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Host–Guest Interaction and Sustainable Consumption Behaviour on Sharing-Accommodation Platforms: Using a Big Data Analytic Approach

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Abstract: The rapid expansion of the sharing economy has ignited diverse perspectives regarding its sustainability implications. Nevertheless, a comprehensive study examining the influence of host–guest interactions on sustainable consumption behaviour is yet to be conducted. To fill the abovementioned gap, this research crawls online data and corresponding consumer reviews of 46,360 properties listed on Muniao Short Rent. Employing latent Dirichlet allocation (LDA) to model sustainable consumption reviews and conducting subsequent regression analysis using SPSS, this research empirically demonstrates that the host–guest interaction frequencies and positive emotions during interaction positively influence guests' sustainable consumption behaviours within the sharing-accommodation context. This research proposes the significance of the host–guest relationship for green consumers and argues that factors such as price and house type negatively moderate the host–guest interactions and guests' sustainable consumption initiatives.

Keywords: user behaviours; sharing-accommodation platforms; host–guest interaction; sustainable consumption behaviour; big data

1. Introduction

It is predicted that sustainability will be a crucial issue for the sharing economy over the next decade [1]. Although the increasing numbers of green consumers play positive roles in making the sharing economy a sustainable economic model [2], the conclusions drawn from the existing literature regarding the impacts of the sharing economy on sustainability are not consistently aligned [3], especially in the sharing accommodation context. For instance, Böcker and Meelen [4] argue that sharing accommodation contributes to sustainability by increasing the efficient utilisation of existing goods and saving necessary scarce resources to produce new goods. However, Czepkiewicz et al. [5] challenge the findings above as they empirically found that sharing accommodation reduces accommodation costs, increasing the usage frequency of existing shared holiday houses and consumption of other supplementary resources (see Appendix A) during extended journeys to reach shared properties in nearby suburbs. Similarly, Martin [6] empirically found that local residents suffer from rising rents caused by sharing accommodation.

This research aims to provide scientific guidance on the role of sharing accommodation in fostering sustainability within the tourism sector. This focus is particularly pertinent given the projected growth of global sharing accommodation, which is expected to surpass traditional hotel growth rates sixfold between 2013 and 2025 [7].

This research empirically investigates the impacts of host–guest interactions on sharing accommodation platforms on consumers' sustainable consumption behaviours. We focus

on host–guest interactions within the sharing accommodation context, as they differ from those between guests and hotel/reception. For instance, the prior literature [8] suggests that host–guest interactions in shared accommodation are more likely to foster a sense of community and personalised experiences compared to traditional hotel services, which are often viewed as a value co-creation process [9]. The development of the internet is gradually giving science and technology an active role in the sharing economy [10]. The popularity of sharing platforms has made sharing accommodation the main representative sector of the sharing economy [11]. Furthermore, according to Sung et al. [12], the platform's value to consumers depends on the service providers, and the platform's value to the service provider is influenced by consumers. Sung et al. [12] also argue that consumers' purposes for participating in the sharing economy differ from those of providers—customers tend to pursue personal interests without considering societal contributions, while providers focus more on societal implications, such as social relationships and sustainability. With asymmetric information between the two sides of a transaction, consumers' willingness to consume and trust is easily influenced by network messages and social interactions [13]. In this setting, weak relationships can spread community information [14] and connect different individuals and communities, and therefore, are more important than strong relationships generated by host–guest communication in the sharing accommodation context. Several studies have shown that in sharing accommodation, the physical environment and interpersonal interactions play an equal role in influencing perceived value and determining subtle differences between attitudes and behavioural loyalty influenced by perceived value [15]. Moreover, host-based word-of-mouth has a more decisive influence on sales performance than list-based word-of-mouth [16]. If the host–guest combination is closer and the interaction is deeper, the subjective feelings and experiences that can be obtained will be more intense [17,18]. Additionally, driven by big data, it is also emerging that sustainability and interaction are inextricably linked. Consumers with higher levels of sharing care more about social interaction and economic value than consumers with lower levels of sharing [19]. Therefore, host–guest interaction is added as an important research factor in this work. Unfortunately, the existing literature on this topic mainly focuses on guests' perspective [20], which means that the discussions on host–guest interaction still require further investigation.

Several related studies have examined the link between green consumer behaviour and the sharing economy; e.g., increasing customers' sustainable consumption behaviour improves objective sales performance [21]. However, the mechanism of how host–guest interaction influences sustainable consumption behaviour is still under investigation [22]. Hence, in this research, we seek to answer the following research questions:

Q1: Is host–guest interaction a crucial factor that green consumers pay attention to in sharing accommodation?

Q2: How does host–guest interaction influence consumers' sustainable consumption behaviours in the sharing accommodation context?

This research combines qualitative and quantitative methods to properly answer the above research questions. By systematically collecting consumer reviews from 46,360 properties listed on Muniao Short Rent, this paper utilises latent Dirichlet allocation (LDA) to model the data. Subsequently, regression analysis is conducted using SPSS to measure the relationship between host–guest interaction and consumers' sustainable consumption behaviours. The empirical findings of this research indicate that sharing accommodation enhances sustainable consumption among consumers by fostering host–guest interaction.

This research theoretically enriches the existing relationship marketing theory by (1) distinguishing 'green' and 'ordinary' customers with different preferences, (2) connecting the host–guest relationship quality to sustainable consumer behaviours, and (3) defining sentiments and frequencies of interactions as new theoretical components in the current relationship marketing theory for better sustainable practices. Moreover, this research suggests measuring the moderating effects of external factors, such as pricing and product

characteristics, to better understand the correlations between host–guest interactions and sustainable consumer behaviours. From the practical implication perspective, this research offers innovative suggestions for sharing platforms and landlords to stimulate sustainable consumer consumption behaviours and make tourism more sustainable.

After this introduction, we consolidate prevailing insights regarding the relationship between host–guest interactions and consumers' sustainable consumption behaviours in Section 2, thereby constructing hypotheses accordingly in Section 3. Section 4 explains the methodology employed in the research. We report the empirical findings in Section 5, followed by a discussion in Section 6.

2. Literature Review

2.1. Sharing Accommodation and Sustainability

Sharing accommodation refers to any peer-to-peer short-term renting and swapping of private-owned lodging facilities [3], which achieves usage optimisation [23] without changing property ownership [24]. In this research, sustainability in the tourism sector refers to a balance between satisfying the needs of different parties (e.g., tourists, businesses and local community) and considering the future generations' well-being [25].

Sharing accommodation manifests in three primary forms [26] on mainstream sharing platforms (e.g., Airbnb). First, the whole rental enables guests to access the house/flat exclusively, thereby sharing no public space with others [27–29]. Second, the single-room rental provides guests with a private room while sharing public areas of the facility with other guests or the host [29]. Third, the shared-room rental entails guests living together with the guests or host in the same room [30].

The impacts of sharing accommodation on sustainability are still under discussion. Some existing studies admit the positive impacts of sharing accommodation on sustainability. Collaborative consumption shifts the paradigm of ownership towards sharing, hence promoting the usage rate of underused goods and reducing unnecessary energy consumption [4,31] and associated environmental issues [32], aligned with the essence of sharing accommodation as it facilitates the sharing of usage rights to properties [33]. Enochsson et al. [34] emphasise the positive impacts of sharing accommodation on urban liveability, since it boosts cultural interaction and the city's resilience in dealing with emergency services.

Comparatively, some scholars [35,36] define sharing accommodation as a disruptive innovation threatening tourism's sustainability. After all, sharing accommodation is criticised for aggravating local residents' displacement [37] and providing unfair competition [7]. For instance, the existing literature [20,38] argues that the growing demand for shared accommodation increases housing prices and the cost of living inflation and reduces long-term rental options. Furthermore, affordable tourist accommodation enhances travel accessibility but can have adverse implications for sustainability, since it exacerbates environmental concerns [39] and increases the pressure on local infrastructure [40].

2.2. Host–Guest Interaction in Shared Accommodation

The dynamics of host–guest relationships within the accommodation-sharing sector are beyond the normal seller–customer relationship in a commercial setting [41]. Host–guest interactions are pivotal in cultivating the connection with local communities [42,43], facilitated by direct and indirect engagements between hosts and guests [44]. Hence, as the key aspect of social benefit [44,45], host–guest interaction is rendered a fundamental dimension for assessing accommodation-sharing experiences [42], since it is beyond mere space-sharing [46]. More importantly, host–guest interactions are crucial to tourism's sustainability, since its success is determined by the collaboration of multiple stakeholders [47].

Host–guest interactions can manifest across physical and virtual interfaces, such as offline contact and reciprocal online reviews [48]. Although the online engagement between host and guest differs from the in-person interactions [49] since it does not rely on verbal communication, facial expressions and body movement [50], it is still fundamental

for sharing accommodation operations. Xie and Chen [49] noted that the online host–guest interactions fulfil the guests' aspirations through participatory dialogue with hosts regarding the services offered. Furthermore, the hosts' prompt response to guests is instrumental in influencing accommodation occupancy rate [51], reflecting the win–win element in such digital correspondence.

2.3. Green Consumers and Sustainable Consumption Behaviours (SCBs) in Shared Accommodation

The intensifying concerns regarding climate change and its extensive ecological consequences influence consumers to make environmentally responsible purchasing decisions [52]. Individuals identified as 'green consumers' have a high propensity to engage in eco-friendly behaviours [53], and they consistently employ terms relevant to green consumption behaviours in their transactional exchanges [54]. Sustainable consumption behaviours (SCBs) encompass a set of behaviours that contribute to sustainability [55]. SCBs notably include eco-friendly purchases, waste reductions, and other practices aimed at diminishing the adverse impacts of consumption on the environment [56]. According to Hamari et al. [57], the perceived sustainability-related environmental benefits motivate consumers' engagement in collaborative consumption services. Sharing accommodation, as argued by Liu et al. [58], is a more ecologically responsible alternative than conventional hospitality services (e.g., hotels), since it decreases resource consumption, such as continuous lighting and heating in communal areas, thereby reducing carbon dioxide emissions. SCBs, driven by altruistic values and personal norms [54], encourage consumers to sacrifice their personal interests [55], such as sharing, supporting others, and behaving responsibly [56] instead of booking hotels from a more hedonic-oriented perspective [58].

Interestingly, apart from the conventional SCBs associated with accommodation-sharing defined in prior studies [26], such as waste reduction and voluntary maintenance of cleanness, it is worth mentioning that host–guest interactions on the online review systems serve as a mirror reflecting customers' SCBs, especially for the millennial generation [59]. After all, online platforms enable customers to observe forerunners' behaviours, thereby making purchasing decisions and augmenting the intention to engage in reciprocal behaviours [60]. Moreover, interactions on online platforms may be influenced by attitudes shaped by social norms or cultural traits [60], such as the preference for green consumption [61]. For instance, based on online host–guest interactions, guests can perceive the signal that the hosts are environmentalists through their commitment to environmental sustainability [21] and thereby adopt more environmentally considerate practices.

2.4. Online Interaction and Sustainable Consumption Behaviours

Although marketers within the accommodation-sharing sector have acknowledged the importance of anticipated environmental sustainability benefits as part of their services, the explicit prioritisation of these benefits in online host–guest communications remains infrequent [58]. Consequently, there are still limited scholarly investigations exploring the relationship between online host–guest interactions and the SCBs of guests within the context of accommodation-sharing. However, the extant studies [62] have explored how social media and online communities influence customer SCBs. Yang et al. [63] argue that social networks play a bigger role in facilitating customer SCBs because online interactions between individuals on specific online communities and recommendation systems [64] regulate customers' behaviours. Bedard and Tolmie [65] identified a positive relationship between online interpersonal influence and green consumption intentions through empirical investigation. This relationship amplifies the impact of digital messages because the enhanced online participation by customers increases the breadth of contributing sources [65] and, meanwhile, gives hosts unprecedented access to a large number of online reviews [66].

On the other hand, a segment of the extant studies [63] concentrates on the impact of online reviews on green purchases. Online reviews encapsulate customers' feedback regarding products or services disseminated via the Internet [67]. Given the burgeoning

prominence of online reviews as an independent and less biased source for consumers, they have the potential to shape customers' green consumption behaviours [59]. Comparatively, Biswas and Roy [62] empirically found that the influence of online peer opinions and comments on customer SCBs is insignificant, since the level of environmental-related concern should also be considered.

3. Research Framework and Hypotheses

This study is divided into two main parts to answer the two questions mentioned in the introduction. First, this paper analyses the topics of concern for green consumers in sharing accommodation using a topic modelling approach to answer Question 1. Second, this paper constructs a research model grounded in relationship marketing theory, which considers the economic, social and ecological dimensions (see Figure 1). This module is utilised to formulate research hypotheses and measure the impact of the host–guest relationship on sustainable consumer behaviour in a sharing accommodation context. Furthermore, the model explores boundary conditions regarding room type and price. Question 2 is answered by elaborating on the development of the research model.
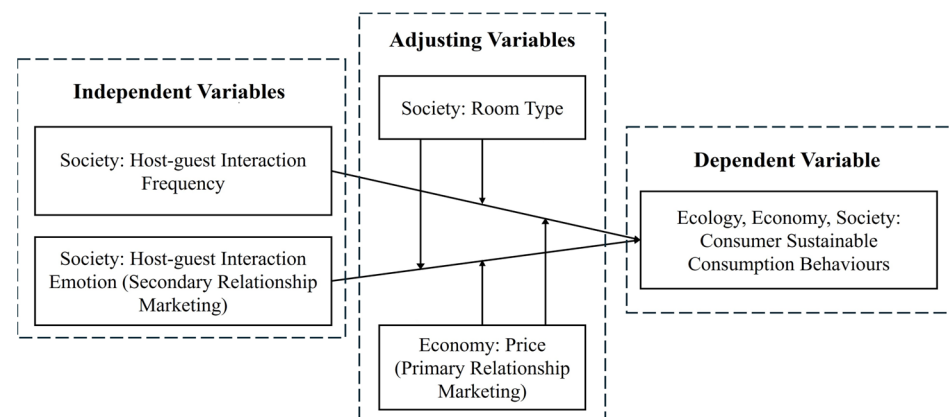

Figure 1. Research model based on relationship marketing theory.

The 'homeowner' category is included in dimensions of all consumer care related to sharing accommodation [61,68,69] and is specific to the context of sharing accommodation [57]. Interpersonal interaction is one of the key factors contributing to host–guest satisfaction and value co-creation [19,70]. For instance, Zhang et al. [71] argue that insufficient host–guest interactions affect consumers' booking, which is not expected by hosts and accommodation-sharing platforms. During the interaction between hosts and guests, the dimensions and importance of guests' and hosts' concerns change as the level of interaction changes [45]. Guests at higher interaction levels care more about social values than those at lower levels. Additionally, the friendliness of hosts and local tourism tips play a facilitating and moderating role in this dynamic [45]. Relationship marketing management can be discussed based on the closeness of the relationship with the customer [72]. For instance, Qiu et al. [73] argue that value co-creation is determined by whether host and guest can interact compatibly. Zhang et al. [74] support the above argument because they observe that unpleasant host–guest interactions lead to value co-destruction for both parties. The first level of relationship marketing is a value concession; the second level meets the customer's needs, and the third level becomes a partnership. Therefore, the number of host–guest interactions (number of host–guest comments) and the emotions that consumers show after a host–guest interaction (host–guest distinction) are added to the model as independent variable 1 and independent variable 2, and the independent variable 2 (host–guest emotional difference) reflects the second level of relationship marketing. Based on previous research, the following hypotheses are put forward:

H1a: *The number of interactions between hosts and guests (the number of comments about host–guest interaction) positively impacts sustainable consumption behaviour.*

H1b: *The more positive the sentiment of the host–guest interaction (host–guest emotional difference), the greater the impact on sustainable consumption behaviour.*

Based on the extant studies, room type and price are the top-ranking factors influencing consumers' accommodation choices [75]:

3.1. Room Type

In the shared accommodation sector, the room type as the main attribute of the house reflects how the host rents out the house. In the current situation, room types in shared accommodation are generally categorised as whole-room rentals, single-room rentals and shared rooms. Except in the United Kingdom, the most common room type are whole-room rentals (full flats) [75,76]. Compared to other room types, whole-room rentals have higher annual incomes and the highest number of bookings, days booked and days rented [77]. It has been found that different room types offer different opportunities for consumers to communicate and interact with the landlord and other guests [78]. However, the purpose of social interactions for consumers staying in different types of rooms varies and generates different evaluations through different interactions [79–81]. Consumers who choose to rent a single room value socialising more than those who choose to live in the entire rented house, but the social skills of the landlord have a significant moderating effect on guests' satisfaction, regardless of room type [41]. Information on trust and reputation also increases the probability of consumers choosing a single room [82]. In addition, consumers staying in a whole house are more interested in the general experience and hedonic values [81,83,84]; consumers staying in a single-room rental are more likely to mention the topics 'location', 'security and privacy' [83]; furthermore, consumers staying in a shared room are more likely to value social interaction with the landlord, are more positive about 'host services' [84] and more likely to think about utility value [85]. Social well-being affects the satisfaction of consumers who live in shared rooms with hosts, but the effect is insignificant for consumers who live in whole houses [86]. Therefore, based on previous research, the hypotheses are the following:

H2a: *The positive impact of the number of interactions (the number of comments about host–guest interaction) on sustainable consumption behaviour is lower in the case of a whole-room rental than in the case of a single-room rental.*

H2b: *The positive impact of the host–guest interaction sentiment (host–guest emotional difference) on guests' sustainable consumption behaviour is lower in the case of a whole-room than in the case of a single-room rental.*

3.2. Price

The price of a room is an important measure of the rent, and the functional characteristics of a room are significantly related to the price of a room [87]. Price is an aspect that consumers are more concerned about [88], which not only influences consumer choice but also has a significant impact on performance and consumer satisfaction [89,90], and which is also closely related to their association with consumer evaluation [91]. In sharing accommodation platforms where prices are more favourable [92], consumers staying in lower-priced rooms pay more attention to aspects such as external facilities and convenience; consumers staying in higher-priced rooms pay more attention to aspects that include internal aspects [81,86]. Previous research [20] has demonstrated that consumers would show gratitude for economic incentives, such as a lower price, and are more likely to engage in sustainable consumption as reciprocal feedback. Similarly, Wang and Yu [56] argue that economic factors (i.e., high prices) negatively affect customers' sustainable consumption behaviour, as well as having a negative impact on future bookings [26], and that rooms with lucky numbers in the price will receive more bookings and customer reviews than other rooms without this price feature [93]. Therefore, based on previous research, this paper proposes the following hypotheses:

H3a: *The positive impact of the number of host–guest interaction frequencies (the number of host–guest comments) on guests' sustainable consumption behaviour is higher for low prices than for high prices.*

H3b: *In the case of low prices, the positive impact of the host–guest interaction sentiment (host–guest emotional difference) on guests' sustainable consumption behaviour is higher than in the case of high prices.*

4. Methodology

4.1. Samples

It is noted that a holistic analysis regarding socioeconomic and environmental implications is still required from the perspectives of different types of accommodation-sharing platforms, since only large organisations (e.g., Airbnb) are investigated in the extant studies [3]. Hence, in this article, we start with the platform in China, Muniao Short Rent, and gather information about the listing information and consumer review data for each listing. Muniao Short-Term Rentals was selected because it was designed to use unused resources efficiently and reduce wastage. It specifically aims to provide offline value-added services centred around local landlords. It can be demonstrated that this platform is a sharing platform for achieving the goal of harmonious coexistence between economy, society and ecology.

After removing all blank comments, 46,360 samples were obtained (1 sample from each piece of rented-room information). A total of 303 Chinese regions were included. The average number of recommendations per listing was 6.58, and the average value of the scores obtained was 4.83 (a range of scores of 0–5). The scores obtained were generally high. The average number of rooms is 2, and the average number of suitable guests is 4. There are 35,239 rooms with room prices ranging from CNY 68 to CNY 500 (about 76%), with an average value of 607.64. A total of 43,611 (about 94.1%) of the sample were whole-room rentals, and 2749 (about 5.9%) were single-room rentals. Drawing from the extant publications [27–29,94], the accommodation options offered by the case platform are representative forms of shared accommodation. Hence, this research primarily assesses the impacts of host–guest interactions within the abovementioned two sharing-accommodation forms on guests' sustainable consumption behaviours.

4.2. Measures

4.2.1. Python Browser

This paper summarises the data on the sharing platform website. Using Python, all relevant information about houses from muniao.com is crawled, such as the number of rooms, room type, price, and rating, and then consumer reviews of these houses are crawled. The data is then sorted and organised. The number of rooms, prices, and ratings are obtained directly by browsing the basic information. Room types are classified as 'whole-room' and 'single-room', and for the convenience of subsequent analysis, 'whole-room' is edited as '1' and 'single-room' is edited as '0'. The "0–1" variable is used directly to represent the room type.

4.2.2. Topic Modelling

After the data were extracted, topic modelling was carried out to extract the dimensions important to them in sustainable consumers' reviews and to find the unique content important to green consumers in sharing accommodation.

The comments of users classified as 'green users' should be filtered by the words they use in their online comments; i.e., green consumers are those who use words related to sustainable lifestyles [95]. Therefore, comments were filtered from all comments using sustainable words and classified as sustainable comments. A sustainable comment is a comment with content that represents a sustainable consumer. Sustainable comments are subjected to topic modelling to extract content that sustainable consumers care about and

to then compare it to the content in traditional comments, to obtain the unique content they care about.

4.2.3. Sentiment Analysis

Consumer reviews are divided into two categories: all consumer reviews and host–guest interaction reviews. The reviews collected by the crawler are considered as all consumer reviews after filtering out the blank feedback. Host-and-guest interaction comments are extracted by summarising the host-and-guest interaction records. Subsequently, sentiment analysis is conducted separately for each type of comment.

The average sentiment of each review across all consumer reviews was calculated with the SnowNLP sentiment package in Python (the sentiment average ranges from 0 to 1 to reflect the degree of consumer sentiment from negative to positive). Then, the average sentiment of all the reviews in each house is summed. The result is divided by the total number of reviews in each house, which is the total consumer sentiment for each sample (house) (hereafter referred to as the total sentiment).

The SnowNLP sentiment package was also used to calculate the average sentiment of each comment in the host–guest interaction comments. Then, the average sentiment was divided into negative (<0.5), average ($=0.5$) and positive (>0.5) comments. The total number of comments with positive- and negative-sentiment averages in each sample was calculated separately, and the host–guest interaction sentiment in each sample was obtained by subtracting the number of negative comments from the number of positive comments in each sample.

4.2.4. Regression Analysis

Based on the research model, the dependent variable in this paper is sustainable consumption behaviour; the independent variables are the number of host–guest interactions and host–guest interaction sentiment; the moderating variables are the room type and price; the control variables are the number of rooms, score and total sentiment. Sustainable consumption behaviour is represented by the number of sustainable reviews [95], so sustainable behaviour for each sample is the total number of sustainable reviews in each sample. Similarly, the number of host–guest interactions is represented by the number of host–guest interaction comments. The definition and measurement of each variable is shown in Table 1.

Table 1. Variable definitions and measurements.

	Variables	Definitions	Measurements
Dependent variables	Sustainable consumption behaviour	Voluntarily adopt their own actions to protect the environment, maintain sustainable development, and form green procurement decision-making behaviours [56,96].	It was measured by the number of consumer reviews that mention sustainable words in each house [95].
Independent variables	The number of host–guest interactions	Consumer reviews involve interactions between hosts and guests, such as communication and feeling at home [19,45,97–99].	It was measured by the number of consumer reviews that mention the host–guest interaction in each house.
	Host–guest interaction sentiment	Positive and negative emotions generated in the interaction between the host and the guest [19,45,97,99].	It was measured by the difference between the number of positive and negative consumer reviews that mention the host–guest interaction words in each house.

Table 1. *Cont.*

	Variables	Definitions	Measurements
Moderating variables	Room type	Rooms rented using different sharing methods.	It was assessed by the platform: "1" denotes full rental, "0" denotes single-room rental.
	Price	The price of the property [56].	It was crawled directly.
	Number of rooms	Number of rooms owned by the property [56].	It was assessed by the platform. It was crawled directly.
Control variables	Score	The evaluation score of the rented house by the tenants.	It was assessed by the platform. It was crawled directly.
	Total sentiment	Consumers' emotional feelings about living in a house.	It was measured by the emotional mean of all consumer comments in each listing.

The interaction between hosts and guests is included in the research model as a unique element of sharing accommodation to analyse its impact on sustainable behaviour. This makes the model different from previous studies.

In this particular regression operation, the control variables were added in the first model; in the second model, the independent variable 1 (number of host–guest interactions), the room type, price and control variables were added to test H1a; in the third model, the independent variable 2 (host–guest interaction sentiment), the room type and price with control variables were added to test H1b; in the fourth model, the product of the price and independent variable 1 based on the second model was added as the price–interaction effect used to test H3a; in the fifth model, the product of price and independent variable 2 based on the third model was added as the price–interaction effect used to test H3b. The dependent variable is added in all five models. As room type is a binary variable, the moderate effect is tested by the group regression used to test H2a and H2b.

Descriptive statistics and correlation coefficients are presented in Table 2.

Table 2. Descriptive statistics and correlation.

Variables	Mean	SD	Min	Max	Variables	Mean	SD	Min						
Sustainable consumption behaviour	2.57	9.553	0	774	1									
Room type	0.94	0.236	0	1	0.024 ***	1								
Price	607.64	2006.197	1	99999	−0.011 ***	0.027 ***	1							
Number of rooms	2	1.782	1	108	−0.024 ***	−0.379 ***	0.255 ***	1						
Score	4.827	0.516	1	5	0.046 ***	0.037 ***	0.037 ***	0.043 ***	1					
Total sentiment	0.744	0.258	0	1	0.04 ***	0.021 ***	0.045 ***	0.041 ***	0.398 ***	1				
The number of host–guest interactions	4.13	12.44	0	618	0.93 ***	0.025 ***	−0.014 ***	−0.026 ***	0.056 ***	0.047 ***	1			
Host–guest interaction sentiment	2.61	10.217	−31	588	0.909 ***	0.026 ***	−0.01 **	−0.023 ***	0.065 ***	0.134 ***	0.959 ***	1		

The standard error is in parentheses. **: $p < 0.05$, ***: $p < 0.01$.

5. Result

After excluding empty data (such as empty comments), this article used Python 3.9 to model themes for all green customer reviews (consumer reviews with sustainable words), and then we used SPSS to carry out regression analysis on the variables.

5.1. Topic Modeling

The content of interest to consumers is extracted and classified into different dimensions, i.e., topics, using the LDA topic modelling approach. The LDA modelling approach requires manual determination of the number of topics required. This research combines quantitative and qualitative methods to determine the optimal number of topics. The quantitative approach is used to determine the number of topics using perplexity; a probability-based perplexity is used to evaluate how well a topic model fits a sample [79], and lower perplexity means better topic modelling can be obtained [85]. As shown in Figure 2, a better model fit is obtained when the number of topics is three. A qualitative approach is used to judge the number of topics needed based on the degree of topic overlap by drawing topic maps. As shown in Figure 3, when the number of topics is three, there is no overlap among topics. Therefore, the number of topics in the LDA is set to three to obtain the final topic classification result. There are differences in content such as "room", "location", "service", "value", etc., which are important for ordinary consumers [61,83,85]. The differences can be seen in that "host", "room", and "environment" are the most frequent words representing the content that consumers care about the most. In particular, 'host' and 'environment' indicate that green consumers care most about communication and interaction with the owner of the space and are particularly concerned about the surrounding environment.
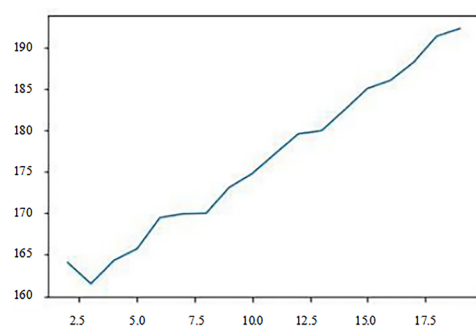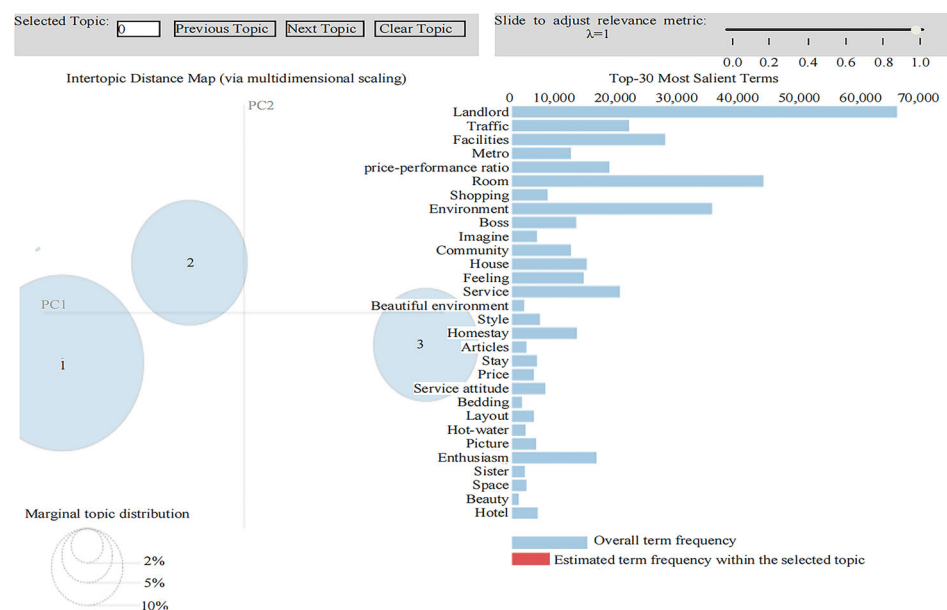

Figure 2. Degree of confusion.

Figure 3. Theme Visualisation.

Finally, three themes were extracted, namely, "host–guest interaction", "internal and external facilities" and "comprehensive" (see Table 3). The theme 'host–guest interaction'

mainly includes content related to the host, such as host, housekeeper, boss, warmth, attitude, experience, etc. It can be seen that green consumers are most concerned about the interaction with the host and attach great importance to the experience of a harmonious relationship with the host in the accommodation. The theme 'internal and external facilities' mainly covers the internal and external amenities of the house, such as transport, facilities, metro, hot water, etc. This theme has the same emphasis as all consumer themes [61,85,92]. They all consider the various facilities of the house as the basic evaluation items and the basic living requirements. The 'comprehensive' theme combines different aspects, including external factors such as space and layout and internal factors such as services and feelings, and integrates different aspects consumers care about [84,87].

Table 3. Subject classification.

Topic No.	Topic Name	Keywords
1	Host–guest interaction	Room, environment, boss, homestay, warm, service, feeling, service attitude, experience, accommodation, friends, hotel, pictures, local, price, butler.
2	Internal and external facilities	Landlord, transportation, facilities, cost–performance ratio, metro, environment, shopping, community, imagination, house, beautiful environment, hot water, service, enthusiastic.
3	Comprehensive	Landlord, room, service, house, facilities, feeling, cost–performance ratio, enthusiastic, style, home accommodation, experience, decoration, supplies, geographical location, space.

In general, the focus of attention of green consumers differs from that of conventional consumers mainly in the theme of 'host–guest interaction', which refers to the content of the host and consumer interaction, their attitude and the feelings that the consumer obtains from the interaction. Green consumers focus on the goal of sustainable development, care most about the interaction with the host and want to experience interpersonal and cultural satisfaction in the interaction.

5.2. Regression Results

Table 4 shows that Model 1 regresses the control variables, while Models 2 and 3 include the main variables, the number of host–guest interactions and host–guest interaction sentiment, respectively. The results show that the number of host–guest interactions can positively influence sustainable consumption behaviour (Model 2: $\beta = 0.93$, $p < 0.01$). Also, host–guest interaction sentiment can positively influence sustainable consumption behaviour (Model 3: $\beta = 0.92$, $p < 0.01$). Therefore, H1a and H1b are valid.

In addition, interaction effects were added to the models in Models 4 and 5 in this paper to test the effect of price as a moderating variable. The results were found to be consistent with the hypotheses: price negatively moderated the relationship between the number of host–guest interactions and sustainable consumption behaviour ($\beta = -0.028$, $p < 0.01$), and price also negatively moderated the effect of host–guest interaction sentiment on sustainable consumption behaviour ($\beta = -0.023$, $p < 0.01$). Thus, H3a and H3b were confirmed, with price acting as a negative moderator [13,91,92].

As room type is a binary variable, a moderating effect test was performed using a group regression, and the results are shown in Table 5. It can be seen that the regression models for both the single-room group and the whole-room group are significant ($F_{single} = 6675.726$, $p < 0.01$; $F_{whole} = 145849.034$, $p < 0.01$). Based on *t*-tests of regression coefficients, all regression coefficients were found to be meaningful and the 95% confidence intervals for single- and whole-room rentals did not overlap (95%CI single1: 0.56~0.596; 95%CI whole1: 0.54~0.558; 95%CI single2: −0.171~−0.124; 95%CI whole2: 0.202~0.225), so the difference

between the regression coefficients is statistically significant, suggesting that room type moderates the impact of the number of host–guest interactions and host–guest interaction sentiment on sustainable consumption behaviour.

Table 4. Regression results.

	Sustainable Consumption Behaviour				
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Main effects					
The number of host–guest interactions		0.93 *** (0.001)		0.941 *** (0.001)	
Host–guest interaction sentiment			0.92 *** (0.002)		0.931 *** (0.002)
Room type		0.001 (0.076)	0.001 (0.084)	0.001 (0.076)	0.001 (0.083)
Price		0.002 (0.000)	0.001 (0.000)	0.015 *** (0.000)	0.009 *** (0.000)
Interaction effects					
The number of host–guest interactions *Price				−0.028 *** (0.000)	
Host–guest interaction sentiment *Price					−0.023 *** (0.000)
Control variables					
Number of rooms	−0.027 *** (0.025)	0.000 (0.01)	0.000 (0.011)	0.000 (0.01)	0.000 (0.011)
Score	0.037 *** (0.094)	−0.005 (0.035)	0.023 *** (0.038)	−0.005 *** (0.035)	0.023 *** (0.038)
Total sentiment	0.026 *** (0.187)	−0.001 (0.069)	−0.092 *** (0.077)	−0.002 (0.069)	−0.092 *** (0.077)
Constant	−1.178 *** (0.42)	0.084 (0.17)	0.75 *** (0.188)	0.062 (0.17)	0.723 *** (0.188)
Observations	9.537	3.519	3.889	3.513	3.884
R-squared	0.003	0.864	0.834	0.865	0.835

The standard error is in parentheses. ***: $p < 0.01$.

Table 5. Grouped regression results.

	Sustainable Consumption Behaviour					
	Single-Room Rental			**Whole-Room Rental**		
Variables	**Standard Coefficient**	**95%CI**		**Standard Coefficient**	**95%CI**	
		Lower Limit	**Superior Limit**		**Lower Limit**	**Superior Limit**
The number of host-guest interactions	1.101 *** (0.0090)	0.56	0.596	0.712 *** (0.005)	0.54	0.558
Host-guest interaction sentiment	−0.218 *** (0.012)	−0.171	−0.124	0.227 *** (0.006)	0.202	0.225
Constant	0.223 *** (0.028)	0.167	0.279	−0.25 *** (0.018)	−0.286	−0.214
F	6675.726			145,849.034		
Significance	0.000			0.000		

The standard error is in parentheses. ***: $p < 0.01$.

To better understand the moderating effect, simple-slope diagrams are used to show the moderating effect on the relationship between the number of host–guest interactions, host–guest interaction sentiment and sustainable consumption behaviour at different levels of moderating variables. Figures 4 and 5 show the moderating effect of room type on

the relationship between host–guest interaction and sustainable consumption behaviour and find that the positive effect of host–guest interaction on sustainable consumption behaviour is higher when room type is a whole-room rental than when room type is a single-room rental, contrary to the results of previous studies [82,84,86]. Therefore, H2a and H2b are invalid, but the moderating effects of room type are reversed. Figures 6 and 7 show the moderating effect of price, and, as hypothesized, both the number of host–guest interactions and the sentiment of host–guest interactions have a greater positive effect on sustainable consumption behaviour at lower prices [13,90,91].
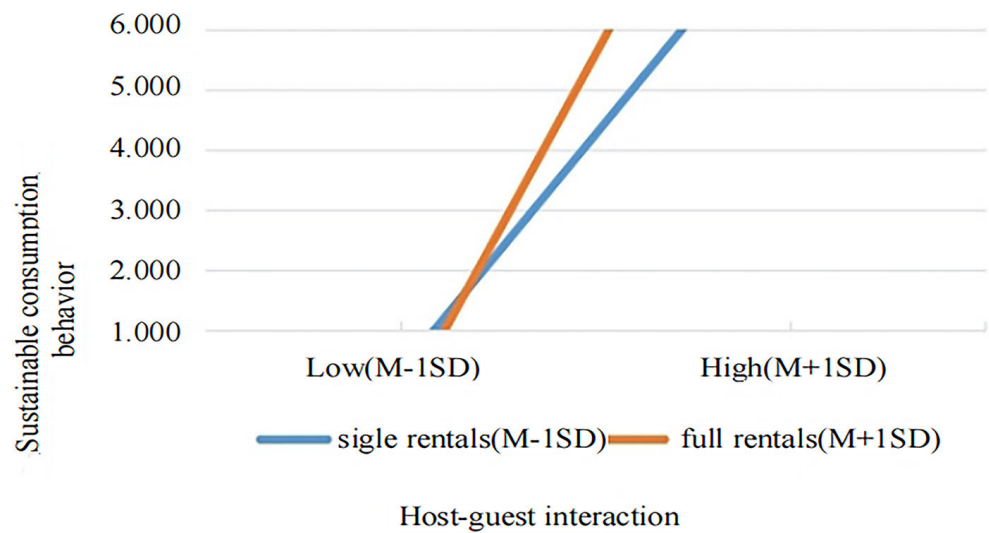

Figure 4. The moderating effect of room type on the relationship of the host–guest interaction.
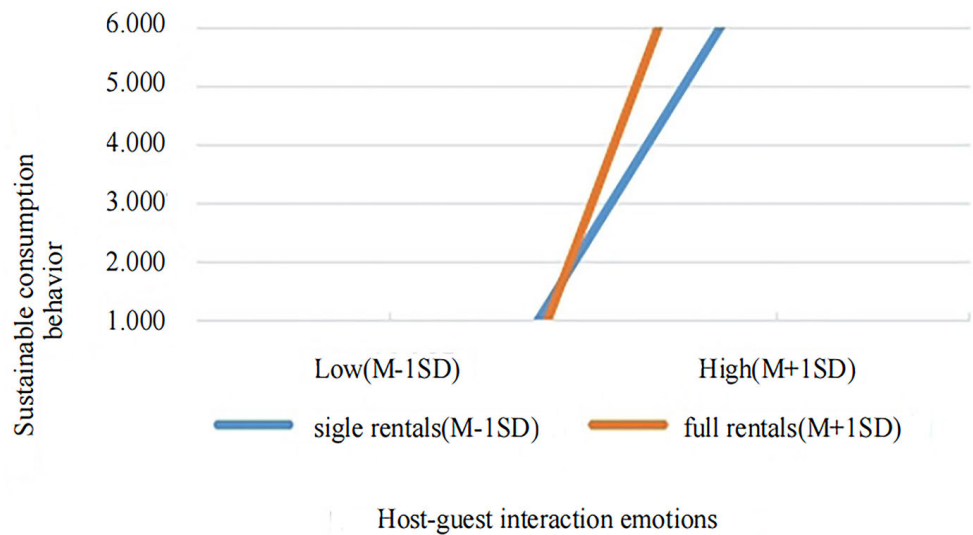

Figure 5. The moderating effect of room type on the relationship of the host–guest interaction emotions and sustainable consumption behaviour.
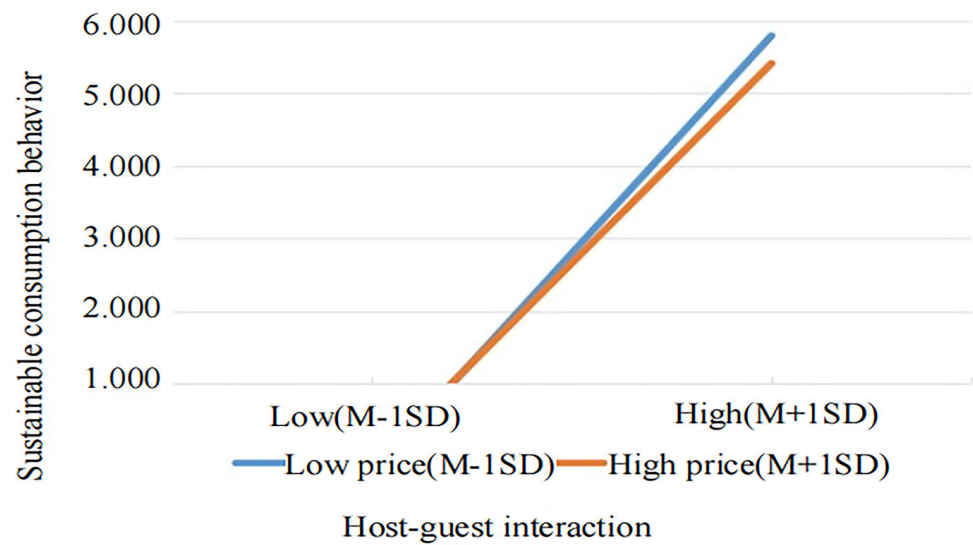
Figure 6. The moderating effect of price on the relationship of the host–guest interaction and sustainable consumption behaviour.
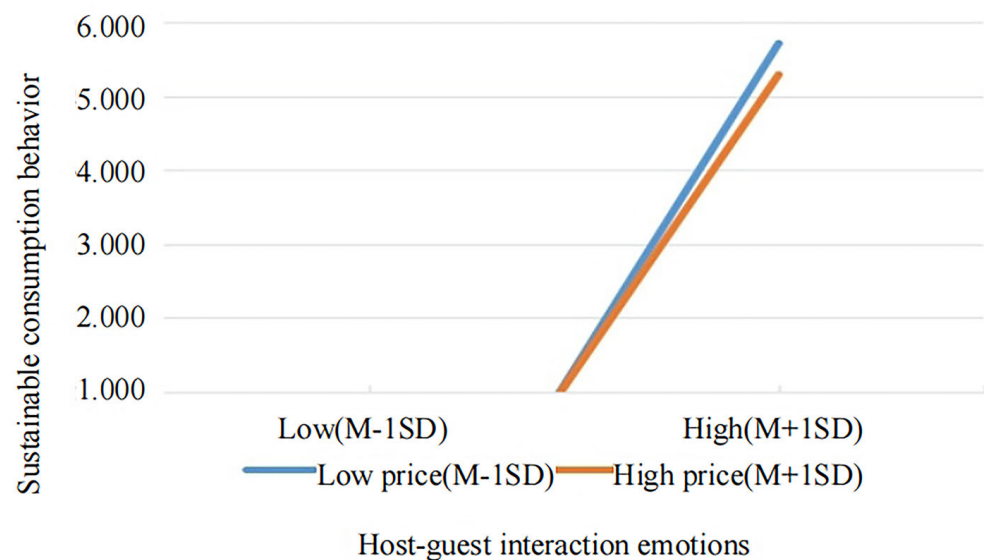

Figure 7. The moderating effect of price on the relationship of the host–guest interaction emotions and sustainable consumption behaviour.

6. Discussion

This research investigates the significance of host–guest interactions among green consumers within the context of sharing accommodation and explores the mechanisms of how the interactions influence consumers' sustainable behaviours. First, by applying the LDA topic modelling, this research empirically establishes host–guest interaction as a crucial factor that green consumers prioritise in the sharing accommodation context. Second, the findings empirically suggest that both the host–guest interaction frequency and sentiment can positively influence consumers' sustainable consumption behaviours. Furthermore, this research identifies the fact that pricing and room types moderate the relationship of the host–guest interactions and sustainable consumption behaviours of consumers.

Through topic modelling analysis of green consumers' comments, this paper empirically indicates that the theme of "host–guest interaction" attracts the most attention among green consumers, distinguishing them from ordinary consumers. Hence, this research empirically proves that green consumers prioritise host–guest interactions, supporting Lee and

Peng [100] as they argue that green consumers are more likely to evaluate relationships with service providers. Hence, this research emphasises the fact that host–guest interaction is a key factor influencing sustainable consumption behaviour in shared accommodation and the significance of building up host–guest relations with the green consumer segment. The above findings support previous papers' results [54] by further demonstrating that relationships are more important in the minds of green consumers and that good relationships are more conducive to sustainable consumption behaviour. Meanwhile, the empirical findings support those of previous papers [37,64,101], demonstrating that host–guest interaction is a process of value co-creation and social exchange instead of pure economic reciprocity, which also explains why green consumers value their relationships with hosts and tend to consume more sustainably in the sharing accommodation context. This research also reveals the significance of relationship marketing for sustainable development in the sharing accommodation context, particularly for green consumers. Empirical findings indicate that a stronger relationship is crucial to fostering sustainable consumption behaviour within the sharing sector. The above empirical findings supplement the previous literature [86,102] and argue that relationship marketing aims to maintain long-term customer relationships, and provides pre-conditions for further understanding sustainable customer-consumption patterns by applying a relationship marketing perspective in the sharing sector.

The regression analysis then shows that more host–guest interactions lead to more sustainable consumption behaviour, which supports Cavagnaro et al. [102] as they argue that the host–guest relationship is crucial to formulating sustainability-related values of both parties (hosts and guests). This research empirically proves that the frequency of host–guest interactions positively affects guests' sustainable consumption behaviours. This finding is aligned with previous studies [38,62], which emphasise that insufficient host–guest interactions result in guests' negative sentiments, leading to a lack of pro-environmental behaviours. Interestingly, this research empirically finds that positive emotions in host–guest interactions correlate with increased sustainable consumption behaviour, contradicting the findings of Wang and Wu [103] as they suggested that the influence of positive emotions on sustainable consumption intentions might not be stronger than negative emotions. A possible explanation for our empirical findings is suggested by previous papers [90,104], which propose that negative emotions generated in host–guest interactions can lead to dissatisfaction with the accommodation experiences and increase the likelihood of consumers' misbehaviours or intentions to conceal misbehaviours, which is against sustainable purposes. Moreover, negative emotions arising from host–guest interactions can also reduce the hosts' satisfaction [105], potentially reducing their motivation to promote sustainable initiatives to future guests and limiting the possibility of future guests consuming sustainably. The above findings empirically enrich Maduku's [106] research by extending the individual's disposition towards positive outcomes on sustainable consumption intention to a more interactive level between hosts and guests within the sharing accommodation context. Meanwhile, the discrepancies between the empirical findings and previous publications also emphasise the significance of investigating the mechanisms of how the negative emotions generated through host–guest interactions would influence guests' sustainable consumption behaviours.

Economic factors (i.e., price) are empirically found to negatively impact guests' sustainable consumption behaviour, which supports Sun [107], since high prices cause high financial and psychological risks, reducing the perceived value and resulting in consumers' misbehaviour or defection. Our findings also supplement [108,109] and further indicate that consumers will be less likely to engage in sustainable consumption behaviours when the cost of their stay increases. Moreover, unlike previous studies [110], this study's results show that 'whole rooms' are more likely to moderate the relationship between host–guest interaction and sustainable consumption behaviour than 'single rooms'. This could be an after-effect of COVID-19, as green consumers also preferred to rent whole rooms, thus creating a greater moderating effect of renting fewer shared rooms. After all, for health and

safety concerns, interacting with locals may no longer be a benefit of sharing accommodation, as it once was [111].

7. Conclusions

This research proposes that host–guest interaction is crucial in distinguishing ordinary and green guests in sharing accommodation contexts. It helps to accurately identify consumer segments and offers a direction to separately investigate the factors influencing sustainable customer consumption behaviours from different segment perspectives. Furthermore, this research empirically finds that the host–guest frequencies and sentiments positively influence guests' sustainable consumption behaviours within the sharing accommodation contexts, enriching the current mainstream viewpoints regarding sustainable consumption mechanisms. This research also extends the discussion of sustainable customer consumption behaviours by introducing a novel emphasis on the importance of price and room types, as they are proven to play a moderating role in the relationship between host–guest interaction and guest-sustainable consumption behaviours.

7.1. Implications

Research on the sharing economy in sustainable development is relatively homogenous, with relatively fixed research questions and methods of analysis, and without sufficient data to support the literature [112] it is difficult to build a systematic theory and advance the sharing economy in practice. Therefore, to enrich the relevant literature on the sharing economy, this paper combines qualitative and quantitative analysis, which is relatively lacking in the literature, and analyses the impact of host–guest interactions on consumers' sustainable consumption behaviour using consumer reviews in a big data setting.

This research enriches the existing relationship marketing theory. First, this research distinguishes 'green' and 'ordinary' guests, suggesting that the relationship marketing strategies should consider the demands of different consumer segments [113] to promote accurate theory application and better sustainable practices. We do not deny ordinary consumers' economic/social contributions, but more effective marketing strategies for different segments should be built to meet economic and sustainable goals. Second, the empirical findings extend the current relationship marketing theory by connecting the quality of host–guest relationships and sustainable practices within the sharing accommodation context. This proposes that the relationship between service providers and consumers can critically influence consumers' sustainable consumption behaviours [40,64]. Hence, this research suggests that fostering positive host–guest interactions would increase environmental responsibilities among consumers [89,90]. Third, this research develops the current relationship marketing theory by identifying two new theoretical components (e.g., sentiments and frequencies of interactions) and acknowledges their impacts on sustainable practices within the context of sharing accommodation; meanwhile, it enriches the discussions conducted by the existing literature [62,91]. Furthermore, this research investigates the moderating effects of external factors, such as pricing and product characteristics, which can be a valuable addition to the existing relationship marketing theory.

Based on the theoretical contributions above, this research proposes the following suggestions for innovation in sharing platforms and service providers (e.g., landlords) to further foster sustainable consumer consumption behaviours. First, it is suggested that sharing platforms and landlords consider promoting 'green customer-exclusive programmes' [93] to attract more potential green customers and further expand the basis of green customers. Second, landlords are recommended to develop their communication skills [58] and the awareness/ability to use the features embedded in the platform websites to create more effective and meaningful online interactions with consumers. Third, this paper suggests that sharing platforms develop and introduce relationship management assessment tools [94,110], to regularly record the frequency of interactions and sentiments generated from the host–guest interactions and enhance consumer satisfaction to achieve

more sustainable consumer consumption. Fourth, the landlords may adjust their pricing strategies and the room types provided to enhance potential sustainable consumer consumption behaviours. For instance, different pricing strategies could be offered based on consumers' behaviours [114].

This would provide ideas for innovative platform governance in the context of digitalisation, to drive collaboration and support sustainable consumption, to create a new development model for a low-carbon economy and creatively progressively reduce the consumption gap between rich and poor. At the same time, the mechanism of sustainable consumption behaviour in sharing accommodation will be deeply explored, providing a possibility for the joint promotion of future economic development, social progress, and ecological environment protection, as well as contributing to the emergence of a global social network.

7.2. Limitations and Future Research

The context of this study is limited to China, and the data are extracted from a sharing platform, which limits the generalisability of the results. In addition, this research focuses on the mechanisms of how host–guest interactions influence sustainable consumption behaviour rather than undertaking a comprehensive study on the relationships between the other factors and sustainable consumption behaviour. Future studies can further expand the range of data sources and analyse the factors influencing the sustainable development of sharing accommodation in different countries and platforms. Other factors influencing sustainable consumption behaviour, such as AI adoption [115], can also be explored more deeply to investigate the sustainability mechanism of sharing accommodation.

Appendix A

Table A1. Sustainable extraction words.

Dimensions	Extract Keywords	Sources
Ecology	Sharing, environment, landscape, green, low carbon, environmental protection, tree, utilisation, conservation, resources, ecology, garbage, greening, cleaning, freshness, nature, development, long-term, durable, maintenance, responsibility, friendship, health.	[13,56,95,97,102,116–119]
Economy	Economy, electricity, water resources, waste.	[56,96,119]
Society	Help, family, feeling at home, like home, comfortable, unique, local, community, food, service, trust, connection, communication, knowledge, culture, human relations, tradition.	[13,43,95,116–118]

Table A2. Extracting words from host–guest interaction.

Methods	Extract Keywords	Sources
Manual screening	Customer service, attentive, butler, boss, enthusiastic, fruit, pictures, photos, attitude, polite, boss's wife, sister, little brother, cat, beauty, uncle, big sister. Enthusiasm, warmth, sincerity, authenticity, friendliness, respect, socializing, being a guest, getting along, being friendly, describing, chatting, face-to-face, interaction, home, hospitality, friends, sharing, communication, harmony, advice, help, friendship, online, offline, host, guest, contact, caring, family, companionship, service, initiative, response, procrastination, resolution, landlord, homeowner, tenant, customer, trust, goodwill, photos, eating together, taking care of, cooperate, communicate, be patient, take care of, care for, chat, connect, respond, invite, inquire, be considerate, welcome.	Consumer reviews
Word deformation		Localized expression

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