

Article

Understanding the Nexus between Social Commerce, Green Customer Citizenship, Eco-Friendly Behavior and Staying in Green Hotels

Ibrahim A. Elshaer ^{1,2}, Mansour Alyahya ^{1,*}, Alaa M. S. Azazz ^{3,4,*}, Mahmoud A. Mansour ²,
Abuelkassem A. A. Mohammad ^{5,6} and Sameh Fayyad ^{2,7}

¹ Department of Management, College of Business Administration, King Faisal University, Al-Ahsaa 380, Saudi Arabia; ielshaer@kfu.edu.sa

² Hotel Studies Department, Faculty of Tourism and Hotels, Suez Canal University, Ismailia 41522, Egypt; mahmoud_mansor@tourism.suez.edu.eg (M.A.M.); sameh.fayyad@tourism.suez.edu.eg (S.F.)

³ Department of Tourism and Hospitality, Arts College, King Faisal University, Al-Ahsaa 380, Saudi Arabia

⁴ Tourism Studies Department, Faculty of Tourism and Hotels, Suez Canal University, Ismailia 41522, Egypt

⁵ Faculty of Tourism and Hotels, Minia University, Minia 61519, Egypt; kassem.mohammad@mu.edu.eg

⁶ Faculty of Tourism and Hospitality, King Salman International University, Sharm El Sheikh 8761250, Egypt

⁷ Hotel Management Department, Faculty of Tourism and Hotels, October 6 University, Giza 12573, Egypt

* Correspondence: malyahya@kfu.edu.sa (M.A.); aazazz@kfu.edu.sa (A.M.S.A.)

Abstract: Understanding the factors and motivations that drive consumers to engage in eco-friendly behavior within the realm of social commerce is essential to provide insights into crafting targeted marketing efforts and campaigns. By aligning eco-friendly initiatives with the inherent motivations of social commerce users, businesses can enhance the effectiveness of their sustainability efforts. Despite that, limited research has investigated the potential impact of social commerce, aligned with green customer citizenship, on eco-friendly behavior and staying in green hotels. To address this gap, this study aims to examine the level to which social commerce practices contribute to shaping customers' eco-friendly behavior in the context of eco-friendly hotels. A quantitative approach design using a questionnaire survey to collect primary data was conducted. Based on valid responses from 336 participants, a structured equation modeling was performed using Smart PLS 4.0 to examine the conceptual model and justify the hypotheses of the study. The findings highlighted the critical role of social commerce in shaping customer eco-friendly behavior and staying in green hotels. The results also confirmed the moderating role of green customer citizenship in supporting the linkage between social commerce and customer eco-friendly behavior in hotel settings. These results contribute to the growing hospitality body of knowledge and provide some valuable practical implications enabling eco-friendly hotels to leverage social commerce as a medium for promoting green initiatives and services.

Keywords: eco-friendly behavior; forums and communities; green customer citizenship behavior; intention to visit a green hotel; ratings and reviews; recommendations and referrals; social commerce



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1. Introduction

Social commerce, integrating social media and online shopping, has transformed consumer engagement globally. Leveraging platforms with billions of users, it shapes consumer choices through reviews, recommendations, and social validation [1–4]. The emergence of green customer citizenship signifies a growing commitment to environmentally responsible consumption, emphasizing consumers' conscientious efforts in making sustainable choices [5,6]. This concept underscores consumers' pivotal role in fostering sustainable practices and has the potential to drive positive change on a larger scale [5,6]. Understanding how social commerce promotes eco-friendly products is vital for sustainability. The convergence of social commerce and green customer citizenship is a key area

of exploration for practitioners and scholars, aiming to comprehend their joint impact on fostering eco-friendly behavior [7]. The integration creates a synergy significantly influencing eco-friendly behavior. Social commerce platforms, acting as influential channels, disseminate information on sustainable products, shaping consumer attitudes and fostering environmental responsibility [8,9]. Investigating how these platforms effectively communicate and reinforce green values is crucial for strategies leveraging the synergistic effects [7].

The connection between social commerce and eco-friendly behavior remains underexplored in the current literature [10,11]. Despite the growing emphasis on sustainability in the hospitality industry, there is a significant gap in understanding how social commerce influences eco-friendly intentions and behaviors in this context. Additionally, there is limited research on the moderating role of green customer citizenship in the relationship between social commerce and eco-friendly behavior in green hotel settings. Previous studies have mainly treated green customer citizenship as an outcome rather than exploring its moderating impact on enhancing eco-friendly behavior [5,12–15]. Examining the supportive role of green customer citizenship in promoting eco-friendly behavior not only helps businesses align with consumer values for brand loyalty but also provides insights for policymakers in crafting effective environmental initiatives. Considering the rapid evolution of social commerce technologies [16,17], it is crucial to assess how these advancements impact individuals' attitudes and behaviors toward sustainability, especially in eco-friendly hotel settings. Also, the diverse array of social commerce tools necessitates updated investigations to understand their influence on fostering environmentally conscious choices [16,17]. Addressing these gaps underscores the importance of empirical research to unravel the intricate interplay between social commerce, eco-friendly intentions, and subsequent behavioral outcomes in the unique context of eco-friendly accommodations.

Thus, this paper sets out to examine the potential role of social commerce and green customer citizenship in shaping and promoting eco-friendly behaviors and staying in hotels. Specifically, this study examines (1) the direct impact of social commerce on eco-friendly behavior and staying in green hotels (SGH), (2) the mediating effect of eco-friendly behavior on the linkage between social commerce and staying in green hotels, and (3) the moderating role of green customer citizenship on the association between the three dimensions of social commerce (i.e., “recommendations and referrals, forums and communities, ratings and reviews”) and eco-friendly behaviors in green hotels. The examination of this nexus is not only academically intriguing but also holds the potential to shape a greener and more socially responsible future. The findings from examining the impact of social commerce and green customer citizenship on eco-friendly behavior present broad implications for businesses and policymakers. By unraveling the dynamics between these variables, businesses and policymakers can capitalize on the synergies to create a more sustainable and environmentally conscious consumer landscape.

2. Literature and Hypothesis Development

2.1. Social Commerce (SC) and Eco-Friendly Behavior (EFB)

To research social commerce, it is possible to use a variety of theoretical frameworks. The research conducted by psychologists [18] served as the foundation for social learning theory, which provides an organized method for addressing a range of behavioral issues in many contexts and professions. According to the social cognitive theory (SCT), learning occurs in a social setting where an individual's environment, behavior, and cognition interact with one other in a dynamic and reciprocal way [19]. In reality, social learning is the process of learning from seeing how other people behave [20]. By watching other individuals, people can pick up new skills and habits [21]. Therefore, social learning theory describes a wide range of human behavior through the use of modeling, imitation, and observational learning [22]. Social learning constitutes the core aspect of the social psychology underpinning social commerce, which is the process of gaining information and experience from others we know or trust [23]. In social commerce, consumers peruse information

created by others to obtain social knowledge about the things they are interested in [24]. This is a process of social learning [22]. Social commerce is a new approach to conducting business that involves interactions among all value chain participants in a cooperative and participatory way [25]. This concept originated from the use of social media platforms, which are now common consumer tools for networking and exchanging information about products [2]. Consumers use online social media to research products and gain social knowledge before making purchases [1]. Hence, social commerce is accomplished by expanding social websites with a consistent and dynamic corporate interface that fosters social connections [2] and that helps consumers to perform informational searches and compare prices and quality standards of various goods and services [3]. Consequently, the demand for online services has grown along with consumption, leading suppliers to become more creative in meeting customer expectations and selling their goods and services at competitive prices [26].

In the current digital business environment, organizations must have a deeper comprehension of the social commerce phenomenon in order to successfully fulfill their marketing objectives [27]. Moreover, organizations can use social commerce as a business strategy to run their operations [28]. Furthermore, with social commerce, companies may save marketing expenses, boost sales, and gain the confidence of their customers [22]. As a result, social commerce has made it easier to create new avenues for improving relationships between companies and their customers, offering a creative way to transform company practices [29]. According to Hajli [30], social commerce platforms offer a wide range of components such as “customers recommendation and referrals (RR), product forums and communities (FC), and customers rating and reviews”. These components are considered the most significant social factors influencing how consumers make decisions [1,30,31]. From a business perspective, it can be challenging to execute the social commerce business model swiftly and effectively [22]; instead, the most practical and efficient method to integrate social commerce is to add social commerce components to already-existing company platforms [8].

Recommendations and referrals are the process of obtaining and recommending content on social media on what to see, eat, purchase, and do [32]. On social commerce websites, consumers may also view social recommendations and remarks left by other customers or ask about their friends’ perceptions [31]. Customers who have made the real purchase experience themselves make recommendations and referrals on social commerce platforms [22]. Once this is done, social commerce platforms share these suggestions with other users who are similar in terms of preferences and social relationships [33]. Because people behave differently in various social media situations, attitudes and opinions regarding the gathering and use of personal data are likely to range greatly within a particular community [34]. Referrals and recommendations occur when people gather information regarding goods or services from family, friends, or other trusted avenues [8]. These types of social commerce have a large impact on customer attitude and trust [9].

Forums and communities are the primary forces driving the shift from e-commerce to social commerce [24]. They are valuable and efficient social media platforms for social commerce that facilitate product selection, discovery, and referrals [35]. Participating in online forums and communities exposes users to a diverse array of opinions and ideas, hence enhancing their trust in the information that is being disseminated [4]. Through forums and communities, customers can obtain information and receive feedback from others, enabling them to make informed purchase decisions [22]. Furthermore, it is argued that internet-based consumer communication inside social commerce frameworks fosters social support, which raises network trust [9]. In addition, Kaššaj and Peráček [36] indicate that the growth of digital content should be aided by mobile connection, data security, and technical advancements. These forms of support, which may be informative as well as emotional, motivate consumers to revisit the platform or explore a new item [3].

Reviewing and rating anything means assigning a number (such as 1–5) to a product or service and writing a review [9]. Reviews and ratings (RARs) let users share their inde-

pendent opinions and experiences about products and help one other make decisions [32]; additionally, systems that gather ratings and reviews assist businesses in integrating user reviews and community elements into their websites [22]. Thus, recommendations from actual customers and independent users on social media are more reliable and helpful when making decisions about what to buy [37].

Consumers' behavioral intention appears to be positively influenced by social contact [38]. Through social connection, customers show who they are and give others informational and emotional support [39]. Due to the enhanced social interaction capability of a social commerce system with social media features, social interaction will boost the stickiness among consumers of social commerce [11]. Additionally, consumers' eco-friendliness is positively impacted by social influence [40]. Environmental protection has been a top priority for our society over the past few decades, as people have grown more environmentally concerned as they have realized how severe ecological issues are [36,41]. As a result, people are becoming more conscious of the environment and adopting eco-friendly behaviors in their daily lives [42]. According to self-determination theory, extrinsic and intrinsic motives are two major factors that influence environmentally conscious consumer behavior [43]. The term "intrinsic motivation" describes actions motivated by pleasure or other internal rewards. When anything is done for external benefits, including reputation and social acceptance, it is said to be motivated by extrinsic factors [11]. Consumers with environmental concerns exhibit a higher likelihood of choosing eco-friendly hotels compared with those who are not environmentally conscious [42]. Positive and negative behavioral assessments are reflected in attitudes about behaviors, which are shaped by behavioral beliefs [44]. A positive attitude toward a specific behavior increases the likelihood that the individual will engage in the behavior [45]. Customers' attitudes regarding traveling to eco-friendly locations for tourist experiences are influenced by their intelligence, friendliness, helpfulness, and attraction [46]. Consumers' desire to behave in an environmentally responsible manner might influence their actual consumption and contribution behaviors [11]. As a result, the below three hypotheses are postulated:

H1. *RRs (as a dimension of social commerce) have a positive and direct impact on EFB.*

H2. *FCs (as a dimension of social commerce) have a positive and direct impact on EFB.*

H3. *RARs (as a dimension of social commerce) have a positive and direct impact on EFB.*

2.2. Eco-Friendly Behavior (EFB) and Staying in Green Hotels (SGH)

Creating positive customer intents is a primary goal for every hospitality company, as it eventually results in increased revenue and retention rates [42]. Based on the theory of reasoned action (TRA) to examine people's deliberate decision-making processes, Fishbein and Ajzen [47] first defined behavioral intentions as the most reliable indicators of actual behavior. Also, the theory of planned behavior (TPB) conduct model states that a person's behavioral intention to carry out a behavior determines whether or not they actually execute it [48]. These theories have some application in the real world of eco-friendly consumption. For instance, customers who wish to have less of an effect on the environment during their stay are going to stay in hotels that have been adapted to protect the environment [49]. Moreover, customers who have positive attitudes toward eco-friendly activities in their daily lives and positive perceptions of green hotels are more likely to suggest and pay more for stays at green hotels [41]. This is because customers share some of the burden for the severe environmental issues brought on by the hotel lodging sector [48]. Previous studies showed that tourists are increasingly driven toward eco-friendly hotels. For example, Mensah [50] reports that 90% of hotel visitors would rather stay in an establishment that uses green management. From this point, a green hotel is an eco-friendly lodging facility that adheres to eco-friendly policies and practices (such as conserving electricity and water or cutting back on emissions and solid waste) in order to protect the environment and

increase the hotel's efficiency [42,48,51]. As customers are increasingly looking for green hotel properties, a hotel can improve its position and competitiveness in the lodging market by marketing its eco-friendly policies [52]. Based on the above discussion, the following hypothesis is formulated:

H4. *EFB has a positive and significant impact on SGH.*

2.3. Eco-Friendly Behavior (EFB) as a Mediator

Social interaction has a significant impact on consumers' behavioral intention [38]. According to social learning theory, individuals express who they are and provide others with emotional and informational assistance [39]. Increased social interaction potential in a social commerce platform will increase consumers' engagement [11]. Social influence was proven to have a favorable effect on consumers' eco-friendly behavior (Bedard and Tolmie, 2018). Referrals and recommendations occur when people gather information regarding goods or services from family, friends, or other trusted avenues [8]. Consequently, they may have an impact on customer attitude [9]. Individuals are more likely to engage in a behavior if they possess a good attitude about it [45]. People are becoming more conscious of the environment and adopting eco-friendly practices in their daily lives [42]. Likewise, customers that care about the environment favor eco-friendly behaviors [40]. If a customer feels good about a certain conduct, it will have a positive impact on their behavioral intention [51]. The quality of the environment is mostly determined by the level of consumer knowledge, attitudes, values, and behaviors [53]. Communities and forums are valuable and efficient social media platforms for social commerce that help with product discovery, recommendations, and selection [35]. They help customers obtain information and receive feedback from others, enabling them to make informed purchase decisions [22]. Engaging in online groups and forums exposes users to a wide range of viewpoints and views, "thus enhancing their confidence in the shared information" [4].

Organizations may include feedback from users and community features into their websites with the use of rating and review systems [22]. Users may assist one other to make decisions by exchanging unbiased thoughts and experiences regarding items through reviews and ratings [3]. Customers' decisions to purchase goods and services on social commerce platforms are largely influenced by their attitudes and beliefs about trust [9]. Simultaneously reducing customer uncertainty and improving cognitive clarity may lead to a rise in consumer trust [54]. On the other hand, customers with positive perceptions of green hotels and attitudes toward eco-friendly activities in their daily life are more likely to recommend and pay more for stays at green hotels [41]. As a result, customers who care about the environment are more inclined to stay in eco-friendly hotels than those who do not [5]. Thus, the following hypotheses are formulated:

H5. *Eco-friendly behavior mediates the linkage between RRs (as a dimension of social commerce) and SGH.*

H6. *Eco-friendly behavior mediates the linkage between FCs (as a dimension of social commerce) and SGH.*

H7. *Eco-friendly behavior mediates the linkage between RARs (as a dimension of social commerce) and SGH.*

2.4. Green Customer Citizenship Behavior (GCCB) as a Moderator

Eco-friendly behaviors become more popular as a result of growing consumer awareness of environmental deterioration and worries about environmental sustainability [5]. The term "green customer citizenship behavior" pertains to the voluntary and discretionary actions by customers that contribute positively to the execution of an organization's green initiatives [6]. It encourages consumers' circle (friends, family, coworkers, affiliated referral

groups) to adopt and utilize environmentally friendly goods more widely [55]. Among the behaviors associated with green customer citizenship are assisting or advising other consumers on ecologically friendly products [56], asking other consumers to purchase from an organization that produces green products (advocacy) [57], and offering suggestions to the organization to enhance its eco-friendly activities, encouraging more green buying [5]. Because green customer citizenship behaviors are optional and voluntary, they may be viewed as extra-role actions [6]. Consumers with high levels of green voluntary behavior are motivated to contribute to the growth of an organization's environmental initiatives and support a green image [58]. This kind of behavior is distinct from in-role behavior, which focuses on the actions consumers must take to guarantee the transaction is completed correctly [55].

Based on the "social cognitive theory" (SCT), learning takes place in a social context in which a person's environment, actions, and thoughts interact with each other in a dynamic and reciprocal manner [19]. As a result, positive product participation in eco-friendly initiatives encourages consumers to behave voluntarily [6]. It has been shown that people with a green attitude show more concern for ecological issues and pay attention to eco-social advantages [59]. The study by Hwang and Lee [57] in a green restaurant context revealed that customer citizenship behaviors such as advocacy and feedback are positively impacted by emotional satisfaction. Accordingly, the subsequent hypotheses are put forth:

H8. *Green customer citizenship behavior (GCCCB) moderates the relationship between RRs (as a dimension of social commerce) and eco-friendly behavior.*

H9. *Green customer citizenship behavior (GCCCB) moderates the relationship between FCs (as a dimension of social commerce) and eco-friendly behavior.*

H10. *Green customer citizenship behavior (GCCCB) moderates the relationship between RARs (as a dimension of social commerce) and eco-friendly behavior.*

Based on the literature review and hypotheses, the conceptual model of this study is structured as presented in Figure 1.

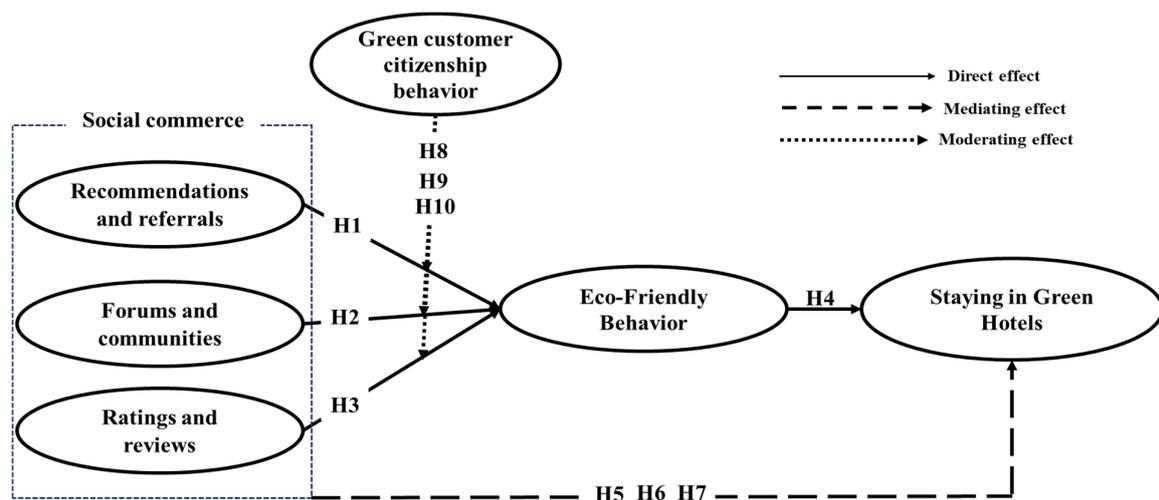


Figure 1. The conceptual model of the study.

3. Methods

The aim of this paper is to comprehensively examine and understand the potential role of social commerce and green customer citizenship in shaping and promoting eco-friendly behaviors and staying in hotels. As suggested by Kaššaj and Peráček [36], our paper relies on developing theoretical data, employing appropriate methods of data analysis, and interpreting and comparing results to the previous literature. We employed a

deductive approach in our research methodology. The deductive approach is characterized by progressing from overarching principles or theories to concrete observations and conclusions. It follows a top-down trajectory, wherein the researcher initiates the inquiry with a comprehensive theoretical framework and subsequently refines the focus toward specific hypotheses. Then we operationalize our study construct to build the research questionnaire that was employed to collect the required data. PLS-SEM was employed to analyze the collected data. PLS-SEM proves suitable for intricate research models, especially those integrating mediation and moderation. Additionally, when compared with alternative tools like AMOS for path modeling, PLS offers a more user-friendly graphical interface. Furthermore, this method serves as a reliable component-based approach with extensive application in previous studies. After analyzing the data, we interpret it as compared with previous empirical studies to verify or falsify the justified hypotheses.

3.1. Measures

All measuring items were adapted from the previous literature. Han and Windsor's [60] twelve items were adapted to estimate the three dimensions of social commerce construct, i.e., recommendations and referrals, forums and communities, and ratings and reviews. The eco-friendly behavior was measured by employing a three-item scale developed by Han and Yoon [61]. To assess the construct of staying in green hotels, three items were adopted from the study of Han et al. [42]. Furthermore, the green customer citizenship behavior was measured using six items from van Tonder et al. [56]. The survey's validity was examined by eight academic experts and eight executives in eco-friendly hotel operations. During these processes, slight modifications were made in the survey's statements. Additionally, this study used Harman's single factor test to overcome the possibility of instrument bias. The result shows that the single factor extracted is 24%, implying that the current study does not have any bias concerns, as the Harman's single factor value is less than 50% [62].

3.2. Data Collection

By operating a time-lagged survey, the study questionnaires were distributed among hotel customers in Egypt, using convenient samples and drop-off and pick-up procedures. Customers participated in the survey willingly, and their replies remained anonymous. The surveys were completed with the help of hotel front office managers. The data were collected from September to November 2023. The study assessed the independent variables of social commerce with its three dimensions, the moderating variable of green customer citizenship behavior, and demographic data in the first stage of the survey. The mediating variable of eco-friendly behavior and the dependent variable of intention to visit a green hotel were in the second survey. Thus, we gathered data at two different time points. A total of 500 customers were targeted during the two phases of the surveys. A total of 336 forms were completed and considered valid, with a recovery rate of 67.2%. The study sample included 182 males (54.2%) and 154 females (45.8%). The participants' ages mainly ranged between 19 and 46. Also, 263 respondents (78.3%) had a college degree, followed by 42 respondents (12.5%) with graduate degrees. All survey items were operated on a five-point Likert scales estimate except the demographic characteristics data.

3.3. Data Analysis

PLS-SEM was performed using Smart PLS 4 software to assess the hypothesized model due to several reasons. First, this method makes it simpler for the researcher to evaluate relationships between constructs and their corresponding latent indicators in the outer model while also assessing relationships between constructs in the inner model. Second, PLS-SEM is appropriate for complex research models, particularly those incorporating mediation and moderation. Third, compared with other tools for path modeling such as AMOS, PLS has a more user-friendly graphical user interface. Fourth, this technique is a trustworthy component-based approach that has been widely applied in past studies [63].

This technique is a two-step analysis approach; in the first stage, the validity and reliability of the measurement (outer) model are investigated, while the structural (inner) model is evaluated in the second stage to test the suggested hypotheses [64].

4. Results

4.1. Psychometric Characteristics of the Measurement Model

The measurement (outer) model was evaluated before the hypotheses were tested. Fit indices widely utilized in CB-SEM are unavailable or ill-advised for PLS-SEM because they adopt a different SEM technique [65]. According to Hair et al. [66], the fit of the PLS-SEM model can be evaluated by operating with the following standards: loadings of the study's items (λ), Cronbach's alpha (α), as well as the composite reliability (CR) test; the required cut-offs of all are < 0.70 ; and the threshold of average variance extracted (AVE) must reach 0.50 to achieve convergent validity (CV) of the outer model. Regarding the model discriminant validity, the AVE of each variable must be greater than the squared inter-construct correlations [67].

As depicted in Table 1, the outer model satisfies all thresholds of a good convergent validity, validating the internal study model's reliability—that is, the consistency of responses to items belonging to the same factor. The AVEs ranged from 0.701 (ratings and reviews (RARs)) to 0.824 (eco-friendly behavior (EFB)), exhibiting a strong correlation between the items in each factor, also confirming the model's convergent validity. Additionally, Table 2 supports the recommended model's discriminant validity because all AVEs are higher than their related squared inter-construct correlations [67]. This indicates that every factor stands out independently from the rest. In addition, in response to the numerous criticisms of Fornell and Lacker's criterion, some studies examined the heterotrait-monotrait ratio of correlation (HTMT) test to confirm the discriminant validity. Table 3 shows that the discriminant validity is appropriate because all HTMT values are < 0.90 [68]. Also, Table 2 displays that an item loading within its construct is larger than any of its cross-loadings with other constructs, ensuring the discriminant validity.

Table 1. Confirmatory factor analysis results for measurement model.

Factors and Items	λ	Mean	SD
"Recommendations and referrals" (RRs) ($\alpha = 0.890$, CR = 0.923, AVE = 0.749)			
SC_1	0.819	3.339	0.854
SC_2	0.872	3.036	1.187
SC_3	0.888	3.077	1.121
SC_4	0.881	3.101	1.100
"Forums and communities" (FCs) ($\alpha = 0.869$, CR = 0.908, AVE = 0.712)			
SC_5	0.889	3.134	1.385
SC_6	0.864	3.101	1.081
SC_7	0.873	3.732	1.476
SC_8	0.740	3.378	1.419
"Ratings and reviews" (RARs) ($\alpha = 0.860$, CR = 0.903, AVE = 0.701)			
SC_9	0.769	3.009	1.196
SC_10	0.774	2.812	1.264
SC_11	0.907	3.107	1.367
SC_12	0.888	2.762	1.231
"Eco-friendly behavior" (EFB) ($\alpha = 0.894$, CR = 0.934, AVE = 0.824)			
EFB_1	0.919	3.435	1.181

Table 1. *Cont.*

Factors and Items	λ	Mean	SD
EFB_2	0.894	3.455	1.146
EFB_3	0.911	3.750	1.285
“Stay in a green hotel” (IV) (a = 0.794, CR = 0.878, AVE = 0.707)			
IV_1	0.806	3.411	0.928
IV_2	0.815	3.693	1.054
IV_3	0.899	3.759	1.187
“Green customer citizenship behavior” (GCCB) (a = 0.930, CR = 0.944, AVE = 0.738)			
GCCB_1	0.856	4.062	1.298
GCCB_2	0.876	4.134	1.342
GCCB_3	0.863	4.161	1.304
GCCB_4	0.859	4.125	1.292
GCCB_5	0.876	4.146	1.241
GCCB_6	0.825	4.223	1.345

Table 2. Cross loadings.

	RRs	FCs	RARs	EFB	IV	GCCB
SC_1	0.819	0.298	0.154	0.277	0.382	0.051
SC_2	0.872	0.430	0.251	0.361	0.287	−0.006
SC_3	0.888	0.405	0.209	0.383	0.185	0.098
SC_4	0.881	0.409	0.262	0.485	0.269	0.092
SC_5	0.469	0.889	0.102	0.372	0.436	0.054
SC_6	0.338	0.864	0.075	0.194	0.328	0.077
SC_7	0.273	0.873	0.054	0.273	0.407	0.165
SC_8	0.438	0.740	0.126	0.178	0.219	0.104
SC_9	0.065	−0.109	0.769	0.176	0.034	0.071
SC_10	0.280	0.096	0.774	0.186	0.095	0.047
SC_11	0.281	0.120	0.907	0.350	0.235	0.137
SC_12	0.204	0.178	0.888	0.240	0.281	0.068
EFB_1	0.423	0.383	0.258	0.919	0.495	0.207
EFB_2	0.356	0.231	0.234	0.894	0.322	0.189
EFB_3	0.436	0.254	0.327	0.911	0.445	0.199
IV_1	0.217	0.454	0.149	0.366	0.806	0.059
IV_2	0.225	0.251	0.112	0.326	0.815	0.007
IV_3	0.331	0.377	0.254	0.477	0.899	0.038
GCCB_1	0.059	0.105	0.073	0.205	0.088	0.856
GCCB_2	0.116	0.071	0.114	0.211	−0.010	0.876
GCCB_3	−0.066	−0.017	0.203	0.158	0.015	0.863
GCCB_4	−0.013	0.146	0.007	0.155	−0.007	0.859
GCCB_5	0.111	0.156	0.002	0.224	0.064	0.876
GCCB_6	0.129	0.109	0.184	0.149	0.060	0.825

Table 3. Fornell–Larcker criterion matrix.

	EFB	FCs	GCCB	IV	RARs	RRs
EFB	0.908					
FCs	0.325	0.844				
GCCB	0.219	0.114	0.859			
IV	0.473	0.433	0.043	0.841		
RARs	0.303	0.103	0.105	0.214	0.837	
RRs	0.450	0.452	0.072	0.314	0.260	0.865

Note: Values off the diagonal line are squared inter-construct-correlations, while values on the diagonal line are AVEs.

4.2. Structural Model and Testing Hypotheses

Given that PLS-SEM lacks the standard fit criteria that CB-SEM includes, an inner model must be evaluated using the variance inflation factor (VIF), R^2 , Q^2 , and standardized path coefficients using the beta value [66]. For the likelihood of “multi-collinearity” among constructs to be ruled out, VIFs must be less than 5.0 for items, R^2 must fulfill norms for the academic area and study situation, and standardized path coefficients (β) must be significant; the Q^2 scores must also fulfill the suggested point value of 0.0 [66].

As presented in Table 4, VIFs ranged between 1.542 and 3.050, below the cut-off value. Thus, no multi-collinearity issues exist, which allows the independent variables’ effects on the dependent variables to be separated from one another because there is no substantial correlation between them. As for R^2 estimates, eco-friendly behavior (EFB) displayed a value of 0.436, implying that the remaining constructs in the structural proposed model accounted for 44.0% of the variation in eco-friendly behavior (EFB). Similarly, the staying in green hotel (SGH)’s R^2 was 0.224, satisfying the cut-off (0.10 or greater). Q^2 exceeded the recommended threshold of 0.0 (As seen in Table 5). Additionally, at the $p = 0.01$ level, all standardized path coefficients were statistically significant (Table 6). When these criteria were considered collectively, it proved how well the structural model suited the data.

Table 4. HTMT matrix.

	EFB	FCs	GCCB	IV	RARs	RRs
Eco-friendly behavior (EFB)						
Forums and communities (FCs)	0.333					
Green customer citizenship behavior (GCCB)	0.233	0.144				
Intention to visit a green hotel (IV)	0.538	0.489	0.069			
Ratings and reviews (RARs)	0.320	0.193	0.136	0.242		
Recommendations and referrals (RRs)	0.481	0.502	0.111	0.376	0.281	

Note: For appropriate DV, all HTMT values need to be < 0.90 .

Additionally, Tenenhaus et al. [69] presented the ensuing equation that can be operated to prove the goodness of fit (GoF) of the PLS-SEM model; values of 0.1, 0.25, and 0.36, respectively, denote a low, medium, and high GoF. The GoF of the proposed model is 0.494, thus indicating a high GoF index.

$$\text{GoF} = \sqrt{AVE_{\text{avy}} \times R^2_{\text{avy}}}$$

Table 5. VIF, R², and Q² results.

Items	VIF	Items	VIF	Items	VIF	Items	VIF
SC_1	2.209	SC_7	2.400	EFB_1	2.686	GCCB_1	2.619
SC_2	2.604	SC_8	1.775	EFB_2	2.735	GCCB_2	2.937
SC_3	2.680	SC_9	1.761	EFB_3	2.630	GCCB_3	3.050
SC_4	2.192	SC_10	1.921	IV_1	1.542	GCCB_4	2.888
SC_5	2.207	SC_11	2.416	IV_2	1.733	GCCB_5	2.843
SC_6	2.623	SC_12	2.790	IV_3	1.926	GCCB_6	2.521
Eco-friendly behavior (EFB)				R ²	0.436	Q ²	0.346
Staying in green hotel (SGH)				R ²	0.224	Q ²	0.152

Utilizing Smart PLS 4, a bootstrapping process with 5000 iterations was performed to test the provided hypotheses for the study as exhibited in Table 6, after verifying the validity of the outer and inner models.

Table 6. Hypothesis testing.

The Hypothesis	β	t	p	Decision
Direct Paths				
H1—Recommendations and referrals (RRs) → Eco-friendly behavior (EFB)	0.376	7.918	0.000	“Supported”
H2—Forums and communities (FCs) → Eco-friendly behavior (EFB)	0.171	3.428	0.001	“Supported”
H3—Ratings and reviews (RARs) → Eco-friendly behavior (EFB)	0.133	2.758	0.006	“Supported”
H4—Eco-friendly behavior (EFB) → Staying in a green hotel (SGH)	0.473	10.809	0.000	“Supported”
Indirect Mediating Paths				
H5—Recommendations and referrals (RRs) → Eco-friendly behavior (EFB) → Staying in a green hotel (SGH)	0.178	6.750	0.000	“Supported”
H6—Forums and communities (FCs) → Eco-friendly behavior (EFB) → Staying in a green hotel (SGH)	0.081	3.224	0.001	“Supported”
H7—Ratings and reviews (RARs) → Eco-friendly behavior (EFB) → Staying in a green hotel (SGH)	0.063	2.598	0.063	“Supported”
Moderating Effects				
H8—RRs * GCCB → EFB	0.166	2.467	0.014	“Supported”
H9—FCs * GCCB → EFB	0.187	2.884	0.004	“Supported”
H10—RARs * GCCB → EFB	0.151	3.274	0.001	“Supported”

The data shown in Table 6 and Figure 2, as extracted from Smart PLS 4.0, indicate that the RRs, FCs, and RARs affected EFB at ($\beta = 0.376$, $t = 7.918$, $p < 0.000$), ($\beta = 0.171$, $t = 3.428$, $p < 0.001$), and ($\beta = 0.133$, $t = 2.758$, $p < 0.006$), respectively, supporting H1, H2, and H3. The EFB impacted SGH at $\beta = 0.473$, $t = 10.809$, and $p < 0.000$, thus proving H4. Additionally, at ($\beta = 0.178$, $t = 6.750$, $p < 0.000$), ($\beta = 0.081$, $t = 3.224$, $p < 0.001$), and ($\beta = 0.063$, $t = 2.598$, $p < 0.063$), respectively, the EFB mediates the link between RRs, FCs, and RARs and SGH, thus proving H5, H6, and H7.

About the moderating effects, Figures 3–5 illustrate that GCCB strengthened the impact of RRs, FCs, and RARs on EFB at ($\beta = 0.166$, $t = 2.467$, and $p = 0.014$), ($\beta = 0.187$, $t = 2.884$, and $p = 0.004$), and ($\beta = 0.151$, $t = 3.274$, and $p = 0.001$), respectively, thus proving H8, H9, and H10.

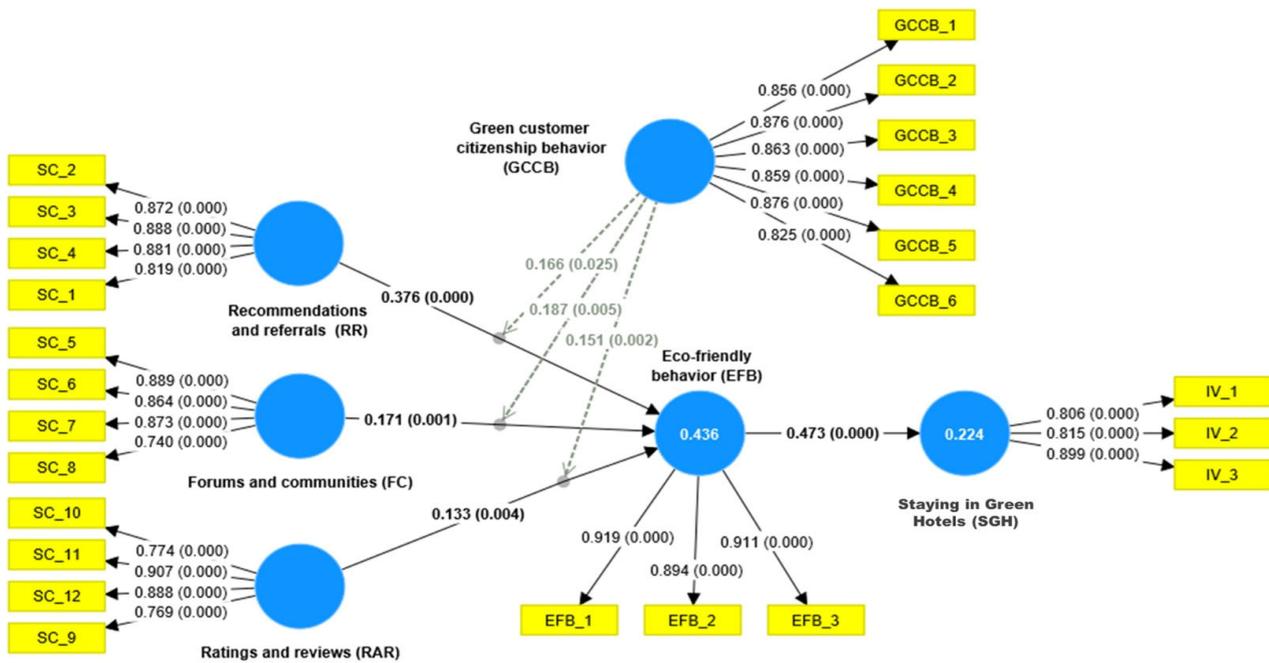


Figure 2. Estimation of structure model.

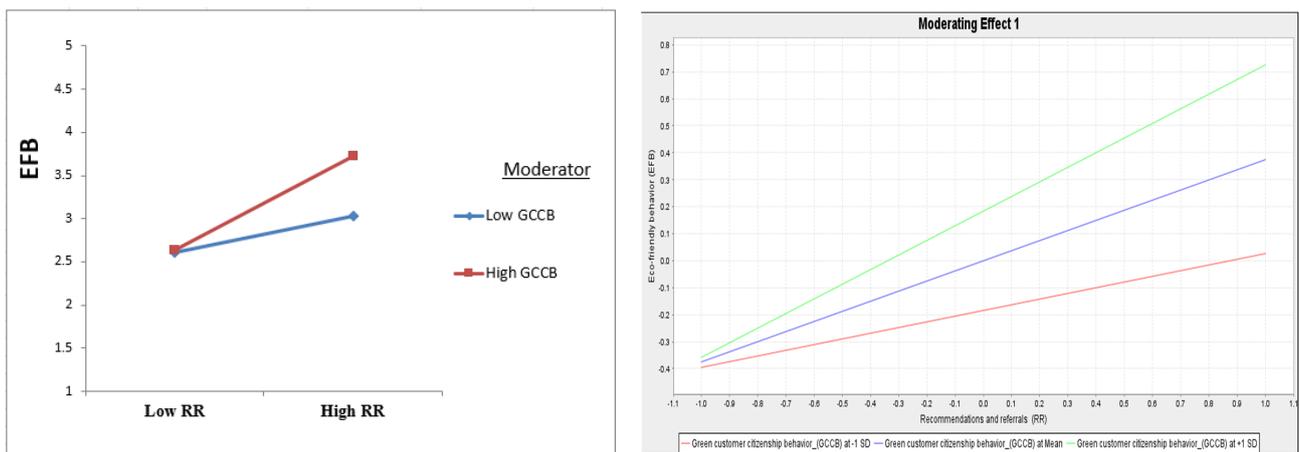


Figure 3. Moderating influence of GCCB on RRs toward EFB.

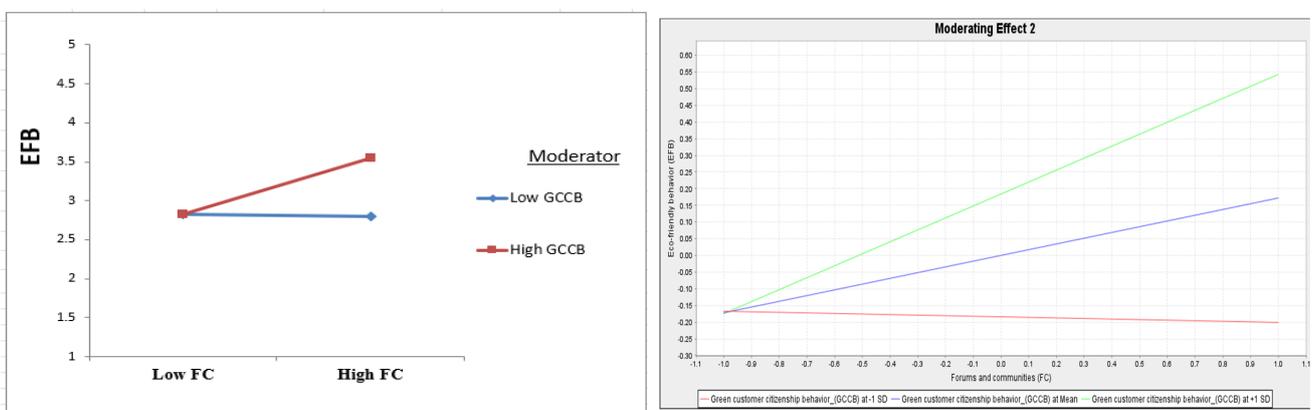


Figure 4. Moderating influence of GCCB on FCs toward EFB.

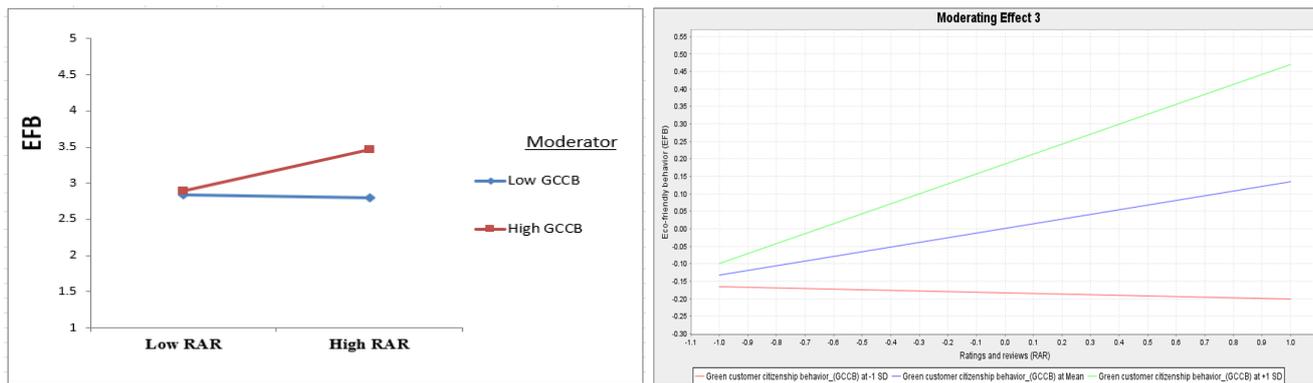


Figure 5. Moderating influence of GCCB on RARs toward EFB.

5. Discussion and Theoretical Implication

In the realm of social commerce, customers are provided with access to social knowledge and experiences that help form their intentions for online purchases, hence enabling them to make more informed and precise judgments regarding their purchases [1]. Nevertheless, there remains a lack of comprehensive understanding regarding the manner in which social commerce components (SCCs) effectively support customers in making purchasing decisions, a knowledge gap that persists within both academic research and industry practices [22].

The topic of sustainable development has been receiving more attention recently from all spheres of society and business, particularly in the tourism and hospitality sectors [7]. Over the past few decades, protecting the environment has been society's primary concern because humans have become more ecologically conscious and aware of how serious the ecological challenges are [70]. Consequently, people are embracing eco-friendly behaviors in their daily lives and becoming more environmentally conscious [53]. In this context, eco-friendly products and services have attracted a lot of attention as a result of customers' growing sensitivity to environmental deterioration and growing concern about environmental sustainability [71]. According to Han et al. [42], a green hotel is an environmentally conscious lodging establishment that follows eco-friendly policies and practices (such as reducing emissions and solid waste or saving water and electricity) in order to safeguard the environment and improve the hotel's operation. Through the implementation of green initiatives, hotels not only help the environment but also reduce expenses, gain a competitive edge, and improve customer and staff satisfaction and loyalty in addition to compliance with regulations [72]. Bedard and Tolmie [40] proved that social influence has a favorable impact on consumers' environmentally conscious behaviors.

The findings of the present study revealed that recommendations and referrals positively affect eco-friendly behavior (H1). According to Han et al. [42], environmentally friendly practices in the hotel industry do not always encourage visitors to request a stay at a green hotel. Hence, it would be more successful to convey such eco-friendly behaviors rather than promoting them in order to draw in more environmentally conscious visitors [73]. As a result, the hotel sector has found that social media platforms are a useful tool for communicating with guests and raising awareness of environmental issues [74]. Consequently, many scholars have developed an interest in recommendation networks as a result of the recent growth in the eco-tourism sector and data analysis techniques [72]. Selecting an optimal eco-friendly hotel can be difficult for customers because there are many options available with varying levels of service quality [48]. Hence, before making a reservation, customers sometimes look for recommendations and referrals [72]. Therefore, recommendations and referrals systems can be useful tools [2]. Basic conversation platforms like internet feedback and recommendations have developed into an accurate source of prospects and inquiries [8]. Customer recommendations and referrals to others

are one way that customers show their satisfaction with the service [75]. A satisfying guest experience will boost hotel revenue and set a hotel apart from its competitors [76–78].

Furthermore, our results discovered that forums and communities positively affect eco-friendly behavior (H2). When making purchases, consumers may use information created by them in addition to that supplied by businesses owing to information-sharing platforms like forums and communities [76]. Customers might use these collaborative platforms to voice their opinions about the services they have used [75]. Participating in online groups and forums exposes users to a diverse array of perspectives and ideas, hence, enhancing their confidence in the shared information [4]. Furthermore, it is argued that internet-based consumer communication inside social commerce frameworks fosters social support, which raises network trust [9]. Trust is seen as a mediating component when examining how social commerce information-sharing activities affect customer behavior, particularly decision-making and purchase intentions [79,80]. Moreover, in order to accurately evaluate the influence of trust on customer behavior, it is necessary to consider a variety of factors, such as organizations, brands, products, information technology and security, and privacy [76,81]. An individual is more likely to participate in a behavior if they have a good attitude about it [45]. Consumers' perceptions of eco-friendly tourism destinations are shaped by their attractiveness, friendliness, intellect, and helpfulness [46]. Additionally, customers' actual consumption and donation habits may be influenced by their intention to engage in an ecologically responsible attitude [11].

Concerning (H3), the study findings proved that ratings and reviews favorably affected eco-friendly behavior. In the hospitality industry, consumer ratings and reviews not only offer distinctive and useful information on hotel services, but they also directly influence the development of competitive strategies [75]. Through the utilization of consumers' expertise and insights, lodging companies might obtain creative concepts [82]. Accordingly, researchers regularly analyze customer reviews found on major independent consumer review websites like Trip Advisor [83], as well as online travel companies like Expedia and Booking [84]. On the other hand, guests' feedback and reviews, one of the primary E-WOM (electronic word-of-mouth) resources, have a significant effect on how visitors make reservations for hospitality services and products [74,85]. Consequently, customers should make efficient use of the extensive user reviews and ratings of hotels found in a tourist website database to assist them in making decisions and ensure they obtain the best products suited to their preferences [72]. Jung et al. [4] argued that the desire of consumers to purchase environmentally friendly products is greatly influenced by their attitudes about environmental conservation and their dedication to environmental responsibility. More precisely, green word-of-mouth (G-WOM) is a potent marketing instrument that influences green consumers' intentions and behavior; as such, hoteliers ought to consider the feedback and comments left by their consumers [86].

Additionally, the study's findings revealed that eco-friendly behavior has a positive impact on staying in green hotels (H4). Budeanu [49] argued that guests who choose to stay in green hotels will experience less of an impact when visiting. According to Han et al. [41], guests are more inclined to recommend and pay more for stays at green hotels if they have positive attitudes about eco-friendly activities in their daily tasks and favorable impressions of these businesses; they also usually recognize the threats tied to environmental contamination, cooperate to lessen or eliminate the problem, and have a desire to contribute to its solution [52]. As a result, they will have no trouble comprehending the eco-friendly features of green hotels [51]. Because green hotels comprehend their duty to preserve the environment and how to incorporate eco-friendly practices, guests who are aware of the drawbacks of visiting in traditional lodging decide on lodging there [42,87]. They are potentially more inclined than others to act in an ecologically friendly attitude [88]. Similarly, Gupta et al. [71] believed that customers staying at green hotels think their choice to do so will impact those who come to the hotel.

Regarding (H5), the study provided empirical evidence that eco-friendly behavior mediates the influence of recommendations and referrals on staying in green hotels. Social

commerce was proven to have a favorable effect on consumers' behavioral intention [38] and on consumers' eco-friendly behavior [40]. Similarity, referrals and recommendations happen when consumers learn about products or services via family, close friends, or other reliable sources [8]. In the context of the social learning theory, Darnall et al. [89] argued that knowledge is seen to have an influence on decision-making processes and on how customers evaluate products and services. Consequently, it has a big impact on customer attitude [9]. Environmental knowledge is defined as the ability of the consumer to identify different environmentally related cues, concepts, and attitudes [52]. People who have a positive attitude about a behavior are more likely to participate in it [45]. Consumers are more likely to recommend and pay more for stays at green hotels if they have favorable attitudes about eco-friendly practices and positive opinions of green hotels [41]. Hoteliers should not take all the blame for the serious environmental problems caused by the accommodation industry; guests also share some of the responsibility [48].

Furthermore, the results of our study revealed that eco-friendly behavior mediates the influence of forums and communities on staying in green hotels (H6). For social commerce, communities and forums are practical and efficient social media channels that support product selection, discovery, and recommendations [35]. According to Chen et al. [22], they assist consumers in acquiring knowledge and requesting opinions of others, empowering them to make informed purchasing decisions. Participating in online communities and forums provides consumers with an array of perspectives and ideas, hence enhancing their confidence in the shared information [4]. Social learning—the act of acquiring knowledge and experience from people we know or trust—is the core social psychology of social commerce [23]. Consumer attitudes and opinions regarding trust have a significant role in determining their decisions to buy products and services on social commerce platforms [9]. Consumer trust may increase when ambiguity is lessened and cognitive clarity is enhanced at the same time [54]. The degree of consumer knowledge, attitudes, values, and actions largely determines the standard of the environment [53]. Customers that care about the environment prefer eco-friendly behaviors, and individuals are growing more environmentally aware and integrating eco-friendly practices into their daily routines [40,42]. Likewise, the study's findings demonstrated that eco-friendly behavior mediates the influence of ratings and reviews on staying in green hotels (H7). Through reviews and ratings, customers may help each other make decisions by sharing objective opinions and experiences about products [3]. Elshaer et al. [9] indicated that consumers' attitudes and views regarding trust have a significant impact on their decisions to buy products and services on social commerce platforms. Consumers are more inclined to suggest and pay more for stays at green hotels if they have favorable opinions of them and attitudes toward engaging in eco-friendly activities in their daily lives [41]. According to Sujood et al. [44] attitudes toward behaviors are influenced by behavioral beliefs and can reflect both positive and negative behavioral assessments. Individuals are more likely to engage in a behavior if they have a good attitude about it [45]. Furthermore, customers' attitudes regarding traveling to eco-friendly locations for tourist experiences are influenced by their intelligence, friendliness, helpfulness, and attraction [46]. Consumers' desire to behave in an environmentally responsible manner might influence their actual consumption and contribution behaviors [11]. Consequently, visitors who care about the environment are more likely to stay in eco-friendly hotels than visitors who do not [5].

One key contribution of our study was to test the moderating role of green customer citizenship behavior in the link between recommendations and referrals and eco-friendly behavior (H8). According to Abdou et al. [5], consumer concerns about environmental sustainability and increased knowledge of environmental degradation have led to an increase in the popularity of eco-friendly behaviors. This promotes the adoption and widespread use of environmentally friendly products by other customers such as friends, family, coworkers, and linked referral groups [55]. Accordingly, green customer citizenship behavior includes assisting or advising other consumers on ecologically friendly products [56], asking other consumers to purchase from an organization that produces green

products [57], and offering suggestions to the organization to enhance its eco-friendly activities, encouraging more green buying [5]. Through social commerce websites, consumers may also view social recommendations and remarks left by other customers or ask their friends' perceptions [31]. On social commerce platforms, customers who have actually made the transaction themselves promote and refer others [22]. After this is completed, the social commerce platforms distribute these recommendations to other users who, in terms of socialization, preferences, and social ties, are comparable to the advocates [33]. Referrals and recommendations happen when consumers learn about products or services from friends, relatives, or other reliable sources [8]. The attitudes and trust of customers are greatly impacted by these forms of social commerce [9].

Notably, the research results demonstrated that green customer citizenship behavior moderates the relationship between forums and communities and eco-friendly behavior (H9). Learning occurs in a social setting, where an individual's surroundings, behaviors, and ideas interact with each other in a dynamic and reciprocal way, according to the social cognitive theory (SCT) [19]. Therefore, customers are encouraged to act willingly when positive products participate in eco-friendly activities [6]. Customers may obtain information and comments from other users through forums and communities, which helps them make informed purchases [22]. Moreover, there is a claim that internet-based customer contact inside social commerce frameworks increases network trust by fostering social support [9]. This kind of assistance may be both emotional and educational [3]. According to the "self-determination theory", extrinsic and intrinsic motives are two major factors that influence environmentally conscious consumer behavior [43]. The term "intrinsic motivation" describes actions motivated by pleasure or other internal rewards [11]. Because green customer citizenship behaviors are optional and voluntary, they may be viewed as extra-role actions [6]. Consumers with high levels of green voluntary behavior are motivated to contribute to the growth of an organization's environmental initiatives and support a green image [58]. Van Tonder et al. [55] distinguish this type of behavior from in-role behavior, which concentrates on what customers need to do to ensure the transaction is finished appropriately. Engaging in virtual discussion forums and communities exposes users to a wide range of viewpoints and concepts, thus boosting their trust in the shared information [4].

Regarding the last hypothesis, the study result proved that green customer citizenship behavior moderates the relationship between ratings and reviews and eco-friendly behavior (H10). Reviews and ratings let users share their independent opinions and experiences about products and help one other make decisions [32]. Positive product participation in eco-friendly initiatives encourages consumers to behave voluntarily [6]. It has been shown that people with a green attitude show more concern for ecological issues and pay attention to eco-social advantages [59,90]. Van Tonder et al. [55] described green customer citizenship behavior as a voluntary, discretionary behavior that is beneficial to the implementation of an organization's green initiatives but is not forced. Among the behaviors associated with green customer citizenship include assisting or advising other consumers on ecologically friendly products [56,91], asking other consumers to purchase from an organization that produces green products (advocacy) [57], and offering suggestions to the organization to enhance its eco-friendly activities, encouraging more green buying [5].

6. Recommendations for Practical Implications

The current study holds various practical implications for the hotel sector. First, based on the findings, hospitality businesses should prioritize providing and creating trusted information about their green practices to motivate customers to recommend and advocate their products or services across social commerce. Secondly, hotel marketers ought to allocate resources toward tactics that foster favorable referrals and recommendations from reliable sources. These tactics include incentivizing customers to write favorable reviews or enticing social media influencers to endorse their eco-friendly goods and services. Transparent communication and emphasizing the environmentally friendly features of

hotel services and goods can both help to motivate guests to do this. Furthermore, hotels should actively interact with their patrons in social commerce forums and communities to construct relationships, display their green expertise and credibility, and handle any worries they may practice greenwashing. Further, green hospitality businesses should actively track and react to patron ratings and reviews to pinpoint areas that require improvement, resolve any unfavorable experiences or issues, and show that they are trying to meet the expectations of environmentally conscious customers. Hotels may address customer worries about greenwashing and improve eco-friendly conduct by doing this, which will increase the desire of guests to stay at green hotels. Finally, the findings of our study suggest that green customer citizenship behavior effectively strengthens the power of social commerce components in motivating customer eco-friendly behavior. Here, hotels can promote GCCB by organizing workshops and meetings with their customers during their stay at the hotel to explain and demonstrate their green operation and contribution to achieving sustainability on the ground. In doing so, customers with GCCB are likely to be strongly involved in helping other customers on e-commerce platforms choose green hotels over others by providing reliable information.

7. Limitations and Future Research

As our study delves into the intricate relationships between social commerce, green customer citizenship, eco-friendly behavior, and the choice to stay in green hotels, it is imperative to critically assess the limitations encountered during the research process. Additionally, outlining avenues for future research will pave the way for a more comprehensive understanding of this multifaceted nexus. The cross-sectional nature of our research provides a snapshot at a particular moment in time. A longitudinal approach would offer insights into the evolving dynamics of the relationships under investigation. Given the rapidly evolving landscape of technology, future research should explore how emerging technologies, such as augmented reality or artificial intelligence, might influence social commerce, green citizenship, and subsequent eco-friendly behaviors and choices. The reliance on self-reported data introduces the possibility of response bias and social desirability. Future research could explore alternative methods, such as observational or behavioral data, to validate and supplement self-reported measures.

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