Impact of Sustainability Attributes of Menu Labels on Restaurant Green Image and Customer Attitudes

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This study investigated the impact of restaurant sustainability menu labels on restaurant green image and customer attitude by comparing three restaurant sustainability attributes. An analysis of covariance (ANCOVA) and a simple linear regression analysis were employed to test the hypotheses. The results suggested that the three restaurant sustainability attributes, food-focused, environment-focused, and administration-focused attributes, significantly affect restaurant green image. An interaction effect suggests that food-focused sustainability attribute significantly affects restaurant green image only when environment-focused attributes are absent. The findings provide strategies for the efficient allocation and effective execution of limited resources in implementing sustainability activities.

Keywords: menu label, restaurant sustainability, restaurant sustainability attributes, restaurant green image

INTRODUCTION

In recent years, consumer demand for environmentally responsible products and services has risen significantly, driven by a heightened awareness of the ecological impacts of human activities and a growing preference for options that are healthy, sustainable, and minimally harmful to the environment (DeWald et al., 2014; Han et al., 2009; Jang et al., 2011). As public concern for the environment grows, businesses across various sectors, including the foodservice industry, have recognized the importance of incorporating sustainability into their operations to remain competitive and cater to the evolving expectations of their clientele (Hu, Parsa, & Self, 2010).

Notably, the foodservice industry is a major energy consumer, with a single restaurant generating the energy equivalent of 490 tons of carbon dioxide per year (Horovitz, 2008). This considerable ecological footprint has led to increasing pressure on the industry to implement sustainable practices in order to reduce environmental impacts and address the concerns of environmentally conscious consumers (Elkhwesky et al., 2022; Hu et al., 2010; Tzschentke et al., 2008).

In the context of the foodservice industry, a restaurant's menu serves not only as a list of available dishes but also as a crucial tool for attracting customers and communicating with them about the values and practices of the establishment. Consequently, researchers have explored the role of the menu in conveying messages from the restaurant to its patrons, including its potential as a signaling platform for communicating sustainability initiatives (Kincaid & Corsun, 2003).

Despite the increasing awareness and concern for environmental issues among consumers, there has been limited research on how menus can effectively communicate sustainable initiatives within the restaurant industry. Previous studies, such as those by Lo, King, and Mackenzie (2017), have examined the impact of sustainability and nutrition menu labels on customer attitudes. Lu and Gursoy (2017) investigated the effects of organic food offerings on customer behavioral intentions. However, most studies have predominantly focused on food-centric aspects of restaurant sustainability, such as organic ingredients or locally sourced produce, leaving other essential dimensions of sustainability underexplored.

Recognizing the menu's role as a primary communication channel with customers, Kwok, Huang, and Hu (2016) argue that further investigation is warranted into menu sustainability labels encompassing a broader range of restaurant sustainability attributes. These attributes can be categorized into three main areas: food-focused, environment-focused, and administration-focused. Therefore, this study explores the distinct roles of these three attributes: menu labels and their influence on the restaurant's green image, customer attitudes, and consumer behavioral intentions towards the establishment. By examining the impact of these sustainability labels on customer perceptions and behaviors, this research can contribute to a deeper understanding of how restaurants can effectively signal their commitment to sustainability and cater to the growing demand for environmentally responsible dining experiences.

LITERATURE REVIEW

Signaling Theory

Signaling theory, first introduced by Spence (1973), provides a framework for understanding the communication process between senders and receivers, particularly in information asymmetry. The theory explains how senders strategically convey information (signals) to receivers, who then interpret or assess these signals to make informed decisions. The primary objective of signals and senders is to reduce information asymmetry by ensuring that senders identify and utilize the most accurate, effective, and efficient means of signaling receivers.

Within the foodservice industry, signaling theory has been applied to investigate various aspects of communication between restaurants and their customers. Lo, King, and Mackenzie (2017) used the signaling theory to explore the influence of menu labels on customer attitudes, recognizing that a restaurant's menu is a vital communication tool. This perspective has been shared by numerous researchers in the field, who have employed signaling theory to examine various elements of menu design and messaging. For instance, Hwang and Lorenzen (2008) analyzed the effects of menu design, nutritional labeling, and pricing, while McCall and Lynn (2008) delved into the relationship between menu item descriptions and customer perceptions of quality, price, and purchase intentions.

In light of these studies, the present research extends the application of signaling theory to examine the effectiveness of restaurant menus as a signaling platform for conveying sustainability attributes. By doing so, the study seeks to provide valuable insights into how restaurants can strategically leverage their menus to promote sustainable practices and appeal to environmentally conscious customers.

Restaurant Sustainability Attributes of Menu Labels

To advance the understanding of restaurant sustainability, Kwok, Huang, and Hu (2016) proposed a taxonomy categorizing sustainability attributes into three distinct groups: food-focused, environment-focused, and administration-focused. This comprehensive framework offers a more targeted approach to assessing and promoting food service sustainability.

First, food-focused attributes emphasize the use of organic and locally sourced ingredients, which are highly appealing to customers due to their perceived health benefits and reduced environmental impact

(Mehrjerdi & Woods, 2022; Hu et al., 2010; Jang et al., 2011; Vieregge et al., 2007). The majority of previous menu labeling research has centered on this aspect of sustainability, with studies exploring the influence of organic and local food offerings on customer preferences and behavior (Hwang & Lorenzen, 2008; McCall & Lynn, 2008).

Second, environment-focused attributes encompass various initiatives aimed at reducing the environmental footprint of restaurants, including waste reduction, reuse, recycling, energy conservation, and efficiency improvement. These initiatives are often referred to as the three Rs (reduce, reuse, recycle) and two Es (energy and efficiency) (Glig et al., 2005). By incorporating these environment-focused attributes into their menus, restaurants can signal their commitment to sustainability and potentially attract customers who prioritize eco-friendly practices.

Lastly, administration-focused attributes pertain to a restaurant's organizational efforts to promote sustainability, such as obtaining green certifications, engaging in Corporate Social Responsibility (CSR) initiatives, and providing employee training in sustainable practices (Kwok et al., 2016). These attributes can serve as indicators of a restaurant's commitment to sustainability, product quality, and reduced risk, which can, in turn, influence customer purchase decisions (Jeddi & Zaiem, 2010; Manaktola & Jauhari, 2007; Mohr & Webb, 2005; Schubert et al., 2010).

By examining the distinct roles of these three sustainability attributes within menu labels, the present study aims to contribute to the existing literature on signaling theory in the foodservice industry and provide practical implications for restaurant operators looking to enhance their sustainability efforts and appeal to eco-conscious consumers.

Restaurant Green Attributes and Green Image: Enhancing Brand Perception Through Sustainable Practices

In recent years, the importance of sustainability and environmental practices has gained significant attention from both consumers and businesses. As a result, organizations have started to incorporate sustainable attributes into their products and services to create a more favorable brand image. In the context of the restaurant industry, an establishment's green image plays an increasingly crucial role in shaping customer attitudes and distinguishing it from competitors. This paper investigates the relationship between restaurant green attributes and green image, customer attitudes, and the role of health consciousness and environmental awareness in shaping these relationships.

Keller (1993) provided a widely accepted definition of brand image, describing it as a collection of customer perceptions associated with a brand. A brand image often reflects the specific features of a product or service that customers remember (Padgett & Allen, 1997). A brand or company's public image is crucial for distinguishing an organization from its competitors (Nguyen & LeBlanc, 2001; Robertson, 1993). The image of a restaurant brand encompasses customer perceptions, emotions, thoughts, and attitudes toward the establishment (Ryu et al., 2011).

Expanding upon Padgett and Allen's definition, Assael (1987) defined a store's image as customer perceptions of its attributes. He later suggested that a store's image is shaped by its most prominent attributes. Although the core attributes of a restaurant typically include food, service, and ambiance, sustainable features have not traditionally been considered primary attributes. However, given the growing concerns and consumer awareness of environmental issues, sustainable attributes significantly influence customer attitudes (Jeong et al., 2014). Bloemer and de Ruyter (1998) emphasized that a store's image, driven by distinctive attributes, plays a vital role in setting it apart from others, and the same holds for restaurants.

Bloemer and de Ruyter (1998) further asserted that a restaurant's green attributes contribute to its green image. Chen (2010) defined a brand or company's green image as the sum of customer perceptions associated with the brand's environmental commitment and practices. Thus, a restaurant's green image can be characterized by customer perceptions of its environmental attributes (Jeong et al., 2014).

The Role of Sustainable Attributes on Restaurant Green Image

Given the importance of a restaurant's green image, it is crucial to understand the factors contributing to its development. This study hypothesizes that the presence of three sustainable attributes on a restaurant menu positively influences its green image (H1a, H1b, and H1c):

H1a: *A menu label with food-focused attributes influences the restaurant's green image.*

H1b: *A menu label with environment-focused attributes influences the restaurant's green image.*

H1c: *A menu label with administration-focused attributes influences the restaurant's green image.*

These sustainable attributes may include locally sourced ingredients, energy-efficient operations, waste reduction practices, and other environmentally conscious efforts that align with customers' values.

Green Image and Customer Attitudes

Ajzen and Fishbein (2000) defined attitudes as a bipolar evaluation of an object, concept, or behavior, encompassing dimensions such as favor or disfavor, like or dislike, and good or bad. Evaluations are determined by customers' subjective values and are associated with an object, concept, or behavior's attributes.

In line with Ajzen and Fishbein's (2000) definition, Jeong et al. (2014) described customer attitudes toward a restaurant as a dimension of favor or disfavor (good or bad). Customers form attitudes based on their subjective values (image) derived from the restaurant's attributes (Ajzen & Fishbein, 2000; Manaktola & Jauhari, 2007). Jeong et al. (2014) discovered that a restaurant's green image, shaped by its sustainable attributes, significantly influences customer attitudes. This study hypothesizes that a restaurant's green image positively affects customer attitudes (H2):

H2: *A restaurant's green image influences customer attitudes toward the establishment.*

Understanding the relationship between a restaurant's green image and customer attitudes can help businesses tailor their sustainable practices and messaging to create more favorable perceptions, ultimately increasing customer satisfaction and loyalty.

Health Consciousness and Environmental Awareness

As Chen (2009) delineated, health consciousness encompasses an individual's concern for their well-being and proactive inclination towards enhancing their overall health. Similarly, environmental awareness is characterized by an individual's cognizance of environmental issues and their implications, as defined by Dunlap and Jones (2002). A plethora of research investigations have underscored the paramount significance of health consciousness and environmental awareness as critical determinants of eco-friendly behaviors, thereby highlighting their interconnectivity and impact on sustainability practices (Alwitt & Pitts, 1996; Chen, 2009; Furnham & Forey, 1994; Gould, 1988; Jeong et al., 2014; Kollmus & Agyeman, 2002; Lee, 2008; Lee et al., 2014; Lo et al., 2017; Michaelidou & Hassan, 2008; Namgung & Jang, 2013; Wardle & Steptoe, 2003).

In order to elucidate the intricate interplay between health consciousness, environmental awareness, and the tripartite restaurant attributes, the present study endeavors to integrate both health consciousness and environmental awareness as covariates within the research model. By comprehending the complex interrelations among these factors, restaurant establishments can more effectively customize their sustainable attributes and communication strategies, thereby bolstering their green image. This, in turn, will contribute to the enhancement of customer attitudes towards eco-friendliness and the subsequent promotion of environmentally conscious behaviors.

METHODOLOGY

Survey Development and Design

The survey instrument employed in this study was carefully designed to ensure reliability and validity by incorporating items that have been previously validated in related research. The primary objective was to explore the relationships between various factors, including green image, customer attitudes, willingness to select a restaurant, health consciousness, and environmental awareness.

The green image construct was assessed using four items adopted from Jeong et al. (2014), a study that thoroughly examined green marketing practices in the restaurant industry. Three items were included from Lee et al. (2014), a research study investigating customer behavior and preferences in the context of restaurant selection to measure customer attitudes towards the restaurant and their willingness to choose it as a dining option. Health consciousness and environmental awareness, two key factors potentially influencing customer decisions, were evaluated using ten items adopted from Lo et al. (2017). This study provided valuable insights into consumer behavior concerning health and environmental concerns, which are increasingly relevant today.

To ensure a diverse range of responses, participants were initially asked to review a randomly proposed menu that showcased various combinations of restaurant sustainability attribute labels, such as eco-friendly practices, locally sourced ingredients, and organic food options. The survey instrument then measured the green image of the restaurant, customer attitudes toward the restaurant, health consciousness, and environmental awareness.

TABLE 1
MENU VERSIONS

Menu Version	Restaurant Sustainability Attributes		
	Food-focused	Environment-focused	Administration-focused
1	X	X	X
2	O	X	X
3	X	O	X
4	X	X	O
5	O	O	X
6	O	X	O
7	X	O	O
8	O	O	O

This 2 x 2 x 2 experimental design created eight distinct menu versions, each with a unique set of sustainability attributes. The menu items were priced between $3.95 and $13.95 to reflect a casual dining setting. This pricing structure was chosen to simulate a real-world scenario, as casual dining restaurants typically offer various prices to cater to customer preferences and budgets.

However, further behavioral intentions to choose the restaurant were excluded from the analysis due to the hypothetical settings of the research design. The focus remained on understanding the factors influencing customer attitudes and perceptions in the context of sustainability attributes rather than predicting actual behavioral intentions.

By employing a well-designed survey instrument that integrates validated items from previous studies and presenting participants with realistic menu options, the study aims to comprehensively understand the factors influencing customer attitudes and decision-making processes when selecting a restaurant based on sustainability attributes.

Data Collection Methodology

Data for this study were meticulously gathered using the online survey platforms, Qualtrics and Amazon Mechanical Turk (MTurk). The survey instrument was systematically deployed via Qualtrics, while respondents were diligently recruited from the MTurk participant pool. Upon completing the survey, each participant was provided with a unique survey completion code, subsequently matched with their corresponding MTurk ID numbers. This procedure was implemented to prevent the occurrence of duplicate survey completions and payments. The incentive for participation in the survey was set at $0.40, and verified respondents were remunerated within a 72-hour time frame following their survey submission.

Data Analysis Techniques

The gathered data were subjected to rigorous statistical analyses utilizing the Statistical Package for Social Sciences (SPSS) version 25. The analytical procedures encompassed four distinct steps: descriptive statistics, reliability assessment, analysis of covariance (ANCOVA), and simple linear regression.

Descriptive statistics were employed to delineate respondents' socio-demographic characteristics, presented in frequencies and percentages. The internal consistency of the data was rigorously examined using Cronbach's alpha scores, with a commonly accepted threshold of 0.70, as posited by Fornell and Larcker (1981).

The hypothesis tests comprised an ANCOVA to scrutinize the influence of sustainability labels on menu choices and an additional simple linear regression to examine the correlation between a restaurant's green image and customer attitudes toward the establishment. This comprehensive analytical approach provided valuable insights into sustainability, customer perceptions, and restaurant choices.

RESULTS

Descriptive Statistics of the Sample Population

The study aimed to gather information from diverse respondents representing eight distinct menu types. Each menu type was allocated an equal number of respondents, resulting in approximately 62 participants per category. Consequently, a total of 498 samples were collected for analysis. To ensure the accuracy and reliability of the data, a multivariate outlier test utilizing Mahalanobis distance was employed, ultimately yielding 453 valid cases. Additionally, 96 surveys were disqualified due to an exceptionally short completion time, raising concerns about the quality of the responses. This exclusion resulted in a final count of 357 usable samples.

The demographic breakdown of the 357 respondents revealed a relatively balanced gender distribution, with male participants constituting 53.5% (n = 191) and female participants accounting for 46.5% (n = 166). The age distribution was primarily concentrated within the 25-34 age bracket (40.6%, n = 145), followed by the 35-44 age group (24.9%, n = 89). The sample was predominantly composed of individuals identifying as white (80.1%, n = 286), reflecting the dominant ethnic group in the population. Regarding educational background, college graduates comprised the largest segment (42.0%, n = 150), closely followed by those who had attended some college (34.5%, n = 123). Regarding marital status, nearly half of the participants were either married (40.3%, n = 144) or single (48.5%, n = 173). The majority of respondents reported an annual household income within the range of $10,000 to $29,999 (20.2%, n = 72), $30,000 to $49,999 (26.3%, n = 94), or $50,000 to $69,999 (19.9%, n = 71).

TABLE 2
DESCRIPTIVE STATISTICS OF SAMPLE

			Menu Type (*N*)							
	N	(%)	1	2	3	4	5	6	7	8
Total Sample Size	357		43	40	44	44	43	46	48	49
Gender										
Male	191	53.5	28	22	24	26	23	22	21	25
Female	166	46.5	15	18	20	18	20	24	27	24
Age										
18-24	31	8.7	2	5	3	4	3	7	4	3
25-34	145	40.6	16	19	19	23	14	14	17	23
35-44	89	24.9	19	5	13	6	14	8	12	12
45-54	46	12.9	4	6	7	6	3	6	9	5
55 & Above	46	12.9	2	5	2	5	9	11	6	6
Ethnicity										
White (Non-Hispanic)	286	80.1	35	36	34	33	33	37	38	40
Hispanic	20	5.6	1	1	4	2	5	1	3	3
African-American	25	7.0	3	1	3	4	3	5	4	2
Asian	18	5.0	4	1	2	0	2	3	3	3
Other	8	2.2	0	1	1	5	0	0	0	1
Education										
High School Graduate	39	10.9	7	4	5	2	8	4	7	2
Some College	123	34.5	12	18	15	19	11	20	14	14
College Graduate	150	42.0	20	14	18	20	19	17	17	25
Some Graduate School	15	4.2	1	0	1	1	1	3	5	3
Completed Graduate School	30	8.4	3	4	5	2	4	2	5	5
Marital Status										
Married	144	40.3	20	18	21	15	18	13	17	22
Widowed	4	1.1	1	0	1	0	0	1	1	0
Single	173	48.5	19	19	20	26	18	24	24	23
Divorced/Separated	36	10.1	3	3	2	3	7	8	6	4
Annual Household Income										
Less than $10,000	17	4.8	1	2	4	2	1	4	3	0
$10,000-$29,999	72	20.2	7	6	3	7	12	15	12	10
$30,000-$49,999	94	26.3	10	18	15	16	6	9	9	11
$50,000-$69,999	71	19.9	8	8	9	7	10	9	7	13
$70,000-$89,999	42	11.8	7	0	5	5	3	6	9	7
$90,000-$109,999	26	7.3	4	2	5	2	6	1	3	3
More than $110,000	35	9.8	6	4	3	5	5	2	5	5

Reliability Assessment

To establish the internal consistency of the measured constructs, Cronbach's alpha scores were calculated for green image, customer attitude, health consciousness, and environmental awareness. The alpha scores ranged from 0.853 to 0.938, surpassing the recommended threshold of 0.70 as suggested by Fornell and Larcker (1981). This outcome confirms the reliability of the measures employed in this study, demonstrating the results' validity and the research methodology's robustness.

TABLE 3
RESULTS OF RELIABILITY TESTS

Construct Survey Item	Cronbach's α	Mean	SD
Green Image (GI)	0.938	5.224	1.143
This restaurant behaves in a socially conscious way.		5.291	1.261
I have the impression that this restaurant is very responsive to environment issues.		5.277	1.373
This restaurant is concerned about the preservation of the environment.		5.232	1.398
I have the feeling that this restaurant is not only concerned about the profit but also concerned about the environment and other consumers.		5.095	1.462
Customer Attitudes (CA)	0.903	5.465	1.143
My attitude toward eating at this restaurant is favorable.		5.473	1.212
My attitude toward the overall menu items served in this restaurant is favorable.		5.425	1.334
My attitude toward this restaurant is favorable.		5.496	1.196
Health Consciousness (HC)	0.853	5.927	0.774
My health is valuable to me.		6.090	0.869
I am aware of the changes in my health.		6.011	0.831
I take responsibility for the state of my health.		6.044	0.976
I am health conscious.		5.619	1.171
I understand healthy eating.		5.871	0.997
Construct Survey Item	Cronbach's α	Mean	SD
Environmental Awareness (EA)	0.925	5.412	1.310
The USA's environmental problems are affecting our health.		5.325	1.372
It is urgent to tackle the USA's environmental problem.		5.658	1.436
The USA's environmental problems are worsening.		5.529	1.502
Environmental problems are affecting the USA's reputation.		5.238	1.569
The current development of the USA is destroying the environment.		5.311	1.578

Analysis of Covariance (ANCOVA)

A comprehensive, full-factorial Analysis of Covariance (ANCOVA) was implemented to rigorously examine the influence of food-focused attributes, environment-focused attributes, and administration-focused attributes on the green image of restaurants. The analysis incorporated covariates such as health consciousness and environmental awareness to control for potential confounding factors. Furthermore, the ANCOVA included all possible two-way and three-way interactions among the restaurant sustainability attributes to capture their combined effects.

Levene's test of equality of error variance was employed to assess the ANCOVA model's assumption of homogeneity of error variance across the groups in the test. The test yielded a non-significant result ($F_{(7,349)} = 1.194$, $p = .306$), indicating that the assumption was met and the model is valid.

TABLE 4
ANCOVA ON RESTAURANT GREEN IMAGE

Source	Type III SS	DF	MS	*F*	Partial η^2
Covariates					
EA	0.863	1	0.863	0.652*	0.002
HC	22.849	1	22.849	17.249***	0.047
Test Effects					
FF	12.478	1	12.478	9.420**	0.026
EF	41.763	1	41.763	31.528***	0.083
AF	7.143	1	7.143	5.392*	0.015
FF*EF	5.551	1	5.551	4.191*	0.012
FF*AF	0.000	1	0.000	0.000	0.000
EF*AF	4.405	1	4.405	3.326	0.009
FF*EF*AF	0.728	1	0.728	0.549	0.002
Error	459.646	347	1.325		
Total	568.323	356			

Note: EA: environmental awareness, HC: health consciousness, FF: food-focused sustainability attributes, EF: environment-focused sustainability attributes, AF: administration-focused sustainability attributes, $^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$.

The findings revealed significant main effects of all the attributes on the restaurant green image. This suggests that labeling food-focused attributes ($F_{(1,347)} = 12.478$, $p < 0.01$), environment-focused attributes ($F_{(1,347)} = 41.763$, $p < 0.001$), and administration-focused attributes ($F_{(1,347)} = 7.143$, $p < 0.05$) on the menu has a considerable impact on the restaurant's green image when respondents' health consciousness and environmental awareness are controlled. Consequently, hypotheses H1a, H1b, and H1c were confirmed as significant:

H1a: *The presence of food-focused attributes on the menu label influences the restaurant's green image.*

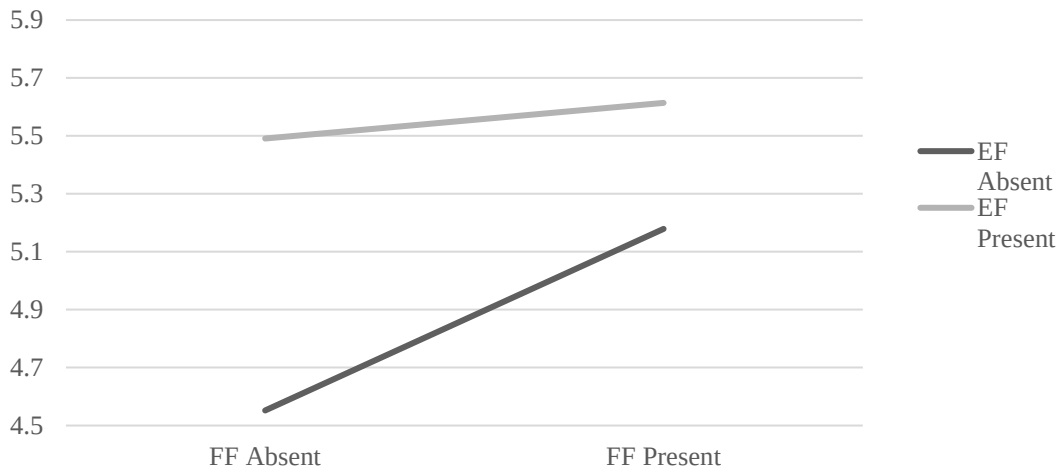
H1b: *The presence of environment-focused attributes on the menu label influences the restaurant's green image.*

H1c: *The presence of administration-focused attributes on the menu label influences the restaurant's green image.*

An examination of the squared eta scores for the factors indicated that environment-focused attributes contributed the most to the explanation of variance in the dependent variable, the restaurant green image (8.3%), followed by food-focused attributes (2.6%) and administration-focused attributes (1.5%).

Furthermore, the results demonstrated a significant interaction effect between food-focused and environment-focused attributes ($F_{(1,347)} = 5.551$, $p < 0.05$). A line chart (Figure 1) revealed that labeling food-focused sustainability attributes on a menu significantly affects the restaurant's green image only when labels of environment-focused attributes are absent. The simple effect of food-focused attributes on the restaurant green image is substantial ($F_{(1,347)} = 16.853$, $p < 0.001$) when labels of environment-focused attributes on the menu are absent. The simple effect of environment-focused attributes is significant regardless of the presence of labels of food-focused attributes on the menu (FF present: $F_{(1,347)} = 29.183$, $p < 0.001$; FF absent: $F_{(1,347)} = 6.303$, $p < 0.05$).

FIGURE 1
ESTIMATED MARGINAL MEANS OF RESTAURANT GREEN IMAGE



Note: FF: Food-focused attributes, EF: Environment-focused attributes

In addition, the magnitude of the main effect of each restaurant sustainability attribute and the simple effects in the interaction between food-focused and environment-focused attributes were assessed using Cohen's d with a 95% confidence interval. The calculations indicated that the impact of labeling each restaurant sustainability attribute on a menu on the restaurant green image ranged from small to large effect sizes. Among the main effects, environment-focused attributes had the largest effect size on the restaurant green image ($d = 0.589$). Regarding the interaction effects, environment-focused attributes with the presence of food-focused attributes had the largest effect size on the restaurant green image ($d = 0.810$).

TABLE 4
SIMPLE EFFECTS OF FF AND EF ON RESTAURANT GREEN IMAGE

FF	EF	RGI Mean	SE	SS	*df*	*F*	Partial η^2
Absent	Absent	4.552	0.124	16.853	1	12.723***	0.035
	Present	5.491	0.121	0.683	1	0.516	0.001
Present	Absent	5.179	0.124	38.656	1	29.183***	0.078
	Present	5.614	0.120	8.349	1	6.303*	0.018
			Error	459.646	347	1.325	

Note: FF: food-focused attributes, EF: environment-focused attributes, RGI: Restaurant Green Image, $^{***}p < 0.001$, $^{*}p < 0.05$

Lastly, a supplementary simple linear regression analysis was conducted to examine the relationship between the restaurant green image and customer attitudes toward the restaurant. The results indicate that the restaurant green image has a significant effect on customer attitudes ($R = 0.557$, $F_{(1,355)} = 159.308$, $p < 0.001$), while accounting for 31.0% of the variance in customer attitudes. This finding confirms the significance of hypothesis H2:

H2: *The restaurant green image influences customer attitudes toward the restaurant.*

TABLE 5
EFFECT SIZES

Attributes	Present			Absent			Cohen's *d*	SE	CI (95%)	
	Mean	N	SD	Mean	N	SD			Lower	Upper
Main Effect										
FF	5.406	178	1.131	5.043	179	1.362	0.290	0.106	0.080	0.498
EF	5.571	184	1.169	4.856	173	1.259	0.589	0.108	0.376	0.800
AF	5.374	187	1.261	5.059	170	1.249	0.251	0.106	0.042	0.459
Simple Effect										
FF wo/ EF	5.179	86	1.150	4.552	87	1.157	0.544	0.155	0.238	0.845
EF w/ FF	5.491	92	1.161	4.552	87	1.157	0.810	0.156	0.502	1.111
EF wo/ FF	5.614	92	1.151	5.179	86	1.150	0.378	0.151	0.080	0.673

Note: FF: food-focused sustainability attributes, EF: environment-focused sustainability attributes, AF: administration-focused sustainability attributes

DISCUSSION

The present study investigates the impact of restaurant sustainability attributes on the green image of the restaurant and explores how these attributes influence customer attitudes. Building upon the findings of Kwok, Huang, and Hu (2016), the study analyzes the importance of environment-focused, food-focused,

and administration-focused attributes and their effect on customer attitudes. The study further highlights the implications, limitations, and suggestions for future research.

The findings of this study indicate that the presence of restaurant sustainability attributes on a menu significantly influences the green image of the restaurant. Specifically, information regarding sustainability practices, such as using organic or locally sourced ingredients, implementing waste reduction or recycling initiatives, and obtaining green certifications or donating to environmental organizations, positively affects customer evaluations of the restaurant's sustainability efforts. Messages centered on environmental activities have the most substantial impact on the restaurant's green image. This is consistent with the results of Kwok et al. (2016), who found that customers prioritize environment-focused attributes over food-focused and administration-focused attributes.

Moreover, the study reveals a similar effect size between food-focused and administration-focused attributes, aligning with Kwok et al.'s (2016) findings that suggest customer indifference between these two categories. The study also found that environment-focused attributes are most effective when combined with food-focused attributes, while the latter lose their impact on the restaurant's green image when used alone.

Consistent with previous research, this study demonstrates a strong relationship between a restaurant's green image and customer attitudes toward the establishment. Furthermore, the results suggest that environment-focused attributes have a more significant impact on restaurant green image and customer attitudes, compared to food-focused sustainability attributes that have been the primary focus of earlier studies.

CONCLUSIONS

Implications

The current study contributes to the existing literature on restaurant sustainability attributes by expanding upon Kwok et al.'s (2016) taxonomy. The findings emphasize the necessity for contemporary research on restaurant sustainability to encompass a broader range of attributes, as previous studies have been limited due to their focus on food-focused attributes or the effectiveness of sustainability operationalization.

Customers are willing to pay a premium for products and services offered by environmentally and socially responsible businesses (Parsa et al., 2015). Recent research suggests that over two-thirds of restaurant patrons are willing to pay extra for green establishments (Namkung & Jang, 2017). However, signaling restaurant sustainability attributes must be cost-effective. In the context of costly signaling theory (Bird & Smith, 2005), signalers can effectively disseminate signals when they can absorb the cost of signals. For instance, the costs associated with certifications are typically high, and the time-consuming process of acquiring certification may render the signal less credible (Connelly et al., 2011).

The findings of this study offer strategies for the efficient allocation and effective execution of limited resources in implementing sustainability initiatives. As the results suggest, priority should be given to environment-focused attributes of restaurant sustainability. After successfully implementing and marketing these initiatives, restaurant managers and owners can shift their focus to food- and administration-focused attributes.

Limitations

A key limitation of this study is its reliance on a hypothetical setting, which precludes the incorporation of core restaurant attributes, such as food, service, and ambiance, that can only be derived from personal experiences. Given the influence of customer experience and perceptions of core attributes on customer attitudes and behavioral intentions, the inability to control for these factors may confound the study's findings.

The use of Amazon Mechanical Turk (MTurk) as a data collection method may also pose limitations. While MTurk data is relatively inexpensive and easily accessible (Difallah et al., 2018; Ford, 2017), and MTurk is the largest online crowdsourcing platform with one-third of its tasks being academic surveys

(Hitlin, 2016; Mortensen & Hughes, 2018), concerns have been raised about the confounding potentials of the method. One of the primary concerns with this online-based data collection method is the lack of quality controls, particularly regarding the presence of speeders and cheaters. Speeders prioritize task completion speed over attentiveness, while cheaters misrepresent themselves to qualify as respondents and receive payment (Chandler et al., 2014; Ford, 2017). Additionally, a small number of "Super-Turkers" complete a significant portion of tasks, leading to potential biases in the data (Ford, 2016).

However, several studies have argued that despite the presence of confounds such as speeding and cheating, MTurk data remains reliable and valid (McGonagle, 2015; Sheehan, 2018; Smith et al., 2016; Stewart et al., 2017). Kees et al. (2017) conducted a comparative study examining the reliability and validity of professional panels, student samples, and MTurk data, finding that the MTurk sample was as good as or better than the other two. Their study found that MTurk data was the most cost-effective option, demonstrating high reliability, ease of data collection, and consistency in hypothesis testing.

Future Research

The findings of this study suggest several avenues for future research in the area of restaurant sustainability attributes and their impact on customer attitudes.

- *Different Signaling Platforms*: Further exploration of how different signaling platforms affect the impact of restaurant sustainability attributes is warranted. Investigating the effectiveness of each attribute on various platforms, such as social media, print advertisements, and in-store promotions, may lead to more efficient utilization of each attribute and provide insights into the most effective communication channels for promoting sustainability initiatives (Gallego, 2021).
- *Real Restaurant Settings*: Future research should be conducted in real restaurant settings, allowing investigators to control and rule out potential confounding variables such as food or service quality and restaurant ambiance (Kang et al., 2020). This approach would provide a more ecologically valid representation of how customers react to sustainability attributes in real-life situations, thereby enhancing the generalizability of the findings.
- *Cross-Cultural Analysis*: Given the increasing globalization of the restaurant industry, examining the impact of restaurant sustainability attributes across different cultures would provide valuable insights into the potential variations in customer attitudes and preferences (Smith & Paladino, 2020). This line of inquiry may inform the development of culturally tailored sustainability strategies for restaurant operators seeking to expand their businesses internationally.
- *Longitudinal Studies*: Longitudinal research designs could be employed to assess the long-term effects of restaurant sustainability attributes on customer attitudes and behavior. Such studies would offer insights into the sustainability of the observed effects and any potential changes in customer preferences over time (Holdsworth & Thomas, 2021).
- *Examination of Additional Sustainability Attributes*: Future studies could expand the scope of the investigation to include other sustainability attributes not considered in this study, such as energy efficiency, fair labor practices, and animal welfare. This would provide a more comprehensive understanding of the factors that contribute to a restaurant's green image and their relative importance to customers.
- *Interactions between Sustainability Attributes*: Further research could also examine the potential interactions between various sustainability attributes and their combined effects on customer attitudes. This would enable restaurant operators to strategically combine different sustainability initiatives to maximize their overall impact on customer perceptions and behavior (Lim & Loose, 2021).

By addressing these areas in future research, scholars and practitioners alike will be better equipped to understand the complexities surrounding restaurant sustainability attributes and their influence on customer

attitudes, ultimately contributing to the development of more effective sustainability strategies within the industry.

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