlessly between multiple channels.

2.2. TPB

TPB, which was proposed by Ajzen [33], has proven effectiveness in predicting and explaining human behavior in multiple fields. Consumers' behavioral intentions are mainly affected by three factors: attitude, subjective norms, and perceived behavioral control.

TPB has been supported by applied and extended empirical research in multiple fields. For instance, studies have applied TPB to understand consumer behavior regarding electric vehicles and environmental protection [34,35]. This study expands the application scope of TPB by including environmental factors. Nekmahmud et al. [36] investigated the sustainable consumption value and choice behavior of European tourists toward green products by integrating TPB and theory of consumer value. Their findings indicated that attitudes, subjective norms, and perceived behavioral control have a positive impact on consumer intentions.

Scholars have frequently used established theoretical frameworks to examine consumer usage intentions within retail contexts. Su et al. [22] employed a combination of innovation diffusion theory, perceived value theory, and TPB to investigate the adoption of recyclable express packaging in online retail food cold chains. They identified consumer involvement as a crucial concept in marketing research, reinforcing its significance in the context of their study. Similarly, Ketelsen et al. [37] analyzed 46 studies on consumer usage intentions for environmentally friendly packaging and determined that TPB is an important theoretical foundation for studying consumer usage intentions. Given these precedents, TPB was considered appropriate for the theoretical foundation in this study to explore consumers' intentions regarding the BORS policy. This theoretical framework facilitates a deeper understanding of consumers' attitudes toward BORS policies, the social norm pressures they undergo, and their perceived control over implementation behaviors, predicting their usage intentions.

2.3. Sustainable Consumption

Sustainable consumption refers to consumption behavior that supports future generations in meeting their material and other needs without causing irreversible damage to the environment [38]. Wang et al. [39] identified it as a fundamental requirement for sustainable development, as it plays a crucial role in environmental protection, social responsibility, and economic growth.

Recently, research on sustainable consumption has received increasing attention. Shehawy [40] explored ways to bridge the gap between intention and behavior in green consumption environments in different cultural contexts. Zakari et al. [41] studied how investing in green energy could help 14 African countries achieve sustainable production and consumption patterns. In the retail industry, research on circular or reusable products is growing, demonstrating the importance of sustainable behavior [21,22,42].

In summary, the study of sustainable consumption behavior is of great significance. Whether in technology or research on green products, it reflects scholars' in-depth exploration of sustainable development. This study investigates how intentions to use the BORS policy enhance consumers' sustainable consumption behaviors from an environmental perspective. We aim to understand whether BORS policies can incentivize consumers to make more environmentally friendly return choices, promoting overall sustainable consumption patterns.

2.4. Relationship between Environmental Awareness and Consumer Behavior

No unified terminology or definition exists in the academic community regarding environmental awareness, with the concept being expressed differently in different studies [43]. Frequently used terms include "environmental awareness", "environmental consciousness", and "environmental concern", each reflecting different aspects of engagement with environmental issues. Although they have slightly different meanings, they cover awareness of and concerns about environmental issues. Thompson and Barton [44] divided environmental awareness into two main types: eco-centric, emphasizing the intrinsic value of nature and ecosystems, and anthropocentric, emphasizing the importance of protecting the natural environment to improve the quality of human life. Regardless of the motivation, environmental awareness is a key antecedent in promoting positive pro-environmental attitudes and behaviors [45]. Environmental awareness drives individuals to adopt more environmentally friendly lifestyles and affects environmental decision-making at the social and policy levels.

Fares et al. [31] found that environmental awareness significantly impacts smart home usage. Consumers with a deeper understanding of environmental issues are more inclined to accept and use new technologies. Song et al. [21] introduced the factor of environmental concern to explore consumers' usage intentions for reusable packaging. Similarly, Shah et al. [46] incorporated environmental awareness into the value adaptation model to analyze consumers' intentions to adopt 5G services. Collectively, these studies underscore the pivotal role of environmental awareness in shaping consumer behavioral intentions, particularly concerning the adoption of new technologies and services. As a flexible return service option provided by retailers, exploring how environmental awareness affects consumers' acceptance of BORS will provide new insights into promoting sustainable consumption.

2.5. Role of Consequence Awareness in Consumer Behavior

Awareness of consequence refers to an individual's awareness and understanding of the possible results or consequences of their actions [47]. This concept focuses on the evaluation of behavioral consequences. Awareness of consequence affects behavioral intentions in various situations [19], especially environmental protection; it also affects individuals' behavioral decisions. Han et al. [48] showed that in the context of pro-environmental behavior, consequence awareness has a significant positive impact on behavioral intentions. Thus, when individuals realize that engaging in pro-environmental behaviors can reduce negative impacts on the environment, they are more likely to take corresponding actions [21]. Therefore, awareness of consequence is a critical factor in consumer decision-making regarding BORS. Awareness of the environmental advantages offered by BORS policies often predisposes consumers to favor these services.

3. Theoretical Foundations and Hypotheses Development

3.1. Design of the Research Model

As illustrated in Figure 1, the TPB model incorporates core variables that determine consumers' intentions to utilize the BORS policy. Awareness of consequence and environmental awareness were integrated as key environmental variables to examine the association between consumers' willingness to adopt BORS policies and their sustainable consumption behavior—directly and indirectly.

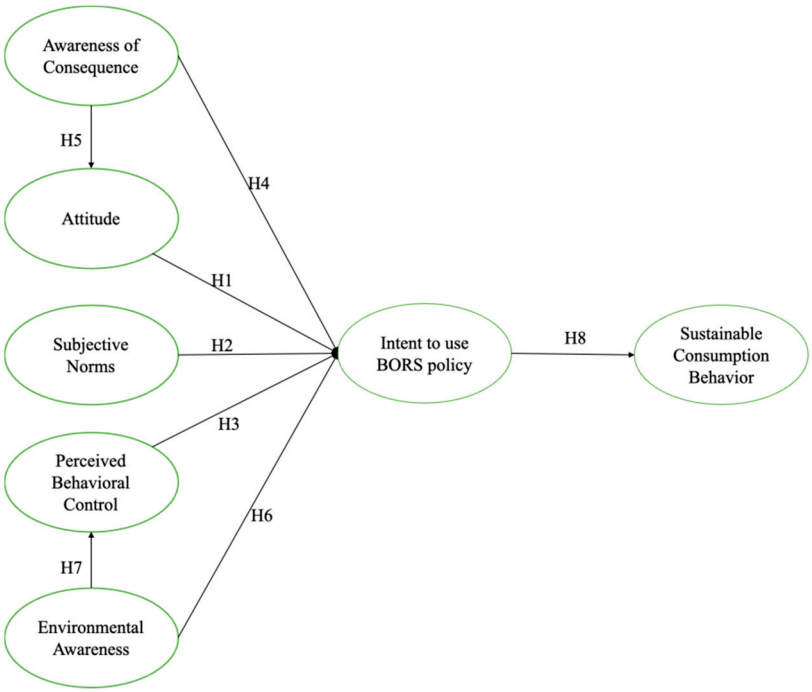

Figure 1. Theoretical model.

3.2. Development of Hypotheses

3.2.1. Attitude and BORS Policy Usage Intentions

Attitude is an individual's positive or negative evaluation of a behavior [33]. In this study, attitude is defined as consumers' overall evaluation of BORS policy to reduce the impact on the environment, specifically their positive attitude towards the effectiveness of the BORS policy in environmental protection. This attitude reflects consumers' comprehensive view of the BORS policy in terms of reducing resource waste and enhancing environmental benefits. In the context of environmental protection, attitude is considered a key factor influencing consumer intentions [49]. As consumers' environmental awareness and their understanding of the environmental consequences of using the BORS policy increase, their support for the policy also grows. Numerous scholars have proven that, within an environmental context, attitudes significantly influence intentions and behaviors [50,51]. Thus, we propose the following hypothesis:

H1. *A positive attitude toward the environmental benefits and convenience of the BORS policy significantly increases consumers' intention to use the policy.*

3.2.2. Subjective Norms and BORS Policy Usage Intentions

Ajzen [33] defined subjective norm as the perceived social pressure influencing an individual's decision to perform or not perform a behavior. Subjective norms, which are fundamentally social constructs, are shaped by influences from friends, family, and other significant individuals in one's social circle [21]. Through the BORS policy, consumers can easily purchase online and return offline, reducing the time and effort in the return and exchange process, thereby enhancing the consumer experience. Previous research has demonstrated that such subjective norms influence consumers' actions to protect the environment, such as using recyclable packaging and green behavior [52,53]. Thus, we propose the following hypothesis:

H2. *Perceived social pressure from peers and family to use the BORS policy significantly increases consumers' intention to use the policy.*

3.2.3. Perceived Behavioral Control and BORS Policy Usage Intentions

Ajzen [33] defined perceived behavioral control as the perceived ease or difficulty of performing an action that reflects an individual's self-perception of their ability. In this study, perceived behavioral control refers to consumers' perceptions of the convenience of using the BORS policy. When consumers believe that the BORS policy enables online purchases and offline returns, they will find it more convenient and improve the overall shopping experience. Furthermore, studies have shown that perceived behavioral control significantly affects consumers' consumption intentions [54,55]. Thus, we propose the following hypothesis:

H3. *High perceived ease of using the BORS policy significantly increases consumers' intentions to use the policy.*

3.2.4. Awareness of Consequence, Attitude, and BORS Policy Usage Intentions

Awareness of consequences refers to an individual's understanding and awareness of the impact that their actions may have on the environment [47]. This concept emphasizes the evaluation of the consequences of actions. It has been applied to the research on the Norm Activation Model and Ethical Decision-Making Model [19]. Within the Norm Activation Model, awareness of consequences is identified as a critical motivator for engaging in pro-environmental actions aimed at mitigating environmental impacts [56]. Previous research has shown that awareness of consequences influences behavioral intentions toward various pro-environmental behaviors. Nketiah et al. [50] found that consequence awareness positively affected citizens' recycling intentions. Sajid et al. [57] found that environmental consequence awareness indirectly influenced consumers' use of car-sharing services through attitudes.

In other words, when individuals possess a heightened awareness of the consequences of their actions, they tend to develop a deeper understanding of the potential environmental impacts, which in turn fosters a more positive attitude toward pro-environmental behaviors. In the context of this study, when consumers recognize that using the BORS policy indirectly contributes to reducing environmental impacts, their willingness to adopt the policy is likely to increase. Furthermore, this heightened awareness can also indirectly influence consumers' use of the BORS policy by shaping their positive attitudes toward it. Based on these insights, we propose the following hypotheses:

H4. *Awareness of environmental consequences positively influences consumer attitudes toward the BORS policy.*

H5. *Awareness of environmental consequences positively influences intentions to use the BORS policy.*

3.2.5. Environmental Awareness, Perceived Behavioral Control, and BORS Policy Usage Intentions

Environmental awareness represents the extent to which individuals are concerned about environmental issues, which significantly influences their behavioral choices [58]. This has been widely discussed in studies on green purchasing and sustainable consumption behavior [36,59]. Consumers' behavioral choices are strongly influenced by their understanding and awareness of environmental issues [60]. Polonsky et al. [61] and Cheng et al. [59] found that consumers with high environmental awareness are more likely to take positive actions when facing environmental issues.

In essence, when individuals possess a high level of environmental awareness, they are more attuned to the environmental impact of their behaviors, which leads them to consider environmental factors more carefully during the decision-making process. For instance, Hong et al. [26] found that consumers with heightened environmental awareness tend to

focus more on the environmental attributes of products and are more inclined to choose products that have a lesser environmental impact. This increased focus on environmental attributes can be seen as an aspect of perceived behavioral control, where consumers actively regulate their behavior to align with environmental protection goals.

In this study, environmental awareness can indirectly influence the use of BORS policies through perceived behavioral control and can also directly impact consumers' intentions to adopt these policies. Therefore, we propose the following hypotheses:

H6. *Environmental awareness positively influences perceived ease of using the BORS policy.*

H7. *Environmental awareness positively influences intentions to use the BORS policy.*

3.2.6. BORS Policy Usage Intentions and Sustainable Consumption Behavior

Sustainable consumption behavior aims to reduce the negative impact of individuals on the environment [62]. Saari et al. [63] found that personal intention has a positive impact on sustainable consumption behavior. The BORS policy allows consumers to return goods offline, reducing the impact of reverse logistics on the environment and improving the shopping experience of easy transition between online and offline. Consumers can take public transportation to stores, which also helps to reduce personal carbon footprint [64]. Thus, we believe that the adoption of BORS policy can both reduce environmental pressure and improve consumer experience. Accordingly, we propose the following hypotheses:

H8. *Intentions to use the BORS policy positively influence sustainable consumption behaviors.*

4. Methodology

4.1. Survey Design

Using individual-level data, this study explores consumer intentions regarding the BORS policy. Table 1 presents the main variables used in the theoretical framework. The content of the questionnaire from the pilot study was adapted with regard to the BORS policy, focusing on how environmental factors influence consumers' use of the policy and sustainable consumption behaviors. We translated the English questionnaire into Chinese and conducted a pre-test with 65 respondents to verify the understandability of the questionnaire. The questionnaire information was further improved through feedback from the pre-test to ensure proper understanding among Chinese respondents.

Table 1. Constructs and measurement items.

Construct	Measurement Item	References
	Attitude (ATT)	
ATT1	I have a positive attitude toward the buy-online-and-return-in-store (BORS) service.	[35,36]
ATT2	I think the use of BORS policy can significantly reduce environmental pollution.	
ATT3	I think the BORS policy will help reduce the carbon emissions generated by logistics.	
ATT4	I believe that using BORS policy can reduce the waste of resources and be more friendly to the environment.	
	Subjective norms (SN)	
SN1	My family and friends think it is a good idea to order online and return items in-store.	[35,36]
SN2	My family and friends support my use of online orders and in-store returns.	
SN3	The retailer encouraged me to order online and return in-store.	
SN4	My family and friends believe that returning an online order in-store is an environmentally responsible behavior.	

Table 1. *Cont.*

Construct	Measurement Item	References
	Perceived behavioral control (PBC)	
PBC1	I find it easy to order online and return items in-store.	[35,36]
PBC2	I have sufficient information and resources to complete an in-store return of an online order.	
PBC3	I prefer online ordering and in-store returns.	
PBC4	I understand the details of the in-store return policy for online orders.	
	Awareness of consequences (AC)	
AC1	I understand that online orders and in-store returns can reduce environmental pollution.	[19,21]
AC2	I am aware that my online ordering and in-store returns impact the sustainability of the environment.	
AC3	I understand the importance of online ordering and in-store return behavior in protecting the environment for the future.	
AC4	I know that returning an online order in-store has less impact on the environment than traditional return methods (such as returning goods by express delivery).	
AC5	I know that returning online orders in-store can be helpful in reducing the environmental impact of shipping.	
	Environmental awareness (EA)	
EA1	I often pay attention to news and information related to environmental protection.	[28,36]
EA2	I know that my return behavior has a direct impact on the environment.	
EA3	In my daily life, I try to adopt environmentally friendly return measures.	
EA4	I regularly seek information on how to reduce my environmental impact through my daily activities.	
	Intent to use BORS policy (IN)	
BORS IN1	If more stores offer in-store return services for online orders, I would be more inclined to use them.	[35,50]
BORS IN2	I am willing to recommend friends and relatives to use the online ordering and in-store return service.	
BORS IN3	I am willing to continue to use the online ordering and in-store return service in the future.	
BORS IN4	When shopping in the future, you will consider choosing a retailer that provides in-store returns for online orders.	
	Sustainable consumption behavior (SCB)	
SCB1	Reduce the use of plastic packaging.	[18]
SCB2	Take actions to reduce energy consumption.	
SCB3	Buy environmentally friendly products frequently.	

4.2. Data Collection

The data-collection period was from 14 December 2023 to 14 January 2024. We used the Chinese third-party online platform "Wenjuanxing" to disseminate the survey measuring Chinese consumers' intention to use the BORS policy. The survey was divided into three parts. The first part of the questionnaire detailed the objectives and significance of the survey, which sought to increase respondents' awareness of the value of their participation. The second part collected respondents' demographic information, including age, gender, and occupation, to facilitate a comprehensive understanding of their background. The third part poses specific questions to thoroughly investigate consumers' intentions to use the BORS service and their impact on sustainable consumption. We added to the questionnaire a question on consumers' return preferences even with the BORS policy. We measured these factors using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with 3 (neutral) as the middle option. Additionally, several attention check questions were included in the survey to verify the focus and authenticity of respondents' answers. If the respondent failed to select a specified option, their questionnaire was considered invalid. A total of 405 valid responses were collected.

4.3. Statistical Analyses

Confirmatory factor analysis was used to verify the hypothesized factor structure underlying the questionnaire items. Relevant model fit indices were computed. Addition-

ally, internal consistency was assessed using composite reliability (CR) and Cronbach's alpha. Discriminant validity was assessed using Fornell and Larcker [65] criterion. We used structural equation modeling to evaluate the research model. The mediating effect of consequence awareness was examined based on Hayes' [66] recommendations. Finally, a multi-group analysis was conducted to compare the impact of online and offline return channels on consumer behavior. SPSS and AMOS were used for the analyses.

5. Results

5.1. Summary of Respondents' Characteristics

Table 2 presents the respondents' basic information, including sex, age, occupation, and educational level. The proportions of male and female respondents were similar, revealing a relatively balanced distribution. Many respondents (more than 60%) were between the ages of 21 and 40, an age group that generally corresponds to more active online shoppers and those with financial means. Corporate employees comprised the largest group of participants in this survey, which may reflect the main user group of online shopping. The respondents' educational backgrounds were mostly college degrees or above. Although retail stores offer BORS policies, 32.346% of the consumers preferred the online return mode.

Table 2. Respondents' profile.

Control Variables		Frequency	Percent (%)
Gender	Male	219	54.074
	Female	186	45.926
Age	Under 20 years old	25	6.173
	21–30 years old	119	29.383
	31–40 years old	137	33.827
	41–50 years old	91	22.469
	50 years old above	33	8.148
Occupations	Student	60	14.815
	Staff	181	44.691
	Freelance	116	28.642
	Other occupations	48	11.852
Education level	High school and below	52	12.839
	College	107	26.420
	Undergraduate	127	31.358
	Master's	63	15.556
	PhD and above	56	13.827
Usual return methods	Order online and offline return	274	67.654
	Order online and online return	131	32.346

5.2. Non-Response Bias

Harman's single-factor test was used to evaluate common method bias, and the results showed that a single factor explained 48.331% of the total variance, which was lower than the standard threshold of 50% [67]. Therefore, our data and findings are relatively reliable and unlikely to be affected by significant biases resulting from the use of the same measurement methods. This suggests that common method bias was not a major issue in this study.

5.3. Measurement Model Analysis

Tables 3 and 4 report the results of the confirmatory factor analysis.

Table 3 shows that the model fit indices (chi-square divided by degrees of freedom [CMIN/DF] = 2.335; comparative fit index [CFI] = 0.945; Tucker Lewis index [TLI] = 0.939; incremental fit index [IFI] = 0.945; root-mean-square error of approximation [RMSEA] = 0.057) met the standards recommended by Hu and Bentler [68] and Hair [69], indicating good model fit. Table 3 shows that Cronbach's alpha exceeded 0.8. The average

variance extracted (AVE) values were above 0.6, and the CR values were above 0.8. All results are within the thresholds recommended of Fornell and Larcker [65]. These results demonstrated internal consistency and reliability. Table 4 shows that the measurement model has discriminant validity. If the AVE root of each latent factor construct is higher than the correlation coefficients between the latent constructs, it is considered to have discriminant validity [65].

Table 3. Confirmatory factor analysis results and scale reliability.

Construct	Item	Estimate	AVE	CR	Cronbach's Alpha
Awareness of Consequences (AC)	AC1	0.887	0.724	0.929	0.930
	AC2	0.860			
	AC3	0.838			
	AC4	0.822			
	AC5	0.846			
Environmental Awareness (EA)	EA1	0.837	0.667	0.889	0.892
	EA2	0.823			
	EA3	0.848			
	EA4	0.755			
Attitude (ATT)	ATT1	0.771	0.675	0.892	0.892
	ATT2	0.829			
	ATT3	0.843			
	ATT4	0.841			
Subjective Norms (SN)	SN1	0.827	0.658	0.885	0.885
	SN2	0.800			
	SN3	0.799			
	SN4	0.819			
Perceived Behavioral Control (PBC)	PBC1	0.851	0.661	0.886	0.885
	PBC2	0.866			
	PBC3	0.795			
	PBC4	0.732			
Intent to use BORS policy (IN)	IN1	0.806	0.623	0.868	0.877
	IN2	0.836			
	IN3	0.822			
	IN4	0.685			
Sustainable consumption behavior (SCB)	SCB1	0.803	0.640	0.842	0.845
	SCB2	0.789			
	SCB3	0.807			

Model fit statistics: chi-square divided by degrees of freedom (CMIN/DF) = 2.335 (CMIN = 791.68; DF = 339); comparative fit index (CFI) = 0.945; Tucker–Lewis index (TLI) = 0.939; incremental fit index (IFI) = 0.945; root-mean-square error of approximation (RMSEA) = 0.057. AVE, average variance extracted; CR, composite reliability.

Table 4. Square root of average variance extracted (AVE; in bold) and correlations between constructs.

	EA	AC	SN	PBC	ATT	IN
EA	**0.817**					
AC	0.711	**0.851**				
SN	0.596	0.658	**0.811**			
PBC	0.707	0.502	0.422	**0.813**		
ATT	0.524	0.737	0.485	0.370	**0.822**	
IN	0.727	0.664	0.620	0.584	0.584	**0.790**

Numbers in bold along the main diagonal are the square root of the AVE values. EA, Environmental Awareness; AC, Awareness of consequences; ATT, Attitude; SN, Subjective norms; PBC, Perceived behavioral control; IN, Intent of use of BORS policy; SCB, Sustainable consumption behavior.

5.4. Path Analysis

Table 5 and Figure 2 present the path analysis results. The three core variables of the TPB model, namely, attitude (0.213 ***), subjective norms (0.271 ***), and perceived behavioral control (0.137 *), exhibited a positive impact on the intention to use the BORS policy.

These results indicate that consumers' positive attitudes toward using the BORS policy, the influence of social norms, and their perceived control over the behavior significantly increase their intention to use the policy. Therefore, Hypotheses 1, 2, and 3 are supported. Moreover, when consumers actively engage with the BORS policy by visiting offline retail stores, the diversity of sales staff services and products indirectly influences consumer behavior, potentially increasing sales in offline retail stores [14,31].

Table 5. Hypothesis testing results.

Hypothesis	Path	Estimate	S.E.	C.R.	Sig.
H1	ATT→IN	0.213	0.065	3.304	***
H2	SN→IN	0.217	0.057	3.831	***
H3	PBC→IN	0.137	0.058	2.338	*
H4	AC→IN	0.035	0.075	0.473	NS
H5	AC→ATT	0.650	0.047	13.887	***
H6	EA→IN	0.368	0.082	4.466	***
H7	EA→PBC	0.741	0.055	13.529	***
H8	IN→SCB	0.646	0.058	11.202	***

Note: * $p < 0.05$, *** $p < 0.001$, NS = not significant ($p > 0.05$). EA, Environmental Awareness; AC, Awareness of consequences; ATT, Attitude; SN, Subjective norms; PBC, perceived behavioral control; IN, Intent to use BORS policy; SCB, Sustainable consumption behavior.

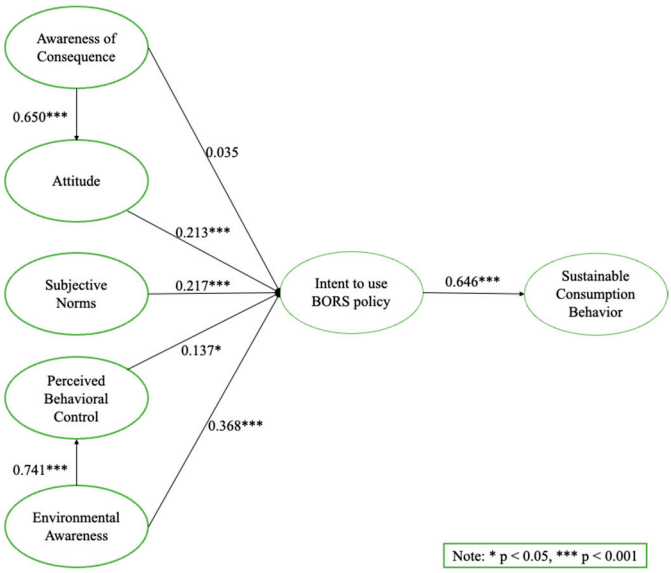

Figure 2. Results of structural equation modeling.

The results show that awareness of consequence (0.035^{ns}) does not significantly affect consumers' direct intention to use the BORS policy, but awareness of consequence (0.650 ***) significantly affects consumers' positive attitudes toward the BORS policy, indirectly affecting intent to use. Therefore, Hypothesis 4 is supported, while Hypothesis 5 is rejected—indicating that consequence awareness does not directly drive consumers' adoption of the BORS policy but plays a significant role in shaping their positive attitudes towards it, which may in turn indirectly influence their adoption behavior.

Additionally, environmental awareness had a significant impact on both intentions to use the BORS policy (0.368 *) and perceived behavioral control (0.741 ***),** indicating that consumers with higher environmental awareness are more likely to use the BORS policy. This finding also suggests that environmental awareness can indirectly influence the intention to use the BORS policy through its impact on perceived behavioral control. Thus, Hypotheses 6 and 7 are supported. Consistent with the findings of Galván-Mendoza et al. [70], these results further confirm that environmental awareness can influence consumers' green behaviors both directly and indirectly.

The results show that the intention to use the BORS policy increases consumers' sustainable consumption behavior (0.646 ***); thus, Hypothesis 8 is supported. These findings further indicate that the BORS policy, by offering a flexible return option, significantly enhances the convenience of product returns for consumers and boosts their environmental awareness, both of which are crucial for promoting environmentally sustainable development.

The path analysis provides robust support for the application of the TPB model in understanding the factors that influence the intention to use BORS policies. The significant relationships identified among attitude, subjective norms, perceived behavioral control, and intention underscore the importance of these constructs in shaping consumer behaviors toward sustainable consumption. The findings also highlight the critical roles of consequence and environmental awareness, both directly and indirectly, in influencing these behaviors. The insights gained from this study can guide retailers and policymakers in designing and promoting BORS policies to enhance sustainable consumption practices.

5.5. Mediation Analysis

Based on the recommendations of Hayes [66], we conducted a significance test for the mediating effect of AC. The results showed that ATT plays a complete mediating role between AC and IN. A 95% confidence interval was generated using the bootstrap method with 5000 samples. As shown in Table 6, the bootstrap analysis results demonstrate that for the AC→ATT→IN path, the 95% confidence intervals for both the total and indirect effects do not include zero, whereas the confidence interval for the direct effect does include zero, confirming the complete mediating role of ATT. Conversely, on the EA→PBC→IN path, as the 95% confidence interval of the indirect effect includes zero, there is no mediating effect.

Table 6. Results of the mediation analysis.

Path		Estimate	Bias-Corrected Percentile Method 95%CI		Percentile Method 95%CI		Result
			Lower Bounds	Upper Bounds	Lower Bounds	Upper Bounds	
AC→ATT→IN	Total Effects	0.174	0.021	0.381	0.018	0.377	Complete mediation
	Direct Effects	0.035	−0.169	0.24	−0.169	0.241	
	Indirect Effects	0.139	0.021	0.3	0.02	0.299	
EA→PBC→IN	Total Effects	0.469	0.269	0.63	0.275	0.635	No mediating effect
	Direct Effects	0.368	0.157	0.549	0.162	0.552	
	Indirect Effects	0.101	−0.031	0.239	−0.034	0.234	

CI, confidence interval; AC, Awareness of consequences; ATT, Attitude; EA, Environmental Awareness; PBC, Perceived behavioral control; IN, Intent to use BORS policy.

This indicates that while AC does not have a direct impact on IN, it significantly influences consumers' intentions to use the BORS policy through the mediating effect of attitude. Therefore, when implementing the BORS policy, retailers can indirectly promote its adoption by fostering positive consumer attitudes. Retailers might achieve this by launching educational campaigns that emphasize the environmental benefits of using the BORS policy, thereby increasing consumer awareness and understanding. Additionally, retailers can shift consumer perceptions by offering incentives that encourage active participation in sustainable consumption behaviors.

5.6. Comparative Impact of Online and Offline Return Channels: A Multi-Group Analysis

This section presents the results of the multi-group analysis, highlighting the significant differences in sensitivity to environmental factors among consumers using these channels.

According to Bentler [71], a critical ratio (z-score) higher than 1.96 indicates a significant difference in factor loadings between the two groups. Table 7 shows that environmental awareness (EA→IN) significantly influences the intention to use the BORS policy among

consumers who return goods offline, with a z-score of 2.241, indicating higher sensitivity to environmental responsibility in this group.

Table 7. Results of the multi-group analysis.

Path	Online Return		Offline Return		
	Estimate	*p*-Value	Estimate	*p*-Value	z-Score
AC→ATT	0.76	***	0.608	***	−1.459
EA→PBC	0.834	***	0.701	***	−1.136
AC→IN	0.339	0.129	−0.008	0.916	−1.473
ATT→IN	0.296	0.069	0.161	0.015	−0.769
SN→IN	0.126	0.244	0.243	***	0.934
PBC→IN	0.339	0.032	0.096	0.114	−1.435
EA→IN	−0.11	0.642	0.456	***	2.241 **
IN→SCB	0.674	***	0.63	***	−0.357

Note: ** $p < 0.01$, *** $p < 0.001$. AC, Awareness of consequences; EA, Environmental Awareness; ATT, Attitude; SN, Subjective norms; PBC, Perceived behavioral control; IN, Intent of use of BORS policy; SCB, Sustainable consumption behavior.

From a statistical perspective, the analysis shows that while most paths, such as awareness of consequences to attitude (AC→ATT) and environmental awareness to perceived behavioral control (EA→PBC), do not significantly differ between the online and offline return channels, environmental awareness (EA→IN) has a notably stronger impact on offline returns. This finding suggests that consumers who return items offline are influenced more by their environmental consciousness. Additionally, subjective norms (SN→IN) and perceived behavioral control (PBC→IN) showed some variability between the two groups, indicating differences in how social influence and perceived control affect online and offline return intentions.

6. Discussion

This study explores the impact of the BORS policy on consumer usage intention and the relationship between BORS usage intention and sustainable consumption behavior. By incorporating environmental variables, we evaluated the pathways through which the environmental attributes of the BORS policy affected consumers' intentions to use the policy.

First, the core variables of the TPB model—attitude, subjective norms, and perceived behavioral control—shape usage intentions. This is consistent with the results of Hong et al. [26], who indicated that positive attitudes, subjective norms, and perceived control over services or products can enhance the intention to engage in green behaviors. This finding has also been strongly validated in various fields, including environmental protection [72,73].

Furthermore, the findings indicate that the impact of consequence awareness on attitudes and environmental awareness on perceived behavioral control cannot be overlooked. While the awareness of consequences does not directly influence the intention to adopt the BORS policy, it significantly shapes consumer attitudes, which in turn indirectly affects their intention to use the policy. When consumers are unaware that using BORS policies can reduce environmental impacts, they are less likely to develop the intention to use them. Thus, it is crucial to enhance consumer awareness that BORS policies contribute to environmental sustainability. By clearly demonstrating how the use of BORS policies can lower the carbon footprint, consumers can intuitively understand the environmental benefits, thereby strengthening their awareness of the consequences. Environmental awareness can directly affect consumers' use of BORS policies and indirectly affect usage intention through perceived behavioral control. Consistent with the results of Khan et al. [74] and Lim et al. [19], consumers who are highly concerned about the environment are more likely to try it when they learn that their behavior can effectively reduce environmental impact. Therefore, it is recommended that retailers increase publicity of the BORS policy, increasing

consumer awareness and adoption, which will boost environmental protection and reduce operating costs related to returns management.

Finally, as a flexible option for returns and exchanges, the BORS policy promotes the integration and optimization of omni-channel retailing and encourages sustainable consumption practices. The results of this study suggest that consumers with higher environmental awareness are more inclined to choose environmentally friendly consumption methods [18,26,40]. The BORS policy provides consumers with more convenience, allowing them to easily switch between different channels, improving the overall shopping experience. In addition, the BORS policy helps to reduce unnecessary logistics and transportation steps, reduces carbon emissions and resource waste, and supports sustainable consumption behaviors and environmental practices.

6.1. Theoretical Contributions

This study makes two main theoretical contributions. First, it explores consumers' intention to use BORS policies using TPB. Previous research has mainly focused on the benefits of the BORS policy on supply chain operations [5,12,25], often neglecting the consumer perspective. This study fills this theoretical gap by incorporating environmental variables, awareness of consequences, and environmental awareness into the TPB model to explore how the environmental characteristics of BORS policies affect consumer intentions to use the policy. The results show that attitude, subjective norms, perceived behavioral control, and environmental awareness are key factors driving consumers to use the BORS policy. Although awareness of consequences does not directly affect the BORS policy, it can positively influence consumers' use of the BORS policy through attitudes. This finding provides a new research perspective in the field of environmental protection and emphasizes the importance of improving consumers' environmental awareness.

Second, consumer intention to use the BORS policy stems from the dual drive of convenient experience in omni-channel shopping and reducing negative environmental impact. Through online purchases and offline returns, consumers can enjoy convenient shopping and returns, minimizing reverse logistics and packaging waste, and reduce carbon emissions and resource consumption. This approach enhances consumers' omni-channel shopping experience and promotes sustainable consumption behaviors. With the rise of environmental awareness, the BORS policy has become an effective strategy to meet convenience needs and promote environmental practices, providing support for the sustainable development of retailers and society.

6.2. Practical Implications

This study indicates that attitudes, subjective norms, perceived behavioral control, and environmental awareness are key factors in the formation of behavioral intentions. To encourage consumer participation in the BORS policy, it is crucial to enhance their understanding and awareness of the policy's ability to reduce environmental impacts and promote sustainable behavior. Retailers can clarify the environmental benefits and consumer advantages of using the BORS policy on their websites and in return and exchange policies, strengthening consumers' desire to use this policy. Retailers should also enhance the training and management of their in-store staff to ensure that the BORS policy provides consistent and efficient services to consumers, eliminating any form of differential treatment [31]. Moreover, increasing and diversifying convenient return locations are recommended to ensure timely returns of online purchases, making it easier for consumers to return items and improve their return experience [14].

Moreover, consumer attitudes and environmental awareness play a crucial role. Retailers, governments, and the media should actively promote consumers' responsibility and ability to protect the environment [36]. Enhancing consumers' environmental awareness can increase their intention to adopt BORS policies. The intervention of retailers, governments, and the media can help consumers filter appropriate information and make informed choices, while also raising their environmental consciousness and encouraging

active participation [75]. For example, retailers can provide consumers with personalized recommendations, such as information on nearby return locations or store inventory, which can significantly enhance their offline shopping experience [76]. Retailers can also leverage data analytics to offer personalized communications and recommendations, aligning the environmental benefits of BORS policies with consumers' personal values to increase participation and adoption.

By utilizing data analytics to personalize communication and marketing efforts, retailers can highlight the environmental benefits of the BORS policy in a way that resonates with individual consumer values and behaviors, thereby increasing engagement and adoption rates. Retailers should also consider collaborating with environmental organizations and influencers to co-create campaigns that emphasize the environmental impact of returns and promote the BORS policy as a sustainable alternative, reaching a wider audience and amplifying the message.

Furthermore, participation rates can be increased by offering incentives, such as discounts or loyalty points, to consumers who choose in-store returns. Establishing feedback mechanisms to gather insights on the return experience will also help retailers improve services and maintain the user-friendliness of the BORS policy. By leveraging mobile applications and offline stores to streamline the return process, consumers can easily switch between shopping channels, track return statuses in real time, and locate return points conveniently. Providing a high-quality omni-channel experience can significantly enhance consumer satisfaction [77].

Retailers carry out environmental protection education and promotion to raise consumers' awareness of the benefits of BORS policy environment for environmental protection. The information displayed on social media and in store can help consumers understand the potential benefits of BORS policies for environmental protection. By implementing these strategies, retailers can increase consumer participation in BORS policies and contribute to broader environmental sustainability efforts. Consistent with the results of this study, these practical steps provide actionable insights for improving the effectiveness of BORS policies.

7. Conclusions, Limitations, and Future Research Directions

7.1. Conclusions

The BORS policy has become a key strategy for omni-channel retail, creating economic benefits for supply chain partners. However, understanding how to effectively implement the BORS policy from a consumer perspective is still a major research topic. The BORS policy enables consumers to switch freely between online and offline channels, improves shopping experience and return convenience, and significantly reduces environmental burden by minimizing reverse logistics and packaging waste. This study shows that attitudes, subjective norms, perceived behavioral control, and environmental awareness have a positive impact on consumers' intention to use BORS policies, thereby promoting sustainable consumption behavior. The BORS policy enables consumers to switch freely among different channels through the integration of online and offline channels, thereby enhancing consumers' shopping experience. At the same time, the use of the BORS policy reduces negative impacts on the environment, encourages consumers to make responsible returns, and reduces resource waste and environmental burden, thereby promoting the development of sustainable consumer behavior.

7.2. Limitations and Future Research Directions

This study has some limitations. Firstly, as the survey mainly targets Chinese consumers and China's BORS policy is still in its infancy, future research should consider conducting this analysis in other countries to verify consumers' intentions and sustainable consumer behavior in using BORS policies. Second, the BORS policy may encourage consumers to engage in secondary consumption, which deserves further exploration in future research. Finally, future research can consider introducing other factors related to

consumer behavior in an omni-channel environment and explore environmental factors such as altruism and egoistic factors for a more comprehensive understanding.

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