

## Article

# From Posts to Action: Leveraging Social Media to Inspire Food Waste Reduction in Hospitality for a Net Zero Future

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**Abstract:** This study explores the contribution of social media to food waste reduction among hospitality customers as part of the global net zero emissions agenda. It does this by using the Stimulus–Organism–Response (SOR) model to examine how social media food waste reduction promotion affects hospitality customer food waste intentions, mediated by social media-driven environmental motivation and sustainability-driven customer happiness. Moreover, gratitude towards food waste initiatives moderates these effects such that motivation and emotional satisfaction are more strongly associated with sustainable behaviors. We find that social media campaigns can effectively elicit cognitive and emotional engagement, which in turn strengthens food waste reduction intentions, using data from 404 hospitality customers in China. Furthermore, the study extends the SOR model to sustainability and consumer behavior literature and provides practical guidance for hospitality businesses to harness social media in engaging customers in sustainability efforts. Organizations can enhance the effectiveness of their environmental campaigns by using emotionally resonant messages and highlighting gratitude. Filling important gaps, this research explores mechanisms driving sustainable behaviors in line with strategies to achieve net zero emissions.

**Keywords:** food waste reduction; social media promotion; sustainability; hospitality industry; net zero emissions; food loss



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## 1. Introduction

Climate change is a challenge faced all over the world, affecting the environment, economies, and societies. Net zero emissions are now central to international agendas and as nations seek long-term sustainability [1]. This means concerted action by governments, organizations, and communities for a carbon-neutral future and a healthy planet for future generations [2]. Food waste is one of the biggest and often overlooked contributors to climate change. The FAO (2019) estimates that globally, one-third of food produced for human consumption is wasted, the implications of which are severe from both environmental and economic viewpoints [3]. Approximately 8 to 10 percent of global emissions are water, energy, and the greenhouse gas emissions associated with the waste of these resources [4]. Food decomposition in landfills emits methane, a very powerful greenhouse gas that speeds up global warming [5]. The poor management of food waste is a further problem that exacerbates other problems, such as deforestation, biodiversity loss, and water scarcity [6]. Therefore, minimizing food waste is important for climate mitigation and reaching net zero emissions.

In this context, this study focuses on the usage of social media as a primary tool to change consumer behavior in decreasing food waste. For this study, food wastage primarily

refers to food ordered by customers at restaurants and hotels that is not consumed. The reach and user engagement of social media have made it a fantastic place to raise awareness and nudge people to change their behaviors [7]. These platforms are not only used for marketing purposes but also to educate and inspire action to reduce food waste or to take collective responsibility in reaching net zero goals [8]. Social media campaigns can spread awareness, but the hard part is getting awareness to translate into sustained action if convenience or past habits are still in the way. Considering that the hospitality industry is one of the key contributors to food waste [9], this research is conducted to examine how social media food waste reduction promotion may influence customer intention to decrease food waste. Utilized as an enabler for sustainability efforts in hospitality organizations, social media is an important forum to publicize sustainability efforts, engage customers in environmental issues, steer consumer behavior, and contribute to broader net zero emissions goals [10]. This context provides an advantage for brands by allowing them to strengthen their reputation by demonstrating their dedication to sustainability, but if these efforts are viewed as superficial or 'greenwashing', then it can damage brand credibility.

This study examines psychological mechanisms that drive consumer behavior, such as social media-driven environmental motivation and sustainability-driven customer happiness as mediators. In explaining why some consumers respond positively to food waste reduction campaigns, we can explain that consumers motivated by environmental values or happiness from supporting sustainable practices are more likely to act on social media messaging [11]. Reactions to sustainability messages are influenced by personal factors such as gratitude [12]. In this regard, gratitude towards food waste initiatives is expected to moderate the relationship between social media campaigns and customers' intentions to reduce food waste. Customers who experience more gratitude for an organization's efforts are also more likely to respond more positively to communication [13]. Gratitude is a psychological factor that, if better understood, can help design more effective strategies to convince consumers to consume sustainably [14]. This study examines the Chinese hospitality sector, as China plays a key role in the world sustainability agenda due to its environmental impact and the rate of urbanization. China is one of the world's largest emitters of greenhouse gases and also one of the world's largest economies, as well as a major source of environmental degradation, which makes China a key player in the fight against climate change [15]. The country has a large population and growing affluence that has driven up food consumption, leading to a large amount of food waste, estimated at 17–18 million tons per year in urban households and hospitality venues, with a huge carbon footprint and undermining the sustainability effort of the country [16]. With respect to this issue, the Chinese hospitality industry offers a strategic opportunity to promote the reduction in food waste and support the net zero emission agenda. Food consumption patterns and total food waste levels are greatly influenced by hotels and restaurants [17]. The purpose of this research is to investigate how Chinese hospitality organizations can use social media to promote sustainable consumption behaviors and less food waste. Targeting the Chinese market offers lessons for other emerging markets in dealing with a pressing environmental issue of a key global economy and also provides a global contribution to sustainability and carbon neutrality.

Despite increasing focus on sustainability, research gaps persist regarding food waste reduction in the hospitality sector. One key gap is the limited exploration of how digital tools, such as social media, could be used to foster sustainable consumer behaviors. Extensive research has explored how social media can enhance brand awareness [18,19], with studies indicating that platforms such as Facebook and Instagram are effective tools for creating and maintaining consumer engagement [20,21]. However, there remains a limited understanding of how social media can be leveraged to drive sustainability-related behavior change [22,23], particularly in the context of food waste reduction. While efforts have been made to explore general pro-environmental behaviors influenced by digital media, such as recycling or energy conservation [24–26], the specific role of social media in addressing food waste behaviors within the hospitality sector has received scant attention. This study

aims to fill this gap by examining how social media food waste reduction promotion impacts hospitality customers' intentions to reduce food waste and how this communication approach fosters sustainable consumption. Additionally, psychological and motivational factors mediating the relationship between sustainability communication and consumer behavior are underexplored in existing research. Studies by Ahmad, et al. [27] and Yuxiang, et al. [28] indicate the importance of emotional and cognitive factors in shaping sustainable actions; yet, the mechanisms through which social media-driven environmental motivation and sustainability-driven customer happiness influence pro-environmental behaviors remain insufficiently studied. Furthermore, personal attributes such as gratitude, which have been shown to significantly amplify pro-social and pro-environmental behaviors [29], are rarely examined in the context of food waste. By introducing gratitude towards food waste initiatives as a moderating variable, this study enriches the literature and demonstrates how personal traits shape consumer receptiveness to sustainability messages, advancing our understanding of how to design impactful communication strategies. In the end, although China has had a huge influence on global sustainability, there are few studies to date on how its hospitality industry can contribute to decreasing food waste and achieving net zero [30]. To fill this gap, this study investigates how hospitality organizations in China can use social media to advocate for food waste reduction, which may be transferrable to other emerging economies and contribute to the global body of sustainability research.

## 2. Literature Review and Theoretical Underpinning

Today, social media advertising is a preferred tool that brands use to manipulate consumer behavior [31]. As digital technologies evolve, so does social media, and the brand–consumer interaction has gone from one-way communication to interactive dialogue and even more engagement [32]. Brands use social media to reach different audiences, advertise their products and services, and change consumer perceptions and behavior in real-time with tailored messages. In particular, it is very useful to promote sustainability initiatives by informing users about environmental activities, educating consumers, and changing their behavior in support of sustainability goals [33]. Creating campaigns that reflect brands' values can shape attitudes and can influence consumers to behave more responsibly. In this study, we examine the influence of social media food waste reduction promotion on hospitality customer food waste intentions. Rini, et al. [34] show that sustainability messages shared through social media can induce eco-friendly behavior, such as cutting back on food waste. Furthermore, hospitality brands can also proactively promote food waste reduction strategies through engaging content that will increase consumer awareness and increase consumer intention to reduce food waste. Although a plethora of existing literature on social media marketing already exists, there is little understanding of how this type of promotion influences the food waste intentions of customers in the hospitality industry. To further underpin this, we employed the Stimulus-Organism-Response (SOR) Model [35] in order to explain this relationship. According to the SOR model, external stimuli (S) (i.e., social media promotions) influence an individual's internal state (O) (i.e., emotions and motivation) that results in a behavioral response (R) (i.e., reduced food waste intentions). Social media food waste reduction promotions act as the stimulus that leads to an internal psychological state, such as environmental motivation and happiness from being able to help support sustainable practices. Thus, the desired response is achieved, i.e., higher intentions to reduce food waste in hospitality settings. This research is best suited for the SOR model because it reflects the way in which social media stimuli affect psychological states and drive behavior [36]. External stimuli in social media food waste reduction promotion create cognitive and emotional reactions in customers, which will then lead to their behavioral intentions. The study applies this model to offer a robust framework to understand how digital stimuli can induce pro-environmental actions for enabling sustainability goals. Therefore, the following hypothesis is proposed:

**H1:** *Social media food waste reduction promotion is positively related to hospitality customer food waste intentions.*

Social media content is valuable because it can provide relevant information and engage with sustainability narratives to generate customers' environmental motivation [37]. Environmental motivation, which is the ability to motivate sustainable consumption through attitudes and values on environmental protection [38], is the main force governing sustainable consumption. The brands that effectively communicate their sustainability initiatives inform their customers about what environmentally responsible actions they are taking. For example, hospitality brands can use social media to post about food waste reduction to build positive attitudes and a stronger sense of environmental responsibility [39]. Social media acts as an external stimulus to induce internal psychological states such as motivation. Consequently, social media food waste reduction promotion is expected to trigger customers' environmental motivation and thus encourage customers to adopt sustainable practices [40]. In this study, we hypothesize that social media food waste reduction promotion will act to increase social media-driven environmental motivation. As an example, hospitality brands can attract customers' concerns about the environment by publishing interesting content such as infographics, videos, and interactive posts that discuss the environmental impacts of food waste and also promote attempts to reduce them [41]. The relationship between social media promotion and environmental motivation explains how social media affects sustainable consumption behaviors. Not only does environmental motivation affect consumers' mindsets, but it also directly impacts their sustainable behavioral intentions. According to research, people who are driven to protect the environment are more inclined to engage in eco-friendly behaviors, such as reducing waste and promoting sustainable products [42]. When dining, customers with higher environmental motivation are more likely to act on their beliefs and reduce food waste in a hospitality context. It indicates that those with stronger intentions to support food waste reduction are more motivated. The expectation in this study is that social media-driven environmental motivation has a direct positive relationship with hospitality customer food waste intentions. Potentially, food waste reduction social media campaigns are also more likely to motivate customers to have more positive intentions of reducing food waste in hospitality settings. In order to judge the effectiveness of sustainability communication to change behavior, this relationship needs to be understood [43]. In addition, environmental motivation serves to mediate the relationship between social media food waste reduction promotion and behavioral intentions. According to the SOR model, social media food waste reduction promotion serves as a stimulus, changing the internal psychological state and environmental motivation, and consequently leads to a behavioral response of food waste reduction intentions. The SOR model supports H2 and H3 by explaining how external stimuli (social media promotions) evoke internal states (environmental motivation), leading to a behavioral response. Research shows that social media can inspire pro-environmental attitudes by fostering awareness and concern for sustainability. Environmental motivation, driven by such stimuli, is a key determinant of eco-friendly behaviors such as reducing food waste. In this way, environmental motivation mediates the relationship between social media promotion and food waste intentions, and also explains the mechanism through which social media affects sustainable consumption behavior. Therefore,

**H2:** *Social media food waste reduction promotion is positively related to social media-driven environmental motivation.*

**H3:** *Social media-driven environmental motivation is positively related to hospitality customer food waste intentions.*

**H4:** *Social media-driven environmental motivation mediates the relationship between social media food waste reduction promotion and hospitality customer food waste intentions.*

How social media content is framed plays a large role in how customers perceive and react to sustainability initiatives [44]. Many organizations use social media to promote their efforts not only to inform customers but also to inspire positive emotional responses that lead to greater engagement and support [45]. Sustainability-driven customer happiness is one key emotional response to the activities supporting environmental sustainability, which is the positive emotional state obtained from supporting activities that contribute to environmental sustainability [46]. If brands communicate their sustainability initiatives correctly, consumers can feel happy for supporting eco-friendly practices [47]. Allen and Allen [48] find that this emotional response can reinforce consumers' intentions to support the brand and its sustainability efforts. Social media food waste reduction promotions are expected to have a positive effect on sustainability-driven customer happiness in this study. Social media can be used by hospitality organizations that promote food waste reduction in order to generate positive emotional responses among customers who resonate with the brand's sustainability values. Customers who perceive these efforts as authentic will most likely experience happiness and satisfaction, which deepens the emotional connection to the brand and its environmental goals [46]. By demonstrating this relationship, we show how sustainability messages driven by social media can generate emotional responses from customers who will support environmental initiatives. There is a significant influence on subsequent behavior from happiness from engaging with a brand's sustainability efforts [49]. According to research, those who are happy tend to engage in behaviors that support the source of their happiness [50]. In the hospitality context, sustainability-driven customer happiness can increase the intention to cut down on food waste because customers are encouraged to behave in alignment with the positive emotions they experience. Therefore, if customers are happy with food waste reduction initiatives, they are more likely to consciously reduce food waste when they visit a particular hospitality services organization. Sustainability-driven customer happiness may positively be related to hospitality customer food waste intentions in the study. Positive emotions from a hospitality brand's food waste reduction efforts can then be transferred into tangible actions, such as actively reducing food waste as customers experience these initiatives [51].

In addition, social media food waste reduction promotions are suggested to be mediated by sustainability-driven customer happiness, influencing hospitality customers' food waste intentions. Social media food waste reduction promotion, viewed through the lens of the SOR model, operates as a stimulus which produces a positive emotional response (happiness). From this emotional response, the resultant behavior is the desired behavior (reducing food waste). The mediating mechanism of sustainability-driven happiness explains the transformation of social media messages into specific consumer actions [52]. Further, H5 and H6 draw from emotional theories in the SOR model, where sustainability-driven happiness serves as an emotional response to social media messaging. Positive emotions reinforce sustainable behaviors, as consumers act in alignment with their happiness derived from supporting eco-friendly practices. Social media creates these emotional connections, which translate into behavioral intentions. It is possible that customers' happiness with food waste reduction campaigns on social media increases the probability of customers supporting these efforts through a reduction in waste. This mediating role further elucidates how hospitality brands can use social media to improve both emotional and behavioral outcomes. Hence,

**H5:** *Social media food waste reduction promotion is positively related to sustainability-driven customer happiness.*

**H6:** *Sustainability-driven customer happiness is positively related to hospitality customer food waste intentions.*

**H7:** *Sustainability-driven customer happiness mediates the relationship between social media food waste reduction promotion and hospitality customer food waste intentions.*

As an emotional state, gratitude motivates people to reward positive actions and efforts with positive responses, sometimes leading to pro-social and pro-environmental behaviors [53]. When people believe that they have been the recipient of someone else's goodwill, they appreciate the experience and want to give back [54]. Gratitude can increase consumers' receptivity to sustainability initiatives by amplifying consumers' likelihood of performing environmentally supportive behaviors [55]. Gratitude can be a powerful tool for hospitality organizations to influence both attitudes and behaviors towards sustainability efforts such as food waste reduction [12]. Customers tend to react positively to promotional messages and endorse the brand's initiatives on the environment when they feel grateful for a brand's real effort in sustainable practices [13]. This study expects the relationship between social media food waste reduction promotion and the internal psychological states (mediators) that determine hospitality customer food waste intentions to be moderated by gratitude. Gratitude is expected to increase the effectiveness of social media messages in increasing customers' environmental motivation [56]. Customers are more likely to be inspired by a hospitality organization's food waste reduction efforts if they feel appreciative of the organization's efforts [53]. This sense of gratitude helps increase the strength of social media messages, making customers more receptive to sustainability content and more likely to translate those feelings into pro-environmental motivations. Therefore, it strengthens the association between social media food waste reduction promotion and environmental motivation, which leads to a higher intention to reduce food waste in hospitality environments. Additionally, gratitude is expected to improve the impact of sustainability-driven customer happiness on social media food waste reduction promotion. If a hospitality brand is grateful for sustainability, customers will be happier engaging with those initiatives. This emotional state reinforces the effect of social media messaging on customer happiness, which leads to higher satisfaction to support the brand's sustainability efforts [57]. People who are happier are more likely to engage in behaviors that are consistent with those positive emotions, such as intentionally reducing food waste, and gratitude makes people happier [58]. Together, this suggests that gratitude is an important driver of the amplification of emotional responses to social media messages, which, in turn, influence customer intentions to support food waste reduction initiatives. Gratitude serves as both a personal disposition that drives sustainable behaviors and a moderator of the psychological mechanisms linking social media promotions to pro-environmental behaviors. Customers' gratitude for an organization's sustainability efforts is intensified when they perceive those efforts as genuine and beneficial, which spurs their motivation and happiness and their intentions to reduce food waste. The moderating effect reveals how emotional factors, such as gratitude, affect the pathway from social media communication to sustainable consumer behaviors in the hospitality sector. Moreover, H8a and H8b integrate gratitude into the SOR framework, where gratitude amplifies motivation and happiness. Studies indicate gratitude enhances receptivity to sustainability efforts, strengthening the impact of emotional and cognitive states on pro-environmental actions. Hence,

**H8a:** *Gratitude towards food waste initiatives moderates the indirect relationship between social media food waste reduction promotion and hospitality customer food waste intentions through social media-driven environmental motivation, such that the indirect relationship is stronger when gratitude is high.*

**H8b:** *Gratitude towards food waste initiatives moderates the indirect relationship between social media food waste reduction promotion and hospitality customer food waste intentions through sustainability-driven customer happiness, such that the indirect relationship is stronger when gratitude is high.*

### 3. Materials and Methods

#### 3.1. Participants and Data Collection Procedure

The data for this study were collected from hospitality customers across three major cities in China: Beijing, Shanghai, and Guangzhou. The selection of these cities was based on their status as international business hubs, diverse demographics, and active engagement with sustainability initiatives, and thus are ideal for investigating consumer responses to food waste reduction initiatives in the hospitality sector. The data collection was conducted in person among hotels and restaurants through the use of a structured questionnaire. The participants were given a brief introduction to the study and its purpose and were assured of voluntary participation. The questionnaire was completed by respondents on-site. The study followed ethical guidelines, such as voluntary participation and the right to withdraw at any time without consequence [59–61]. Specifically, the data collection protocols were approved by the ethics committee of Kaifeng University, China (Approval No. SCTK-2024-033, 15 February 2024). Participants' confidentiality and anonymity were assured, and no personally identifiable information was collected [62–64]. However, considering the observational nature of the study and the absence of any medical treatment for the respondents, this study required no formal ethical approval from a local ethics committee. The data were used only for research, which helped to build trust and to receive honest answers. Cohen [65] power analysis was used to determine the sample size to ensure sufficient statistical power. With a medium effect size ( $f^2 = 0.15$ ), a significance level of 0.05, and a statistical power of 0.80, a sample size of approximately 380 was recommended. In order to account for possible low response rates, 600 questionnaires were distributed across the three cities. Of these, 429 were returned, with 404 valid responses after the removal of incomplete or inconsistent responses, exceeding the recommended sample size and providing robust, reliable data for analysis. To ensure that the high frequency of visits to hospitality establishments did not unduly influence responses, the survey design randomized the question order to minimize bias. Respondents were instructed to consider general attitudes toward sustainability rather than specific experiences. Table 1 below presents a summary of the socio-demographic characteristics of the final sample.

**Table 1.** Socio-demographic detail.

Characteristic	Frequency (n)	Percentage (%)
Gender		
Male	194	48
Female	210	52
Age		
Under 20	22	5.4
21–30	164	40.6
31–40	127	31.4
41–50	65	16.1
Above 50	26	6.4
Educational Level		
High School	49	12.1
Diploma	87	21.5
Bachelor’s Degree	193	47.8
Master’s Degree	60	14.9
Ph.D. or Higher	15	3.7
Monthly Income (RMB)		
Less than 3000	65	16.1
3001–5000	119	29.5
5001–8000	108	26.7
8001–10,000	66	16.3
Above 10,000	46	11.4
Frequency of Visits		
1–2 times per month	78	19.3
3–5 times per month	142	35.1
6–8 times per month	116	28.7
More than 8 times	68	16.8

### 3.2. Measures

To ensure the reliability and validity of the study variables, established scales from reputable journals were used in operationalizing the variables, and all items were measured on a five-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). The social media food waste reduction promotion was assessed using a four-item scale adapted from Herman, et al. [66]. An example item is as follows: “This hospitality services organization uses clear and compelling messages in social media posts to promote minimizing food waste”. Social media-driven environmental motivation was measured using a five-item scale adopted from Ali, et al. [67]. A sample item is as follows: “I enjoy engaging with new sustainable food practices promoted by hospitality services on social media”. Sustainability-driven customer happiness was measured using a five-item scale adopted from Ruo-Fei, et al. [46]. An example item is as follows: “I am happy to support this hospitality organization’s sustainable food practices”. Gratitude toward food waste initiatives was measured using a three-item scale adopted from Kim and Park [68]. An example item is as follows: “I am grateful that this hospitality organization is trying to educate people on how to practice responsible food and reduce food waste”. Finally, a five-item scale adopted from Bell and Ulhas [69] was used to assess hospitality customer food waste intentions. A sample item is as follows: “I strive to minimize the amount of food waste I produce during my visits to hospitality services”.

To mitigate method bias, procedural remedies were applied during questionnaire design and data collection. Items were rephrased for clarity, and their order was randomized to reduce patterned responses [70]. Social desirability bias was addressed by ensuring anonymity and emphasizing that there were no right or wrong answers to encourage honesty. Harman’s Single-Factor Test was conducted to check for common method bias [71–73]. Results showed that the largest factor accounted for less than 40% of the variance, suggesting that bias was not a significant concern and the data were reliable for analysis.



#### 4. Data Analysis

The measurement model was reliable according to the analysis conducted in SMART-PLS, as all indicator loadings for the variables were above the recommended threshold of 0.70. The internal consistency was also above the 0.70 threshold [74,75] for each construct, and the composite reliability was also high. Good convergent validity was confirmed through the average variance extracted (AVE), exceeding the 0.50 threshold for each construct [76,77]. Table 2 summarizes these findings.

The Fornell-Larcker criterion and Heterotrait-Monotrait (HTMT) ratio were used to test discriminant validity (Table 3). The Fornell-Larcker criterion compares the square root of the average variance extracted from each construct to its correlations. To confirm the discriminant validity, the square root of the AVE is higher than the correlation between the constructs; the diagonal elements (square root of AVEs) are greater than the off-diagonal correlations in Table 3 [78–81]. Furthermore, all HTMT values in the table are below 0.90, suggesting discriminant validity, and it is also observed that all values are below 0.90. For example, consider the square root of the AVE for GFWI (0.915) exceeds the correlations with other constructs (e.g., 0.528 with HCFWI). Furthermore, we confirm the constructs are distinct, with HTMT for GFWI and SDCH being 0.661. Both tests also render adequate discriminant validity.

The result of hypothesis testing showed significant relationships among the variables that indicate SMFWP, SMDEM, and SDCH shape HCFWI. Social media promotions had a significant effect on the path from SMFWP to HCFWI (Beta = 0.320) and thus significantly influenced customers' intention to reduce food waste. Furthermore, the SMDEM to SMFWP path was also significant (Beta = 0.421), showing that social media leads to sustainable behavior. Results provided support for the relationship between SMDEM and HCFWI (Beta = 0.175), indicating that environmentally motivated customers have stronger food waste reduction intentions. Confirming that gratitude increased environmental motivation to reduce food waste, SMDEM (Beta = 0.071) was also mediated through GFWI. Results for SMFWP showed a positive effect on SDCH (Beta = 0.415), and SDCH was found to be significantly related to HCFWI (Beta = 0.428). This indicated a positive relationship between customer happiness due to supporting sustainability and food waste reduction intentions. Additionally, GFWI moderated the effect of SMDEM and SDCH on HCFWI (Beta = 0.017; Beta = 0.057), such that environmental motivation and happiness increased their influence on food waste intentions. The model explanatory power is shown by the R-square values. The model explained 40.9% of the variance for HCFWI. The model explained 43.3% of the variance in SDCH and 38.2% of the variance in SMDEM. Table 4 includes more detail and Figure 1 represents the structural model of this study.

**Table 2.** Quality indicators of the measurement model.

Construct	Abbreviation	Item	Loading	Composite Reliability	Average Variance Extracted (AVE)
Gratitude Towards Food Waste Initiatives	GFWI	GFWI1	0.905	0.94	0.838
		GFWI2	0.923		
		GFWI3	0.918		
Hospitality Customer Food Waste Intentions	HCFWI	HCFWI1	0.932	0.975	0.888
		HCFWI2	0.943		
		HCFWI3	0.953		
		HCFWI4	0.942		
		HCFWI5	0.941		
Sustainability-Driven Customer Happiness	SDCH	SDCH1	0.925	0.948	0.785
		SDCH2	0.738		
		SDCH3	0.918		
		SDCH4	0.937		
		SDCH5	0.896		
Social Media-Driven Environmental Motivation	SMDEM	SMDEM1	0.822	0.925	0.711
		SMDEM2	0.846		
		SMDEM3	0.851		
		SMDEM4	0.844		
		SMDEM5	0.852		
Social Media Food Waste Reduction Promotion	SMFWP	SMFWP1	0.763	0.865	0.616
		SMFWP2	0.763		
		SMFWP3	0.82		
		SMFWP4	0.792		

**Table 3.** Discriminant validity.

Construct	GFWI	HCFWI	SDCH	SMDEM	SMFWP
Correlations and Square Root of AVEs					
GFWI	0.915				
HCFWI	0.528	0.942			
SDCH	0.604	0.77	0.886		
SMDEM	0.618	0.708	0.758	0.843	
SMFWP	0.476	0.715	0.656	0.655	0.785
HTMT Ratios					
GFWI					
HCFWI	0.565				
SDCH	0.661	0.811			
SMDEM	0.69	0.747	0.829		
SMFWP	0.446	0.586	0.581	0.614	

Table 4. The results of structural model.

Hypothesis	Beta Coefficient	S.D.	t-Statistics	p-Value	Lower CI	Upper CI	R-Square
SDCH → HCFWI (H7)	0.428	0.071	6.001	0.000	0.294	0.570	HCFWI (R <sup>2</sup> = 0.409)
SMDDEM → HCFWI (H3)	0.175	0.064	2.740	0.006	0.042	0.297	
SMFWP → HCFWI (H1)	0.320	0.044	7.230	0.000	0.249	0.420	
SMFWP → SDCH (H5)	0.415	0.035	11.772	0.000	0.337	0.485	SDCH (R <sup>2</sup> = 0.433)
SMFWP → SMDDEM (H2)	0.421	0.036	11.715	0.000	0.344	0.484	SMDDEM (R <sup>2</sup> = 0.382)
Moderating Effect 1 (H8b)	0.057	0.016	3.653	0.000	0.030	0.090	-
SMFWP → SDCH → HCFWI (H7)	0.178	0.038	4.688	0.000	0.113	0.267	-
GFWI → SMDDEM → HCFWI (H4)	0.071	0.027	2.648	0.008	0.017	0.122	-
Moderating Effect 2 (H8a)	0.017	0.008	2.102	0.036	0.005	0.035	-

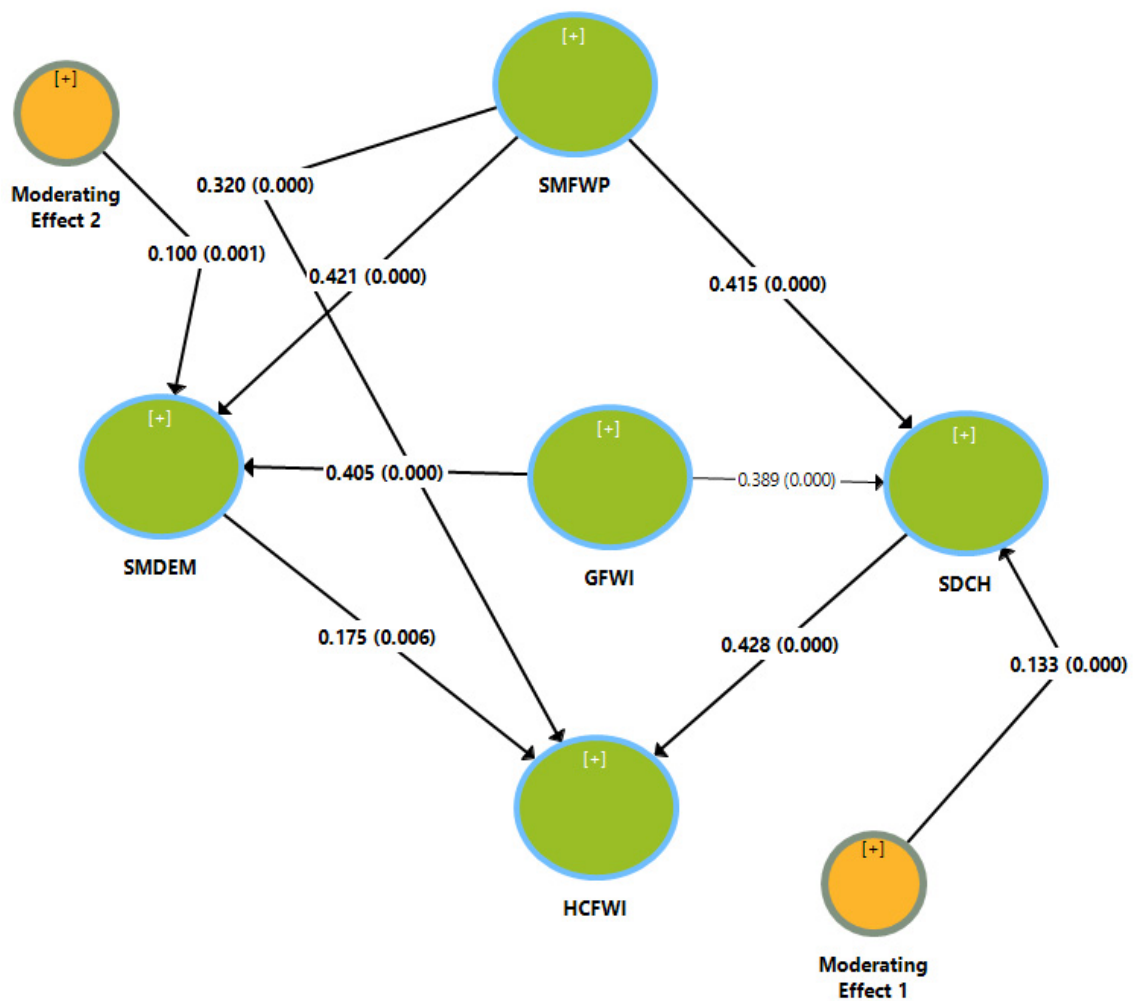


Figure 1. The structural model, showing the hypothesized relationships.

### 5. Discussion

This study identified several critical direct effects of food waste reduction in the hospitality industry. Social media campaigns are positively related to hospitality customer food waste intentions and, hence, encourage customers to reduce food waste. This aligns with recent work that social media can foster pro-environmental behaviors [33]. Further, the above discussion also aligns with Lau, et al. [82], who acknowledged the role of social media in shaping customer behavior in the context of food waste. Social media food waste reduction promotion also directly influences sustainability-driven customer happiness because customers feel emotional happiness in supporting social media-promoted sustainability efforts. This is in line with previous work from Ruo-Fei, et al. [46], who showed that emotional responses may be a driver of pro-environmental actions. Furthermore, a posi-

tive relationship between social media-driven environmental motivation and hospitality customer food waste intentions implies that those customers with higher environmental motivation are likely to engage in sustainable behavior [42]. This study also helps to understand how mediating effects affect food waste reduction behaviors. Social media food waste reduction promotion and hospitality customer food waste intentions were significantly mediated by social media-driven environmental motivation, meaning that the more food waste reduction social media campaigns drive environmental motivation, the more food waste reduction will occur. Motivation is identified as a critical bridge between awareness and action. Similarly, sustainability-driven customer happiness mediated the relationship between social media food waste reduction promotion and food waste intentions. This implies that, in addition to informing, campaigns also promote happiness that leads to sustainable action, thus emphasizing the dual impact of cognitive (motivation) and emotional (happiness) factors in encouraging the sustainable behavior of customers. The findings of this study align with recent research emphasizing the role of social media in driving pro-environmental behaviors. For example, Teoh, et al. [41] highlighted how interactive social media campaigns can significantly influence food waste reduction behaviors by engaging users with visually compelling content. Similarly, Jenkins, et al. [83] demonstrated that social media's ability to disseminate educational materials enhances consumers' motivation for sustainable food practices. Our results corroborate these findings by showing that social media-driven environmental motivation and sustainability-driven happiness are significant predictors of food waste reduction intentions.

Gratitude towards food waste initiatives also had a significant moderating role, enhancing the relationship between mediators and hospitality customer food waste intentions. The effects of social media-driven environmental motivation and sustainability-driven customer happiness were amplified by gratitude, increasing their effect on food waste reduction intentions. This is consistent with Tam [53] research on gratitude as a motivator of prosocial behavior and extends it by demonstrating that gratitude increases the effectiveness of sustainability campaigns. Those customers who feel grateful for a hospitality brand's sustainability efforts are more likely to be motivated and emotionally engaged and, therefore, have stronger intentions to reduce food waste. Gratitude promotes cognitive and emotional processes in the hospitality sector to drive sustainable behavior. Furthermore, this study advances the literature by introducing gratitude as a moderator, extending the work of Tam [53], who explored gratitude's role in amplifying pro-social behaviors. These contributions emphasize the importance of integrating cognitive and emotional factors into sustainability-focused social media campaigns to achieve meaningful behavioral change in the hospitality sector. These findings validate the SOR model. Social media food waste reduction promotion acts as the external stimulus, triggering internal states, social media-driven environmental motivation, and sustainability-driven customer happiness that lead to food waste reduction behaviors. Gratitude further amplifies these internal states, strengthening their impact on behavior. By integrating cognitive (motivation) and emotional (happiness, gratitude) factors, this study offers a more complete understanding of how social media campaigns influence sustainable consumption in hospitality. The SOR model effectively captures the interaction between external stimuli, psychological states, and behavior, offering key insights into what drives pro-environmental actions.

### *5.1. Theoretical Implications*

This research is important theoretically and can help push the frontier in terms of how social media can spur responsible behaviors, in particular in the case of food waste reduction in the hospitality sector. This study extends the application of the SOR model to sustainability research to show that external stimuli, such as social media food waste reduction promotion, can trigger both cognitive and emotional internal states, social media-driven environmental motivation and sustainability-driven customer happiness, that lead to concrete behavioral outcomes such as reduced food waste. The integration of cognitive and emotional factors into the SOR framework in this sophisticated way constitutes a

major step forward over previous models that fail to recognize the emotional involvement required for continuous pro-social behavior. In a social media context, this study makes important theoretical contributions by demonstrating that digital platforms are not just communication tools but strong behavioral change drivers. The study demonstrates that social media campaigns aimed at promoting sustainability, specifically food waste reduction, can have far-reaching psychological effects on consumers, which in turn affects their motivation and their emotional satisfaction. This research fills a critical gap in the literature by focusing on the role of social media to generate not only awareness but also emotional engagement. This demonstrates that social media can serve as a powerful stimulus that provides the impetus for complex emotional and cognitive responses (i.e., motivation and happiness), which lead to meaningful behavioral outcomes (i.e., less food waste). This insight highlights the changing role of social media in sustainability marketing and its ability to influence other pro-environmental behaviors. In addition, gratitude towards food waste initiatives is added as a key moderating factor that theoretically disrupts the existing theoretical paradigms, emphasizing the role of a positive emotional state in amplifying the effect of social media campaigns. Trusting the SOR model to focus on external stimuli and internal processing, this research reveals that gratitude is an amplifier of the former two, which enhances motivation and happiness and, in turn, motivates consumers to act on their environmental intentions. This is a major contribution to the sustainability and consumer behavior literature that emphasizes the importance of emotional resonance in stimulating sustainable consumer actions, particularly in the hospitality industry, which has been overlooked by environmental psychology and marketing research. Additionally, this study fills a key gap in the literature by specifically studying the hospitality sector and food waste reduction and by focusing more deeply on how targeted social media campaigns can change consumer behavior in this context. The models suggest that responsible behaviors are not purely rational decisions and are influenced by emotional factors, such as happiness and gratitude, which have been ignored in previous models. Therefore, this research offers a robust theoretical base for future work on the role of emotions in sustainability marketing and a pathway to future work incorporating the integration of emotional and cognitive responses into broader behavioral theories.

### *5.2. Practical Implications*

These research implications have valuable practical implications for the hospitality industry, especially in terms of sustainability and reducing food waste. We found that social media campaigns can indeed be a powerful instrument to influence customer behavior to more sustainable practices such as saving food waste. Social media platforms provide a great opportunity for hospitality organizations to design specific campaigns that not only raise awareness of sustainability efforts but also evoke customer emotions (motivation and happiness) to encourage customers to participate in sustainability efforts. These campaigns should be consistent, informative, and emotional and should target tangible benefits in reducing food waste for the environment and for society as a whole. For example, the hospitality sector is urged to incorporate gratitude in its messaging, such as saying 'thank you' to customers for helping to keep the industry afloat. Findings from this study suggest that gratitude enhances the influence of social media-driven motivation and happiness on plans to reduce food waste. For instance, hospitality organizations can show appreciation for customers performing sustainability actions through personal thank you messages or incentives for sustainable behavior, such as discounts or rewards for customers who decide to reduce waste through portion control or participation in recycling programs. It can contribute to increasing the emotional relationship between the customer and the brand and to greater loyalty and more pro-environmental behavior. In addition, hospitality organizations require their sustainability communications to engage both cognitively and emotionally. To support the organization's efforts in this case, we can use engaging content such as videos, infographics, and interactive posts, which not only inform but also make them happy and fulfilled to support the organization. In

fact, hospitality services can enhance their probability of long-term behavioral change by customers' emotional satisfaction with working for sustainability initiatives. In addition to this, they can also organize educational workshops or events that talk about how important it is to reduce food waste, both online and in person, to a bigger audience. Lastly, hospitality businesses should measure and monitor the impact of their social media campaigns on customers' behavior in order to continuously adjust their strategy. Data analytics tools can be used by companies to find out which types of messages and content are most effective in inducing the desired food waste reduction behaviors and to adjust their communications to have the greatest impact. By doing this, hospitality organizations can lead the global sustainability movement and help the organization's own environmental goals and wider efforts to achieve net zero emissions.

### *5.3. Limitations and Future Research Directions*

This study offers valuable insights, but some limitations must be acknowledged. First, the data were collected from hospitality customers in three major Chinese cities, which may limit the generalizability to other regions and cultures where attitudes towards sustainability and food waste may differ. Future research should explore these dynamics in other countries to account for potential cultural variations. Second, the focus on the hospitality sector and food waste limits the broader application of these findings. Further research should examine how social media influences pro-environmental behaviors in other industries, such as retail or tourism, to see if the same mechanisms of motivation, happiness, and gratitude apply. Additionally, the use of cross-sectional data prevents establishing causal relationships between variables. Longitudinal studies could confirm how sustained exposure to social media campaigns impacts behaviors over time. The reliance on self-reported data also introduces the risk of social desirability bias, as respondents may overstate pro-environmental intentions. Future studies could use objective behavioral measures, such as actual food waste reduction data. Finally, exploring other psychological factors, such as environmental guilt or pride, and examining the effects of different social media content types (user-generated vs. brand-generated), could provide a fuller understanding of how digital platforms drive sustainability behaviors.

## **6. Conclusions**

This research provides valuable insights into the role of social media in promoting pro-environmental behaviors, specifically in the context of food waste reduction in the hospitality sector. By applying the SOR model, this study demonstrates that social media food waste reduction promotion can effectively influence hospitality customer food waste intentions through the mediating effects of social media-driven environmental motivation and sustainability-driven customer happiness. The findings underscore the importance of emotional and cognitive factors, showing that both motivation and emotional satisfaction play crucial roles in driving sustainable behaviors. Furthermore, the moderating role of gratitude towards food waste initiatives highlights how positive emotional responses can amplify the impact of social media campaigns on customer behavior. This study contributes to both the theoretical understanding of consumer behavior in sustainability contexts and offers practical recommendations for hospitality organizations to leverage social media as a tool to engage customers in reducing food waste. By incorporating emotionally resonant messages and expressing gratitude for customer participation in sustainability initiatives, hospitality businesses can enhance the effectiveness of their environmental campaigns. While the study is not without limitations, it opens several avenues for future research, including examining other sectors, expanding geographic scope, and employing longitudinal designs to better understand the long-term effects of social media-driven pro-environmental behavior. Overall, this research emphasizes the transformative potential of social media in promoting sustainability and the critical role of emotional engagement in achieving meaningful behavioral change.

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