

Article

The Power of Responsibility: Unlocking the Potential of CSR in Hospitality's Fight against Food Waste

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Abstract: This research focuses on the significant role of Corporate Social Responsibility (CSR) in shaping employees' behavior towards the reduction of food waste in the hospitality industry that has been under scrutiny for its environmental impact. The study aimed at understanding how CSR, coupled with employees' moral attitudes, admiration for their organization, and climate change awareness influences sustainable practices by realizing the complex interplay between company initiatives and personal psychology. The participants were staff members who worked in several hotels in China where there were active CSR programs. Using established scales, we collected 422 valid responses over three waves to strengthen our data collection process. Empirically, it was found that CSR directly influenced food-waste-reduction behavior. Additionally, it was discovered that this relationship was mediated by moral attitudes and employee admiration as well as moderated by awareness of climate change. The findings have substantial theoretical implications regarding the interaction between emotional and cognitive factors within the CSR framework to influence behavior among employees. This paves the way for creating well-rounded strategies that appeal to staff and encourage sustainability in the hotel business. While focused on China's hospitality industry, this research creates room for future studies in other places around the world using various methods. The conclusions drawn underline the critical role of CSR in promoting environmental sustainability in the hospitality industry, providing a pathway for organizations to engage employees in meaningful and impactful sustainability initiatives.

Keywords: sustainable individual behavior; food wastage; emotions; cognitions; hospitality



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1. Introduction

This research draws attention to the issue of food wastage, which is a significant environmental concern especially in this era of environmental sustainability and climate change. The worldwide dimension of food wastage is alarming, with about one third of all foods that are produced for human consumption globally, or nearly 1.3 billion tons per annum, being lost or wasted [1]. It represents an enormous economic loss as well as a major contributor to environmental deterioration. Environmental implications include increased emission of greenhouse gases, reduction of resource base, and biodiversity depletion [2]. For instance, in EU countries alone, food waste produces 186 million tons of CO₂-equivalent emissions; 1.7 million tons of SO₂; and 0.7 million tons of PO₄; representing 15–16% of the total impact across all stages of the food supply chain [3]. Additionally, the management and treatment of food waste, such as through composting techniques, are vital in mitigating its environmental impact [4].

The connection between the food-waste problem and the hospitality industry, being the sector that generates the most food waste, underscores the need for a solution that involves the development of effective waste-reduction strategies. Although consumer

behavior regarding food waste in the hospitality sector is widely studied [5,6], this research focuses on the less explored, but equally important, area; that is, the employee behavior towards food waste. Indeed, employees are the ones who must deal with the implementation and maintenance of the approaches that have a high potential to reduce food waste. Knowledge and control of their behavior is a strategic position that can help to push forward environmental sustainability within the industry [7]. Such a shift in focus highlights the employees' contribution to the practical implementation of the waste-reduction strategies, from the preparation stage to the service point, which is a gap that is lacking in the literature. Employee behavior influenced by organizational and personal/psychological factors [8,9] is vital in ensuring the success of these strategies. The imperativeness of employees' ethical attitudes and the effect of management practices on their behavior regarding the reduction of food waste are emphasized in the recent literature [10]. The conversation is also extended to corporate social responsibility (CSR) within the hospitality industry, which further illustrates its role in the creation of sustainable employee behaviors that contribute to the reduction of food waste [11,12].

Although it has been acknowledged that the CSR practices do affect employee behavior with regard to sustainability issues [13,14], the literature on the CSR–employee behavior relation in the hospitality context and, more specifically, on food-waste reduction is still scarce. This stringency still rings true despite the fact that preliminary studies show that corporations' CSR can greatly affect societies' response concerning the environment and waste management [15]. This study intends to fill the knowledge gap by bringing out empirical proof of how CSR impacts employee food-waste reduction and, thus, tends to generate applicable information to help enrich our understanding of the subject. The study also focuses on the psychological factors of moral attitude and employee admiration, as well as their role as mediators in the CSR framework, proposing that they are the most important factors in influencing employees' behavior in terms of food-waste reduction [16,17]. In addition to that, we also investigate the moderating effect of climate-change awareness on the connection between CSR, moral attitude, employee admiration, and food-waste-reduction behavior. A higher awareness of climate change among employees helps to amplify the effect of CSR on their sustainable behavior, reinforcing the need to integrate CSR activities with climate-change-awareness activities [18].

Given China's unique position in the global debate on sustainability and food-waste management, it is imperative that we test our hypothesized relationships within China's hospitality sector. With rapid economic development, a huge ecological footprint, and social changes occurring within its population, China provides a unique context for exploring relationships between CSR, climate-change awareness, and reduction in food wastage by hotels. China is home to one of the world's largest populations, with a growing hospitality industry that contributes significantly to global food waste, resulting in formidable implications related to environmental sustainability, resource utilization, and climate change. Researches have indicated that there exist significant amounts of food waste generated by the food-service industry, including hotels, which are contributed to by various factors [19]. Hence, it is an ideal place for discovering how CSR, combined with employee's attitudes towards climate change, can impact behaviors leading to lessening food wastage. To date, there has been limited knowledge regarding how CSR initiatives can go together with employees' consciousness about climate change so as to enhance effective strategies for reducing this type of waste among Chinese hotels. Such research will contribute majorly towards the existing knowledge pool by providing guidance on the role of CSR towards promoting sustainable practices in an influential market such as China.

Several research lacunae are intended to be filled through this study. For instance, most studies on CSR have either adopted rational models or emotional theories, which creates a gap in our understanding of employees' behavior towards food-waste reduction. Recent criticisms postulate that emotions are not independent from cognitions [20]. This study will address this anomaly by offering an integrated model comprising both rational (e.g., moral attitudes) and emotional (e.g., admiration) perspectives of human psychology

within a CSR framework. This makes it unique since it captures multiple major aspects of employee behavior about food waste in the hospitality industry at once. Similarly, there has been an increasing number of works on food-waste management in the hospitality industry, but there is limited research focusing on China as a case study. This study will, therefore, help to fill this void through its focus on how CSR initiatives made by Chinese hospitality businesses can influence employee attitudes toward food-waste reduction with due consideration for the cultural, economic, and environmental circumstances associated with China's uniqueness. Additionally, our research aims at bridging the gap left by previous studies that did not consider climate-change awareness as a moderating factor between CSR and employees' behavior towards food-waste reduction. Even though it has been noted that individual climate-change awareness is important for promoting sustainable practices, there is a scarcity of knowledge about how such awareness particularly interacts with CSR initiatives so as to affect food-waste behavior within hotels. Therefore, our research focuses on this interaction, thereby divulging information that can be useful to managers who want to make their activities more environmentally friendly through reducing the amount of waste produced.

On a further note, many existing studies touching on CSR and food wastage are theoretical or conceptual in nature rather than empirical works [21]. A study is therefore necessary to test the usability of these theories under different cultural and operational environments such as China. Empirically, this study will attempt to fill this gap by testing an integrated model of factors influencing food-waste-reduction behavior from emotional and rational perspectives within CSR. Finally, our research seeks to provide an enriched understanding of the dynamics of food-waste generation and reduction in the hospitality industry. This includes investigations into how factors such as organizational policies, employee attitudes, customer behavior, and different socioeconomic backgrounds interrelate with one another. In-depth studies like this are important if we must develop good strategies for managing food waste in the hospitality industry.

Theoretical Background and Literature

The theory that underlies our research is the theory of planned behavior (TPB) that was first proposed by Ajzen [22]. TPB has been vital in understanding how beliefs, attitudes, and behavior are related. It argues that an individual's behavior is a direct function of their intention to perform the behavior, which in turn is determined by their attitude toward the behavior, subjective norms, and perceived behavioral control. This theory is particularly pertinent to our study as it offers a strong framework for investigating the psychological mechanisms behind employees' practices of food-waste reduction within the hospitality sector. Drawing on TPB, we can analyze how employees' attitudes toward CSR initiatives are influenced by their feelings on morality and their emotions; which can, together with perceived social norms and the control over waste-reduction practices, lead to food waste reduction practice. This theoretical perspective, therefore, enables us to comprehensively understand rationalities and emotions within a CSR framework, thus deepening our knowledge about sustainable changes in behavior towards environmental-conservation issues and food-wastage management.

Several researchers have shown that CSR positively influences various employee behaviors at work [23,24]. CSR as an umbrella term encompasses a range of activities done by companies to evaluate their impact on society generally or specifically (employees) [25]. Through these programs, they affect employee's attitudes and behaviors too [26]. It has been found that effective CSR programs lead to increased levels of job satisfaction among employees as well as raising engagement levels while creating positive work environments [27]. All these outcomes are important as they contribute towards having a more motivated workforce that is committed to implementing sustainable practices within an organization. In relation to food wastage specifically, CSR has a particularly significant impact [28]. Employees who perceive their organizations to be environmentally responsible and dedicated to achieving sustainability goals are more likely to engage in food-wastage-

reduction methods [7,29]. This is because CSR activities often create awareness about climate change and the depletion of resources due to food wastage. Therefore, employees become more cautious about their actions and the ability of the environment to be affected by them, which, in turn, increases their willingness to take part in food-waste-reduction projects.

From the standpoint of our theoretical backdrop, CSR can be seen as influencing its three main components—attitudes, subjective norms, and perceived behavioral control. In terms of reducing food losses, a positive attitude towards waste minimization can be developed through corporate social responsibility advocating its environmental advantages. Additionally, CRS affects subjective norms by fostering a culture where sustainable practices are embraced and expected [30]. Finally, CSR helps to enhance employees' perceived behavioral control by providing necessary resources, training, and supportive measures that would enable them engage in effective food-loss reductions. Based on this theoretical and empirical background, we state our first hypothesis:

H1. *CSR initiatives within the hospitality industry positively influence employees' food-waste-reduction behavior.*

Employees' attitudes towards food wasting can be shaped by their moral attitude, which is critical to behavior change [31]. If employees possess moral attitudes that are against food waste, they are expected to behave in ways that reduce wastage. This has been confirmed through studies showing the direct impact of moral attitudes on sustainability and environmental conservation [32]. Moral attitudes among employees in hospitality industry play a central role in determining their food-waste-behaviors, characterizing their intentions and actual practices [7]. While the existing research acknowledges the direct role of moral attitude in behavior formation, its mediating role has also been realized by the extant behavioral scholars [33]. We, in this regard, argue that moral attitude mediates the relationship between CSR and employee's food waste reduction behavior. This means that corporate initiatives such as ethical and environmental-related issues may influence moral attitudes against food waste among employees, hence leading to more sustainable actions. The mediation mechanism suggests that CSR not only directly determines what employees do but also changes their internal principles, which have a bearing on their conduct toward reducing food waste [34]. TPB explains the links between moral attitude and the three determinants of behavior: attitude towards behavior, subjective norms, and perceived behavioral control. Therefore, a strong sense of morality regarding food wasting plays an important role in enhancing one's view towards food wastage, thereby increasing the ability of organizations to manipulate such effects at workplaces. We thus propose,

H2. *Employees' moral attitudes positively affect their engagement in reducing food waste.*

H3. *Moral attitudes mediate the path between CSR activities and employees' food-waste-reduction behavior.*

Employee admiration acts like a bridge, translating the organization's CSR efforts into concrete employee actions aimed at sustainability [35]. When employees admire their organization's commitment to sustainability and CSR efforts, they are likely to mirror these values in their own behaviors [36]. This admiration can be cultivated through effective communication and demonstration of the organization's commitment to sustainability [37]. By doing so, they will be able to better help the organization's broader environmental objectives. Employee admiration bridges the gap between CSR and employees' food-waste-reduction behavior. It is postulated by this hypothesis that the discretion of an organization's employees, in terms of their perception towards CSR, dictates their admiration for it [38]. This increased admiration, in turn, motivates employees to align their behavior with the CSR goals of the organization, including reducing food waste. Employee

admiration acts as a bridge between what an organization does to promote sustainability and what its employees do about it [39].

Accordingly, from a TPB standpoint, these assumptions are supported by emotional factors like employees' admiration as well as by behavioral determinants such as attitude, subjective norms, and perceived behavioral control. Employee admiration fosters more optimistic attitudes by means of establishing positive emotions toward organizational values [40], reinforces subjective norms by promoting sustainability culture inside organizations, and increases perceived behavioral control through giving incentives for taking steps to reduce food waste.

H4. *Employee admiration has a positive effect on food-waste-reduction behavior of employees.*

H5. *Employee admiration mediates the path between CSR activities and employee's food-waste-reduction behavior.*

Employee climate-change awareness can be thought of as an important element in moderating relationships between moral attitudes, CSR initiatives, admiration for employees, and food-waste-reduction behavior. Concerning the workplace, climate change awareness can be explained as a comprehension that workers have about climate change and its devastating impacts on the environment [41]. This is especially important in the hospitality industry, where the environmental impact of operation, including the amount of food wasted, is substantial [42]. Employees with a greater understanding of the consequences of climate change are more likely to be more accepting towards CSR initiatives that promote sustainable practices such as food-waste reduction [43]. Moreover, this awareness can amplify the effects of moral attitude and admiration toward an organization, thereby motivating employees to adopt and continue to act in line with environmental objectives of their organizations. In our study's context, we expect that our hypothesized relationships will be strengthened by employee climate-change awareness that moderates these variables. Specifically, greater levels of climate-change awareness are expected among employees who engage more actively in food-waste reduction due to their participation in CSR initiatives and those who develop a stronger sense of respect towards their organization's societal reputation. This enhanced state may result into a deeper sustained behavioral transformation since employees not only appreciate significance of these initiations but also feel more responsible for their outcome [44].

According to TPB, climate-change awareness can affect subjective norms and perceived behavioral control. Workers who have knowledge of how climate change affects food waste are expected to experience increased appreciation of organizational norms favoring sustainability practices. They may also perceive themselves as empowered enough to contribute towards these acts thereby increasing their perceived behavioral control over behaviors concerning reducing food waste. Hence:

H6. *Employee climate-change awareness moderates the relationship between CSR and moral attitude/employee admiration such that these relationships are stronger when awareness is higher, leading to greater food-waste-reduction behavior.*

2. Materials and Methods

The Chinese hospitality industry plays a vital part in China's service sector, which is characterized by rapid growth rates and a significant contribution towards the economy. This sector is made up of a wide range of hospitality organizations from luxury hotels to budget accommodation, and it is central to tourism, employment, and economic development. The significance of the Chinese hospitality sector is demonstrated by its ability to adapt to changing market conditions and influence global tourism trends [45]. In our study, we focus on data collection from key cities in China that are representative of diverse hospitality environments. These cities include Beijing, Shanghai, and Guangzhou, which are not only economic powerhouses but also cultural and tourist hubs with a significant

influx of both domestic and international travelers. Taking into consideration the fact that the geographical context can influence CSR practices as well as the behaviors of employees towards food-waste reduction, the study has looked into how the city in which employees are working has an effect on the latter. This is especially relevant as the specific economic, cultural, and regulatory settings of different cities can affect both the design and the reception of CSR plans by employees. Beijing, Shanghai, and Guangzhou, the cities at the focus of our research, offer distinct environments: For instance, Beijing's immense historical and political legacy, Shanghai's modernity and international business focus, and Guangzhou's role as a key economic and trading hub in Southern China. Differences in the settings either serve to represent the types and vary of environments within which hospitality companies function and apply CSR strategies, or to create an overall view of the contexts within which hospitality organizations operate and implement CSR strategies. Through analyzing employee responses and CSR practices in these cities, our research seeks to uncover how place-specific conditions can affect the success of CSR programs in promoting sustainable food-waste-reduction behavior. This approach yields the opportunity for us to consider not only the entire effect of CSR on food-waste-reduction behaviors across the Chinese hospitality industry but also how the food-waste-reduction behaviors might vary in different urban settings.

Beijing is rich in historical and cultural significance because it is the capital city, making it an ideal location for studying the impact of CSR initiatives in the hospitality sector. In contrast, Shanghai's modernity and global business appeal provide insights into how cosmopolitan influences affect hospitality practices. On the other hand, Guangzhou, as a major economic and trading center in South China, provides a view on how economic growth correlates with hospitality trends. The selection of these cities is justified by their diversity as well as the potential insights they can offer into different aspects of food-waste-reduction behaviors in the hospitality sector within the broader context of China's economic and cultural landscape [46].

This study specifically targeted hotels with visible and active CSR programs among other factors. We combined a variety of methods, such as research and direct inquiries, to verify and select hotels that have visible CSR plans. At the beginning, we carried out an initial review of the information that is in the public domain, such as sustainability reports, company websites, and press releases, so we could learn about the visibility and activeness of the CSR initiatives of the selected hotels. Furthermore, we encompassed a series of direct inquiries to the hotels, where the hotels were requested to provide detailed descriptions of their CSR activities. The hotel that offered tangible proof of the operations of a CSR program were selected to be part of the study. This methodological step ensures that our focus remains on organizations with a genuine commitment to CSR, aligning with our research objectives. We formally reached out to these hotels requesting them to cooperate in our data-collection process for the mutual benefit of academia and industry. Those who positively replied to our request were later approached to schedule appointments so that we could collect data from their employees. We decided to use a three-wave method in collecting information from participants, minimizing the response bias which might have occurred if we used a one-wave method where all variables were collected at once, thereby increasing chances for common-method bias. In wave one, we focused on gathering data about CSR initiatives and employee climate-change awareness. In wave two, we collected data regarding employees' moral attitudes towards their company, including whether or not they admired it. Finally, wave three concentrated on measuring employees' food-waste-reduction behavior. This staggered approach to data collection ensured a more reliable and nuanced understanding of the various factors influencing food-waste-reduction behaviors in the hospitality sector.

During our data-collection process, we strictly followed the guidelines stipulated in the Helsinki Declaration in order to maintain ethical standards. In this regard, we obtained informed consent from all participants, confirming that they will remain anonymous and their responses confidential throughout our research. They were briefed about the

objectives of our study and their involvement, and assured about the use of such responses only for scholarly purposes. Importantly, it must be noted that participation was voluntary; therefore, any respondent could withdraw from the study at any stage without facing consequences. Throughout the data-collection process, the dignity and autonomy of our respondents were respected while ensuring no harm or discomfort was caused to them. These guidelines were established with an aim of ensuring that our research is conducted ethically so as to enhance the integrity and validity of the information provided by our participants.

For determining the sample size of our study, we utilized an a priori sample-size calculator, an essential tool for ensuring statistical validity and power in research. It helps to estimate an appropriate sample size to detect the effects of interest while minimizing the risk of type I and type II errors, hence it is important. The calculator's recommended sample size was 388 based on input parameters such as: alpha level, power, and effect size. Aware that survey research may have low response rates, we chose to distribute 600 questionnaires among the employees of selected hotels. This step was taken to anticipate non-response cases or incomplete data.

The data-collection process went through three waves, and we examined data cleaning checks to ensure maximum quality and consistency regarding respondents' feedback. We finally received 422 valid questionnaires after thoroughly scrubbing our database. This number exceeded our desired minimum sample size, cementing a strong basis for statistical analysis while providing more data for a holistic understanding of employees' behaviors and attitudes towards food-waste reduction in relation to CSR initiatives within the hospitality sector.

We used several strategies in this study to decrease social-desirability bias and common-method variance (CMV), which are potential problems in behavioral research. In the first place, the questionnaire was constructed to be as neutral as possible, avoiding leading or emotionally charged questions that might prompt socially desirable responses. We also used indirect questioning techniques to ask about sensitive topics such as personal attitudes and behaviors so that participants would respond more candidly rather than providing answers they deem socially acceptable.

Moreover, we carried out a three-wave collection of data to reduce CMV. Also, we performed Harman's single-factor test. By collecting data on different variables at different times, we minimized the likelihood of earlier responses influencing their subsequent responses. Additionally, respondents were assured of the confidentiality and anonymity of their answers to encourage honest feedback and minimize attempts to conform with social expectations. These measures collectively enhanced the reliability and validity of our data, providing a more accurate reflection of employees' real attitudes and behaviors towards CSR and food-waste reduction in hospitality industry.

To prepare our dataset for analysis with Smart PLS, we undertook a rigorous coding process. At first, responses from the questionnaires were coded numerically to enable quantitative analysis. This referred to the allocation of numerical values (1 to 5) to categorical data, for example, responses to Likert-scale questions on CSR initiatives, employee behavior towards food waste, and other variables of interest. The coding scheme was developed to warrant consistent use across the whole dataset, thus paving the way for accurate and structured analysis. After the coding, we used Smart PLS software 3.28 version for the data analysis. Smart PLS has a comparative advantage in dealing with complicated models, which makes it more suitable for research aimed at developing theories [47,48]. The software's capabilities enabled us to accurately model the interactions between the coded variables. Additionally, our selection of purposive sampling helped us in gathering data from hotels that have CSR programs and, thus, provided a focused lens to explore our research questions. This sampling method, along with our coding and analysis using Smart PLS, highlights the research rigor of our study and strengthens the validity and usefulness of our findings to the arena of CSR in the hospitality industry.

We operationalized the variables using already established scales that guarantee the reliability and validity of our measurements. The use of established scales ensures comparability with other studies, thereby enhancing consistence and accuracy in our research. For instance, CSR was measured using a six-item scale by Alvarado-Herrera, et al. [49] including a sample item “this hotel is really trying to recycle its waste materials properly”. This is a well-reputed scale to measure CSR perceptions of individuals, especially in the context of tourism and hospitality. This is why several other researchers have used this scale to operationalize the construct of CSR [50,51]. On the other hand, food-waste-reduction behavior (FWRB) was measured through five items taken from the study of Bell and Ulhas [52] aimed at capturing how employees are engaging in practices that help reduce food wastage. One sample item from this scale was “I try to throw away no food at all”. The same scale has also been utilized by Lavén [53] in the context of restaurants.

As mediators, we used a three-item scale by Stancu, et al. [54] for moral attitude (MOA) focusing on cognitive aspects concerning what employees think about throwing away food, including a sample item “Wasting food would make me feel guilty about people who do not have enough food”. The other authors have also used this variable to predict the sustainable behavior of individuals [55]. Similarly, employee admiration (ADM) was measured employing the five-item scale of Sweetman, et al. [56]. One sample item from this scale was “I feel admiration when I think about this hotel”. Prior researchers like Ahmad, et al. [57] have also used the same scale to evaluate employee admiration as a mediator that influences the sustainable behavior of individuals. Finally, climate-change awareness (CLA) served as a moderator for which we utilized the four-item scale presented in the study of Bell and Ulhas [52] measuring how much employees know and care about implications of climate change. One sample item from this scale was “I am concerned about climate change”. Clayton and Karazsia [58] have also asserted the significance of this variable in influencing individuals’ green psychology. Table 1 includes the demographic information of our sample.

Table 1. Sample demographic.

Demographic Factor	Frequency	Percentage (%)
Gender		
Male	210	49.8
Female	212	50.2
Age Group		
18–25	100	23.7
26–35	170	40.3
36–45	100	23.7
46–55	40	9.5
55+	12	2.8
Education Level		
High School or Below	50	11.8
Associate Degree	120	28.4
Bachelor’s Degree	200	47.4
Master’s Degree or Above	52	12.3
Years of Experience		
Less than 1 year	60	14.2
1–5 years	182	43.1
6–10 years	110	26.1
More than 10 years	70	16.6
Job Position		
Entry Level	180	42.7
Mid-Level Management	150	35.5
Senior Management	92	21.8
Department		
Kitchen/Food Production	120	28.4
Food and Beverage Service	150	35.5
Housekeeping	80	19
Front Office		

3. Results

Our study established the psychometric properties of ADM, CLA, CSR, FWRB, and MOA. Notably, factor loadings for constructs under investigation provided a sophisticated picture of validity and reliability. For example, ADM items showed factor loadings ranging between 0.925 and 0.745, representing a strong yet diverse connection to ADM construct. Similarly, the range of CLA items from 0.740 to 0.780, and that of CSR items from 0.713 to 0.880, shows wide but rational involvement in those critical dimensions addressed in our study. In addition, this was also demonstrated through various items that exhibited similar patterns across FWRB as well as MOA, among other factors. The statistical analysis further solidified these findings, with T statistics for all items surpassing the critical threshold of 1.96, alongside p values falling below the 0.05 threshold, affirming the statistical significance of our results. Thus, it is evident that such details have contributed towards ensuring that there are no methodological weaknesses in our research. In addition, a glance at the high Cronbach's alpha, composite reliability, and average variance extracted (AVE) scores across various constructs, such as ADM's impressive Cronbach's alpha of 0.930 and FWRB's composite reliability 0.926, not only support internal consistency/reliability checks on measures used but also indicate their abilities to capture latent constructs. Among other things, these metrics include AVE scores above the 0.5 cut-off value, which implies sufficient convergent validity, ensuring that our constructs aptly capture the essence of the variables of interest. In sum, our findings are more than just generic descriptions of psychometric analyses, but rather form a pathway that provides insights into how ADM, CLA, CSR, FWRB, and MOA interact within the context of sustainability and responsible consumption in hospitality. The above analysis not only confirms the methodological strength of our study but also demonstrates the level of sophistication involved in promoting environmental stewardship among hospitality organizations. Table 2 includes more detail, whereas Figure 1 includes the measurement model of this study.

Table 2. Psychometric Properties of Constructs.

Construct	Item	Factor Loading	Standard Deviation	T Statistics	p Value	Cronbach's Alpha	rho_A	Composite Reliability	AVE
						0.930	0.941	0.948	0.785
ADM	ADM-1	0.91	0.017	52.753	0.000				
ADM	ADM-2	0.925	0.009	100.158	0.000				
ADM	ADM-3	0.922	0.013	72.73	0.000				
ADM	ADM-4	0.915	0.013	68.874	0.000				
ADM	ADM-5	0.745	0.039	18.961	0.000				
						0.755	0.756	0.845	0.576
CLA	CLA-1	0.78	0.034	22.944	0.000				
CLA	CLA-2	0.74	0.037	19.908	0.000				
CLA	CLA-3	0.759	0.031	24.359	0.000				
CLA	CLA-4	0.758	0.031	24.154	0.000				
						0.897	0.906	0.921	0.663
CSR	CSR-1	0.713	0.033	21.661	0.000				
CSR	CSR-2	0.772	0.029	26.578	0.000				
CSR	CSR-3	0.755	0.029	26.072	0.000				
CSR	CSR-4	0.877	0.013	67.364	0.000				
CSR	CSR-5	0.88	0.016	54.617	0.000				
CSR	CSR-6	0.873	0.019	46.116	0.000				

Table 2. Cont.

Construct	Item	Factor Loading	Standard Deviation	T Statistics	p Value	Cronbach's Alpha	rho_A	Composite Reliability	AVE
						0.900	0.9	0.926	0.714
FWRB	FWRB-1	0.836	0.02	41.793	0.000				
FWRB	FWRB-2	0.861	0.018	48.99	0.000				
FWRB	FWRB-3	0.838	0.023	36.945	0.000				
FWRB	FWRB-4	0.846	0.02	43.348	0.000				
FWRB	FWRB-5	0.843	0.02	42.956	0.000				
						0.837	0.837	0.902	0.756
MOA	MOA-1	0.814	0.022	37.663	0.000				
MOA	MOA-2	0.897	0.016	57.134	0.000				
MOA	MOA-3	0.895	0.015	58.346	0.000				

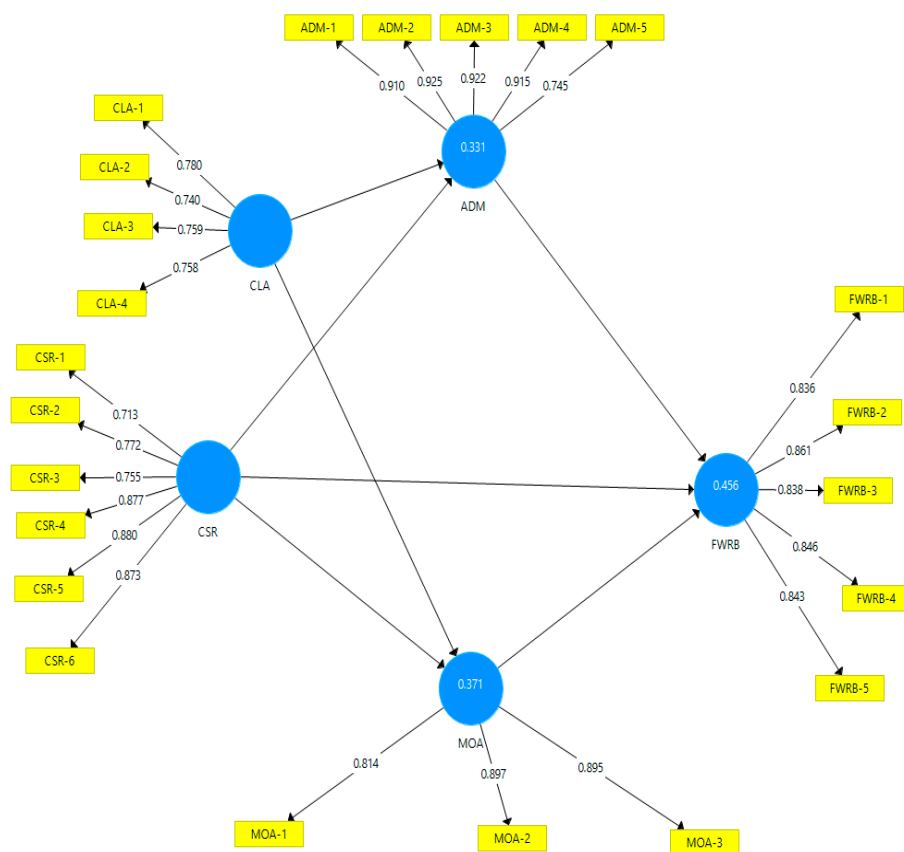


Figure 1. The measurement model.

Focusing on the R-square and f-square values from the Table 3, we unveil some important insights underlying the influence and interrelation among our variables. The R-square value of 0.331, in combination with an f-square of 0.405 for ADM, establishes a significant variance in FWRB, which can be attributed to the level of ADM. It implies that the ADM has a significant impact on the adoption of the sustainable practices. Moreover, MOA is proven to have been greatly affected by CSR through f-square, which is 0.311. This means that CSR is the one factor on which the employee’s ethical attitudes towards food waste depend; therefore, the vitality of CSR programs is a key element in creating a sustainable culture. The r-square values for FWRB and MOA, at 0.456 and 0.371, respectively, show a

large portion of the variance in the dependent constructs that is explained by our model, supporting the depth of influence created by ADM and CSR. By taking a closer look at these results, we go beyond the generic presentation to stress the specific mechanisms that guide the food-waste-reduction endeavors of the hospitality industry. Statistical significance and the relationships between our constructs give a rich and detailed visualization of how these factors interact to drive the adoption of sustainable behaviors, thereby demonstrating the complexity and the multifaceted nature of the implementation of CSR.

Table 3. R square and f square values.

Construct	R Square	R Square Adjusted	F Square ADM	F Square CLA	F Square CSR	F Square FWRB	F Square MOA
ADM	0.331	0.328	-	0.302	0.026	0.405	-
CLA	-	-	-	-	-	-	0.056
CSR	-	-	-	-	-	0.042	0.311
FWRB	0.456	0.451	-	-	-	-	0.021
MOA	0.371	0.368	-	-	-	-	-

A quick look at Table 4 shows that the square root of AVEs exceeds inter-construct correlations, thus supporting discriminant validity. ADM's correlation with CLA is 0.560, and their square roots of AVEs are 0.886 and 0.759, respectively. Moreover, for most pairs of relationships, HTMT ratios (lower triangle) are less than the threshold. For instance, CSR-FWRB HTMT ratio of 0.503 suggesting that these constructs are clearly different from each other. This table, as such, captures all relationships and the distinctiveness existing in our study's constructs, thereby affirming the soundness of our measurement model.

Table 4. Correlations and discriminant validity.

	Correlations and Square Root of AVE					HTMT Ratios				
	ADM	CLA	CSR	FWRB	MOA	ADM	CLA	CSR	FWRB	MOA
ADM (0.886)	1					-	0.667	0.391	0.672	0.356
CLA (0.759)	0.560	1				-	-	0.523	0.736	0.527
CSR (0.814)	0.359	0.431	1			-	-	-	0.503	0.664
FWRB (0.845)	0.620	0.606	0.452	1		-	-	-	-	0.467
MOA (0.869)	0.317	0.419			1					

For hypotheses testing, we examined the effects of CSR, MOA, and ADM on FWRB, while also considering the interaction effect of CLA (Table 5). In H1 there was a positive relationship between CSR and FWRB with a beta value equal to 0.191. This significant result has p -value of 0.000 and, therefore, suggests that FWRB is discernibly influenced by CSR initiatives, as is evidenced in the confidence interval ranging from 0.121 to 0.306, affirming the consistency of our results. Similarly, H2 assessed MOA's influence on FWRB, generating a beta value of 0.134 and a p -value of 0.014, implying that MOA has a statistically significant effect, albeit one that is smaller than CSR's direct effect on FWRB. The confidence interval for this hypothesis is 0.031–0.243, supporting MOA's significant effect on FWRB. Our H4 showed that ADM had the greatest impact, with the beta coefficient being equal to 0.509. The low p -value of this finding, at 0.000, and its confidence interval range from 0.412 to 0.612, highlights its significance as an influential factor in shaping FWRB behavior. H3 (CSR→MOA→FWRB) and H5 (CSR→ADM→FWRB) involve mediating effects whose results are statistically significant. While H3 has a beta value of 0.066, its p -value stands at 0.02, and H5 reveals a beta value of 0.063 alongside a p -value at 0.013; hence, both MOA and ADM act as mediators in the relationship between CSR & FWRB.

Table 5. Hypotheses analysis.

Hypothesis	Beta Value	Std. Dev.	T Statistics	p Value	LLCI	ULCI
H1: CSR→FWRB	0.191	0.054	3.525	0.000	0.121	0.306
H2: MOA→FWRB	0.134	0.054	2.476	0.014	0.031	0.243
H4: ADM→FWRB	0.509	0.052	9.807	0.000	0.412	0.612
H3: CSR→MOA→FWRB	0.066	0.028	2.343	0.020	0.017	0.128
H5: CSR→ADM→FWRB	0.063	0.025	2.494	0.013	0.016	0.115
H6: CSR*CLA→MOA→FWRB	0.093	0.019	4.895	0.000	0.008	0.113
H7: CSR*CLA→ADM→FWRB	0.107	0.026	4.198	0.000	0.061	0.167

Additionally, we explored how the influence of MOA and ADM on FWRB were affected through the interaction between CSR and CLA in H6 and H7. The beta values for the interaction terms (CSR×CLA→MOA→FWRB: H6 and CSR×CLA→ADM→FWRB: H7) are 0.093 and 0.107, respectively, both being significant at a *p*-value of 0.000. Thus, these findings reveal the critical role that CLA plays in influencing MOA and ADM while acting as a moderating factor for FWRB initiated by CSR measures. The confidence intervals for H6 (0.008 to 0.113) and H7 (0.061 to 0.167) strengthen these results. Our findings extend beyond generic interpretations, offering targeted insights into the mechanisms driving FWRB and outlining potential pathways for future research and policy formulation. Figure 2 includes the structural model.

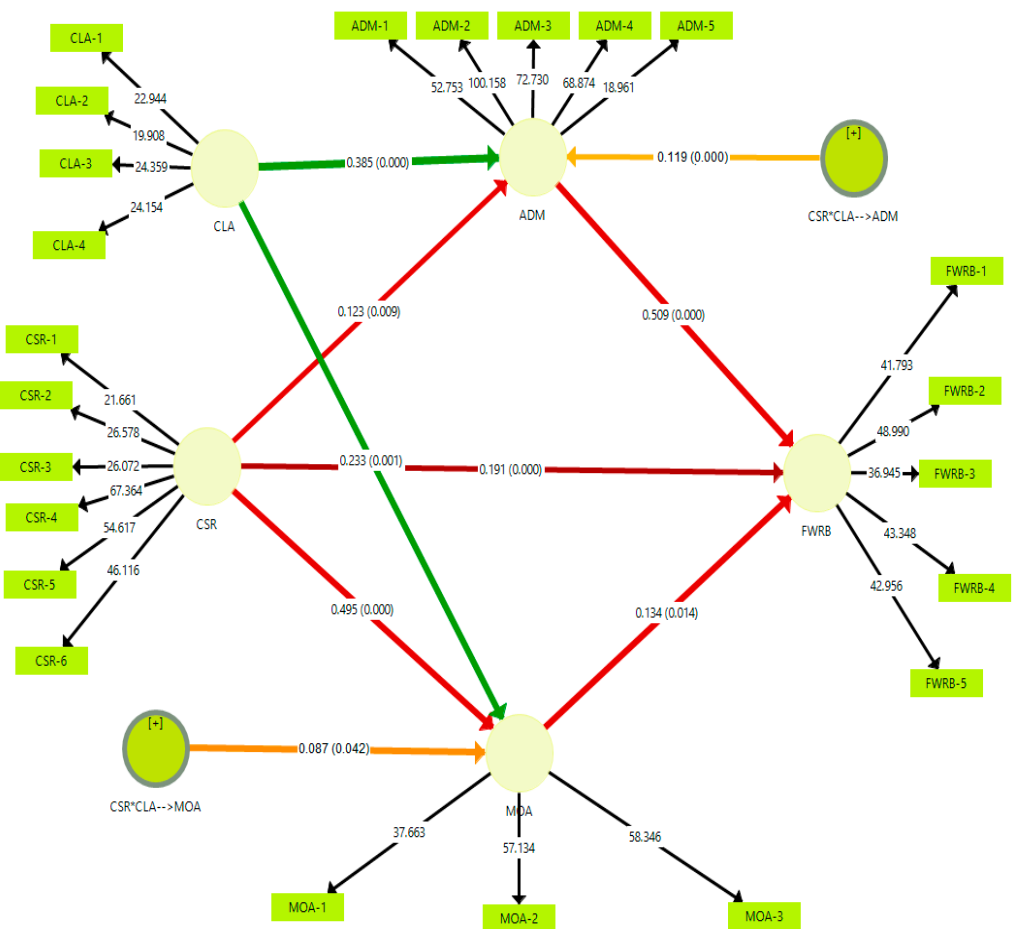


Figure 2. The structural model.

4. Discussion

Our research seeks to understand the relationship between CSR and the food-waste-reduction behavior of employees in the hospitality industry, providing a much deeper level of insight than what is already known. Specifically, this study explores the CSR→FWRB link (H1), which reveals how critical CSR is in promoting sustainable practices to employees, just as Luu [7] and Islam, et al. [29] have shown that the sustainability initiatives of organizations greatly influences employee behavior regarding food waste. However, our research indicates that the effect of CSR on FWRB is not merely an enactment of policies but is rather rooted in the company's environmental culture as reflected by its employees' psychological engagement. The narrative of CSR sustainability becomes even more complex when both moral attitude and employee admiration are brought into focus as mediators between CSR and the food-waste-reduction behavior of employees. This cognitive-emotional connection to environmental issues was also supported by H2 (MOA→FWRB) and H4 (ADM→FWRB). These findings support the argument of Turner [39] that CSR initiatives not only directly influence employees' behavior but also indirectly shape their moral attitudes and admiration towards the company. Our study enriches this perspective by quantitatively proving these mediational pathways, underscoring the complex interplay between organizational initiatives and personal values.

Additionally, we elucidate how climate-change awareness alters these relationships (H6), which contributes to a growing body of literature emphasizing the significance of awareness for effective CSR initiatives. Higher levels of environmental consciousness among employees strengthen the direct impact of CSR on food-waste-reduction behavior and increase the intermediary roles played by moral attitude as well admiration in this regard. This enhanced state may result in a deeper, sustained behavioral transformation since employees not only appreciate the significance of these initiatives but also feel more responsible for their outcome, which is in line with the findings of Kallmuenzer, et al. [44]. This suggests that for CSR initiatives to fully realize their potential in promoting sustainable practices, they must be accompanied by efforts to raise awareness about environmental issues among employees. We further analyze our findings within the framework of the TPB and offer a comprehensive explanation of how and why CSR initiatives affect employee behavior in the hospitality industry. The TPB claims that behavior is a function of behavioral intentions, which, in turn, are shaped by attitudes, subjective norms, and perceived behavioral control as indicated by Ajzen [22]. In our case, socially responsible corporate initiatives become a substitute for an objective norm, shaping employees' attitudes (reflected by moral attitude) and perceived behavioral control (heightened through admiration and climate-change awareness) towards food-waste reduction. Additionally, this theoretical alignment not only strengthens our empirical findings but also emphasizes the need of a holistic approach that incorporates cognitive, emotional, and normative dimensions in encouraging sustainable behaviors.

The conversation transcends academia, providing not only theory but also practical insights for hospitality managers. Through CSR involvement and focusing on moral attitudes, admiration of the organization, and climate-change awareness, managers can produce a workforce that is not only conscious of but also actively engaged in sustainability practices. This holistic approach emphasizes the use of a combination of policy implementation, emotional attachment, and education to fight food waste successfully. In summary, our study provides a more detailed insight into the mechanisms through which CSR initiatives affect food-waste-reduction behavior in the hospitality sector. Through dissection of the mediating and moderating variables within the TPB framework, we explored the complex psychological terrain that drives ecologically sound behaviors of employees. Additionally, it strengthens the theoretical fundamentals of CSR and sustainability in hospitality, and offers industry practitioners a guide to how to improve their sustainability practices.

4.1. Theoretical Implications

The theoretical significance of our research is colossal, as it adds to the existing knowledge base regarding CSR, employee behavior, and environmental sustainability. To begin with, this study has been able to indicate how different combined effects like those of CSR initiatives, moral attitudes, employee admiration and climate change awareness affect food-waste-reduction behavior in hotels. This multidimensional approach provides a deeper understanding of how various elements interact in order to influence employee behavior, which has been scantily addressed by previous researchers.

Further, one of the key theoretical contributions of our research is the integration of emotional and cognitive factors within a CSR framework, which is not often discussed in traditional CSR studies. Furthermore, investigating moral attitudes (cognitive component) and employee admiration (emotional component) as mediators, our study offers insight into the two paths through which CSR initiatives influence employee behavior. Therefore, future CSR research should consider the complex interplay of rational and emotional dimensions of employees' responses. Moreover, our research has highlighted how climate-change awareness modifies the relationship between CSR and behavior. This finding is significant in light of the current global concerns over environmental issues. It implies that, when employees are aware of climate change, it intensifies the effectiveness of their company's CSR programs, providing another way to increase the impact of corporate sustainability programs.

What is more, this study positions its findings within TPB, thereby expanding its application in the organizational behavior and CSR literature. This theoretical extension thus offers a fine insight into sustainable employee-behavior mechanisms with an emphasis on subjective norms (CSR), attitudes (moral attitudes), and perceived behavioral control (employee admiration and climate change awareness). In a nutshell, this study not only fills existing gaps in the literature but also provides a new theoretical framework for understanding the dynamics between CSR and employee behavior in the hospitality industry. This contributes to better comprehension of how organizations can effectively engage employees in sustainability initiatives, thus assisting broader efforts towards mitigating environmental challenges.

4.2. Practical Implications

In terms of practical implications in the hospitality industry, especially in fostering sustainability practices, this research is of major significance. Firstly, since it is evident that CSR initiatives have a major impact on food-waste-reduction actions by employees in hotels, there will be a need for managers to create all-inclusive strategies that focus on environmental matters besides enhancing greenness. For them to construct such strategies that would make an impact on their employees' daily activities, they must be designed to align with them and allow employees to be active in environmental sustainability. The other point is that the cognitive and emotional aspects of CSR communication are equally important according to our study, where we found that moral attitudes and employee admiration have dual mediating effects. Ethical training and awareness programs for hospitality managers should emphasize the moral aspects of food waste and environmental sustainability. Further, open and consistent communication about the company's achievements in sustainability as well as its goals can build pride among employees, leading to admiration for its CSR engagement.

In addition, an increase in employees' awareness of climate change which acts as a moderator is a way of enhancing the effectiveness of CSR initiatives. This can be done through training seminars, workshops, and engaging employees in the company's efforts towards sustainability. The goal of such programs is not just to educate employees but also to enable them to contribute actively towards the achievement of the organization's sustainability objectives. Moreover, the possibilities for practical application of TPB provided by our study gives hospitality managers a tool for understanding employee behavior towards sustainability. By realizing their influence on subjective norms (CSR initiatives), personal

attitudes (moral attitudes), and perceived behavioral control (employee admiration and climate-change awareness), managers can come up with strategies directed at motivating employees to engage in food-waste-reduction activities on an ongoing basis. Our analysis provides practical knowledge for the hotel industry to develop their CSR programs as well as encourage and motivate staff to engage in sustainable activities. This is largely applicable in a sector that experiences significant ecological ramifications and where employees' actions impact sustainability measures.

4.3. Limitation and Future Research Directions

There are some limitations in our study, which have been used as grounds for future research. Initially, the study is confined to the hospitality industry in China, thereby restricting the generalizability of findings to other areas or sectors. Future research may replicate this study across various cultural and geographical contexts to confirm and expand on our findings. Moreover, the reliance on self-reported measures is another limitation; although we tried to minimize it, it can still be affected by social-desirability bias. For example, future studies could incorporate more objective criteria or observation data to support self-reported behavior, especially regarding reducing food waste. Another limitation of this study is its cross-sectional design that prevents causal inferences from being made. In view of theoretical expansion, potential research can investigate additional psychological constructs that may affect the relationship between CSR and employee behavior like job satisfaction or organizational identification. More so, an integration of other theoretical frameworks such as social identity theory, as well as the concept of organizational justice, would lead to a better understanding of how CSR initiatives influence employee behavior. Finally, given the growing significance of digital technology and social media platforms, there is a need for future investigations into the role played by these platforms in enhancing employees' awareness and involvement in CSR activities. Exploring the impact of digital CSR communication on employee behavior can provide valuable insights to contemporary organizations navigating the digital environment.

5. Conclusions

In summary, our work provides valuable insights into the complex dynamics of CSR, employee conduct within this industry, and environmental conservation. We have shown that CSR initiatives significantly affect employee food-waste-reduction behavior while, at the same time, uncovering the intervening effects of moral attitudes and employee admiration as well as the moderating role of climate-change awareness. This study adds to the existing literature by revealing more about how organizational initiatives work with individual psychological factors to stimulate sustainable behaviors. Hospitality managers can draw practical implications from our research by considering that comprehensive CSR strategies should be deeply felt on emotional and cognitive grounds by their employees. Hence, it demonstrates that, for the organizations, achieving sustainability goals will require them to effectively put in place supportive CSR activities besides meaningful CSR communication, particularly in this era where CSR has become a key strategic tool. The present study has certain limitations, which could be useful for future investigations in different contexts and through different theoretical lenses. In essence, this research contributes to our understanding of how companies can engage in CSR effectively for the purpose of promoting environmental sustainability, an issue critical not only in the hospitality industry but beyond it. Embedding CSR into an organization's strategy, along with gaining a better understanding of employee behavior, may help in addressing global environmental challenges as well as advancing us towards a sustainable future.

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