THE EFFECTS OF SUSTAINABLE RESTAURANT PRACTICES ON DINER BEHAVIOR

BANU ÖZDEN

BOĞAZİÇİ UNIVERSITY

2023

THE EFFECTS OF SUSTAINABLE RESTAURANT PRACTICES ON DINER BEHAVIOR

Thesis submitted to the

Institute for Graduate Studies in Social Sciences

in partial fulfillment of the requirements for the degree of

Master of Arts

in

Sustainable Tourism Management

by

Banu Özden

Boğaziçi University

2023

The Effects of Sustainable Restaurant Practices on Diner Behavior

The thesis of Banu Özden

has been approved by:

Assoc. Prof. Ahmet Uşaklı _____
(Thesis Advisor)

Prof. Maria Dolores Alvarez _____

Assist. Prof. Stella Kladou _____
(External Member)

January 2023

DECLARATION OF ORIGINALITY

I, Banu Özden, certify that

- I am the sole author of this thesis and that I have fully acknowledged and documented in my thesis all sources of ideas and words, including digital resources, which have been produced or published by another person or institution;
- this thesis contains no material that has been submitted or accepted for a degree or diploma in any other educational institution;
- this is a true copy of the thesis approved by my advisor and thesis committee at Boğaziçi University, including final revisions required by them.

Signature…….

Date ……

ABSTRACT

The Effects of Sustainable Restaurant Practices on Diner Behavior

The purpose of this study is to investigate the effects of sustainable restaurant practices on green brand image (GBI) and sustainability-related diner loyalty (LOY) by providing a comparative analysis between two major types of restaurants [i.e., full-service restaurant (FSR) and quick-service restaurant (QSR)]. Additionally, the present study examines the moderating role of restaurant type (FSR vs. QSR) on the relationships between sustainable restaurant practices, GBI, and LOY. An online self-administered questionnaire was used to collect the data. The sustainable restaurant practices were measured using four dimensions, namely (1) food-focused sustainability practices (FfSP), (2) waste-reduction practices (WRP), (3) water- and energy-efficiency practices (WEEP), and (4) administration-focused sustainability practices (AfSP). A convenience sample of 656 Turkish restaurant customers were surveyed and a total of 623 useable questionnaires (316 FSR customers and 307 QSR customers) were analyzed. To analyze the data, partial least squares structural equation modeling (PLS-SEM) was performed. The results indicate that FfSP and AfSP positively influence GBI for both FSR and QSR customers. It was also found that FfSP, WRP and AfSP positively influence LOY for FSR customers. On the other hand, WEEP and AfSP were found to have positive effects on LOY for QSR customers. The study also reveals two significant results regarding the moderating role of restaurant type. While the positive effect of WRP on LOY was found to be stronger for FSR customers, the positive effect of WEEP on LOY was found to be stronger for QSR customers.

ÖZET

Sürdürülebilir Restoran Uygulamalarının Müşteri Davranışı Üzerindeki Etkileri

Bu çalışmanın amacı, iki temel restoran türü [tam hizmet veren restoranlar (THR) ve hızlı hizmet veren restoranlar (HHR)] arasında karşılaştırmalı bir analiz yaparak, sürdürülebilir restoran uygulamalarının yeşil marka imajı ve sürdürülebilirlik bağlantılı müşteri sadakati üzerindeki etkilerini incelemektedir. Ayrıca çalışma kapsamında restoran türünün (THR ve HHR); sürdürülebilir restoran uygulamaları, yeşil marka imajı ve sürdürülebilirlik bağlantılı müşteri sadakati arasındaki ilişkiler üzerindeki moderatör rolü de incelenmiştir. Çalışmada kullanılan veriler, çevrim içi anket yöntemi ile toplanmıştır. Sürdürülebilir restoran uygulamaları; (1) gıda odaklı sürdürülebilirlik uygulamaları, (2) atık azaltma uygulamaları, (3) su ve enerji verimliliği uygulamaları ve (4) yönetim odaklı sürdürülebilirlik uygulamaları olmak üzere dört boyutta ölçülmüştür. Türk restoran müşterileri arasından kolay ulaşılabilir örnekleme yöntemi ile toplanan 656 anketin içerisinden 623 kullanılabilir anket (316 THR müşterisi ve 307 HHR müşterisi) analiz edilmiştir. Verilerin analizinde, kısmi en küçük kareler yapısal eşitlik modellemesi (PLS-SEM) kullanılmıştır. Araştırma sonuçları hem THR hem de HHR müşterileri için, gıda odaklı ve yönetim odaklı sürdürülebilirlik uygulamalarının, yeşil marka imajını olumlu yönde etkilediğini göstermektedir. Ayrıca THR müşterileri için gıda odaklı, yönetim odaklı sürdürülebilirlik uygulamaları ile atık azaltma uygulamalarının sürdürülebilirlik bağlantılı müşteri sadakatini olumlu yönde etkilediği tespit edilmiştir. Öte yandan, THR müşterileri için su ve enerji verimliliği uygulamaları ile yönetim odaklı sürdürülebilirlik uygulamaları, sürdürülebilirlik bağlantılı müşteri sadakatini olumlu yönde etkilemektedir. Çalışma kapsamında restoran türünün moderatör rolüne ilişkin

iki önemli sonuca ulaşılmıştır. Buna göre, atık azaltma uygulamalarının sürdürülebilirlik bağlantılı müşteri sadakati üzerindeki etkisi THR müşteri ile daha güçlü bulunurken, su ve enerji verimliliği uygulamalarının sürdürülebilirlik bağlantılı müşteri sadakati üzerindeki pozitif etkisi ise HHR müşterileri için daha güçlü bulunmuştur.

ACKNOWLEDGMENTS

I would like to express my deepest gratitude to my thesis advisor, Assoc. Prof. Ahmet Uşaklı for his continuous support, constructive feedback, and guidance throughout the thesis process.

I also would like to thank all my professors at Boğaziçi University, Prof. Bengi Ertuna, Prof. Maria Dolores Alvarez, Prof. Kıvanç İnelmen, Prof. Sevil Acar Aytekin, Assoc. Prof. Evinç Doğan, and Assist. Prof. Duygu Salman Öztürk as well as my thesis advisor Assoc. Prof. Ahmet Uşaklı, for their great passion and skill in teaching and for providing a valuable learning experience for me.

Finally, I would like to thank my family for their continuous support and encouragement throughout all the stages of this research and writing process.

TABLE OF CONTENTS

CHAPTER 1: INTRODUCTION 1

1.1 Research background 1

1.2 Problem statement 4

CHAPTER 2: LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT ... 6

2.1 Sustainable restaurant practices 6

2.2 Green brand image 18

2.3 Sustainability-related diner loyalty 21

2.4 Hypotheses and model development 24

CHAPTER 3: METHODOLOGY 29

3.1 Research instrument 29

3.2 Sample and data collection 31

3.3 Analysis of data 32

CHAPTER 4: RESULTS 34

4.1 Respondent profile 34

4.2 Assessment of Outer (Measurement) Model 35

4.3 Assessment of Inner (Structural) Model 39

4.4 Multi-group analysis 45

CHAPTER 5: CONCLUSION 49

5.1 Discussions 49

5.2 Theoretical implications 51

5.3 Practical implications 55

5.4 Limitations and recommendations for future research 56

APPENDIX A: QUESTIONNAIRE IN ENGLISH 588

APPENDIX B: QUESTIONNAIRE IN TURKISH 61

APPENDIX C: ETHICS COMMITTEE APPROVAL 64

REFERENCES..... 65

LIST OF TABLES

Table 1. Demographic Profile of the Respondents 34

Table 2. Dining Characteristics of the Respondents 35

Table 3. Assessment of the Measurement Model 37

Table 4. Discriminant Validity for the FSR Sample ($HTMT_{0.85}$ Criterion) 39

Table 5. Discriminant Validity for the QSR Sample ($HTMT_{0.85}$ Criterion) 39

Table 6. Structural Model Results 44

Table 7. Measurement Invariance Testing Using Permutation 47

Table 8. Multi-Group Analysis 48

Table 9. The Results of the Study 50

Table 10. The Moderating Role of Restaurant Type 50

ABBREVIATIONS

FSR: Full-service restaurant

QSR: Quick-service restaurant

FfSP: Food-focused sustainability practices

WRP: Waste-reduction practices

WEEP: Water- and energy-efficiency practices

AfSP: Administration-focused sustainability practices

GBI: Green brand image

LOY: Sustainability-related diner loyalty

CHAPTER 1

INTRODUCTION

1.1 Research background

Sustainability is one of the most conjecturally argued terms of current times. Several definitions have been proposed throughout the literature over the years. Fundamentally, sustainability is based on adhering to environmental principles, but subsequent definitions propose a broader perspective that also incorporates social and economic dimensions to meet human needs in a reasonable manner. It is generally regarded as a solution to problems facing societies, economies and the environment by intergovernmental organizations, policymakers, and academics (Jones et al., 2016). In the business sense, as sustainability practices have expanded, it has become imperative for companies to promote the triple bottom line-approach; therefore economic, social, and environmental dimensions of sustainability were embedded into the business strategies and practices (Han and Hyun, 2018).

There are several views regarding the earliest mention of sustainable tourism in academic literature. One of the earliest studies dates to the 1970s. More specifically, Jost Krippendorf wrote about the negative impacts of tourism and suggested alternatives in his book titled “Landscape Eaters” (1975). In the tourism literature, a paper published by Jones (1987) is considered by some to be one of the first studies to mention sustainable tourism (Ninerola et al., 2019), and others take sustainable tourism’s first appearance to be in the *Journal of Sustainable Tourism* (1993), where several articles and a book review were published on the subject (Weaver 2006: 10; Hunter C. 2002:3; Dodds and Butler, 2009: 43)

The initial work on sustainability practices within the tourism industry focused on accommodation establishments. Despite the hotel industry's slow adoption of sustainability practices (Jones et al., 2016; Trang, Lee, and Han, 2019), this growing trend and increased consumer awareness encouraged hotel companies to apply such standards and change their practices to align with sustainability principles. Furthermore, the sustainability practices of hotels have become an important factor that influences consumer behavior in different forms, such as satisfaction, loyalty, and decision-making processes (Olya et al., 2020). As a result, a significant number of studies focused on investigating consumer perceptions and attitudes regarding sustainability practices utilized in hotel environments (e.g., Berezan et al., 2013; Chen, 2015; Kang et al., 2012; Ponnapureddy et al., 2017; Prud'homme and Raymond, 2013).

The foodservice industry, however, has received comparatively less attention (Line, Hanks, Zhang, 2016). Restaurant establishments produce patently negative effects on the natural environment due to unsustainable practices such as waste creation from food and other recyclable items, air pollution caused by cooking operations, the extreme use of natural resources, and the use of harmful chemicals that put a great strain on the environment. (Schubert et al., 2010; Salzberg et al., 2019; Madanguli et al., 2020).

The demand for environmentally friendly products within the hospitality industry has increased over time (Jang et al., 2011). The interest of restaurant diners in sustainability practices and their increased concern about the environment have driven researchers to investigate the diner approach and the effects of sustainable restaurant practices on diner behavior. As more people recognize the seriousness of the environmental damage wrought by restaurants, diner behavior started to gravitate

towards environmentally conscious products and services. Research suggests that restaurant patrons are becoming more conscious over time and willing to pay more for sustainability practices and services applied at the restaurants (Dewald et al., 2014; Han et al., 2009; DiPietro et al., 2013; Susskind, 2014).

Restaurants that recognize the importance of sustainability practices, started to allocate a specific budget for these practices within the establishments (Jang et al., 2015). Among those practices, the most common are installing energy and water-efficient equipment and offering sustainably grown local and organic food products (Bonn et al., 2016). Yet restaurants often struggle to communicate such practices with diners, whereas in a hotel setting, it is simpler to disclose them to the guests through the communication materials placed in hotel rooms (DiPietro & Gregory, 2013). Consequently, it is imperative that restaurants report their sustainability practices and any green certifications that they have acquired to their diners (Schubert et al., 2010). Establishing such a relationship between the sustainable restaurant and its diners lies in marketing efforts and effective communication. By creating visibility about sustainability practices, restaurants can develop a green brand image and increase sustainability-related diner loyalty.

Extant research reveals that diner behavior is influenced by sustainable practices implemented at restaurants (e.g., Kim & Hall, 2020; DiPietro et al., 2013; Jeong & Jang, 2010). However, in their comprehensive review study, Arun et al. (2021) identified that most previous studies about sustainable restaurant practices focused mainly on a single type of restaurant. Hence, comparative studies focusing on the issue from the perspective of different types of restaurants remains largely unexplored. Therefore, this study aims to provide a comparative understanding between two major types of restaurants (i.e., full-service restaurants vs. quick-service

restaurants) on sustainable restaurant practices and its effects on green brand image and sustainability-related diner loyalty. Additionally, the present study examines whether the restaurant type (full-service vs. quick service) moderates the effects of sustainable restaurant practices on green brand image and sustainability-related diner loyalty.

1.2 Problem statement

The current study seeks to address the following research gaps and extend the previous research on tourism in two important ways.

First, the previous research on sustainability practices in the restaurant industry focused on a limited number of sustainability dimensions. To name a few: Baldwin et al. (2011) investigated reducing the environmental footprint in food-related operations within the restaurant environment; Hu et al. (2013) focused on carbon reduction and energy conservation; Tehrani et al. (2020) investigated waste management; several research studied the reduction of food waste in restaurants (Lins et al., 2021; Papargyropoulou et al., 2019; Pirani & Arafat, 2016); a study by Kim & Hall (2020) proposed a research model that focused on two dimensions, namely food-focused sustainability practices and waste-reduction practices; and research by Kwok et al. (2016) included food-focused sustainability practices, environment-focused sustainability practices and administration-focused sustainability practices in their conceptual model.

Therefore, the present study fills this gap by extending the dimensions of the sustainable business practices adopted by the restaurant industry, focusing on sustainable restaurant practices in four key areas: 1) food-focused sustainability practices, 2) waste-reduction practices, 3) water- and energy-efficiency practices and

4) administration-focused sustainability practices. By concentrating on these areas, this study investigates diners' perceptions about the sustainable business practices that are utilized in restaurants. It also measures diners' perceptions and attitudes about green brand image, and their loyalty to these restaurants.

Second, most of the previous research focused on a single type of restaurant when investigating sustainable business practices, indicating that a comparative understanding across different types of restaurants remains largely unknown (e.g., Ryu et al., 2008; DiPietro et al., 2013; Wang, 2012; Jeong et al., 2014). Only an extremely limited number of studies compared different restaurant types while discussing the sustainability practices utilized (e.g., DiPietro and Gregory, 2013, Namkung and Jang, 2017). It is important to acknowledge that studying different restaurant types can allow researchers and restaurant professionals alike to determine strategies more suitable for the type of restaurant and the diner base (DiPietro et al., 2013). Unlike much of the past research, this study fills this gap by providing a comparison between full-service and quick-service restaurants and testing the moderating effect of the restaurant type (i.e., full-service vs. quick-service restaurants) on the relationships between sustainable restaurant practices, green brand image, and sustainability-related diner loyalty. In other words, it investigates whether the effects of sustainable restaurant practices on green brand image and sustainability-related diner loyalty are different between full-service and quick-service restaurants.

CHAPTER 2

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Today, sustainability studies about all areas of the hospitality industry including restaurants are growing. Society at large and specifically restaurant diners are becoming more aware of the environmental damage created by the restaurant industry, and there are preceding studies that investigate this subject in academia around the world.

Managing the restaurant industry in how it applies sustainable restaurant practices is the initial step in providing the commitment to environmental issues and adopting relevant policies. This should be followed by introducing these policies to the staff and to diners, which would eventually help improve the environmental performance of the restaurant industry (Cantele & Cassia, 2020) and create a green brand image.

2.1 Sustainable restaurant practices

The restaurant industry and restaurant facilities negatively affect the environment through the overuse of natural resources such as water, electricity, gas, improper disposal of products and packaging, as well as the use of non-recyclable products and harmful chemicals, all of which contributes to carbon emission because they are delivered on a daily basis from suppliers (Baldwin et al., 2011; Schubert et al., 2010). Restaurants account for almost 30% of global greenhouse gas (GHG) emissions (Baldwin et al., 2011; Cavagnaro & Gehrels, 2009; Ranke et al., 2014), followed by considerable contribution to the world's food waste (Amato & Musella, 2017).

Through these standard restaurant operations, it becomes evident that restaurants play an important role in environmental degradation.

To reverse this environmental disruption, it is imperative for restaurants to change their business operations and become more sustainable. Sustainable restaurants have many varied definitions in the literature. Sometimes referred to as green, ecological, or environmentally friendly, these are establishments that minimize their negative impacts on the environment by implementing practices that reduce the lesser strain on the environment. (Myung et al., 2012; Kim and Hall, 2020). Jang et al. (2011) defines green restaurants as "a type of restaurant that offers a selection of green food menu items that use locally grown or organic certified food, as well as one that implements green practices such as recycling program, efficient use of energy and water and reduction of solid waste" (p. 308).

The definition in the previous paragraph can be illustrated by the sustainability practices implemented in Starbucks stores, such as using recyclable take-out containers, water-efficient equipment, and energy efficient lighting (Jeong et al., 2014). In Cantele & Cassia's study, (2020), interviews done with restaurant owners show examples of sustainability practices including using LED lightbulbs, reducing waste by offering doggy bags for uneaten portions of food, using local and seasonal products, offering menus for different dietary needs, and training employees to be more health and safety conscious in food preparation, which illustrates that these practices are not only cost efficient for restaurants but can also create positive relationship between diners and employees.

Sustainable business practices in restaurants mostly focus on using water- and energy-efficient equipment, purchasing locally grown or organic food products, limiting the use of disposable materials, implementing proper recycling procedures,

and training the employees on sustainability practices (Dutta et al., 2008; Schubert et al., 2010).

Some scholars categorize sustainable restaurant practices into two groups: non-food related (environmentally focused) practices and food-related (food-focused) practices (Filimonaou & De Coteau's, 2019; Jeong et al., 2014; Jang et al., 2016). To be specific, food-related sustainability practices include incorporating locally grown, organic food items without the use of pesticides and chemical fertilizers along with sustainably grown produce, meat, and seafood products; and reducing the amount of food waste (Sanchez-Franco et al., 2009; Jeong & Jang, 2010; Chou et al., 2012; Wang, 2012; Jeong et al., 2014; Namkung & Jang, 2017; Kim & Hall, 2020; Green Restaurant Association, 2022). Composting to help in soil improvement, taking leftover foods home after dining out (Talwar et al., 2021), and creating a circularity of wasted food to decrease the amount wasted in the preparation stages (Sehnem et al., 2022) have been introduced in the literature as policies that can be implemented by restaurants to reduce food waste.

On the other hand, non-food related sustainability practices include recycling serving ware and packaging such as glass, metal, paper, and plastic supplies. Using biodegradable or recyclable packaging for take-out food can help reduce plastic waste. Implementing water- and energy-saving equipment, especially in the kitchens and bathrooms; and using energy-efficient lighting and water-efficient spray valves can help minimize water usage and save energy also can reduce negative environment impacts and be cost-effective. Lastly, using environmentally friendly cleaning supplies such as non-toxic chemicals to clean the restaurant, dishes and linens reduces the negative impact created by chemicals (Sanchez-Franco et al.,

2009; Jeong & Jang, 2010; Chou et al., 2012; Wang, 2012; Jeong et al., 2014; Namkung & Jang, 2017; Kim & Hall, 2020; Green Restaurant Association, 2022).

Although most studies in the literature focus on the environmental aspects of restaurant practices (Higgins-Desbiolles et al., 2017), restaurant associations and organizations also incorporate the economic and social aspects of sustainability. These include the use of fair-trade products, eco-friendly furnishings and green designs of buildings and space, livable income and decent labor relations, and interaction with the local community (Hall & Gössling, 2013; Wang et al., 2013). In other words, making restaurants' services more sustainable does not only reduce their negative environmental impacts but also helps restaurants to gain diners' trust (Sanchez-Franco et al., 2009; Green Restaurant Association, 2022).

Negative environmental and social implications created through the hospitality industry continues to be a concern for society. Therefore, the demand for environmentally friendly hospitality products and services have increased considerably in the past decade (Jang et al., 2011) and is reflected in diners' behavior regarding their decisions about choosing hospitality establishments (Dewald et al., 2014).

The increased environmental concern of consumers and the general restaurant practices that damage the environment have driven researchers to investigate the diner approach and the effects of sustainable restaurant practices on diner behavior. As more diners recognize the seriousness of the environmental damage caused by restaurants, their purchasing behaviors started to gravitate towards environmentally conscious products and services. To comply with the growing expectations of diners, the restaurant industry started to adjust their services and products within their establishments by adopting sustainable business practices that reduce their damage to

the environment, contribute to their economy, and behave in a socially conscious way (Wang, 2012). For example, menu items started to shape consumers' choices when dining out. To comply with diners' requests and expectations, menus are designed within the framework of sustainability practices (Filimonau and Krivcova, 2017).

Schubert et al. (2010) suggest that the most important sustainable practices perceived by diners were: reducing energy and waste, using recyclable or biodegradable materials, and serving locally grown produce, which translated into higher quality food. Furthermore, Neff et al. (2015) reveal various diner suggestions to reduce food waste and the negative impact on the environment, such as donating excessive foods and serving smaller portions.

The increase in diner awareness has prompted the hospitality industry and particularly the restaurant industry to recognize the importance of sustainability (Jang et al., 2015) and to allocate a specific budget to develop sustainability practices within their establishments (Bonn et al., 2016). Among those practices, the most commonly visible ones are installing energy- and water-saving equipment, offering sustainably grown local and organic food products, reducing waste, and respecting labor rights (National Restaurant Association, 2022; Bonn et al., 2016; Higgins-Desbiolles et al., 2017)

Furthermore, since food establishments are deemed as one of the greatest users of energy, water, and other natural resources, generating waste, increasing their carbon footprints, and releasing harmful chemicals into the environment became a subject of interest for researchers around the world (Kim & Hall, 2020; DiPietro & Gregory, 2013). Sustainability practices embraced by food establishments can positively affect the environment and satisfy their environmentally conscious diners.

Because this study aims to measure the four key areas of sustainable business practices in restaurants (i.e., food-focused sustainability practices, waste-reduction practices, water- and energy-efficiency practices, and administration-focused sustainability practices), the following subsections discuss each of them in greater detail.

2.1.1 Food-focused sustainability practices

Food plays a key role as the product and service in a food establishment. Therefore, research on food sustainability and how to reduce food waste in the hospitality industry has grown substantially (Baldwin et al., 2011; Hu et al., 2013; Pirani & Arafat, 2016; Visschers & Siegrist, 2015). Food-related sustainability practices are also referred to as menu sustainability in the literature, which includes locally grown ingredients, organically labelled food items, and sustainably sourced fish, seafood, and meat, etc. In addition, food-focused sustainable practices in a restaurant also include principles such as limiting the use of chemicals like pesticides, antibiotics, hormones, and genetically modified genes in agricultural products (Jeong & Jang, 2010; Jang et al. 2011).

Menu-labelling practices that promote environmentally friendly and locally grown food are also considered an efficient way to reduce GHG emissions and to inform diners about sustainability practices within the restaurant, which also positively influences the diner satisfaction (Visschers & Siegrist, 2015).

The shorter transportation distances resulting from purchasing locally produced food facilitates energy efficiency, helps reduce GHG emissions and combat global warming (Schubert et al., 2010; Frash Jr., DiPietro, & Smith, 2015). According to research done by the National Restaurant Association (2022), 76% of

adults indicated that they are more inclined to visit a restaurant establishment that offers locally sourced foods. Therefore, owners and managers of restaurants are motivated to establish relationships with local farmers and strive to purchase locally grown ingredients, which also decreases the negative impacts of restaurants on the environment (Green & Dougherty, 2008). However, effective implementation of these strategies requires the restaurant owners and managers to carefully select their local suppliers, since locally produced food does not always translate into sustainably grown food. Choosing local producers who use environmentally friendly practices will benefit the restaurant as well as attract environmentally conscious diners. Sharing this information through communication channels such as social media, restaurant web sites or visual materials on site can be an effective way to promote the restaurant's sustainability practices to consumers (Shin et al., 2017). In other words, communicating this information to diners is as equally important as implementing such sustainability practices.

2.1.2 Waste-reduction practices

Dining out has grown in popularity in recent years, which contributes greatly to the increase of waste generated through the restaurant industry (Talwar et al., 2021). The disposal of edible food and waste generated in the food-production process and the environmental impact of non-recyclable and non-biodegradable products used in the restaurant industry contribute to waste creation, which has become the focus of governments and restaurants because of the tie between waste creation and carbon emissions (Pirani & Arafat, 2016). In 2018, it is estimated that approximately 643 million meals were thrown away in the United States (Cochran et al., 2018). The United Nations Environment Program's (2021) research found that 20% of total food

waste is generated by the food service industry worldwide, and about 40 billion units of plastic utensils end up in landfills and oceans every year (Tenenbaum, 2019). Therefore, it is important to understand what type of sustainability practices are being implemented by restaurants to decrease waste generation.

Effective waste-reduction practices in a restaurant start with adopting efficient recycling measures to decrease the amount of waste. Placing recycling bins in establishments will encourage both employees and diners to be more responsible. Glass, plastic, paper, metal, or aluminum materials can all be potentially recycled or turned into post-consumer products for re-usage. Using environmentally friendly packaging for take-out food can help reduce plastic waste (Jeong & Jang, 2010). Environmentally friendly packaging can be defined as a type of packaging that is made from recyclable or biodegradable materials and is safe for human consumption as well as for the environment (Wandosell et al., 2021). For example, a quick service restaurant chain called White Castle replaced their white paper sacks with 100% recycled brown paper sacks and recycles 1,200 pounds of plastic and thousands of pounds of metal each year (Schwartz, 2009).

Restaurants are one of the largest contributors of food waste in the hospitality industry, with waste being created in all stages of the food chain (Dhir et al., 2020). The motivation to decrease food waste is the result of increasing concerns about hunger, conserving the natural resources, the environmental and economic costs incurred, and the waste management industry's transition to become more sustainable following current trends (Westendorf, 2000). Food waste is a recognized global issue, with concerns related to public policy; therefore, it was included in the 17 sustainable development goals of United Nations, which promote sustainable production and consumption (Talwar et al., 2021).

The U.S. Environmental Protection Agency (2022) created a food waste recovery hierarchy as a guide to help treat food before it becomes waste. There are six steps: (1) decreasing the amount of food waste from the source; (2) food donation to charities and providing food for hungry people; (3) donating food to farms to feed the animals; (4) donating fats and food discards to be used for producing animal feed; (5) transforming food waste into nutrient-rich organic matter through composting; and (6) as a final option landfill or incineration (EPA, 2022).

Economically, almost 23% of the purchased value of food is lost due to waste, the majority of which occurs during preparation and as leftovers on diners' plates (Papargyropoulou et al., 2019). Kilibarda, et al. (2019) argue that if only 5% of the food waste was reduced, more than US$250 million would be saved (Kilibarda, et al., 2019). In addition to its negative impact on the environment, food waste in the hospitality industry also negatively affects profitability (Curtis & Slocum 2016).

Large portion sizes served at restaurants contribute to the problem of leftover food. To solve this problem, restaurants can offer to pack the unconsumed food in takeout containers for the diner to take home (Filimonaou & De Coteau, 2019).

Donation is another method that prevents edible food from becoming waste. To encourage more donation and charity activities, the United States has provided a tax-deduction system for the value of donated food. For instance, the Colorado Charitable Crop Donation Act allocated a 25% tax credit for businesses to donate food to food banks (Berardo et al., 2020). However, there are barriers to the donation process. Some restaurants are unwilling to take responsibility for the safety of their donated food, since they do not have full control over the chain of donation. They are also concerned that some hygiene-related incidents may harm their brands (Pirani &

Arafat, 2014). Having policies to protect restaurant owners regarding the safety of the donated food can help encourage them to support this movement.

Finally, a great portion of the food waste created by the restaurant industry can be reused for other purposes, such as in soil treatment, utilizing it as alternative energy sources, or transforming it into alternative food sources (Davies and Konisky, 2000).

2.1.3 Water- and energy-efficiency practices

Water and energy efficiency is one of the notable issues concerning restaurant establishments due to the high usage of water and electricity as part of its operations. Most of the energy in restaurant establishments is used in food preparation, including refrigeration, heating, ventilation, air conditioning, lighting, and cooking equipment (Baldwin et al., 2011). U.S. restaurants on average consume energy that translates to USD$161 dollars per seat in terms of the annual cost of electricity and gas (Stys, 2008). A study executed by the Florida Energy Extension Service and Miller (1994) found that restaurants in Florida are the most energy-consuming commercial buildings in the state, using 22 times more energy than an average family of four and about 40% more energy on air-conditioning, which results in a negative environmental impact of 30 billion pounds of CO_2 and 84 million pounds of SO_2 released into the air. Investing in energy-saving equipment in the kitchen and other parts of the restaurant, such as refrigerators or temperature control systems, using long lasting light bulbs or LED lights, and using motion sensors for lighting the infrequently used areas are all effective ways to be more energy efficient (Jeong & Jang, 2010).

White Castle is a good illustration of energy-efficiency practices. The quick-service restaurant chain used energy-efficient lighting in 55 of its stores and reduced electricity costs as well as 948 tons of carbon emission annually (Schwartz, 2009). It is estimated that changing to LED lighting will result in a 7% per-store reduction in energy use for the Starbucks chain (Jeong and Jang, 2010). Other quick-service restaurant chains (i.e., Arby's, Carl's Jr., Chipotle Mexican Grill, Subway) have also started building sustainable restaurants. This can be illustrated by Arby's and Chipotle having at least one LEED-certified restaurant, and Chipotle and Mexican Grill installing a wind-turbine in one of their restaurant locations to generate more than 7% of its energy needs (Hu et al., 2010).

With respect to water efficiency, large quantities of water are used in restaurant operations, especially in the kitchen, restrooms, landscape maintenance, ventilation equipment, and sprinklers (Salzberg et al., 2019; Hu et al., 2010). Using water-saving equipment such as dual flush toilets, waterless urinals, onsite water recycling sources to repurpose water for other uses (e.g., toilets), motion-sensor faucets in kitchen and bathrooms and serving water to diners only upon request can be effective ways to decrease usage (Salzbert et al., 2019; Jeong & Jang, 2010).

All these examples indicate that implementing sustainability practices are benefiting restaurants by cutting operational costs and decreasing their negative environmental impacts. Installing energy- and water-efficient equipment in the kitchens and dining areas can help the restaurants to be more cost-efficient and environmentally friendly.

2.1.4 Administration-focused sustainability practices

Administration-focused sustainability practices generally refer to any type of green certifications, corporate social responsibility (CSR), and training employees on sustainability practices. Over the years, several green certifications were implemented by various organizations around the world within the food service industry. Some examples include Leadership in Energy and Environmental Design (LEED) Certification, Green Seal Certification, and Green Restaurant Association Certifications (Kwok et al., 2016). Baldwin et al. (2011) state that restaurants that received the Green Seal standard certification significantly reduced their ecological footprints without increasing long-term costs.

A similar movement was initiated in 2017 in Turkey called Yeni Nesil Restorancılık (The Green Generation Restaurant - YNR), a collaboration of Boğaziçi University and the World Wildlife Fund (WWF). However, no further information was found regarding this certification in any related academic articles, proving that it did not have a long-lasting effect (Keseci, 2018).

Kwok et al. (2016) indicate that administration-focused practices include observable commitments to socially responsible environmental projects, training employees on sustainability practices and their implementation, and qualifying for and displaying one of the accredited green certification programs. It is important to note that administration-focused sustainability practices, especially backed-up with a green certification, work like an internal support mechanism and demonstrate a restaurant's commitment to sustainability practices where employees, managers and even owners receive training on sustainability practices. To provide effectiveness, these training programs should not only explain sustainable practices, but also incorporate the consequences for restaurants that generate negative impacts on the

environment such as water pollution, air pollution, contributions to carbon footprints and global warming, and accumulated waste through restaurant operations (Hu et al., 2010).

Given the fact that some administration-focused practices may not be observed by restaurant patrons, as they are not as visible as some other practices (e.g., food-focused sustainability practices), some administration-focused practices may not have affected the dining experience (Kim et al., 2015 Abbas & Hussein, 2017). Thus, such administration-focused practices should be actively promoted to increase diners' awareness. It should be noted that implementation of these sustainability practices not only results in a long-term financial gain but also helps restaurants gain a competitive advantage by creating a positive green brand image (DiPietro et al., 2013).

2.2 Green brand image

Brand image is important for companies because it directly affects customers' perception of the value of the company's brand. In other words, brand image is the mental image or impression of a brand perceived by the public (Jin et al., 2012; Nguyen & Leblanc, 2001). Within this image are the company's name, its products, services, culture and the communication chain between it and its stakeholders (Nguyen and Leblanc, 2001). Brand image also helps to differentiate businesses from their competitors. In the case of restaurants, brand image influences diners' perception regarding the restaurant, helping them evaluate its quality. However, restaurants contain both tangible and intangible attributes in terms of products and services. The intangible nature of restaurant services and diners' inability to assess the quality of the service experience prior to purchasing, makes brand image an even

more crucial concept for restaurant establishments. Diners mostly rely on the images of restaurants created by tangible attributes, such as the brand name or the type of establishment. Subsequently, brand image is a relevant and an important concept in the restaurant industry because it can influence diners to form subjective impressions that in turn influence restaurant visit intentions, diner satisfaction, and loyalty (Yi et al., 2018; Jin et al., 2012).

Green brand image can be defined as the perception of an organization based on its interactions with its stakeholders regarding environmental commitments and concerns (Wu et al., 2019). In other words, green brand image can be explained as the consumer's perspective on the environmental image of a company based on their commitment to protecting the environment through sustainability practices (Jeong et al, 2014). To measure green brand image, Chen (2009) suggests using five indicators: "1) the brand is regarded as the best benchmark of environmental commitments; 2) the brand is professional about environmental reputation; 3) the brand is successful about environmental performance; 4) the brand is well-established about environmental concern; and 5) the brand is trustworthy about environmental promises" (p.312).

When a restaurant engages in sustainability practices, the green brand image and the perceived quality positively influence the perceptions and attitudes of diners (Namkung & Jang, 2013). As a result, changing expectations of restaurant diners regarding environmentally focused practices urged restaurants to adopt sustainable products and services in their establishments. (Wang, 2012). Adopting sustainability practices also served as a business strategy for restaurants to differentiate themselves from competitors, helping them to become more attractive to diners and to increase prices while offering healthier products (Namkung & Jang, 2017).

Implementation of sustainability practices are considered tangible attributes of a restaurant, since diners can observe a restaurant's green brand image through green menu items, recycling bins in the establishments, recyclable takeout containers, and motion-detector lighting (Jeong & Jang, 2010). Adopting sustainability practices in restaurants and visible marketing of such efforts appear to influence diners' decisions when choosing a restaurant (Hu et al., 2010), especially when these practices create a trust in the brand and give diners a sense entitlement by being a part of the experience (Namkung & Jang, 2017).

It has been suggested that some factors influence diner perceptions of a restaurant's green brand image, such as the type of establishment, diner's age, education, health consciousness or personal sustainability practices (Kim & Hall 2020; Jeong et al., 2014; DPietro et al., 2013; Hu et al., 2010). For example, in the upscale restaurant segment, Namkung & Jang (2013) revealed that food-related sustainability practices (e.g., the use of locally grown or organic foods) were more efficient in influencing green brand image and diner's behavioral intentions than environmentally focused sustainability practices. The authors also found that environmentally focused sustainability practices (e.g., the use of motion-sensor lighting or compostable take-out containers) were found to be more effective in developing a positive green brand image in the casual restaurant segment.

Past research indicates that good corporate image helps companies to establish and maintain a loyal relationship with their customers (Andreassen and Lindestand, 1998; Nguyen and Leblanc, 2001; Robertson, 1993; Jeong and Jang, 2010). Therefore, pursuing sustainability practices and improving their green brand image and reputation in the eyes of the public becomes an important strategy for restaurants. Additionally, many business owners think that improved image can

eventually affect consumer perceptions, which in the long run will contribute to sustainability-related diner loyalty (Ryu, Han & Kim, 2008; Wang, 2012). Thus, restaurant establishments can benefit and receive great results from the connection between sustainability practices, green brand image and sustainability-related diner loyalty because diners rely on the strong green brand image of a restaurant when deciding (Namkung & Jang, 2013).

2.3 Sustainability-related diner loyalty

Oliver (2010) defines consumer loyalty as "a deeply held commitment to re-buy or patronize a preferred product or service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behavior" (p. 432). In the context of restaurants, diner loyalty can be explained as the positive attitude towards a restaurant, demonstrating intentions to visit or purchase again, recommending the restaurant to others, and spreading positive word-of-mouth (Kim & Hall, 2020; Jin, Lee & Huffman, 2012; Jeong & Jang, 2010). Especially among restaurant diners, a positive brand image encourages positive attitudes towards a restaurant, which translates to diner loyalty (Yi et al., 2018).

Research suggests that environmentally conscious diners, especially those who utilize green practices in their daily lives, are more likely to become loyal patrons of sustainable restaurants (Hu et al., 2010; Schubert et al., 2010). The relationship between a diner's level of knowledge regarding sustainability practices, personal green behavior, and willingness to buy green products and utilize sustainable services has been well researched in previous studies as an important motivation factor for patronizing sustainable restaurants (Hu et al., 2010; Jeong & Jang, 2010; Schubert et al., 2010; DiPietro et al., 2013; Kwok et al., 2016).

The demand for restaurants that participate in sustainability practices create a competitive advantage over non-sustainable restaurants therefore creating an increased diner loyalty that is sustainability related (Kassinis and Soteriou, 2003). However, most of the food-related sustainability practices take place in the kitchens and therefore are not visible to diners unless promoted by the restaurant. Despite spending time and money to implement sustainability practices within restaurants, many are inadequate in marketing their efforts (Kassinis and Soteriou, 2003; Dodds and Butler, 2009), resulting in diner unawareness. Therefore, it is imperative that restaurants market their sustainability practices and any green certifications that they acquired to their diners (Schubert et al., 2010). By creating visibility in terms of sustainability practices, restaurants can develop green brand image which in turn increases sustainability-related diner loyalty.

To improve diner's awareness regarding sustainability practices adopted by the restaurants, menu cards and displays around the restaurant or information cards can be utilized. For example, Starbucks uses counter card displays, websites and information printed on coffee cups to show its support for sustainability and to increase sustainability-related consumer loyalty (Hu et al., 2010). Therefore, marketing sustainability practices of a restaurant create awareness among diners (Choi et al., 2009; Dipietro et al.,2013) and can help build sustainability-related diner loyalty.

Past research argues that diner behavior, specifically sustainability-related diner loyalty, is evident in behaviors such as re-visit intentions, suggesting the restaurant to others, or willingness to pay more for products and services (Wu et al., 2019; Cakici et al., 2019; Jeong & Jang, 2010). More specifically, sustainability practices influence diners' preferences toward such restaurants and results in

elevated revisit intentions. In other words, environmentally concerned diners are more likely to revisit sustainable restaurants than their counterparts (Shin et al., 2017; Jeong & Jang, 2010). In addition, Kim, and Hall (2020) revealed that diners having received the pleasure and benefit of eating at a sustainable restaurant will likely become loyal diners by increasing their visits to such establishments.

Willingness to pay more at sustainable restaurants can, however, differ based on diner's personal behavior. Diners who tend to be concerned about their health and more responsive to environmental and social issues would be willing to pay more for sustainable foods and practices in restaurants (Jeong et al, 2011; Dutta et al., 2008). Vieregge et al. (2017) concluded in their research that 67% of respondents favored local products in their menu items, among which elder diners indicated that they would pay 10% more for local ingredients.

Dutta et al. (2008) focused on diners' sustainability practices by comparing results from two countries: India and the United States. Their results revealed that American diners were willing to pay up to 10% or higher for the menu items that indicated a higher degree of involvement in environmentally and socially responsible practices within restaurants. In comparison, Indian diners were concerned with health issues and were willing to pay more than 10% or higher for menu items. Hu et al. (2010) found that over half of the respondents indicated that they would be willing to pay 2%-6% more at sustainable restaurants, and approximately one-third were willing to pay 8%-12% more.

In addition, the type of restaurant may also play a role in determining willingness to pay more. In this regard, Schubert et al. (2010) demonstrated that most of the respondents in their survey indicated that they would be willing to pay more for sustainability practices in casual dining restaurants. On the other hand, DiPietro

et al. (2013) indicated that diners of quick-service restaurants were only willing to pay up to 1% or more, where the extra costs should be taken on by the restaurant company.

As a result, restaurant establishments that utilize sustainability practices and market these efforts to their diners help increase sustainability-related diner loyalty and attract new diners to their products and services (Perramon et al., 2014). Thus, creating a sustainable restaurant concept can help restaurant owners and managers attract an increased number of like-minded diners who will increase future sustainability-related diner loyalty.

2.4 Hypotheses and model development

The literature review on sustainable restaurant practices, green brand image, and sustainability-related diner loyalty led to the conceptual model used in this study (Figure 1). More specifically, this study proposes that sustainable business practices utilized by restaurants influence diners' perceptions of green brand image and their loyalty toward such restaurants.

As diners are becoming more sensitive towards environmental issues, implementing sustainability practices in restaurants enhances the green brand image, making it more marketable for diners (Hu, Parsa, Self, 2010). Previous research contributes greatly to depict this relationship between sustainability practices and a restaurant's green brand image. Chen (2008) asserts that sustainability practices positively affect green brand image. Similarly, Namkung and Jang (2013) indicate that diners' concerns regarding food and environmental sustainability have a positive effect on the restaurants' green brand image. Additionally, a more recent study by Jeong et al. (2014) indicates that diners' perceptions of sustainability practices

positively effect restaurants' green brand image. Following these previous studies, this study asserts that four dimensions of sustainable restaurant practices positively affect the green brand image of a restaurant. Therefore, the following hypothesis and sub-hypotheses are proposed:

H1: Sustainable restaurant practices positively influence green brand image.

H1a: Food-focused sustainability practices positively influence green brand image.

H1b: Waste-reduction practices positively influence green brand image.

H1c: Water- and energy-efficiency practices positively influence green brand image.

H1d: Administration-focused sustainability practices positively influence green brand image.

Namkung and Jang's research (2013) examining the effects and results of sustainability practices in the formation of green brand image indicated that such practices positively influence a restaurant's brand image and diners' behavioral intentions. Therefore, restaurants' adoption of sustainable practices not only contributes to a positive brand image but operating with sustainable practices also builds customer loyalty over time (Zhang et al., 2021; Jeong & Jang, 2010; Namkung & Jang, 2017, DiPietro et al., 2013). This discussion suggests the formation of the second hypothesis and its sub-hypotheses as follows:

H2: Sustainable restaurant practices positively influence sustainability-related diner loyalty.

H2a: Food-focused sustainability practices positively influence sustainability-related diner loyalty.

H2b: Waste-reduction practices positively influence sustainability-related diner loyalty.

H2c: Water- and energy-efficiency practices positively influence sustainability-related diner loyalty.

H2d: Administration-focused sustainability practices positively influence sustainability-related diner loyalty.

Sustainable restaurant practices are an important criterion when selecting a restaurant. Restaurants that establish environmentally friendly practices acquire a green brand image and thereby attract diners and enhance diner satisfaction (Hu et al., 2010; Manaktola and Jauhari, 2007, Kim and Hall, 2020). Restaurant brands that utilize sustainability practices can engage diners' attention and create customer satisfaction through their green image (Manaktola and Jauhari, 2007). Following these discussions and as an extension of the first and second hypotheses, a further investigation is needed to understand the relationship between green restaurant brand image and sustainability-related diner loyalty. Thus, the following hypothesis was developed:

H3: Green restaurant brand image positively influences sustainability-related diner loyalty.

Previous research by DiPietro & Gregory (2013) shows that diner willingness to revisit sustainable restaurants and to pay more at these restaurants differ based on the restaurant type. Additionally, in their comprehensive review, Arun et al. (2021) revealed that restaurant type serves as a moderating variable on the relationship between sustainable restaurant practices and the resulting diner behavior. In line with these discussions, this study proposes that restaurant type plays an important role in moderating the relationships between sustainable restaurant practices, green brand

image, and sustainability-related diner loyalty. Therefore, the following hypothesis and sub-hypothesis were developed:

H4: The restaurant type (full-service vs. quick-service) moderates the relationships between sustainable restaurant practices, green brand image, and sustainability-related diner loyalty.

H4a: The restaurant type (full-service vs. quick service) moderates the relationship between sustainable restaurant practices and green brand image.

H4b: The restaurant type (full-service vs. quick-service) moderates the relationship between sustainable restaurant practices and sustainability-related diner loyalty.

H4c: The restaurant type (full-service vs. quick-service) moderates the relationship between green brand image and sustainability-related diner loyalty.

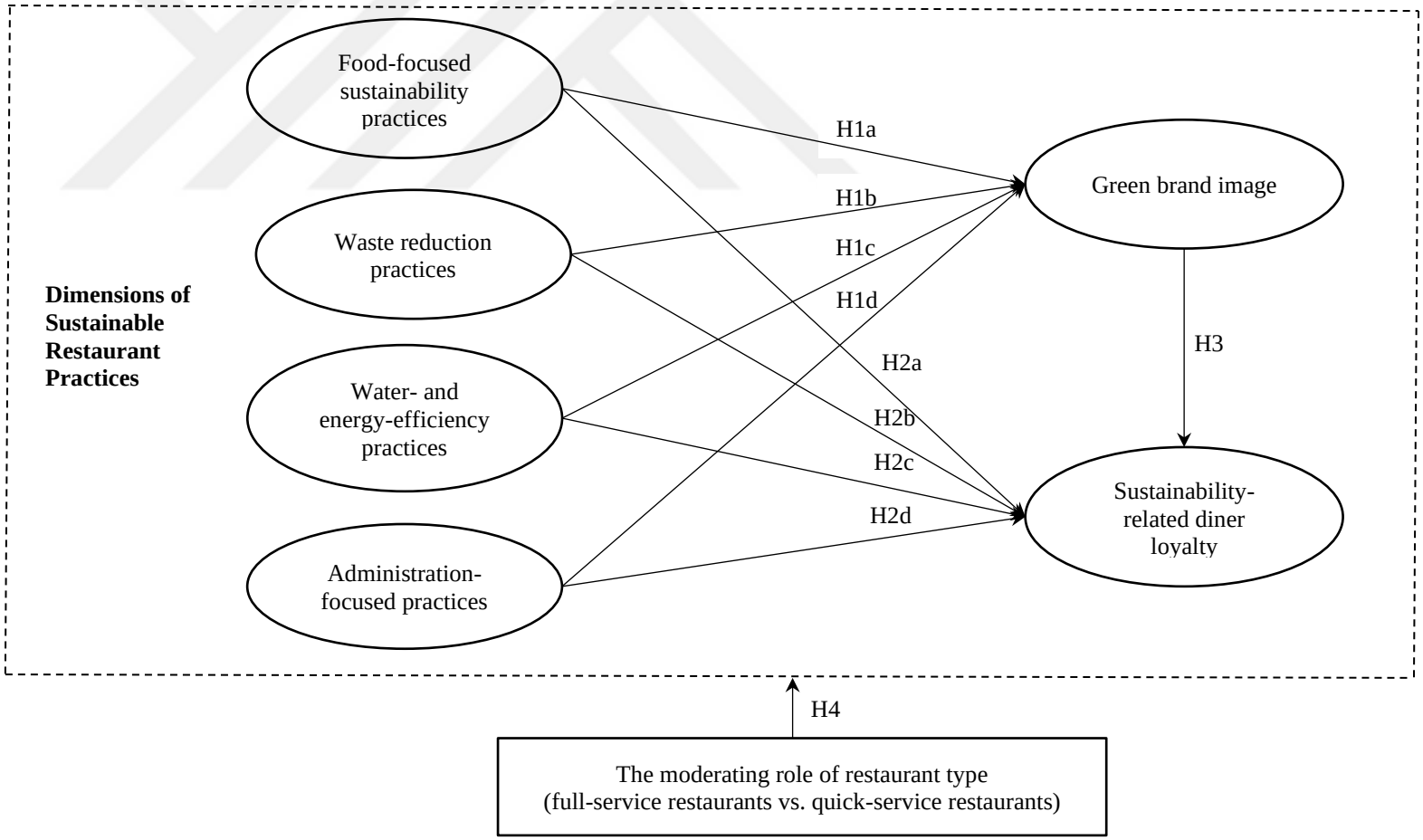


Figure 1. Conceptual model

CHAPTER 3

METHODOLOGY

3.1 Research instrument

The exogenous constructs in this study capture the four dimensions of sustainable restaurant practices, which were derived from the literature and are as follows: (1) food-focused sustainability practices, (2) waste-reduction practices, (3) water- and energy-efficiency practices, and (4) administration-focused sustainability practices. Within this context, a total of 23 items were adapted to measure these four dimensions. More specifically, seven items were used to measure the food-focused sustainability practices that were adapted from previous research (i.e. Kim & Hall, 2020; Kwok & Huang, 2019; Kwok et al., 2016; Perramon et al., 2014; Jeong & Jang, 2010), and another seven items were used to measure waste-reduction practices that were generated from previous studies (i.e. Kim & Hall, 2020; Kwok et al., 2016; Wang et al., 2013; Jeong & Jang, 2010). To measure water- and energy-efficiency practices, five items were derived from previous research (i.e., Kwok & Huang, 2019; Perramon et al., 2014; Wang et al., 2013). Finally, four items that focus on administration-focused sustainability practices were generated using previous research (Kwok and Huang, 2019; Kwok et. al, 2016; Alarcón and Cole, 2019; Asadullah et. al, 2021).

As shown in Figure 1, the endogenous constructs that are used in this study are green brand image and sustainability-related diner loyalty. To measure green brand image, four items were used that were adapted from Jeong et al. (2014): (1)

"this restaurant behaves in a socially conscious way," (2) "this restaurant is very susceptible to environmental issues," (3) "this restaurant is concerned about preserving the environment," and (4) "this restaurant is not only concerned about the profit but also concerned about the environment and other consumers." On the other hand, sustainability-related diner loyalty was measured using the following four key behavioral intentions derived from previous research (Zhang et al., 2021; Jeong & Jang, 2010; Namkung & Jang, 2017; Di Pietro et al., 2013): (1) intention to revisit the restaurant, (2) intention to recommend the restaurant, (3) saying positive things about the restaurant, and (4) willingness to spend more at the restaurant.

All items in this study were rated using a five-point Likert-type scale, ranging from "1=strongly disagree to 5=strongly agree". The restaurant type and some questions about dining characteristics (e.g., previous experience with the restaurant, purpose of dining out, average spending at the restaurant, and eating style) were asked. To provide additional background about the respondents, some demographic questions (e.g., gender, age, marital status, education, monthly income) were also asked.

To ensure the content validity of the sustainable restaurant practices, a series of expert interviews were conducted with three representatives from the restaurant industry (e.g., restaurant owners/managers). Based on these interviews, some minor revisions were made.

The questionnaire as can be seen in Appendix A was prepared in English and then translated into Turkish by the researcher as seen in Appendix B. The translated questionnaire was checked by a professor who is fluent in Turkish and English to reduce any errors in the translation process.

3.2 Sample and data collection

The data were collected using a convenience sample of Turkish restaurant diners aged 18 years and over, distributed with the cooperation of food influencers on social media platforms. Due to the COVID-19 pandemic and the measures taken by restaurant owners/operators (i.e., not allowing face-to-face data collection at restaurants), this study required respondents to answer the survey questions by recalling their most recent restaurant experience within the last month. To do this, a screening question was asked first, and respondents answered all the questions based on their most recent restaurant experience. To ensure confidentiality, the name of the restaurants were not asked. The data were collected between January 1st and June 30th, 2022. The questionnaires were self-completed by restaurant diners through an online platform (i.e., google forms). To ensure confidentiality, the respondents remained anonymous, and participation to this study was on voluntary basis. Each respondent was informed of the confidentiality, the subject, and the purpose of the study before completing the questionnaire.

Following the above-mentioned procedures, a total of 656 respondents were surveyed for this study. After screening the data, 33 questionnaires were removed due to outliers and unengaged responses. As a result, a total of 623 useable questionnaires (316 full-service restaurant customers and 307 quick-service restaurant customers) were used in the data analysis.

The adequacy of the sample size was determined based on statistical power analysis using G*Power software (Faul et al., 2009). The minimum sample size required for the proposed research model was calculated to be at least 138 respondents for each sample (with an anticipated effect size of 0.15, a desired statistical power level of 0.95, and a probability level of 0.05). It has been suggested

to double this number to have a more consistent model (Ringle et al., 2014), making a minimum sample size of 276 respondents for each sample of this research. Based on the results of G*Power analysis and Ringle et al.'s (2014) additional recommendation, it has been concluded that 316 full-service restaurant customers and 307 quick-service restaurant customers are acceptable sample sizes to analyze the proposed research model.

3.3 Analysis of data

To test the proposed research model, partial least squares structural modeling equation (PLS-SEM) was used, which has become progressively more popular not only in hospitality and tourism but also in other fields of social sciences thanks to its several advantages, such as the ability to operate with the non-normal distribution of data, small sample sizes, and complex models with multiple indicators (Usakli and Kucukergin, 2018). In this study, the primary reason for using PLS-SEM is the multivariate non-normal distribution of data. The multivariate normality was assessed using Mardia's (1970) multivariate skewness and kurtosis. The results revealed that the datasets for both full-service and quick-service samples violate the multivariate normality ($FSR_{\text{multivariate skewness}} = 5.87$, $p=0.000$; $FSR_{\text{multivariate kurtosis}} = 53.21$, $p=0.000$; $QSR_{\text{multivariate skewness}} = 5.86$, $p=0.000$; $QSR_{\text{multivariate kurtosis}} = 55.68$, $p=0.000$).

First, the outer model (measurement model) was assessed to ensure the reliability and the validity (both convergent and discriminant validity) of the constructs used. Then, the inner model (structural model) was assessed to test the first three hypotheses. Finally, to test the moderating effect of the restaurant type (full-service vs. quick-service restaurants) on the relationships between sustainable

restaurant practices, green brand image, and sustainability-related diner loyalty, two different methods of multi-group analysis (both Henseler's MGA and the permutation method) was performed.

CHAPTER 4

RESULTS

4.1 Respondent profile

A total of 316 full-service restaurant (FSR) customers and 307 quick-service restaurant (QSR) customers participated in this study. As shown in Table 1, most respondents were female both in the FSR sample (55.7%) and QSR sample (59.8%). While the mean age of respondents for FSR was 47.4 and 91.5% held a bachelor's degree or higher, the average age for QSR was 37.7 and only 69.7% of those respondents held a bachelor's degree or higher.

Table 1. Demographic Profile of the Respondents

Characteristics	Frequency		Percentage	
	FSR (n=316)	QSR (n=307)	FSR	QSR
Gender				
Female	189	171	59.8	55.7
Male	127	136	40.2	44.3
Age				
Mean (years)	47.4	37.7	–	–
Median (years)	45	36	–	–
Level of education				
High school or less	13	68	4.1	22.1
Associate degree (2-year college)	14	25	4.4	8.1
Bachelor's degree (4-year college)	187	155	59.2	50.5
Masters and/or PhD	102	59	32.3	19.2
Marital status				
Single	118	141	37.3	45.9
Married	173	147	54.8	47.9
Other	25	19	7.9	6.2
Individual monthly net income				
Less than TRY 3,000	40	65	12.7	21.2
TRY 3,000 – 5,999	50	71	15.8	23.1
TRY 6,000 – 8,999	54	79	17.1	25.7
TRY 6,000 – 8,999	56	59	17.7	19.2
TRY 12,000 or more	116	33	36.7	10.7

Note: TRY 14.83 = USD 1.00 (average exchange rate during the data collection period).

As can be seen in Table 2, analysis of the dining characteristics of the respondents revealed similar results. In both the FSR and QSR samples, most respondents were repeat guests (FSR=75.9% QSR=79.5%); therefore, it can be concluded that many of the guests is familiar with the restaurant and its practices. A large majority of respondents were found to be non-vegetarian (FSR=94.3% QSR=94.5%). Furthermore, the respondent's purpose for eating out was primarily for social gathering (FSR=52.5% QSR=55.4%). While almost half of the respondents (45.3%) in the FSR sample spent between 100-250 TL, more than half of the respondents (59.6%) in the QSR sample spent less than 100 TL.

Table 2. Dining Characteristics of the Respondents

Characteristics	Frequency		Percentage	
	FSR (n=316)	QSR (n=307)	FSR	QSR
First vs. repeat visit to the restaurant				
First visit	76	63	24.1	20.5
Repeat visit	240	244	75.9	79.5
Purpose of dining out				
Social gathering	166	170	52.5	55.4
Family gathering	100	70	31.6	22.8
Business meeting	8	44	2.5	14.3
Other	42	23	13.3	7.5
Average spending per person				
Less than TRY 100	83	183	26.3	59.6
TRY 100 – 250	143	123	45.3	40.1
More than TRY 250	90	1	28.5	0.3
Eating style				
Non-vegetarian	298	290	94.3	94.5
Vegetarian	17	15	5.4	4.9
Vegan	1	2	0.3	0.6

4.2 Assessment of Outer (Measurement) Model

As the first stage of PLS-SEM, the outer model was tested to assess the reliability and validity of the study constructs. The six constructs used in this study are food-focused sustainability practices (FfSP), waste-reduction practices (WRP), water- and

energy-efficiency practices (WEEP), administration-focused sustainability practices (AfSP), green brand image (GBI), and sustainability-related diner loyalty (LOY). Since all six were reflectively measured, the outer model was assessed by examining the four main criteria: indicator reliability, internal consistency, convergent validity, and discriminant validity (Usakli and Rasoolimanesh, 2023).

Table 3 shows the results of the measurement model assessment. Six items were removed due to low factor loadings (< 0.70). All other items for both the FSR sample and the QSR sample were above 0.70, meaning that indicator reliability was established. To establish internal consistency, the composite reliability (CR) should be higher than 0.70. The composite reliability scores ranged from 0.889 to 0.951 for the FSR sample and from 0.876 to 0.934 for the QSR sample, indicating that all constructs had strong internal consistency for both samples. Furthermore, average variance extracted (AVE) scores were examined to test the convergent validity. Since all AVE scores were above 0.50, convergent validity was established for both samples.

To evaluate the discriminant validity, heterotrait-monotrait (HTMT) ratio of correlations was used as it is a superior method over Fornell-Larker (1981) criterion (Henseler et al.,2015). Tables 4 and 5 demonstrate the results of the HTMT method. There are two suggested thresholds for the HTMT analysis (i.e., ≤ 0.85 and ≤ 0.90) where ≤ 0.85 represents a more conservative value. As can be seen in Tables 4 and 5, all HTMT correlations for both the FSR and QSR samples were below the more conservative threshold of $HTMT_{0.85.}$ Thus, discriminant validity was established for both samples.

Table 3. Assessment of the Measurement Model

Construct/Associated Items	Loading		CR		AVE	
	FSR	QSR	FSR	QSR	FSR	QSR
Food-focused sustainability practices (FfSP)			0.902	0.901	0.605	0.604
This restaurant has smaller size servings of meals.	0.772	0.774				
This restaurant mainly serves vegetable dishes.	0.764	0.764				
This restaurant uses menu labeling (e.g., calorie, nutritional information, or source of the ingredients).	0.724	0.733				
This restaurant primarily uses organic food/ingredients.	0.816	0.808				
This restaurant primarily uses locally grown food/ingredients.	0.807	0.799				
This restaurant uses sustainable meat and/or fish products. *	–	–				
This restaurant uses ecologically grown (no chemicals, artificial pesticides, or fertilizer usage) products.	0.781	0.783				
Waste reduction practices (WRP)			0.903	0.914	0.651	0.680
This restaurant uses recyclable materials (e.g., paper, wood)	0.867	0.859				
This restaurant uses strategies for reducing food waste.	0.859	0.831				
This restaurant uses durable items (e.g., glass and metal) rather than disposable items.	0.803	0.795				
This restaurant uses local food/ingredients to minimize food waste. *	–	–				
This restaurant donates leftover foods to food banks and/or animal shelters.	0.757	0.822				
This restaurant encourages customers to take away leftovers to minimize food waste. *	–	–				
This restaurant avoids over-packaging for take-away foods.	0.738	0.816				
Water- and energy-efficiency practices (WEEP)			0.951	0.934	0.828	0.781
This restaurant implements water-saving practices (i.e., dual flushes, motion detector faucets)	0.927	0.932				
To reduce bottle waste, this restaurant only serves water upon request, in pitchers. *	–	–				
This restaurant uses strategies for reducing water waste.	0.922	0.888				
This restaurant implements energy-saving practices (i.e., motion sensor electric lights in the toilet)	0.918	0.899				
This restaurant makes use of sunlight as natural lighting (i.e., having outside seating areas or using large windows in the dining room).	0.872	0.811				
Administration-focused sustainability practices (AfSP)			0.889	0.876	0.728	0.702
This restaurant demonstrates a commitment to socially responsible sustainable projects.	0.868	0.879				
This restaurant trains its employees in implementing sustainable practices. *	–	–				
This restaurant shows its commitment to sustainable practices by using visual materials.	0.861	0.817				
This restaurant offers gender balance among its employees.	0.831	0.816				

Green brand image (GRI)			0.898	0.890	0.746	0.729
This restaurant behaves in a socially conscious way. *	–	–				
This restaurant is very responsive to environmental issues.	0.907	0.902				
This restaurant is concerned about the preservation of the environment.	0.861	0.831				
This restaurant is not only concerned about the profit but also concerned about the environment and other consumers.	0.822	0.827				
Sustainability-related diner loyalty (LOY)			0.908	0.898	0.712	0.689
I would like to revisit this restaurant because of its environmentally friendly practices.	0.900	0.876				
I would recommend this restaurant to others because I think it is a sustainable restaurant.	0.852	0.876				
I have positive things to say about this restaurant because it conducts ecofriendly practices.	0.829	0.819				
I am willing to pay more to dine at this restaurant because of its sustainable practices.	0.791	0.744				

Notes: * Items are removed due to low factor loadings (<0.7)

All item loadings are significant at $p<0.001$

FRSs: Full-service restaurants; QSRs: Quick-service restaurants; CR: Composite reliability; AVE: Average variance extracted

Table 4. Discriminant Validity for the FSR Sample ($HTMT_{0.85}$ Criterion)

Constructs	FfSP	WRP	WEEP	AfSP	GBI	LOY
FfSP						
WRP	0.451					
WEEP	0.497	0.531				
AfSP	0.381	0.560	0.358			
GBI	0.515	0.402	0.383	0.503		
LOY	0.498	0.562	0.422	0.736	0.631	

Table 5. Discriminant Validity for the QSR Sample ($HTMT_{0.85}$ Criterion)

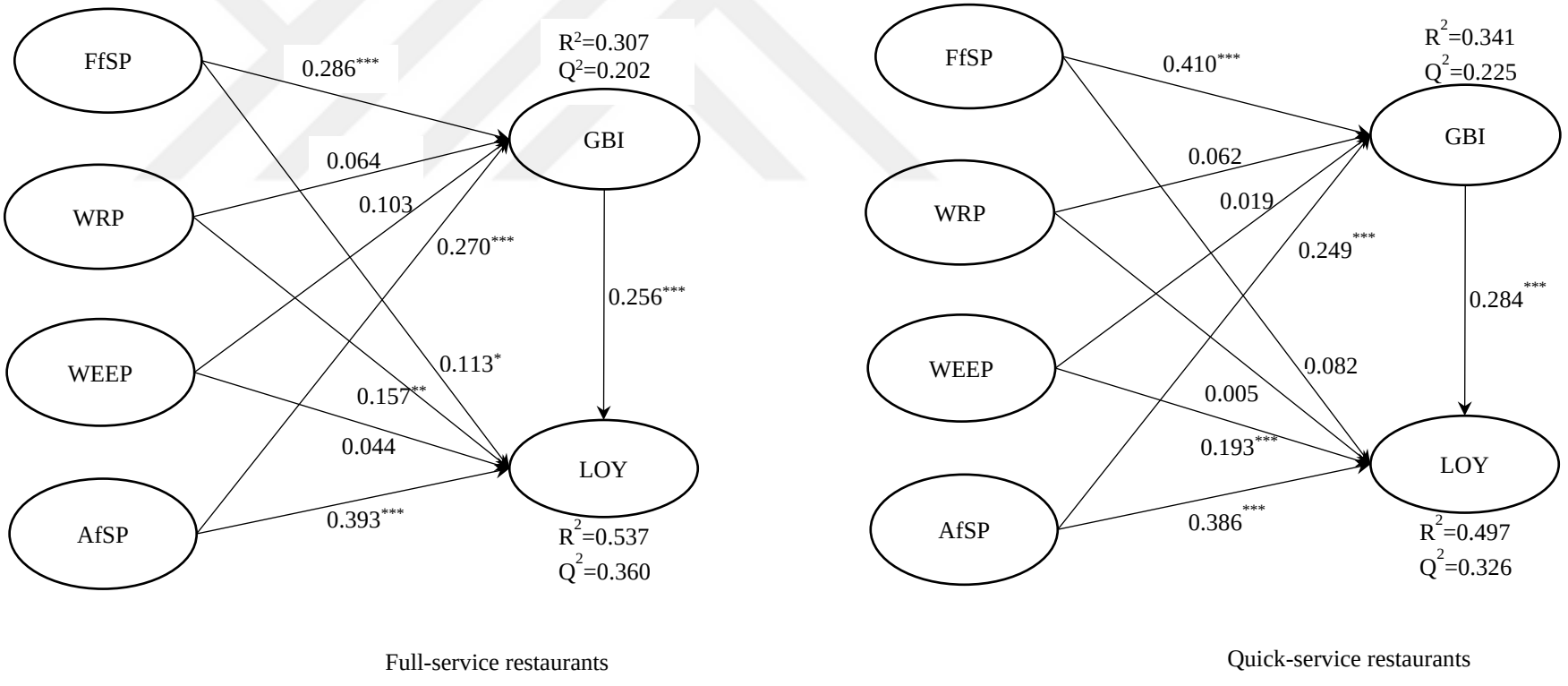
Constructs	FfSP	WRP	WEEP	AfSP	GBI	LOY
FfSP						
WRP	0.459					
WEEP	0.500	0.553				
AfSP	0.328	0.504	0.312			
GBI	0.592	0.377	0.328	0.462		
LOY	0.477	0.444	0.470	0.692	0.622	

4.3 Assessment of Inner (Structural) Model

The inner (structural) model was assessed after the reliability and the validity of the measurement model were established. Standard evaluation criteria for inner models include the examination of collinearity, explained variance (R^2), predictive relevance (Q^2), the significance of path coefficients, and effect sizes (Usakli & Kucukergin, 2018). When assessing the inner model, a bootstrapping procedure with 5,000 subsamples was used. The inner model results are presented in Figure 2 and Table 5.

First, the VIF values were examined to test the potential multicollinearity problem. It has been suggested that VIF scores should be less than 5, but ideally 3.3 or below (Hair et al., 2019). In the FSR sample, the VIF values ranged from 1.352 to 1.587 and in the QSR sample the VIF scores were between 1.256 and 1.626, therefore there is no multicollinearity problem. Next, the explained variance (R^2) of the endogenous constructs was examined. Even though R^2 largely depends on the area of research, the following criteria were used to evaluate the R^2 values: 0.75 (substantial), 0.50 (moderate), and 0.25 (weak) (Henseler et al., 2009). Figure 2

shows that R^2 value of green brand image was 0.307 in the FSR sample and 0.341 in the QSR sample, indicating a weak to moderate predictive accuracy for the model. On the other hand, R^2 value of sustainability-related diner loyalty was 0.537 in the FSR sample and 0.497 in the QSR sample, revealing a moderate predictive accuracy. In addition, Stone-Geisser's cross-validated redundancy was calculated to assess the predictive relevance (Q^2) of the structural model. The acceptable Q^2 values are: 0 (small), 0.25 (medium) and 0.50 (large) (Hair et al., 2019). Based on these values, it was found that green brand image both in the FSR sample (0.202) and the QSR sample (0.225) showed low to medium predictive relevance, whereas sustainability-related diner loyalty had medium predictive relevance (0.360 in the FSR sample and 0.326 in the QSR sample).



FfSP: Food-focused sustainability practices, WRP: waste-reduction practices, WEEP: Water- and energy-efficiency practices, AfSP: Administration-focused sustainability practices, GBI: Green brand image, LOY: Sustainability-related diner loyalty

*p<0.05, **p<0.01, ***p<0.001

Figure 2. Structural model

Table 6 demonstrates the significance of path coefficients for both the FSR and the QSR samples. The bias-corrected confidence intervals (Bc-CI) were also examined to provide detailed information on the stability of the path coefficients. In both the FSR and QSR samples, the results indicate that H1a and H1d were supported. More specifically, it was found that FfSP positively influence GBI for both the FSR sample (β=0.286, *t*=4.858, f^2=00.85) and for the QSR sample (β=0.410, *t*=7.387, f^2=0.186). Similarly, for both the FSR sample (β=0.270, t=4.648, f^2=0.078) and the QSR sample (β=0.249, t=4.246, f^2=0.075) AfSP positively influences GBI. On the other hand, H1b and H1c were not supported in both FSR and QSR samples because both WRP (FSR sample β=0.064, *t*=1.113; QSR sample β=0.062, t=1.092) and WEEP (FSR sample β= 0.103, *t*=1.654; QSR sample β= 0.019, t=0.309) had no effect on GBI.

The results revealed differences between the FSR and QSR samples in terms of H2 (i.e., the effects of sustainable business practices on sustainability-related diner loyalty). More specifically, the results indicate that H2a, H2b and H2d were supported for the FSR sample. In other words, FfSP (β=0.113, t=2.070, f^2=0.018), WRP (β=0.157, t=3.200, f^2=0.034) and AfSP (β=0.393, t=7.337, f^2=0.228) positively influence sustainability-related diner loyalty toward full-service restaurants. Nevertheless, WEEP (β=0.044, *t*=0.939) were found to have no effect on sustainability-related diner loyalty. On the other hand, in the QSR sample, it was found that WEEP (β=0.193, t=3.565, f^2=0.050) and AfSP (β=0.386, t=7.875, f^2=0.220) positively influence loyalty to sustainable restaurants, whereas FfSP and WRP had no effect on loyalty.

When the effect of GBI on LOY is examined, the results indicate that H3 was supported for both the FSR (β=0.256, t=5.265, f^2=0.098) and the QSR (β=0.284, t=5.184, f^2=0.106) samples.

Table 6. Structural Model Results

	Effect	Full-Service Restaurants						Quick-Service Restaurants					
		β	95% Bc CI	*t*	Supported	VIF	f^2	β	95% Bc CI	*t*	Supported	VIF	f^2
H1a	FfSP → GBI	0.286***	[0.168, 0.398]	4.858	Yes	1.393	0.085	0.410***	[0.292, 0.511]	7.387	Yes	1.371	0.186
H1b	WRP → GBI	0.064	[-0.056, 0.174]	1.113	No	1.581	0.004	0.062	[-0.058, 0.165]	1.092	No	1.584	0.004
H1c	WEEP → GBI	0.103	[-0.020, 0.222]	1.654	No	1.452	0.011	0.019	[-0.104, 0.139]	0.309	No	1.473	0.000
H1d	AfSP → GBI	0.270***	[0.155, 0.381]	4.648	Yes	1.352	0.078	0.249***	[0.131, 0.361]	4.246	Yes	1.256	0.075
H2a	FfSP → LOY	0.113*	[0.001, 0.214]	2.070	Yes	1.511	0.018	0.082	[-0.028, 0.288]	1.467	No	1.626	0.008
H2b	WRP → LOY	0.157**	[0.060, 0.255]	3.200	Yes	1.587	0.034	0.005	[-0.096, 0.105]	0.089	No	1.590	0.000
H2c	WEEP → LOY	0.044	[-0.051, 0.131]	0.939	No	1.468	0.003	0.193***	[0.086, 0.297]	3.565	Yes	1.473	0.050
H2d	AfSP → LOY	0.393***	[0.284, 0.494]	7.337	Yes	1.458	0.228	0.386***	[0.286, 0.481]	7.875	Yes	1.350	0.220
H3	GBI → LOY	0.256***	[0.164, 0.353]	5.265	Yes	1.443	0.098	0.284***	[0.180, 0.393]	5.184	Yes	1.518	0.106

Notes: *p<0.05, **p<0.01, ***p<0.001 Confidence intervals are bias corrected.

FfSP: Food-focused sustainability practices, WRP: waste-reduction practices, WEEP: Water- and energy-efficiency practices, AfSP: Administration-focused sustainability practices, GBI: Green brand image, LOY: Sustainability-related diner loyalty

4.4 Multi-group analysis

H4 deals with the moderating role of restaurant type on the relationships between sustainable restaurant practices, green brand image, and sustainability-related diner loyalty. Because the moderating role of restaurant type requires the comparison of two samples (i.e., FSR customers vs. QSR customers), measurement invariance must be established first. There are two types of measurement invariance, namely partial measurement invariance and full measurement invariance. As presented in Table 7, partial measurement invariance was established in this study. In other words, partial invariance exits across both samples.

Since partial measurement invariance was established, the two samples can be compared and thereby the moderating role of restaurant type can be tested. H4 proposes that restaurant type (FSR vs. QSR) moderates the relationships between sustainable restaurant practices, green brand image, and sustainability-related diner loyalty. To test this hypothesis, two different methods were used: Henseler's MGA (Henseler et al., 2009) and the permutation test (Chin and Dibbern, 2010). Table 8 shows the path coefficients for both samples and the results of multi-method MGA.

As given in Table 8, only two significant moderating effects of restaurant type were found with respect to the effects of sustainable restaurant practices on diner loyalty (H4b). First, the effect of WRP on LOY was found to be moderated by restaurant type. More specifically, the positive effect of WRP on LOY was found to be stronger ($\beta_{difference}$=0.153, $p<0.05$) for FSR customers (β=0.157) than QSR customers (β=0.005). Second, the effect of WEEP on LOY was also found to be moderated by restaurant type. An examination of path coefficients reveals that the positive effect of WEEP on LOY was found to be stronger ($\beta_{difference}$=0.149, $p<0.05$) for QSR customers (β=0.193) than FSR customers (β=0.044). In conclusion, these

two significant results indicate that while the effect of WRP on LOY is greater for FSR customers, the effect of WEEP on LOY is greater for QSR customers. However, no moderating effects of restaurant type were found with respect to the effects of FfSP and WRP on LOY. Therefore, H4b was partially supported.

Furthermore, the results do not support any significant differences between FSR and QSR customers with respect to the effects of sustainable restaurant practices on green brand image (H4a) and the effect of green brand image on sustainability-related diner loyalty (H4c). Thus, H4a and H4c were not supported.

Table 7. Measurement Invariance Testing Using Permutation

Constructs	Configural Invariance [a]	Compositional Invariance (Correlation =1)		Partial Measurement Invariance Established	Equal Mean Assessment			Equal Variance Assessment			Full Measurement Invariance Established
		C=1	Confidence Interval		Differences	Confidence Interval	Equal	Differences	Confidence Interval	Equal	
FfSP	Yes	1.000	[0.997, 1.000]	Yes	-0.165	[-0.155, 0.157]	No	0.030	[-0.241, 0.239]	Yes	No
WRP	Yes	0.998	[0.995, 1.000]	Yes	-0.109	[-0.161, 0.160]	Yes	0.067	[-0.228, 0.223]	Yes	Yes
WEEP	Yes	1.000	[0.999, 1.000]	Yes	-0.146	[-0.160, 0.152]	Yes	0.281	[-0.240, 0.240]	No	No
AfSP	Yes	1.000	[0.997, 1.000]	Yes	-0.018	[-0.155, 0.155]	Yes	0.103	[-0.219, 0.210]	Yes	Yes
GBI	Yes	1.000	[0.997, 1.000]	Yes	-0.108	[-0.159, 0.155]	Yes	0.153	[-0.242, 0.234]	Yes	Yes
LOY	Yes	1.000	[0.999, 1.000]	Yes	-0.070	[-0.155, 0.159]	Yes	0.092	[-0.338, 0.329]	Yes	Yes

[a] Configural invariance: Same algorithms for both FSRs and QSRs

Table 8. Multi-Group Analysis

	Effect	Path coefficient		Path coefficient difference	*p*-value for the difference		Supported
		FSR	QSR		Henseler's MGA	Permutation test	
H4a	FfSP → GBI	0.286***	0.410***	-0.124	0.129	0.126	No/No
	WRP → GBI	0.064	0.062	0.003	0.976	0.978	No/No
	WEEP → GBI	0.103	0.019	0.084	0.344	0.347	No/No
	AfSP → GBI	0.270***	0.249***	0.021	0.793	0.794	No/No
H4b	FfSP → LOY	0.113*	0.082	0.031	0.684	0.694	No/No
	WRP → LOY	0.157**	0.005	0.153*	0.036	0.034	Yes/Yes
	WEEP → LOY	0.044	0.193***	-0.149*	0.038	0.039	Yes/Yes
	AfSP → LOY	0.393***	0.386***	0.007	0.929	0.929	No/No
H4c	GBI → LOY	0.256	0.284	-0.028	0.690	0.697	No/No

*p<0.05, **p<0.01, ***p<0.001

CHAPTER 5

CONCLUSION

5.1 Discussions

This study examined the effects of sustainable restaurant practices (i.e., food-focused sustainability practices, waste-reduction practices, water- and energy-efficiency practices, and administration-focused sustainability practices) on green brand image and sustainability-related diner loyalty by providing a comparative analysis between two major types of restaurants [i.e., full-service restaurants (FSR) and quick-service restaurants (QSR)]. The present study also examined the moderating role of restaurant type (FSR vs. QSR) on the relationships between sustainable restaurant practices, green brand image, and sustainability-related diner loyalty. In line with this purpose, a conceptual model was developed and four hypotheses tested. The results of these hypotheses are summarized in Tables 9 and 10.

H1 proposed that sustainable restaurant practices positively influence green brand image. The results indicate that food-focused and administration-focused sustainability practices positively influence green brand image, whereas waste-reduction practices and water- and energy-efficiency practices did not influence green brand image both in full-service and quick-service restaurants. H2 focused on the effects of sustainable restaurant practices on sustainability-related diner loyalty. The results for this hypothesis demonstrate that food-focused sustainability practices, waste-reduction practices, and administration-focused sustainability practices positively influence sustainability-related diner loyalty for full-service restaurant customers. On the other hand, water- and energy-efficiency practices and

administration-focused sustainability practices positively influence sustainability-related diner loyalty for quick-service restaurant customers. H3 suggested that green brand image affects sustainability-related diner loyalty. This study found evidence that green restaurant brand image positively influences sustainability-related diner loyalty for both full-service and quick-service restaurant customers. Finally, H4 tested the moderating role of restaurant type (full-service vs. quick service restaurants) on the relationships between sustainable restaurant practices, green brand image, and sustainability-related diner loyalty. The results revealed only two significant moderating effects on the relationship between the two dimensions of sustainable restaurant practices (i.e. waste-reduction practices and water- and energy-efficiency practices) and sustainability-related diner loyalty.

Table 9. The Results of the Study

	Effects	Full-Service Restaurants	Quick-Service Restaurants
H1a	FfSP → GBI	Supported	Supported
H1b	WRP → GBI	Not supported	Not supported
H1c	WEEP → GBI	Not supported	Not supported
H1d	AfSP → GBI	Supported	Supported
H2a	FfSP → LOY	Supported	Not supported
H2b	WRP → LOY	Supported	Not supported
H2c	WEEP → LOY	Not supported	Supported
H2d	AfSP → LOY	Supported	Supported
H3	GBI → LOY	Supported	Supported

Table 10. The Moderating Role of Restaurant Type

	Effects	Moderating role (Full-service restaurants vs. Quick-service restaurants)
H4a	FfSP → GBI	No
	WRP → GBI	No
	WEEP → GBI	No
	AfSP → GBI	No
H4b	FfSP → LOY	No
	WRP → LOY	Yes (FSR > QSR)
	WEEP → LOY	Yes (QSR > FSR)
	AfSP → LOY	No
H4c	GBI → LOY	No

5.2 Theoretical implications

From a theoretical point of view, the current study provides several key contributions to the literature about sustainable business practices in restaurants and their effects on green brand image and sustainability-related diner loyalty.

First, this study extends the measurement spectrum of sustainable restaurant practices used in previous research. It is important to note that most of the previous studies either conceptualized sustainable restaurant practices as a unidimensional construct (e.g., DiPietro et al., 2013; Jeong et al., 2014) or used an extremely limited number of dimensions (such as focusing only on food-focused sustainability practices and/or waste-reduction practices) when measuring sustainable restaurant practices (e.g., Kim and Hall, 2020; Baldwin et al., 2011; Hu et al., 2013; Pirani and Arafat; 2016; Abbas & Hussein, 2017).

To fill this gap in the literature, the present study extends the scope of dimensions used to measure sustainable restaurant practices. To be specific, the present study validates four dimensions of sustainable business practices for restaurants, namely food-focused sustainability practices, waste-reduction practices, water- and energy-efficiency practices, and administration-focused sustainability practices. By measuring these four dimensions, the present study investigated the effects of sustainability practices on green restaurant brand image and sustainability-related diner loyalty.

Second, and most importantly, many of the previous studies focused on a single restaurant type or did not consider the restaurant type when investigating sustainable restaurant practices or their effects on diner behavior (Arun et al., 2021). Thus, indicating that a comparative understanding between different types of restaurants regarding sustainability practices remains largely unknown, as few

studies incorporated the restaurant type when examining sustainable restaurant practices (i.e., DiPietro and Gregory, 2013; Namkung and Jang, 2013). Unlike much of the previous research, the present study adopts a comparative investigation and examines sustainable restaurant practices and their effects on green brand image and sustainability-related diner loyalty between two major types of restaurants (i.e., full-service restaurants vs. quick-service restaurants). Accordingly, by investigating and analyzing different restaurant types, this study provides an opportunity to determine strategies for two major types of restaurants.

Third, the current study empirically examined the effects of four dimensions of sustainable restaurant practices on green brand image. In both the full-service and quick-service samples, the results indicate that food-focused sustainability practices and administration-focused sustainability practices positively influence green brand image (H1a and H1d supported). The positive effect of food-focused sustainability practices on green brand image revealed in this study is consistent with Namkung and Jang (2013), who found a similar effect in upscale and casual dining restaurants. Furthermore, the present study indicates that the effect size (relative impact) of food-focused sustainability practices on green brand image were found to be greater than administrative-focused sustainability practices in quick-service restaurants, whereas the effect sizes of both food-focused and administration-focused sustainability practices on green brand image were similar in full-service restaurants.
On the other hand, no effects of waste reduction and water- and energy-efficiency practices were found in both restaurant types (H1b and H1c not supported).

Fourth, in addition to the effects of sustainable restaurant practices on green brand image, the present study tested the direct effects of four dimensions of sustainable restaurant practices on sustainability-related diner loyalty. For full-

service restaurants, the results indicate that food-focused sustainability practices, waste-reduction practices and administration-focused sustainability practices positively affect sustainability-related diner loyalty (H2a, H2b, and H2d supported), while no effect of water- and energy-efficiency practices were found on sustainability-related diner loyalty (H2c not supported). On the other hand, for quick-service restaurants, the present study reveals the positive significant effects of only two sustainability dimensions (i.e., water- and energy-efficiency practices and administration-focused practices) on sustainability-related diner loyalty (H2c and H2d supported).

Fifth, drawing on the well-established relationship between brand image and loyalty in the consumer behavior literature, the present study examined the impact of green restaurant image on sustainability-related diner loyalty. Consistent with previous research (e.g., Jin et al., 2012, Wu et al., 2019), this study provides evidence that green brand image has a positive effect on sustainability-related diner loyalty both for full-service restaurants and additionally for quick-service restaurants (H3 supported).

Finally, the present study not only tested the effects of sustainable restaurant practices on green brand image and sustainability-related diner loyalty separately for full-service and quick-service restaurants but also tested whether the type of restaurant (i.e., full-service vs. quick-service) plays a moderating role on the relationships between sustainable restaurant practices, green brand image, and sustainability-related diner loyalty. In other words, the present study argues that the effects of sustainable restaurant practices on diner attitudes and behavior differ based on restaurant type.

This argument is also in line with the findings of Arun et al. (2021), who conducted a comprehensive review study on consumer adoption of green restaurants. Specifically, Arun et al. (2021) identified that restaurant type serves as a contextual factor in consumer's adoption of green restaurants and that there is a lack of research investigating the restaurant type as a moderator. Thus, this study explored the moderating role of restaurant type (full-service vs. quick service) on the relationships between sustainable restaurant practices, green brand image, and sustainability-related diner loyalty and revealed two significant results regarding the moderating effect of restaurant type on the relationship between sustainable restaurant practices and sustainability-related diner loyalty (H4b partially supported). First, the positive effect of waste-reduction practices on sustainability-related diner loyalty was found to be stronger for full-service restaurant customers than quick-service restaurant customers. Second, the positive effect of water- and energy-efficiency practices on sustainability-related diner loyalty was found to be stronger for quick-service restaurant customers than full-service restaurant customers. These two significant results indicate that while the effect of waste-reduction practices on sustainability-related diner loyalty is greater for full-service restaurant customers, the effect of water- and energy-efficiency practices on sustainability-related diner loyalty is greater for quick-service restaurant customers. It is worthy to note that previous studies (even the comparative ones, such as Namkung & Jang, 2013; DiPietro & Gregory, 2013) did not examine the moderating role of restaurant type. Therefore, this study extends the previous research and contributes to the literature in understanding how restaurant type moderates the effect of sustainability practices on sustainability-related diner loyalty.

5.3 Practical implications

This study provides several practical implications for restaurants in terms of developing strategies to improve green brand image and to increase sustainability-related diner loyalty through sustainable business practices. The results of this study indicate that food-focused sustainability practices and administration-focused sustainability practices positively influence green brand image in both full-service and quick-service restaurant segments. Therefore, to increase green brand image, restaurant owners and managers should invest more in practices that concentrate on food- and administrative-focused sustainability practices. For instance, restaurants could focus more on using local suppliers who practice sustainability, integrating ecologically grown, organic, and seasonal ingredients into their menus, identifying portion sizes that meet diner needs, and including nutritional information and source of the food products on their menus. As for administration-focused sustainability practices, training employees on restaurants' sustainability practices, applying for a green certification, contributing to environmentally and socially responsible projects, demonstrating gender equality among employees, and marketing their sustainability practices to their diners would also help increase the restaurants' green brand image.

The results also demonstrate that three dimensions of sustainable restaurant practices (i.e., food focused sustainability practices, waste-reduction practices, and administration focused sustainability practices) positively influence sustainability-related diner loyalty in full-service restaurants. This suggests that full-service restaurants should focus on reducing waste to increase sustainability-related diner loyalty, in addition to the above-mentioned food-focused and administration-focused sustainability practices. For instance, to reduce waste, full-service restaurants can implement business practices, such as purchasing locally grown ingredients, using

recyclable materials, training employees on food waste, donating left-over foods or encouraging guests to take away leftover foods. On the other hand, in quick-service restaurants it was found that water- and-energy efficiency practices and administration-focused sustainability practices positively influence sustainability-related diner loyalty. This indicates that quick-service restaurants should focus on water- and energy-efficiency practices to increase sustainability-related diner loyalty in addition to the above-mentioned administration-focused sustainability practices. This can be achieved by implementing practices, such as installing energy efficient lighting and equipment, using motion-sensor lighting, installing low flow and motion-sensor faucets, or eliminating kitchen equipment that utilizes high water consumption. Given that some restaurant sustainability practices, particularly kitchen-based ones, are invisible to diners, restaurants should introduce such practices in their marketing campaigns and thereby make them visible to diners to increase the sustainability-related diner loyalty (Schubert et al., 2010).

5.4 Limitations and recommendations for future research

This study has certain limitations that may provide some avenues for future research. First, due to the COVID-19 pandemic and the measures taken by restaurant owners/operators, this study used an online questionnaire and required respondents to answer the survey questions by recalling their most recent restaurant experience within the last month. To increase the validity of the results, future studies should collect data on-site, immediately after the dining experience. Second, it used a convenience sample of both full-service and quick-service restaurant customers in Turkey and is cross-sectional by design. To provide more generalizable results and to understand the effects of sustainable restaurant practices on diner behavior over a

longer period, future research should replicate this study by using a probability sampling method, collecting data in multiple countries/cultures, and adopting a longitudinal research design. Third, although the measurement scales used in this study included some items focusing on economic sustainability (e.g., using locally grown foods, some water- and energy-efficiency practices) and social sustainability (i.e., gender balance among employees, commitment to socially responsible projects), most items used to measure sustainable restaurant practices focused on environmental sustainability. This is also due to a lack of reliable and comprehensive scale to measure all three pillars of sustainability. Future studies might focus on developing a comprehensive scale considering all three pillars of sustainability when measuring sustainable restaurant practices.

Finally, future studies might also examine the moderating role of specific demographic characteristics (e.g., age, gender) on the relationship between sustainable restaurant practices and diner behavior. For instance, conflicting results were found with respect to age. While some scholars argue that younger people are more environmentally responsible (Kwok et al., 2016), others argue that older people are more sensitive about environmental issues (Moon, 2021). Additionally, the literature on sustainability suggests that an eco-gender gap exists, indicating that women are more environmentally conscious as compared to men (Brough et al., 2016; Galbreath, 2019). Based on these discussions, future studies are needed to gain insight into whether age and gender moderate the effects of sustainable restaurant practices on diner behavior.

APPENDIX A

QUESTIONNAIRE IN ENGLISH

This study is carried out within the scope of the master's thesis titled "The effects of sustainable restaurant practices on diner behavior" by Banu Özden, a student of Boğaziçi University Sustainable Tourism Management Department. The aim of this study is to obtain information about environmentally friendly and sustainable practices that can be observed by diners in food and beverage establishments, and to investigate the effects on the formation of green brand image and sustainability related diner loyalty to restaurants in the light of this information.

To assist us in this research, we request you to take less than 10 minutes of your time and answer the questionnaire, taking into account your experience in a food and beverage establishment that you have visited in the last month.

Screening Question
Have you recently dined at a food and beverage establishment?
_____ Yes
_____ No

If yes, please answer the following questions by recalling your most recent restaurant experience.

Dining Characteristics
Please specify the type of this restaurant.
_____ Fast-food restaurant
_____ Full-service restaurant

Is this your first visit to this restaurant?
_____ Yes
_____ No

What was the purpose of dining out at this establishment?
_____ Friend/social gathering
_____ Family gathering
_____ Business meeting
_____ Other (please specify) _____

How much did you spend at this establishment? (Per person)
_____ Less than 100 TL
_____ 100 – 250 TL
_____ More than 250 TL

Please indicate your eating style?
_____ Non-vegetarian
_____ Vegetarian
_____ Vegan

Sustainable Restaurant Practices

Please answer the following questions based on your most recent dining experience at this restaurant. Indicate your agreement or disagreement on the following statements using the scale below, where '1' means strongly disagree and '5' means strongly agree.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1	2	3	4	5

Food-focused sustainability practices (FfSP)

1. This restaurant has smaller size servings of meals.
2. This restaurant mainly serves vegetable dishes.
3. This restaurant uses menu labeling (e.g., calorie, nutritional information, or source of the ingredients).
4. This restaurant primarily uses organic food/ingredients.
5. This restaurant primarily uses locally grown food/ingredients.
6. This restaurant uses sustainable meat and/or fish products.
7. This restaurant uses ecologically grown (no chemicals, artificial pesticides, or fertilizer usage) products.

Waste-reduction practices (WRP)

1. This restaurant uses recyclable materials (e.g., paper, wood)
2. This restaurant uses strategies for reducing food waste.
3. This restaurant uses durable items (e.g., glass and metal) rather than disposable items.
4. This restaurant uses local food/ingredients to minimize food waste.
5. This restaurant donates leftover foods to food banks and/or animal shelters.
6. This restaurant encourages customers to take away leftovers to minimize food waste.
7. This restaurant avoids over-packaging for take-away foods.

Water- and energy-efficiency practices (WEEP)

1. This restaurant implements water-saving practices (i.e., dual flushes, motion detector faucets)
2. To reduce bottle waste, this restaurant only serves water upon request, in pitchers.
3. This restaurant uses strategies for reducing water waste.
4. This restaurant implements energy-saving practices (i.e., motion sensor electric lights in the toilet)
5. This restaurant makes use of sunlight as natural lighting (i.e., having outside seating areas or using large windows in the dining room).

Administration-focused sustainability practices (AfSP)

1. This restaurant demonstrates a commitment to socially responsible sustainable projects.
2. This restaurant trains its employees in implementing sustainable practices.
3. This restaurant shows its commitment to sustainable practices by using visual materials.
4. This restaurant offers gender balance among its employees.

Green brand image (GRI)

1. This restaurant behaves in a socially conscious way.
2. This restaurant is very responsive to environmental issues.
3. This restaurant is concerned about the preservation of the environment.
4. This restaurant is not only concerned about the profit but also concerned about the environment and other consumers.

Sustainability-related diner loyalty (LOY)

1. I would like to revisit this restaurant because of its environmentally friendly practices.
2. I would recommend this restaurant to others because I think it is a sustainable restaurant.
3. I have positive things to say about this restaurant because it conducts ecofriendly practices.
4. I am willing to pay more to dine at this restaurant because of its sustainable practices.

Demographic questions

Gender
_____ Male
_____ Female
_____ Non-binary

Age_____

Level of education
_____ High school or less
_____ University (2 years)
_____ University (4 years)
_____ Masters or PhD

Marital status
_____ Single
_____ Married
_____ Other

Individual monthly net income (TL)
_____ Less than 3000 TL
_____ 3000 - 6,000 TL
_____ 6,000 – 9,000 TL
_____ 9,000 – 12,000 TL
_____ Above 12,000 TL

APPENDIX B

QUESTIONNAIRE IN TURKISH

Bu çalışma, Boğaziçi Üniversitesi Sürdürülebilir Turizm Yönetimi Bölümü öğrencisi Banu Özden'in "Sürdürülebilir restoran uygulamalarının müşteri davranışları üzerindeki etkileri" başlıklı yüksek lisans tezi kapsamında yürütülmektedir. Bu çalışmanın amacı yiyecek-içecek işletmelerinde müşteriler tarafından gözlemlenebilen sürdürülebilir çevre dostu uygulamalar hakkında bilgi edinmek, bu bilgi ışığında restoranların yeşil marka imajının ve müşteri sadakatinin oluşmasındaki etkileri araştırmaktır.

Bu araştırmada bize yardımcı olmanız için sizden ricamız 10 dakikadan az zamanınızı ayırarak son bir ay içinde ziyaret etmiş olduğunuz yiyecek içecek işletmesindeki deneyiminizi göz önünde bulundurarak anketteki soruları cevaplamanız.

Eleme Sorusu
Son bir ay içinde bir yiyecek ve içecek işletmesinde yemek yediniz mi?
_____ Evet
_____ Hayır

Eğer cevabınız evet ise lütfen aşağıdaki soruları en son yemek yediğiniz yiyecek içecek işletmesindeki deneyiminize göre cevaplayın.

Yemek Deneyimi
Lütfen ne tür bir restoran olduğunu işaretleyiniz.
_____Hızlı servis veren yiyecek içecek işletmesi (fast-food/self-servis)
_____Tam hizmet veren yiyecek içecek işletmesi (yemeklerin servis personeli tarafından masalara servis edildiği)

Bu restorana ilk gidişiniz mi?
____ Evet
____ Hayır

Bu restoranda yemek yemenizin amacı neydi?
_____Arkadaşlarla yemek
_____Aile yemeği
_____İş toplantısı
_____Diğer (lütfen belirtin) _____

Gittiğiniz bu restoranda kişi başı ne kadar harcadınız?
_____100 TL'den az
_____100 – 250 TL arası
_____250 TL'den fazla

Yemek stilinizi en uygun ifade eden seçenek hangisidir?
_____Vejeteryan veya vegan değilim
_____Vejeteryanım
_____Veganım

Sürdürülebilir Restoran Uygulamaları
Lütfen aşağıdaki soruları, en son ziyaret ettiğiniz bu restorandaki deneyiminizi düşünerek, '1' kesinlikle katılmıyorum ve '5' kesinlikle katılıyorum anlamına gelen aşağıdaki ölçeği kullanarak aşağıdaki ifadelere katılıp katılmadığınızı belirtiniz.

Kesinlikle katılmıyorum	Katılmıyorum	Ne katılıyorum ne katılmıyorum	Katılıyorum	Kesinlikle katılıyorum
1	2	3	4	5

Gıda odaklı sürdürülebilirlik uygulamaları

1. Bu restorandaki yemek porsiyonları küçük boyutlardadır.
2. Bu restoranda genelde sebze ağırlıklı yemekler servis edilmektedir.
3. Bu restoranın menüsünde bilgi verici etiketleme kullanılmaktadır (örneğin, yemeğin kalorisi, besin değerleri veya ürünlerin kaynağı).
4. Bu restoran çoğunlukla organik ürünler kullanmaktadır.
5. Bu restoran çoğunlukla yerel olarak yetiştirilen ürünler kullanmaktadır.
6. Bu restoran sürdürülebilir et ve/veya balık ürünleri kullanmaktadır.
7. Bu restoranda ekolojik olarak yetiştirilen (kimyasal, suni gübre veya böcek ilacı içermeyen) ürünler kullanılmaktadır.

Atık azaltma uygulamaları

1. Bu restoran geri dönüştürülebilir malzemeler kullanmaktadır (örneğin, kağıt veya ahşap).
2. Bu restoran gıda atıklarını azaltmak için stratejiler geliştirmektedir.
3. Bu restoran, tek kullanımlık ürünler yerine, dayanıklı ürünler (örneğin, cam veya metal) kullanmaktadır.
4. Bu restoran yemek hazırlıklarında yerel ürünler kullanarak minimum gıda atığı üretmektedir.
5. Bu restoran gıda artıklarını gıda bankalarına ya da hayvan barınaklarına bağışlamaktadır.
6. Bu restoran atıkları azaltmak için müşterilerinin bitiremediği yemekleri paket yapmaları için teşvikte bulunmaktadır.
7. Bu restoran al-götür yemekler için fazla paketleme malzemeleri kullanmaktan kaçınmaktadır.

Su ve enerji verimliliği uygulamaları

1. Bu restoranda su tasarrufu sağlayan uygulamalar kullanılmaktadır (örneğin, çift sifon veya hareket sensörlü musluklar)
2. Şişe israfını azaltmak için bu restoranda sadece istek üzerine sürahilerde su servis edilmektedir.
3. Bu restoran su atıklarını azaltmak için stratejiler geliştirmektedir.
4. Bu restoran enerji tasarrufu uygulamaları kullanmaktadır (örneğin, tuvalette hareket sensörlü elektrik lambaları).
5. Bu restoran doğal ışıktan yararlanmaktadır (örneğin, dışarıda oturma yeri veya yemek salonunda büyük pencerelerin olması).

Yönetim odaklı sürdürülebilirlik uygulamalar

1. Bu restoran sosyal sorumluluk çerçevesinde sürdürülebilir projelere destek vermektedir.

2. Bu restoran, çalışanlarını sürdürülebilir uygulamalar konusunda eğitmektedir.
3. Bu restoran, görsel materyeller aracılığıyla sürdürülebilir uygulamalara bağlılığını göstermektedir.
4. Bu restoran, çalışanları arasında cinsiyet dengesi olmasına önem vermektedir.

Yeşil marka imajı

1. Bu restoran, sosyal bilince sahiptir.
2. Bu restoran çevre sorunlarına karşı duyarlıdır.
3. Bu restoran çevreyi korumakla ilgilenmektedir.
4. Bu restoran, sadece kar etmekle ilgilenmeyip aynı zamanda çevreye ve diğer tüketicilere karşı da duyarlıdır.

Sürdürülebilirlik bağlantılı restoran müşterisi sadakati

1. Çevre dostu uygulamaları nedeniyle bu restoranı tekrar ziyaret ederim.
2. Sürdürülebilir uygulamaları nedeniyle bu restoranı başkalarına tavsiye ederim.
3. Çevre dostu uygulamaları nedeniyle bu restoran hakkında söyleyeceğim olumlu söylemler vardır.
4. Bu restorandaki sürdürülebilir uygulamalar nedeniyle yemeğim için daha fazla ödemeye razıyım.

Demografik sorular

Cinsiyet
_____Erkek
_____ Kadın
_____Non-binary

Yaş_____

Eğitim
_____Lise veya altı
_____ Üniversite (Ön lisans)
_____ Üniversite (Lisans)
_____Yüksek lisans ve/veya doktora

Medeni durum
_____Bekar
_____Evli
_____Diğer

Kişibaşı aylık net gelir (TL)
_____3000 TL'den az
_____3000 - 6,000TL arası
_____6,000 – 9,000TL arası
_____9,000 – 12,000TL arası
_____12,000TL'den fazla

APPENDIX C

THE ETHICS COMMITTEE APPROVAL

Evrak Tarih ve Sayısı: 27.11.2021-40497

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ
SOSYAL VE BEŞERİ BİLİMLER YÜKSEK LİSANS VE DOKTORA TEZLERİ ETİK İNCELEME KOMİSYONU
TOPLANTI KARAR TUTANAĞI

Toplantı Sayısı	:	24
Toplantı Tarihi	:	24.11.2021
Toplantı Saati	:	14:00
Toplantı Yeri	:	Zoom Sanal Toplantı
Bulunanlar	:	Prof. Dr. Ebru Kaya, Prof. Dr. Fatma Nevra Seggie, Dr. Öğr. Üyesi Yasemin Sohtorik İlkmen
Bulunmayanlar	:	

Banu Özden
Turizm İşletmeciliği

Sayın Araştırmacı,

"The effects of sustainable restaurant practices on diner behavior" başlıklı projeniz ile ilgili olarak yaptığınız SBB-EAK 2021/71 sayılı başvuru komisyonumuz tarafından 24 Kasım 2021 tarihli toplantıda incelenmiş ve uygun bulunmuştur.

Bu karar tüm üyelerin toplantıya çevrimiçi olarak katılımı ve oybirliği ile alınmıştır. COVID-19 önlemleri kapsamında kurul üyelerinden ıslak imza alınamadığı için bu onay mektubu üye ve raportör olarak Fatma Nevra Seggie tarafından bütün üyeler adına e-imzalanmıştır.

Saygılarımızla, bilgilerinizi rica ederiz.

Prof. Dr. Fatma Nevra SEGGIE
ÜYE

e-imzalıdır
Prof. Dr.Fatma Nevra SEGGIE
Raportör

SOBETİK 24 24.11.2021

Bu belge 5070 sayılı Elektronik İmza Kanununun 5. Maddesi gereğince güvenli elektronik imza ile imzalanmıştır.

REFERENCES

Abbas, T., & Hussien, F. (2017). The effects of green marketing and green corporate social responsibility on customers' willingness to patronize a casual dining restaurant. *International Academic Journal Faculty of Tourism and Hotel Management*, *3*(3), 137-157.

Alarcón, D.M. & Cole, S. (2019). No sustainability for tourism without gender equality. *Journal of Sustainable Tourism*, *27*(7), 903-919.

Amato, M., & Musella, M. (2017). Quantification of food waste within food service in the historic center of Naples: a case study. *Quality Access Success*, *18*, 22–28.

Andreassen, T. W., & Lindestad, B. (1998). The antecedents and consequences of customer satisfaction for firms. *Marketing Science*, *2*, 125-143.

Arun, T. M., Kaur, P., Ferraris, A., & Dhir, A. (2021). What motivates the adoption of green restaurant products and services? a systematic review and future research agenda. *Business Strategy and the Environment*, *30*, 2224-2240.

Asadullah, M.A., Ul Haq, M. Z., Wahba, K., Hashmi, S., (Markham) Kim, H., & Hwang, J. (2021). Gender differences and employee performance: evidence from the restaurant industry. *Journal of Hospitality and Tourism Management*, *48*, 248-255.

Baldwin, C., Wilberforce, N., & Kapur, A. (2011). Restaurant and food service life cycle assessment and development of a sustainability standard. *International Journal of Life Cycle Assessment*, *16*, 40–49.

Berardo I., Campos K., Oronez R., Saravio F., Sullivan N., & Williner F. (2020). Fighting food waste in the tourism sector: challenges and opportunities for Latin America, the Caribbean, and Beyond. Retrieved from https://www.idbinvest.org/en/publications/fighting-food-waste-tourism-sector-challenges-and-opportunities-latin-america

Berezan, O., Raab, C., Yoo, M., & Love, C. (2013). Sustainable hotel practices and nationality: the impact on guest satisfaction and guest intention to return. *International Journal of Hospitality Management*, *34*, 227-233.

Bonn, M.A., Cronin Jr., J.J., & Cho, M. (2016). Do environmental sustainable practices of organic wine suppliers affect consumers' behavioral intentions? the moderating role of trust. *Cornell Hospitality Quarterly*, *57*(1), 21–37.

Brough A.R., Wilkie J.E.B., Ma J., Isaac M.S., Gal D. (2016). Is eco-friendly unmanly? the green-feminine stereotype and its effect on sustainable consumption. *Journal of Consumer Research*, *43*(4), 567–582.

Cakici, A.C., Akgunduz, Y., & Yildirim, O. (2019). The impact of perceived price justice and satisfaction on loyalty: the mediating effect of revisit intention. *Tourism Review, 74*(3), 443-462.

Cantele, S., & Cassia, F. (2020). Sustainability implementation in restaurants: a comprehensive model of drivers, barriers, and competitiveness-mediated effects on firm performance. *International Journal of Hospitality Management, 87,* 1-10.

Cavagnaro, E., & Gehrels, S.A. (2009). Sweet and sour grapes: implementing sustainability in the hospitality industry- a case study. *Journal of Culinary Science & Technology, 7,* 181–195.

Chen, C-T., Lee, W-H., Chang, Y-Y., & Cheng, C-C. (2015). The strategy for enhancing consumer intention to dine at green restaurants: three phase decision-making model. *Total Quality Management & Business Excellence, 28*(5-6), 614–632.

Chen, R. J. (2015). From sustainability to customer loyalty: a case of full-service hotels' guests. *Journal of Retailing and Consumer Services, 22,* 261-265.

Chen, Y.S. (2008). The driver of green innovation and green image–green core competence. *Journal of Business Ethics, 81*(3), 531–543.

Chen, Y.S. (2009). The drivers of green brand equity: green brand image, green satisfaction, and green trust. *Journal of Business Ethics, 93,* 307-319.

Chin, W. W., & Dibbern, J. (2010). A permutation-based procedure for multi-group PLS analysis: results of tests of differences on simulated data and a cross cultural analysis of the sourcing of information system services between Germany and the USA. In V. Esposito Vinzi, W. W., Chin, J., Henseler, & H. Wang (Eds.), *Handbook of partial least squares: concepts, methods and applications* (pp. 171-193). Heidelberg, Germany: Springer.

Choi, G., Parsa, G., Sigala, M., & Putrevu, S., (2009). Consumers' environmental concerns and behaviors in the lodging industry: a comparison between Greece and the US. *Journal of Quality Assurance in Hospitality and Tourism, 10,* 93–112.

Chou, C., Chena, K., & Wang, Y. (2012). Green practices in the restaurant industry from an innovation adoption perspective: evidence from Taiwan. *International Journal of Hospitality Management, 31,* 703-711.

Cochran, C., Goulbourne, E., Hunt, C. & Veza, A. (2018). Restaurant food waste action guide [PDF File]. Retrieved from https://refed.org/downloads/Restaurant_Guide_Web.pdf

Curtis, K. & Slocum, S., (2016). The role of sustainability certification programs in reducing food waste in tourism. *Journal of Developments in Sustainable Agriculture, 11*(1), 1–7.

Davies, T. & Konisky, D. M. (2000). Environmental implications of the foodservice and food retail industries. Retrieved from https://www.rff.org/publications/working-papers/environmental-implications-of-the-foodservice-and-food-retail-industries/

Dewald, B., Bruin, B.J., & Jang, Y.J. (2014). US consumer attitudes towards green restaurants. *Anatolia*, *25*(2), 171-180.

DiPietro, R. B., & Gregory, S. (2013). A comparative study of customer perceptions regarding green restaurant practices: fast food vs. upscale casual. *Hospitality Review*, *30*(1), 1-22.

DiPietro, R. B., Cao, Y., & Partlow, C. (2013). Green practices in upscale foodservice operations: customer perceptions and purchase intentions. *International Journal of Contemporary Hospitality Management*, *25*(5), 779-796.

Dhir, A., Talwar, S., Kaur, P., & Malibari, A. (2020). Food waste in hospitality and food services: a systematic literature review and framework development approach. *Journal of Cleaner Production*, *270*, Article 122861.

Dodds, R., & Butler, R. (2009) Inaction more than action barriers to the implementation of sustainable tourism policies. In S. Gosling, M. Hall & D. Weaver (Eds.), *Sustainable tourism future*. (pp. 35-53) New York, NY: Routledge.

Dutta, K., Umashankar, V., Choi, G., & Parsa, H.G. (2008). A comparative study of consumers' green practice orientation in India and the United States: a study from the restaurant industry. *Journal of Foodservice Business Research*, *11*(3), 269-285.

Environmental Protection Agency (n.d.). Retrieved from https://www.epa.gov/sustainable-management-food

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.G. (2009). Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149-1160.

Filimonau, V., & de Coteau, D. (2019). Food waste management in hospitality operations: a critical review. *Tourism Management*, *71*, 234-245.

Florida Energy Extension Service & Miller, K. (1994). Energy efficiency & environmental news. June. Gainseville: Florida Energy Extension Service, Institute of Food and Agricultural Sciences, University of Florida.

Frash, Jr., R. E., DiPietro, R., & Smith, W. (2015). Pay more for McLocal? examining motivators for willingness to pay for local food in a chain restaurant setting. *Journal of Hospitality Marketing & Management*, *24*(4), 411–434.

Galbreath, J. (2019). Drivers of green innovations: the impact of export intensity, women leaders, and absorptive capacity. *Journal of Business Ethics, 158*(1), 47–61.

Green, G. P., & Dougherty, M. L. (2008). Localizing linkages for food and tourism: culinary tourism as a community development strategy. *Community Development, 39*(3), 148–158.

Green Restaurant Association (2022). Green restaurant certification standards. Retrieved from http://www.dinegreen.com/certification.standards.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24.

Hall, C. M., & Gössling, S. (Eds.). (2013). *Sustainable culinary systems: Local foods, innovation, and tourism & hospitality*. London, England: Routledge.

Han, H., Hsu, L.T.J., & Lee, J.S., (2009). Empirical investigation of the roles of attitudes toward green behaviors, overall image, gender, and age in hotel customers' eco-friendly decision-making process. *International Journal of Hospitality Management, 28*(4), 519–528.

Han, H., & Hyun, S. (2018). What influences water conservation and towel reuse practices of hotel guests? *Tourism Management, 64*, 87-97.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In R. R. Sinkovics & P. N. Ghauri (Eds.), *New challenges to international marketing* (Advances in international marketing, vol. 20) (pp. 277–319). Bingley, UK: Emerald Group Publishing Limited.

Henseler, J., Ringle, C.M. and Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115-135.

Higgins-Desbiolles, F., Moskwa, E., & Wijesinghe, G., (2017). How sustainable is sustainable hospitality research? a review of sustainable restaurant literature from 1991 to 2015. *Current Issues in Tourism*. *22*(13), 1551–1580.

Hu, H., Parsa, H.G., & Self, J. (2010). The dynamics of green restaurant patronage. *Cornell Hospitality Quarterly, 51*, 344-362.

Hu, M. L., Horng, J. S., Teng, C. C., & Chou, S. F. (2013). A criteria model of restaurant energy conservation and carbon reduction in Taiwan. *Journal of Sustainable Tourism*, *21*(5), 765–779.

Huang, Y. C., & Liu, C. H. S. (2017). Moderating and mediating roles of environmental concern and ecotourism experience for revisit intention. *International Journal of Contemporary Hospitality Management*, *29*(7), 1854–1872.

Hunter, C. (2002). Aspects of sustainable tourism debate from a natural resources' perspective. In R. Harris, T. Griffin & P. Williams (Eds.), *Sustainable tourism – a global perspective* (pp.3-23) Oxford, England: Butterworth-Heinemann.

Iamkovaia M., Arcila, M., Martins, F.C., & Izquierdo, A. (2019). Sustainable development of coastal food services. *Sustainability, 11*(13), 3728.

Jang, Y.J., Kim, W.G., & Bonn, M.A. (2011). Generation Y consumers' attributes and behavioral intentions concerning green restaurants. *International Journal of Hospitality Management, 30*, 803–811.

Jeong, E.H., & Jang, S.C. (2010, June). Effects of restaurant green practices; which practices are important and effective? Presented at Caesars Hospitality Research Summit, Las Vegas, Nevada.

Jeong E.H., Jang S.C., Day J., & Ha S. (2014). The impact of eco-friendly practices on green image and customer attitudes: an investigation in a café setting. *International Journal of Hospitality Management, 41*,10-20.

Jang, Y.J., Kim, W.G., Lee, H.Y. (2015). Coffee shop consumers' emotional attachment and loyalty to green stores: the moderating role of green consciousness. *International Journal of Hospitality Management*, *44*, 146-156.

Jin, N. (P.), Lee, S. & Huffman, L. (2012) Impact of restaurant experience on brand image and customer loyalty: moderating role of dining motivation. *Journal of Travel & Tourism Marketing*, *29*(6), 532-551.

Jones, A. (1987) Green tourism. *Tourism Management, 8*(4), 354–356.

Jones, P., Hillier, D., & Comfort, D. (2016). Sustainability in the hospitality industry: some personal reflections on corporate challenges and research agendas. *International Journal of Contemporary Hospitality Management*, *28*(1), 36-67.

Kang, K. H., Stein, L., Heo, C. Y., & Lee, S. (2012). Consumers' willingness to pay for green initiatives of the hotel industry. *International Journal of Hospitality Management, 31*(2), 564-572.

Kasim, A., & Ismail, A. (2012). Environmentally friendly practices among restaurants: drivers and barriers to change. *Journal of Sustainable Tourism, 20*(4), 551–570.

Kassinis, G.I., & Soteriou, C. (2003). Greening the service profit chain: the impact of environmental management practices. *Production & Operations Management, 12*(3), 386-402.

Keseci, S. (2018). Yeşil restoran uygulamaları, restoran atıklarının değerlendirilmesi ve geri kazanımı. (Unpublished master's thesis). Mersin University, Turkey.

Kilibarda, N., Djokovic, F., & Suzic, R. (2019). Food Waste Management — Reducing and Managing Food Waste in Hospitality. *Meat Technology, 60*(2), 134–142.

Kim, S. Yoon, J. & Shin, J. (2015). Sustainable business-and-industry foodservice: consumers' perception and willingness to pay a premium in South Korea. *International Journal of Contemporary Hospitality Management, 27*(4), 648-669.

Kim, M. J., & Hall, C. M. (2020). Can sustainable restaurant practices enhance customer loyalty? The roles of value theory and environmental concerns. *Journal of Hospitality and Tourism Management, 43*, 127–138.

Kwok, L., Huang, Y. K., & Hu, L. (2016). Green attributes of restaurant: what really matters to consumers? *International Journal of Hospitality Management, 55*, 107-117.

Kwok, L., & Huang, Y.K. (2019). Green attributes of restaurants: do consumers, owners, and managers think alike? *International Journal of Hospitality Management, 83*(1), 28–32.

Line, N.D., Hanks, L., & Zhang, L. (2016). Sustainability communication: the effect of message construal on consumers' attitudes towards green restaurants. *International Journal of Hospitality Management, 57*(1), 143-151.

Lins, M., Puppin Zandonadi, R., Raposo, A., Ginani, V.C. (2021). Food waste on foodservice: an overview through the perspective of sustainable dimensions. *Foods, 10*(6),1175.

Manaktola, K. & Jauhari, V. (2007). Exploring consumer attitude and behavior towards green practices in the lodging industry in India. *International Journal of Contemporary Hospitality Management, 19*, 364-377.

Mardia, K.V. (1970). Measures of multivariate skewness and kurtosis with applications. *Biometrika, 57*(3), 519-530.

Millar, M. & Baloğlu, S. (2011). Hotel guests' preferences for green guest room attributes. *Cornell Hospitality Quarterly, 52*, 302-311.

Moon, S. J. (2021). Investigating beliefs, attitudes, and intentions regarding green restaurant patronage: An application of the extended theory of planned behavior with moderating effects of gender and age. *International Journal of Hospitality Management, 92*, 102727.

Myung, E., McClaren, A., & Li, L. (2012). Environmentally related research in scholarly hospitality journals: current status and future opportunities. *International Journal of Hospitality Management, 31*(4), 1264-1275.

Namkung, Y., & Jang S. (2017). Are consumers willing to pay more for green practices at restaurants? *Journal of Hospitality & Tourism Research, 41*(3), 329-356.

Namkung, Y. & Jang, S. (2013). Effects of restaurant green practices on brand equity formation: do green practices really matter? *International Journal of Hospitality Management, 33,* 85-95.

National Restaurant Association (2022). National Restaurant Association Releases 2020 State of the Restaurant Industry Report. Retrieved from https://restaurant.org/research-and-media/media/press-releases/national-restaurant-association-releases-2020-state-of-the-restaurant-industry-report/

Neff, R. A., Spiker, M. L., & Truant, P. L. (2015). Wasted food: U.S. consumers' reported awareness, attitudes, and behaviors. *PLOS One*, *10*(6), 1–16.

Nguyen, N., & Leblanc, G. (2001). Corporate image and corporate reputation in customers' retention decisions in services. *Journal of Retailing and Consumer Services*, *8,* 227-236.

Niñerola, A, Sánchez-Rebull, M-V., & Hernández-Lara, A-B. (2019). Tourism research on sustainability: a bibliometric analysis. *Sustainability*. *11*(5), 1377.

Oliver, R. L. (2010). *Satisfaction: A behavioral perspective on the consumer*. New York, NY: M. E. Sharpe.

Olya, H., Altinay, L., Farmaki, A., Kenebayeva, A., & Gursoy, D. (2020) Hotels' sustainability practices and guests' familiarity, attitudes, and behaviors. *Journal of Sustainable Tourism*, *28*(7), 1063-1081

Papargyropoulou, E., Steinberger, J.K., Wright, N., Lozano R., Padfield R., & Ujang, Z. (2019). Patterns and causes of food waste in the hospitality and food service sector: food waste prevention insights from Malaysia. *Sustainability*, *11*(21), 6016.

Park, E.(O)., Kim, W.-H. and Kwon, J. (2021). Understanding the relationship between green restaurant certification programs and a green restaurant image: the case of TripAdvisor reviews. *Kybernetes*, *50*(6), 1689-1703.

Perramon, J., Alonso-Almeida, M., Llach, J. & Bagur-Femenías, L. (2014). Green practices in restaurants: impact on firm performance. *Operations Management Research, 7*(2), 2-12.

Pirani S.I., & Arafat H.A. (2016). Reduction of food waste generation in the hospitality industry. *Journal of Cleaner Production, 132*, 129-145.

Ponnapureddy, S., Priskin, J., Ohnmacht, T., Vinzenz, F., & Wirth, W. (2017). The influence of trust perceptions on German tourists' intention to book a sustainable hotel: a new approach to analyzing marketing information. *Journal of Sustainable Tourism, 25*(7), 970-988.

Prud'homme, B., & Raymond, L. (2013). Sustainable development practices in the hospitality industry: an empirical study of their impact on customer satisfaction and intentions. *International Journal of Hospitality Management, 34*, 116-126.

Ranke, T.D. & Mitchell, C.L. & George, D.M.S., & D'Adamo, C.R. (2014). Evaluation of the balanced menus challenge: a healthy food and sustainability programme in hospitals in Maryland. *Public Health Nutrition*. *18*, 2341–2349.

Ringle, M. C., da Silva, D., & Bido, D. (2014). Structural equation modeling with the SmartPLS. *Brazilian Journal of Marketing*, *13*(2), 56-73.

Robertson, T. S. (1993). How to reduce market penetration cycle times. *Sloan Management Review*, *35*(1), 87-92.

Ryu, K., Han, H., & Kim, T.H (2008). The relationships among overall quick-casual restaurant image, perceived value, customer satisfaction, and behavioral intentions. *International Journal of Hospitality Management*, *27*, 459-469.

Salzberg, A.C., Gough, M.Z. & Suen, I. (2019) Sustainable innovation behavior in restaurants. *Journal of Foodservice Business Research*, *22*(2), 167-190.

Sanchez-Franco, M.J., Ramos, A.F.V., & Velicia, F.A.M. (2009). The moderating effect of gender on relationship quality and loyalty toward internet service providers. *Information & Management*, *46*, 196–202.

Schubert, F., Kandampully, J., Solnet, D., & Kralj, A. (2010). Exploring consumer perceptions of green restaurants in the US. *Tourism and Hospitality Research*, *10*(4), 286-300.

Schwartz, A. (2009). White Castle gets green packaging. Retrieved from https://www.greenbiz.com/article/white-castle-gets-green-packaging

Schwartz, J., & Miller, T. (1991). The earth's best friends. *American demographics*, *13*(2), 26-35.

Sehnem, S., Pereira, L.H., Junior, S.S., Juarez Bernardy, R., & Lara, A.C. (2022). Management of food waste in restaurants by way of circular practices. *Journal of Material Cycles and Waste Management*, *24*, 1020–1036.

Shin, Y.H., Im, J., Jung, S.E. & Severt, K. (2017). Consumers' willingness to patronize locally sourced restaurants: the impact of environmental concern, environmental knowledge, and ecological behavior. *Journal of Hospitality Marketing & Management*, *26*(6), 644-658.

Soper, D. S. (2021). A-priori sample size calculator for structural equation models [Software]. Available from https://www.danielsoper.com/statcalc/calculator.aspx?id=89

Stys, B., (2008). Green restaurants: commercial kitchens face unique challenges as well as opportunities for saving energy and materials. *Environmental Design & Construction*, *11*(5), 64.

Susskind, A.M., (2014). Guests' reactions to in-room sustainability initiatives: an experimental look at product performance and guest satisfaction. *Cornell Hospitality Quarterly*, *55*(3), 228–238.

Talwar, S., Kaur, P., Yadav, R., Sharma, & R., Dhir, A. (2021). Food waste and out-of-home-dining: antecedents and consequents of the decision to take away leftovers after dining at restaurants. *Journal of Sustainable Tourism, 31*(1), 47-72.

Tehrani, M., Fulton, L., Schmutz, B. (2020). Green cities and waste management: the restaurant industry. Sustainability, *12*, 5964.

Tenenbaum, L. (2019). Plastic cutlery is terrible for the environment, and we don't need to have it delivered. Retrieved from https://www.forbes.com/sites/lauratenenbaum/2019/07/16/plastic-cutlery-is-terrible-for-the-environment-and-we-dont-need-to-have-it-delivered/?sh=38503784019c

Teng, Y.-M. & Wu, K.-S. (2019). Sustainability development in hospitality: the effect of perceived value on customers' green restaurant behavioral intention. *Sustainability*, *11*(7), 1987.

T. M., A, Kaur, P., Ferraris, A., & Dhir, A. (2020). What motivates the adoption of green restaurant products and services? a systematic review and future research agenda. *Business Strategy and the Environment, 30*, 2224– 2240.

Trang, H., Lee, J., & Han, H. (2019). How do green attributes elicit guest pro-environmental behaviors? the case of green hotels in Vietnam. *Journal of Travel and Tourism Marketing*, *36*(1), 14-28.

UNEP-United Nations Environment Programme (2021). Food Waste Index Report 2021. Retrieved from https://www.unep.org/resources/report/unep-food-waste-index-report-2021

Usakli A. & Kucukergin K. G. (2018). Using partial least squares structural equation modeling in hospitality and tourism, do researchers follow practical guidelines? *International Journal of Contemporary Hospitality Management, 30*(11), 3462-3512.

Usakli, A., & Rasoolimanesh, S. M. (2023). Which SEM to use and what to report? a comparison of CB-SEM and PLS-SEM. In F. Okumus, S. M. Rasoolimanesh, & S. Jahani (Eds.), *Cutting Edge Research Methods in Hospitality and Tourism* (pp. 5-28). Bingley, England: Emerald Publishing Limited.

Vieregge, M., Scanlon, N., & Huss, J., (2007). Marketing locally grown food products in globally branded restaurants: do customers care? *Journal of Foodservice Business Research, 10*(2), 67–82.

Visschers, V. H. M., & Siegrist, M. (2015). Does better for the environment mean less tasty? offering more climate-friendly meals is good for the environment and customer satisfaction. *Appetite, 95*, 475–483.

Yi, S., Zhao, J., & Joung, H. (2018) Influence of price and brand image on restaurant customers' restaurant selection attribute. *Journal of Foodservice Business Research*, *21*(2), 200-217.

Wandosell, G, Parra-Meroño, MC, Alcayde, A, & Baños, R. (2021). Green packaging from consumer and business perspectives. *Sustainability*, *13*(3):135.

Wang, R. (2012). Investigations of important and effective effects of green practices in restaurants. *Procedia - Social and Behavioral Sciences*, *40*, 94-98.

Wang, Y.F., Chen, S.P., Lee, Y.C., & Tsai, C.T. (2013). Developing green management standards for restaurants: an application of green supply chain management. *International Journal of Hospitality Management, 34*, 263-273.

Weaver, D. (2006). *Sustainable tourism: Theory and practice*, Oxford, England: Butterworth Heinemann.

Westendorf, M. L. (Ed.). (2000). *Food waste to animal feed*. Ames, IA: Iowa State University Press.

Westland, J. C. (2010). Lower bounds on sample size in structural equation modeling. *Electronic Commerce Research and Applications*, *9*(6), 476-487.

Wu, H.C., Cheng, C. C. & Ai, C.H. (2019), What drives green experiential loyalty towards green restaurants? *Tourism Review*, *76*(5), 1084-1103.

Zhang X., Shao X., Jeong E.H., & Jang S.C. (2021). The effects of restaurant green demarketing on green skepticism and dining intentions: investigating the roles of benefit associations and green reputation. *International Journal of Hospitality Management*, *97*, 103007.

Zimmer, M. R., Stafford, T. F., & Stafford, M. R. (1994). Green issues: dimensions of environmental concern. *Journal of Business Research*, *30*(1), 63-74.