

PROTECTING THE ENVIRONMENT: THE EFFECTS OF GREEN MENU DESIGN ON
RESTAURANT CUSTOMERS' WILLINGNESS TO PAY

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by

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The undersigned, appointed by the Associate Vice Chancellor of the Office of Research and Graduate Studies, have examined the dissertation entitled

PROTECTING THE ENVIRONMENT: THE EFFECTS OF GREEN MENU DESIGN ON
RESTAURANT CUSTOMERS' WILLINGNESS TO PAY

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a candidate for the degree of Doctor of Philosophy,

and hereby certify that, in their opinion, it is worthy of acceptance.

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DEDICATION

This dissertation is dedicated to me, who spent the countless days away from home to accomplish my goal. Also, this dissertation is dedicated to my husband, Eric Ha, who spent the past four years without me. I love you to the moon and back. Thank you for being there for me. And I apologize that I couldn't live with you. I am a fortunate person to marry you. Lastly, I would like to dedicate my dissertation to my family members, my mom, dad, one and only brother, sister-in-law, and my niece, who were always there for me giving me unconditional love. I thank my family for supporting me both mentally and financially. I love you all.

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ABSTRACT

The present study conducted experiments to reveal the relationship between various message appeals and customers' menu selection processes. There is a dearth of studies that explore the consumer green menu selection behaviors, particularly in full-service restaurants in the United States. By utilizing the Value-Belief-Norm (VBN) theory and integrating the Elaboration Likelihood Model (ELM) into the Dual Coding Theory (DCT), the present study is intended to investigate the effects of green menu designs that may influence willingness to pay more at full-service restaurants. A total of 521 samples were collected through MTurk. Various statistical analyses revealed meaningful results that can be utilized by restaurant marketers with insights for developing effective green marketing strategies to attract and retain customers.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The proliferation of green consumption and increased levels of environmental awareness among consumers has resulted in a growing number of restaurants to use green practices (National Restaurant Association, 2020; Yu et al., 2018). This phenomenon has also brought several changes to the restaurant industry. In 1987, the concept of sustainability was first mentioned and began to gain popularity in the hospitality and tourism sector (Ernst & Young, 2008), and sustainability practices during food production and meal preparation appear to be a newly important aspect of how consumers rate a restaurant's quality (Karagiannis & Andrinou, 2021). The United States accounts for half of the world's organic food sales and is thus the largest market for organic or sustainable food (NRA, 2018). Moreover, it has seen an increasing number of organic producers that seek to meet the growing demand for organic agricultural products (NRA, 2018; Statista, 2021). One contemporary gastronomic trend involves restaurants growing or harvesting their own ingredients (Bozic & Milosevic, 2021).

A green restaurant is any restaurant that engages in green practices (Schubert et al., 2010) and/or offers a selection of green food menu items (Jang et al., 2011). The Green Restaurant Association (GRA) details eight green practices in restaurants (2021): water efficiency; waste reduction and recycling; sustainable durable goods and building materials; sustainable food; energy; reusables and environmentally preferable disposables; chemical and pollution reduction; and transparency and education. Jang et al. (2011) define a restaurant with green practices as one that implements environmentally sustainable practices, including organic menu options, recycling and composting, and energy efficiency. Wolfe and Shanklin (2001) and NRA (2018)

classify as “green” any actions aimed at reducing impact on the environment, such as eco-purchasing and green consumption.

In general, restaurants that promote green consumption have energy- and water-efficient kitchen equipment, locally grown foods, limited disposable products, and suitably trained employees, all of which help reduce pollution. Scholars have stressed that the restaurant industry is seeing greater consumer demand for restaurants with green practices, a trend that is expected to expand rapidly (Verma et al., 2019; Yu et al., 2018). To meet this growing consumer demand, previous researchers have suggested that restaurants should engage in green practices that are more focused on food attributes rather than other restaurant characteristics (Namkung & Jang, 2017). In addition, casual dining restaurants may emphasize environmentally friendly practices, such as recyclable materials, eco-friendly packages, and motion sensors in bathrooms to promote a green image (Namkung & Jang, 2017). The words “green” and “pro-environmental” have been used interchangeably (Shrum et al., 1995). Green or pro-environmental behavior can be defined as behavior that consciously tries to minimize any negative impacts on the environment that is caused by human action (Wang et al., 2019). Companies adopted green marketing strategies to deliver environmentally friendly services or products to improve their customer satisfaction metrics; they provide green products and emphasize to their customers that they seek to have minimal impacts on the environment (Soonthonsmai, 2007).

Numerous studies have been conducted to identify factors affecting green restaurant patronage (Basha & Lal, 2019; Filimonau et al., 2017; Kim & Magnini, 2020; Moon, 2021; Soonthonsmai, 2007). Basha and Lal (2019) identified determinants that influence intention to purchase of organically produced foods and found that safety and trust are the most important factors for customers in terms of green patronage (Basha & Lal, 2019). Environmental

knowledge can also be an important factor. A high level of environmental knowledge or value can lead to pro-environmental behavior (Hu et al., 2010; Mostafa, 2009). While many restaurants in the United States are adopting environmentally friendly practices, some restaurant operations still need to actively preserve the environment by understanding today's ecological issues (Martin-Rios et al., 2018). A study intended to investigate factors that influence organic consumption behavior found that individuals who consume organic food pay particular attention to food labelling or menu design and thus to ingredients. More specifically, the presence of detailed labelling is related to consumers' level of trust when consuming organic foods (Essoussi & Zahaf, 2009). Additionally, during in-depth interviews, retail food consumers indicated that health, environment, and support for local farmers were their main motivators for purchasing organic products (Essoussi & Zahaf, 2009).

Existing empirical studies have focused on exploring the influence of attitudes, subjective norms, and behavioral control of green consumers by using a theory of planned behavior (TPB) framework (Basha & Lal, 2019; Kim et al., 2013; Moon, 2021). Studies that adopted TPB found that green restaurant marketers should emphasize the positive consequences of environmental protection through green practices. This would help encourage customers to choose restaurants with green practices (Moon, 2021). Meanwhile, Mostafa (2007) and Namkung and Jang (2017) reported that gender and age can moderate the relationship between green decision-making processes and intention to patronize, adding that women appear to show greater environmental concerns than men. Nevertheless, women's participation in environmental protection is rather low. Another study (D'Souza et al., 2007) investigated green consumers' demographic and psychological characteristics to identify important determinants of green purchasing in decision-making processes. The results show that green product quality, price perceptions, and consumer

self-confidence are significantly associated with green purchase intentions. Among studies that explored what specific factors strongly affect green consumption, it was found that a menu design is an important antecedent of consumers' green patronage intention (Filimonau et al., 2017; Kim & Magnini, 2020).

According to the National Restaurant Association (NRA, 2018), restaurant menus are evolving to reflect the growing demand for transparency, as more consumers are willing to increase their knowledge of how food is produced. Having a well-designed menu can positively impact diners' experience and satisfy their wants and needs (Grunert et al., 2014). It is a strategic tool for better communication and marketing. Previous studies have found that menu management is comprised of planning, pricing, and designing the food that is ultimately presented to customers (Grunert et al., 2014; Ozdemir & Caliskan, 2014). Information presented on the menu significantly impacts customers' food selections (Grunert et al., 2014; NRA, 2018). More specifically, a menu with descriptive labels was regarded as the most influential factor in the consumer decision-making process, according to Gueguen and Jacob (2012). Sensory or descriptive menu labels have a positive effect on restaurant sales. For example, when a plain menu name, "Seafood filet," was modified by adding a descriptive term to create "Succulent Italian seafood filet," it increased diners' revisit intentions (Gueguen & Jacob, 2012). Moreover, when a menu displayed the carbon intensity of the food items, that was viewed more favorably by restaurant diners (Filimonau et al., 2017). Study respondents were asked to fill out a face-to-face survey to measure their food preferences when viewing a restaurant menu design featuring carbon intensity values (Filimonau et al., 2017). It was observed that restaurant customers are more likely to choose less carbon-intense menu items, as there was a slight decrease in ordering a gourmet beef burger that entailed the highest level of greenhouse emissions (Filimonau et al.,

2017). Nevertheless, the authors also cautioned that the adoption of carbon emission labels in the future remains unclear. Furthermore, traffic-light colored menu labels have been examined in foodservice operations to highlight their effects on diners' intentions to choose items from a menu. Brunner et al. (2018) discovered that when the most eco-friendly food item was listed in green, sales of the item increased, whereas sales declined when the least eco-friendly food item was displayed in red. Because traffic lights are simple—red, yellow, and green— and widely understood, they are an attractive and effective tool to indicate which food items are high, medium, and low, respectively, in terms of emissions (Brunner et al., 2018). Previous research had confirmed that information presented using colors can capture and retain attention more effectively than black-and-white presentations (Lohse, 1997).

It has also been found that when restaurant customers view a well-designed menu, they are more willing to pay higher prices and revisit the restaurant (Gueguen & Jacob, 2012). Other studies confirm that menu items with quality labels can positively affect consumers' attitudes, which would also encourage them to pay premium prices (Homburg et al., 2005; Swahn et al., 2012).

As such, menu design appears to have a dominant position because it informs customers about what will be produced and served and, to some extent, the ingredients that go into each item (Ozdemir & Caliskan, 2014). Many restaurant operators are focused on sustainable menu design, food waste reduction, and local sourcing (NRA, 2018, 2022). It has also been predicted that environmental sustainability will be among the top menu trends in the restaurant industry (NRA, 2022). As it is becoming more important to have effective menu designs to remain competitive in a rapidly changing and perennially competitive foodservice industry, restaurants

must be more attentive to meeting the changing demands of the foodservice industry and, more importantly, its customers.

1.2 Statement of the Problem

Since the turn of the millennium, many people have become more concerned about environmental issues, such as global warming, energy, water conservation, and supply chains (Pimentel & Pimentel, 2003; Tsai & Tsai, 2008; United States Department of Agriculture [USDA], 2007). Based on a recent report by the Pew Research Center (2020), two thirds of adults in the United States believe that climate change is one of the biggest concerns for their communities. Additionally, support for protecting the environment increased by 8% between 2019 and 2020, the second largest increase since 2016 (Pew Research Center, 2020). When asked what proposal appears to have the most potential to reduce the effects of climate change, nearly 80% of respondents supported tougher restrictions on carbon emissions and energy use by businesses. Public concern about climate change is thus obviously increasing. More than half of survey respondents viewed climate change as a major threat to people's well-being (Pew Research Center, 2020). Gilbert (2012) found that global agriculture and food production contributed to global warming to a large extent, accounting for about a third of human-caused greenhouse gas emissions. This number has not significantly changed since that report (U.S. Energy Information Administration, 2019).

Of the 5.3 billion tons of carbon dioxide emitted in the United States in 2018 (U.S. Energy Information Administration, 2019), restaurants contribute to air pollution and thus climate change because they use large amounts of water and discard substantial amounts of food (Long et al., 2021). The food production system contributes substantially to environmental concerns, which has prompted researchers to evaluate both the environmental and nutritional

impacts of consumers' dietary choices (Richter, 2017). Because of the food industry's large-scale production and greenhouse gas emissions in different types of restaurants such as full-service restaurants and commercial kitchens, more attention has been paid to the impacts of restaurants on the environment (Gilbert, 2012; Green Restaurant Association, 2019). Cooking methods such as barbecuing, grilling, and charbroiling contribute prominently to air pollution (Green Restaurant Association, 2019). Diners today are more considered about such effects than they were in the past (Lopez et al., 2019).

To meet the growing demand for green consumption, the restaurant industry has considered house-made food items, natural and organic ingredients, locally grown produce, sustainable meat and seafood, and menu simplicity (NRA, 2018). The menu is one of the most important ways to encourage sustainable consumption because it gives operators the opportunity to promote their sustainability efforts (NRA, 2018). Consumers rated including green information on the restaurant's website as the second most important way to promote restaurant sustainability, followed by sharing it on social media, printing it on food packaging (as in fast food establishments), having workers explain the restaurant's efforts, showing them on a poster, and using a sticker on the front door or window (NRA, 2018). Overall, though, consumers found that a restaurant menu played the most important role in encouraging sustainable consumption.

Because human behavior is complex and changes with time, preferences, experience, and concerns, it is critical to first understand what triggers restaurant diners to choose certain food items from a menu. Green menus feature food items that are locally sourced or are grown free of harmful pollutants (USA Facts, 2021). The effects of green messaging have been discussed in fields like retail industry (Essousi & Zahaf, 2009; Swahn et al., 2012). Consumers' responses to color-coded green messaging were generally favorable, because they make consumers believe

that a business is committed to sustaining a healthy environment. Moreover, it gives consumers the impression that the business will provide helpful information about their current green practices for patrons (Essousi & Zahaf, 2009). Another study supports this claim; its results show that a green menu item in a restaurant positively influences consumers' green purchasing behaviors (Grunert et al., 2014).

Companies are often confronted with difficulty when integrating environmental issues into their strategic plans (Moon, 2021). Han and Yoon (2015) found that environmental practices such as recycling products did not significantly impact green hotel visiting intentions, adding that emphasizing environmental protection issues is not sufficient to encourage customers to visit such a hotel. For this reason, Tsai and Tsai (2008) recommend that green hotels offer discounts to hotel guests for not frequently requesting fresh towels. As such, more hospitality firms have started to engage in a wide range of sustainability practices to protect the environment (Verma et al., 2019). It is thus crucial that restaurants inform the public about their green practices in order to attract customers. However, customers may not recognize a restaurant's commitment to green practices simply through green advertising, regardless of how intensive those practices are (Jeong & Jang, 2010). For this reason, restaurateurs should maximize the utility of attainable green practices to identify specific green segments that their target customers expect from restaurants (Jeong & Jang, 2010; Han & Yoon, 2015). Researchers have stressed the importance of putting up signs to educate customers about green practice opportunities when visiting a restaurant, which may contribute to improving the green image of the restaurant (Jeong & Jang, 2010). A menu design can be a practical strategy to emphasize green practices (Kim & Magnini, 2020). Overall, the relationship between green practices embedded in restaurant menus and consumers' purchasing behavior is understudied.

While green practices are being increasingly adopted in the restaurant industry, there has been limited research that explores green menu design on customers' willingness to pay more. Nearly a quarter of a century ago, LeBruto and Ashley (1997) suggested that restaurants improve menu designs to remain competitive, without specific reference to the environment. Therefore, restaurants should establish and sustain their competitiveness by understanding green consumers and adopting menu items that reflect what they have learned about their patrons' preferences. Thus, the present study will help restaurants meet customers' demands and perhaps their unacknowledged preferences. One unexplored area in the sustainable restaurant literature is the development of a theoretical model to investigate consumers' purchasing intentions regarding green menus and patronage of restaurants that offer green options.

With this statement of the problem, the present study aims to investigate the degree to which people's green purchasing behaviors are influenced by how they value environmental issues. The extended value-belief-norm (VBN) theory is used as a framework for the study. The extended VBN theory focuses on how personal values, beliefs, and norms can influence people's behaviors; in this case, the area of interest is purchasing intentions of green menu items, willingness to pay a premium for such items, and the overall patronage of green restaurants. The present study incorporates subjective norm as they are constructed using the TPB. According to Liebe et al. (2011), subjective norm strengthens an individual's intention to perform a specific behavior. Studies that adopt behavioral theory assert that it is better for understanding consumers' purchasing behaviors (Basha & Lal, 2019; Kaiser et al., 2005). Through the extended VBN components, the present study explores how customers' values, beliefs, and norms in the green restaurant context shape their willingness to patronize such restaurants; more specifically, the effect of green menu design is examined.

1.3 Research Questions

There are several reasons for a study that investigates the effects of green menu design on customers' purchasing intentions. First, the menu is a crucial communication tool for diners (Chen et al., 2020); the information on a restaurant menu can significantly affect diners' selections (Lockyer, 2006). In addition, Kim and Magnini (2020) report that changing the terms used on restaurant menus—as opposed to the food being offered—involves little time and cost. Thus, restaurant managers should consider adopting a distinctive menu design that uses targeted images to better appeal to customers. Second, green practices can strengthen a restaurant's eco-friendly image to attract more people's attention. The use of green menu design and its impacts on customers' willingness to pay has received limited scholarly attention to date. Third, although the moderating effects of age and income level have been substantially explored in the green restaurant context (Nicolau et al., 2020; Zhang et al., 2019), they have not been investigated in sufficient depth. While age and income levels may moderate the relationship between customers' values, beliefs, and norms, and their willingness to pay more at a full-service restaurant, the effects of age and income level in the restaurant menu context have been unexplored. To fill this gap, the main purpose of the present study is to investigate the effects of green menu design on customers' purchasing intentions through experimental designs and applying the extended VBN theory. The research questions are as follows: (1) How do the effects of green menu design impact customers' willingness to pay more at a full-service restaurant? (2) How do restaurant customers' purchasing intentions at a full-service restaurant with green practices differ with age and income level? (3) What strategies can be suggested for a full-service restaurant menu design to remain competitive?

1.4 Significance of the Study

The current study is significant because it aims to investigate the growing phenomenon of green purchasing behaviors among full-service restaurant customers. There is a gap between what restaurants with green practices offer on the menu and how they can encourage customers to pay higher prices for what is on that menu. According to Filimonau et al.'s (2017) intervention study, restaurant operations have a crucial role to play in long-term sustainability by providing menus that intervene effectively in customers' decision-making processes. Other studies have used a combination of TPB and VBN to explore how an individual's purchasing or consuming behavior can be influenced by different constructs embedded in traditional restaurant and hotel contexts (Han, 2015; Youn et al., 2020). However, there is limited research that sheds light on customers' purchasing intentions at a full-service restaurant with a green menu design.

Consumers who are committed to practicing green lifestyles are known as green customers. Generally, those who are concerned about protecting the environment are also concerned about the consequences of green practices. Researchers noted that green purchasing intentions are heavily affected by how much people believe their behavior will impact the environment (Ellen, Wiener, & Cobb-Walgren, 1991; Swahn, Mossberg, Ostrom, & Gustafsson, 2012). Moreover, green customers support companies that incorporate green practices, and one study has shown that people who lack knowledge about sustainability or green management are eager to learn about those issues (Jeong & Jang, 2010). Customers' perceptions of green practices in restaurants may positively affect their behavioral intentions by forming an important connection between perceived value and behavioral intentions (Jeong & Jang, 2010). Annunziata et al. (2019) found that customers may be motivated to purchase green products if they believe that would be beneficial to their personal or family health and help alleviate environmental concerns. Customers are motivated to consume green food items because they are made without

pesticides and fewer or even no preservatives (Annunziata et al., 2019). The present study will apply the extended VBN theory to measure customers' values, beliefs, and norms and how they are reflected in behavioral intentions to better understand how much more customers are willing to pay for green menu items.

1.5 Goals of the study

The main goal of the study is to investigate how green menu design can be adopted in full-service restaurants in the United States to influence customers' behaviors, chiefly by encouraging them to pay a premium for green items. Previous studies that applied the VBN and TPB models in the green restaurant context have effectively predicted customers' future intentions. However, no studies have investigated the effects of green menu design on purchasing behaviors. Hence, the present study is intended to fill the gap and explain how customers' values, beliefs, and mores may affect their willingness to pay more for green menu items and how that may differ across age and income level. More specifically, there are three goals: (1) measuring the effectiveness of green menu design in encouraging current restaurant customers to pay more for green menu items; (2) discovering specific areas that influence full-service restaurant diners' purchasing intentions with moderating roles of age and income level; (3) suggesting both theoretical and practical marketing strategies to enhance restaurant menu design to promote green selections at full-service restaurants. Achieving these goals would not only ease environmental concerns but also enable full-service restaurants to adopt green menu designs that encourage customers to pay premiums and thus help restaurants remain competitive.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview of green practices in the restaurant industry

Environmental conservation

The restaurant industry is considered the largest consumer of water and energy (NRA, 2018). Also, it generates excessive carbon footprint, food waste, plastic use, and other misuse of products (Martin-Rios et al., 2018; NRA, 2018). One reason for this can be restaurants' lack of green practices during food production and services which can significantly impact the environment (Karagiannis & Andrinou, 2021). The use of chemicals, and large amounts of water and energy during the meal production process can be the cause of environmental deterioration in current days (Karagiannis & Andrinou, 2021). If the environmental conservation is not considered seriously, it is projected to cause reduced food yield, quality, and food scarcity in many parts of the world (Siegel, 2020). While the restaurant industry plays an important role in retaining the environment clean, current consumers should also demand and practice green (Karagiannis & Andrinou, 2021). It can be inferred that consumers need to contribute to the environmental sustainability. In this sense, consumers should be educated, and restaurant operations should establish practices to conserve the natural resources.

Global climate change, water and air pollution, and loss of species have caused the alarming environmental issues that continuously threaten both the environment and human lives (Jena & Behera, 2017; Martin-Rios et al., 2018). As Clayton and Brook (2005) pointed out, it is the collective impact of human behaviors that contribute to climate change. It implies that environmental degradation might be the result of lack of human responsibility and shaped relationship between people and nature. Hence, in this environmental crisis, human behavior

plays an important role to promote sustainability and human wellness (Jena & Behera, 2017). Generally, restaurants use significant amounts of water and energy to operate their businesses (NRA, 2018). Some negative environmental impacts that are being engendered in restaurant operations include excessive energy consumption particularly associated with greenhouse gas emissions, plastic packing, and food waste (Martin-Rios et al., 2018). If restaurant operations continue to promote green practice, it may contribute to restaurant meal quality which would also improve financial efficiency (Feil et al., 2020; NRA, 2018). Other researchers also stated that a full-service restaurant uses about one third of energy consumption in the U.S. (Schubert et al., 2010; Verma et al., 2019). Because restaurants need to meet the growing demands of diverse dietary patterns as the global population is moving towards urban lifestyle, they should be prepared to provide meat, dairy, and greenhouse gas intensive foods (Lopez et al., 2019; Thyberg & Tonjes, 2016). Among the various types of meals that restaurants prepare, meat-based foods require significant amount of nonrenewable fossil energy that is not sustainable in the long term (Pimentel & Pimentel, 2003). Meat dishes require more energy, land, and water to produce than plant-based diet (Pimentel & Pimentel, 2003). Hence, researchers who investigated modern dining trends state in the study that restaurants should promote a healthy eating behavior and encourage to consume low-energy foods (Bozic & Milosevic, 2021). With a growing concern regarding environmental conservation, foodservice operations use water and energy-saving cooking equipment or appliances to prepare dish (NRA, 2018). For instance, Starbucks has developed a plan to adopt more green practices besides offering green beverages. According to the most recent report from Starbucks (2020), stores encourage customers to reduce waste by offering reusable tumblers, recycling paper cups, and eliminating plastic straws. Starbucks decided to provide these only upon request. According to the recent survey conducted by NRA

(2020), more than half of restaurant consumers tend to choose the restaurant based on its eco-friendly practices. In this sense, more consumers look forward to restaurants' efforts on green practices nowadays.

In terms of green practices, Gilg, et al (2005) highlight the use of three Rs-Reduce, reuse, and recycle. Also, two Es which include energy and efficiency. Gilg et al. (2005) note that these can be important elements to identify green and non-green initiatives. The use of energy and water-efficient equipment in restaurant kitchen can be one of the essential parts to protect the environment (Thyberg & Tonjes, 2016). Human actions also contribute to negative environmental impact during stages of meal production, including transportation, receiving, storage, and distribution of the meal (Lopez et al., 2019).

Climate change

It was predicted in a study conducted by Pimentel et al. (1992) in early 1990s that the global warming or climate changes can most likely alter agriculture production in North America. Since the climate changes affect temperature, moisture, pest control system, and crop varieties, it was expected that climate changes can substantially reduce the food production resulting in severe food shortages (Pimentel et al., 1992). This forecast is not significantly different today. Siegel (2020) states that constant increases in temperatures have already started to destroy food system that causes food insecurity. The consequences of climate changes involve melting glaciers, ecosystem disruptions, and food and water insecurity. When temperature rises, it affects the ecosystems that prevents feeding and procreation (Siegel, 2020). If this problem persists, it will rapidly diminish ecosystems' natural resources capacities (Siegel, 2020). If greenhouse gas emissions continue to release, it would substantially cause food insecurity (USDA, 2007).

National Oceanic and atmosphere Administration (NOAA) (2020) reports that 2020 was considered the second-warmest year on record as the average global temperature was 1.76 °F above the 20th century average. In February 2021, snowstorm in Texas had surprised a lot of U.S. populations. Experts quoted that climate change such as global warming leads to increased evaporation. Then, this leads to increased precipitation (Henson, 2021). An expert suggested that transportation, heating, and industrial processes that use direct fossil fuel should consider to be electrified (NOAA, 2020). Arctic warming may have caused some winter extremes in the mid-latitudes, ironically contributing to intense cold weather in a warming climate (Henson, 2021). Because global temperature and climate change can significantly impact many aspects of human health, it is imperative to enhance the understanding of climate change effects (NOAA, 2020).

Places that are focused on pollution prevention tend to find ways to achieve it by reusing or improving operational practices. In restaurants, less cooking procedure or simplified recipe may contribute to reduced gas emissions. Oftentimes, electricity and power are available from renewable resources such as wind, solar, geothermal, small hydro, and biomass. These energy sources cause dramatically less air pollution and environmental damage compared to fossil fuel, nuclear, and large-scale hydroelectric energy source. If green energy sources are used, pollution can be significantly reduced as they avoid mining or drilling operations that can harm the ecosystems (Intergovernmental Panel on Climate Change, 2012). As defined by IPCC (2012), renewable energy source can be produced using sunlight and turn it into electricity. Then, solar power can be used for water during cooking. Moreover, it has become affordable that residential areas provide power to neighborhoods. The climate change has been a growing concern for quite a long time. In 2012, IPCC reported that greenhouse gas emissions and a climate change may be attributed directly or indirectly to human activities that may alter the global temperature. Today,

IPCC (2021) again reports similar statistics. It was revealed that human activities still substantially affect climate change over several decades.

A study by Jeong & Jang (2010) highlight that locally grown foods reduce the amount of pollution associated with transportation primarily by fossil fuels. For this reason, the study suggested that restaurateurs should offer locally grown food ingredients, sustainable seafood, and foods that are not genetically modified (Jeong & Jang, 2010). Restaurant foods that require fewer natural resources can create less pollution per calorie consumed. One reason that restaurants are encouraged to prevent pollution is because restaurants alone accountable for nearly 30% of global greenhouse gas emissions while the food waste also remains substantial (Amato & Musella, 2017).

As the demand for food away from home increases, the number of restaurants in the U.S. also increases (NRA, 2019). Along with this restaurant popularity, nearly 40% of food processed in the U.S. is never consumed and 90% of food waste is landfilled (Green Era Sustainability, 2019). As a result, it pollutes air, water, and soil. Food waste represents one of the largest solid waste streams that reaches landfills. Surprisingly, it is predicted that many local landfills reach full capacity within 10 years (Green Era Sustainability, 2019). For this reason, restaurants should be encouraged to adopt green practices and resource management to improve the air quality.

Sustainable consumption

Sustainability practices have become an important part of restaurant's attribute that influence customer satisfaction and revisit intention (Karagiannis & Andrinou, 2021). Some sustainability practices in the restaurant industry include purchasing seasonal product items and green materials, maintaining certain amount of sustainably grown food, and improving energy efficiency (Karagiannis & Andrinou, 2021). Sustainability is not only practiced in restaurant

businesses, but also in retail food stores. A chain grocery store called Trader Joe's has been practicing sustainability by composting and recycling plastics, cardboards, and other organic materials (Hirsh, 2021). They also replace plastic packaging with a paper-based box, avoided the use of any harmful substances in food packaging. More importantly, they have been providing information about sustainability to increase shoppers' understanding on how to adhere to sustainability practices (Hirsh, 2021).

Globally, the sales of organic food have significantly increased between 2000 and 2019 (Statista, 2021). Organic food produced about 95 billion revenues in U.S dollars in 2018 (Statista, 2021). Wunsch (2020) indicates that organic food is produced in a way that does not have pesticides and chemical fertilizers. Green practices and management in the restaurant industry include sustainable operations, purchasing organic and local foods, pollution prevention, and reducing food waste (Statista, 2021). Additionally, farm-raised refers to poultry or meat raised on a local farm (USDA, 2007). Sustainable foods and locally grown foods support the long-term maintenance of ecosystems and agriculture for future generations (United States Department of Agriculture, 2007). Sustainable foods are comprised of organic ingredients to qualify as organic foods. Because organic agriculture prohibits the use of toxic synthetic pesticides and fertilizers, irradiation, sewage sludge, and genetic engineering (Organic Trade Association, n.d), this farming practice can be better for consumers' health as well (USDA, 2007). According to National Geographic (2021), sustainable seafood sourcing prevents overfishing, so it protects fish and minimizes impacts to habitats. While sustainable consumption meets the basic needs of people, it protects and preserves the ecosystem by not exceeding the long-term limits of ecosystem capacity. Hence, sustainable consumption is a behavior that minimizes the use of natural resources or other environmentally harmful activities (USDA,

2007). Seafoods caught with sustainable methods can greatly minimize carbon footprint (NOAA, 2020).

Nowadays, more research studies are focused on promoting sustainable consumption. A recent survey conducted by Maciejewski (2020) states that only a few percent of survey respondents agreed with the urgent need to save natural resources when preparing meals. Maciejewski (2020) recommends that current consumers should be encouraged to reduce water waste, electricity usage, but use natural gas when preparing foods. A significantly higher level of carbon footprint can be released from grilling with charcoal than a gas grill (NOAA, 2020). Because charcoal grill continues to burn, it releases harmful substances into the atmosphere (GRA, 2019). If consumers value sustainability, they are likely to have positive attitudes towards sustainable consumption (Maciejewski, 2020). As such, USDA (2007) highlighted that organic agriculture is strictly managed by government standards that it is being closely monitored in the U.S. food production system. As a result, farmers should avoid heavy dependence on fossil energy as it is not sustainable (Pimentel & Pimentel, 2003).

There are several reasons why sustainable food menu is beneficial than non-sustainable foods. First, the meat-based food system requires much more energy, land, and water resources than plant-based food. Plant-based foods require fewer natural resources that unlikely cause pollution per calorie consumed (Green Restaurant Association, 2021). World Resources Institute (2016) also indicates that animal-based foods are more resource-intensive and environmentally impactful. WRI (2016) adds that animal-based foods accounted for more than three-quarters of global land use in late 2000's. Second, organic foods contain least human-modified ingredients, such as artificial flavors, chemical or synthetic seasoning, and colors (Chen, 2007). When restaurant customers order organic dishes from the menu, they are served with foods that are

made of organic or green ingredients. Because organic ingredients are grown without the use of pesticides and fertilizers, they are sustainably produced foods that less likely harmful to the environment and human health. Last, an increasing number of sustainable operations began to enter the U.S. market (GRA, 2021). If companies need to meet the growing demand of sustainable consumption, they should focus on adapting sustainable practices. Environmentally sustainable operations are encouraged in that its size and constant growth of the hospitality industry urges operations to cooperate (World Meteorological Organization, 2020). Nonetheless, climate changes or rising temperatures are leading the loss of ecosystems that may reduce agricultural yields, contributing food insecurity (WMO, 2020).

A recent study by Feil et al. (2020) explore consumers' behavior towards organic food consumption in Brazil. This study uses a quantitative approach to investigate the relation between consumption motivations, perceptions, and attitudes and organic food consumers in Brazil. Because the growth of the organic food market depends on consumer behavior, it is necessary to create effective development and promotion of sustainable food system (Chekima et al., 2017). The results from the study conducted by Feil et al. (2020) show that there is a complex perspective about motivations, perceptions, and attitudes of consumers that it should be further investigated to assess a sustainable consumption in line with consumer profiles. In other words, it was suggested that managers can put efforts on building an effective consumer marketing strategy by finding a homogenous perception and motivation to consume or purchase organic foods. It may be important to thoroughly understand which groups of consumers tend to have specific motivations, perceptions, and attitudes to design organic products that can better appeal to those groups.

Some green practices may include purchasing seasonal produce, green materials, and maintaining certain percentages of local foods (Lopez et al., 2019). Organic or sustainable foods are known for its pesticide-free, hormone-free, and they contain less or no antibiotics, GMOs, and chemicals (Essoussi & Zahaf, 2009).

2.2 Dual Coding Theory

The dual coding theory postulates that there are three different information processing codes: visual, verbal, and a combination of the two (Paivio, 1971, 1991). Visual cues are processed through peripheral routes that require less cognitive thinking, and verbal cues are processed through central routes that require effortful thinking (Petty & Cacioppo, 1986; Paivio, 1991). Of these three routes, Xue and Muralidharan (2015) state that using visual and verbal cues together can influence consumers to respond more favorably to print advertising and thus convey the core message more effectively. This could occur because when an advertisement presents both visual and textual information, it evokes stronger memory recall, especially when the images are interactive (Xue & Muralidharan, 2015). Past research studies adopt the dual coding theory to elucidate the effects of advertisements in a consumer behavior context (Jaini et al., 2019; Kao & Du, 2020). Chang et al.'s (2020) results indicate that companies should focus more on esthetically appealing graphic design to attract consumer attention. This would be especially useful to appeal to people who tend to process information through peripheral routes. It appears that they are more attracted to the esthetics or design of an advertisement. Studies have adapted the dual coding theory in various research topics to explore the effectiveness of message types, including the hotel (Sahin et al., 2020), green advertisement (Hartmann & Apaolaza-Ibanez, 2009), and restaurant menu labelling contexts (Bosselman et al., 2020). One of the first studies that applied dual coding theory examined how humans view textual and pictorial messages to

build mental representations in animations (Mayer & Anderson, 1991). The authors investigated the effects of an animated explanation of how a bicycle tire works. They conducted an experiment using different presentations featuring words, pictures, audio, and video and concluded that individuals who viewed information presented in words combined with pictures showed better problem-solving performance and had more referential connections between verbal and visual cues (Mayer & Anderson, 1991). Later, this result was confirmed by Hartmann and Apaolaza-Ibanez (2009), who stress that a combination of descriptive and visual green image advertisements had a stronger effect on consumers' environmental concern than either type of design when used alone. A similar study conducted by Lee and Kim (2020) found that "pictures and verbal stimuli are processed in the visual code and information processed in the visual code stimulates mental imagery" (p.3); they were interested in finding the menu design that was most effective at encouraging customers to order food from the menu. Thus, dual coding theory has been widely discussed in the advertising context. However, limited research has been carried out in the specific area of green menu selection.

2.3 Elaboration Likelihood Model

The elaboration likelihood model (ELM) proposes that an individual's motivation and ability to think about a certain persuasive message can be impacted by how that message's characteristics change the individual's attitude. The ELM was first developed by Petty and Cacioppo (1986) to explain how and why people are persuaded in a certain way to change their attitudes. The ELM also indicates that individuals use different routes of thinking that ultimately lead to different reactions to messages (Petty & Cacioppo, 1986). When people are more concerned about information processing, they are motivated to take the time to clarify information about products or advertisements (Petty & Cacioppo, 1984, 1986). People who

evaluate information carefully are referred to as central route takers; they decide whether a given piece of information is credible after a careful thinking process. By contrast, individuals who are not motivated to pay careful attention to information details tend to rely more on irrelevant information in making their judgments. Consequently, they have low involvement in products. As a framework, the ELM can be a useful model to indicate processing styles such as central and peripheral routes, but the model would be greatly improved if it could indicate the ways in which these cues can be processed under different situations.

Under both dual coding theory and the ELM, an individual who takes the central route tends to think carefully and scrutinize relevant arguments prior to making a final decision about behavior. Such an individual probably prefers verbal or textual message cues that require a considerable amount of thinking and is likely to rate information quality as important. In the context of this study, this suggests adopting a descriptive menu design. Conversely, an individual who prefers the peripheral route judges arguments more simply (Paivio, 1991); this individual is more likely to prefer visual or pictorial message cues, which in the present study refers to carbon footprints and the traffic lights menu. Kulhavy et al. (1993) argue that while the ELM is limited to how individuals process pictorial stimuli, dual coding theory is suitable for describing a more facilitative relation between visual and textual displays. A person who takes both central and peripheral routes likely responds to both verbal and visual cues, which in the present study is referred to as a combined menu design. In order to better understand the persuasive effects of green menu design, the present study adopts dual coding theory and the ELM to explain changes in information processing among restaurant customers.

In an experiment conducted by Kulhavy et al. (1993), undergraduate students were asked to study a city map that featured landmarks and were given both pictures and verbal information.

The authors found that a combination of visual and textual displays appeared to be important for the retrieval of a given piece of information. The ELM and dual coding theory may seem identical, but Kulhavy et al.'s (1993) experimental study shows that some results can be explained by dual coding theory but not by the ELM. Based on this distinction, the present study proposes that individuals' current values, beliefs, and norms can contribute to their behaviors, while dual coding theory supports the effects of visual and verbal cues on individuals' decision-making processes. Under dual coding theory, stimuli are presented to elucidate the relationships between green messages presented on a menu in a visualized format, those presented in a verbal format, and those presented using a combination of both. The present study applies the extended VBN and dual coding theories to measure customers' values, beliefs, and norms and how they are reflected in behavioral intentions to better understand how much more customers are willing to pay for green menu items.

2.4 Value-Belief Norm (VBN) Theory

The VBN theory was first introduced by Stern et al. (1999). According to the VBN theory, consumers are likely to engage in protecting the environment when they feel morally obliged to do so. Moreover, having a feeling of moral obligation is stronger when consumers are already aware of environmental problems that may be caused by their behavior. Therefore, the higher the awareness, the higher the environmental concern. Previous study investigated how personal values determine willingness to pay for the reduction of pollution using the VBN theory (Sanchez et al., 2018). This study considered three values based on the VBN theory: biospheric, egoistic, and altruistic values, and attitudes and perceived behavioral control from the Theory of Planned Behavior (TPB). With an increasing interest in environment protection, Sanchez et al. (2018) explain that an individual's attitude, value orientation, environmental belief, and norms

all significantly affect those who have pro-environmental behaviors. Other studies also support that consumers' current perceptions towards green restaurants can directly affect green consumption intentions (Sanchez et al., 2018; Long et al., 2021). As a result, it is important to first promote good values in relation to the human environmental protection because these values can considerably affect willingness to pay for green practices (Sanchez et al., 2018). The current study extends the VBN theory by adding social norm to explore full-service restaurant customers' green menu selecting behaviors. Previous studies suggest that opinions of significant others influence whether to select or not to select food and it has been tested in food choice context (Choi et al., 2015; Han et al., 2016; Shepherd, 1999; Youn et al., 2020). However, it has not been tested in the green menu selecting behaviors. For this reason, the current study includes social norms into the VBN theory to construct the research framework to better predict customers' future menu selecting behaviors.

In the hotel industry context, Choi et al. (2015) also apply the VBN and TPB theory to explain guests' intentions to stay at a green hotel. The main purpose of this study was to expand the knowledge of hotel guests' green behaviors by testing the extended VBN theory in the hotel context. In order to respond to guests' awareness of green practices, it is important to first understand what triggers visiting intentions. A study by Choi et al. (2015) is one of the first studies that attempted to integrate subjective norm and green trust to find evidence of hotel guests' demands on eco-friendly lodging service. When they measured value, beliefs, norms, and new variables, they revealed an important effect of subjective norm in explaining hotel customers' decision to stay at a green hotel (Choi et al., 2015). As a result, the intention to visit a green hotel may be influenced by their significant others. Another study by Pinto et al. (2011) explore how personal values can influence water consumption habits in Brazil. The study noted

that current environmental awareness and personal values can be important predictors for wasteful habits (Pinto et al., 2011). Since a person's value regarding natural resources can reflect consumption behaviors, a personal value influences responsible water consumption (Pinto et al., 2011). Moreover, Schaefer and Crane (2005) stress that environmentally conscious consumers tend to be strongly motivated by their environmental values. As such, personal values play as an important guidance to evaluate a specific action which then leads to an actual behavior (Stern et al., 1999). The key benefits that consumers expect from foods is then used to design and establish new products to consumers (Grunert et al., 2014). Hofstede (1984) defined a value as a belief in which an individual bases a certain behavior or action in accordance with preferences. Values then influence awareness of consequences. Stern et al. (1999) indicate that awareness of consequences precedes ascription of responsibility. It is a belief that a behavior can either prevent or promote undesirable consequences. Awareness of consequences is closely related to the belief that either improves or threatens the environment (Stern et al., 1999). It should be noted that there are causal moves from awareness of consequences and ascribed responsibility to personal norm (Youn et al., 2020). These moves suggest that a person should understand any consequences of behavior prior to feeling responsible to be taking part of behavior or acknowledging that the contribution may be useful (Youn et al., 2020). Choi et al. (2015) describe ascription of responsibility as a person's responsibility to avoid any negative environmental consequences. The environmentally responsible behavior is one of the essential aspects that affects green purchasing behaviors (Choi et al., 2015; Young et al., 2020). When Stern et al. (1999) established the VBN theory, they highlighted the influence of human value on behavior in the pro-environmental context. A person tends to develop personal norms to perform a specific action in various prosocial contexts (Schwartz & Howard, 1981). Belief norms refer to

a person's own thoughts about the natural environment. They explained that personal norms are activated by personal values and beliefs about the relationships between humans and the environment, consequences, and responsibility of a person taking corrective actions (Youn et al., 2020). For instance, personal norms positively encourage pro-environmental behaviors. As stated by Fishbein (1967), both personal norms and subjective norms can help better understand consumer behavior towards green behavior because a person would likely behave in a certain way especially when their family, friends, and co-workers also value a certain behavior (Ajzen, 1991). Thus, the inclusion of social or subjective norms can better predict a person's future behaviors, including food choices. According to the study conducted by Han et al. (2010), attitudes of individuals who decide to visit green hotels heavily relied on the thoughts and opinions of other people who are close to them. The TPB assumes that subjective norms have an impact on individuals' opinions. In this sense, it depends on whether people around them also support and approve of selecting green menu items, their selections can be affected.

The present study will therefore extend the VBN theory by adding social norms. Accordingly, it can be proposed that a full-service restaurant customers' willingness to pay more is influenced by both personal and social norms. When a person holds beliefs that it is important to maintain the environment clean, it can affect personal norms. Kiatkawsin and Han (2017) stated that personal norms are feelings of obligation to preserve the environment. Values first influence beliefs, which in turn influences awareness of consequences (Kiatkawsin & Han, 2017). Subjective norm is a function of an individual's normative beliefs of other people that influence a certain action or inaction (Ajzen, 1991). Although personal norm has been explored extensively, not many studies examined in conjunction to subjective norm (Choi et al. 2015). Subjective norm is a social pressure from important individual or a group of people who approve

or disapprove a behavior. It can be assumed that when a person's significant others believe that staying at a green hotel or restaurant is an appropriate behavior, then the person would likely consider visiting a green hotel complying with their referents (Ajzen, 1991). Based on the extended VBN theory, the following hypotheses were developed:

H1. Customers' green values positively affect their awareness of consequences for ordering a green item.

H2. Customers' awareness of consequences for ordering a green item positively affects their ascribed responsibility in ordering a green item at a restaurant.

H3. Customers' ascribed responsibility positively affects their personal norm to support green practices when dining at a restaurant.

H4. Customers' personal norms positively affect their behavioral intention to dine at a restaurant.

H5. Customers' Social norms positively affect personal norms to support green practices by dining in a restaurant.

H6. Social norms positively affect customers' willingness to pay more at a restaurant.

2.5 Green Menu

According to the most recent study conducted by Moon (2021), the availability of information appeared to be one of the important control factors when dining at a restaurant. This can be an important aspect to consider when managing a restaurant. While an interest in restaurants with green practices has been continuously increasing, restaurants neglect to provide enough information about green practices (Moon, 2021). There are some restaurants with limited green practices that they often fail to note specific information regarding the way they contribute to a green environment. According to the study results from Feil et al. (2020), it is important to enrich the positive perception of consumers by informing any benefits of consuming or

purchasing green foods. For instance, green restaurants can inform consumers that green foods are free from any pesticides. Because menu labelling is an important tool to inform consumers of food contents, restaurants may use menu labelling to better appeal to green consumers. Since early days, customers view the menu looking for benefits they believe will satisfy their needs (Schellinck, 1983). Because green consumption has become increasingly popular among current customers, there is a need to consider designing a menu in a more effective way to better meet customers' expectations.

As menu plays an important role to attract customers, the research regarding menu design has been gaining a considerable attention from scholars. For instance, some studies scrutinized menu positioning (Murano & Lomas, 2015), menu pricing (Kelly et al., 2009), nutrition menu labelling (Morley et al., 2013). In a study conducted by Murano and Lomas (2015), they tested the effects of different menu position, such as left vertical, right vertical, top, and bottom horizontal. This study suggested restaurateurs what strategies can be applied in restaurant operations by effectively positioning menu (Murano & Lomas, 2015). Kelly et al. (2009) explains various ways to differentiate menu pricing. Kelly et al. (2009) also state that menu is the first thing that a customer looks at. Restaurant managers can optimize menu pricing to higher the total revenue without reducing sales (Kelly et al., 2009). Morley et al. (2013) attempt to uncover the relationship between nutrition menu labelling and diners' intention to choose less energy-intensive foods. The findings reveal that adding nutrition information on the restaurant menu may positively influence diners' willingness to select healthier food choices (Morley et al., 2013). This study therefore noted the effectiveness of menu labelling in informing unhealthy food items.

It is also important to note that every consumer is different in terms of perceptions and knowledge level. While some people solely care about food taste and preferences, others might have a difficulty finding green foods due to lack of knowledge. For this reason, public policy makers need to clearly explain about public health and environmental benefits to increase green consumption (Feil et al., 2020). As such, the informativeness may play an important role in better identifying green foods and consequences of consumption. Moreover, insufficient information from green companies can affect customers' visiting and purchasing intentions which may engender ineffective communication between the firms' environmental policy or business philosophy and targeted customers (Chen & Tung, 2014).

Descriptive menu label

The use of descriptive words on the restaurant food menu is one effective strategy that can influence customers to have positive attitudes towards foods, restaurant, and post-consumption behaviors (Kim & Magnini, 2020). Because words that convey sensory appeal may enhance customers' food choices, restaurants can effectively use sensory menu labels to appeal to customers. Although many research studies have been conducted regarding menu labels containing calorie intake or nutrient (Ellison et al., 2014; Filimonau & Krivcova, 2017), the effects of using descriptive menu names on green food items is scant.

When descriptive menu names are offered, the restaurant sales increased, and customers rated the menu items as higher quality than customers who chose items with regular menu labels (Lockyer, 2006). A study by Lockyer (2006) indicates that the use of words on the menu plays an important role that the management should adopt. Lockyer (2006) examines the use of words on the restaurant menu such as 'tender', and 'natural'. Descriptive menu labels had a positive influence on restaurants purchasing intentions as it increased the sales by 27 percent. It has been

shown by a research study from Kim et al. (2019) that restaurants are encouraged to boost the sales through the design elements of the menu. As such, descriptive or sensory menu labels may positively influence a customer's willingness to pay more for a restaurant service.

Kim and Magnini (2020) indicate that changing the restaurant menu names involves little time and cost that a manager should consider adapting a unique menu name to promote targeted images and taste to customers. Kim and Magnini (2020) also conclude that using descriptive menu labels help strengthen the food image. Studies found that descriptive menu names help customers visualize the food quality as it uses adjectives to describe the menu item (Lockyer, 2006; Stern, 1988). For instance, when customers look at the menu named 'homemade cheesecake', they alter their perceptions to meet their beliefs about homemade food to what they believe about the restaurant food. The effects of descriptive labels also have been investigated in the consumer purchasing behavior study by Swahn et al. (2012). Consumers were observed in a retail store setting to explore if descriptive labelling has an impact on consumers' choice. This observational study found that a product with descriptive labelling was more frequently chosen by consumers as opposed to the product with general names (Swahn et al., 2012). Descriptive names attempt to deliver food taste, smell, texture, and mouthfeel (Swahn et al., 2012). Kim and Magnini (2020) also support through the study that restaurants should deliver quality foods and services to heighten menu descriptions to customers. Moreover, it was identified from the study of Lockyer (2006) that a focus group showed a higher preference on menu items with specific descriptive words. As such, words that convey sensory appeal on the menu can enhance food choices.

Descriptive words on restaurant menu can positively affect customers' menu selections. The use of descriptive menu label has not only been investigated in a full-service restaurant

context, but in the beverage context as well. A recent experiment by Viejo et al. (2021) point out that virtual sensory beverage labels may directly affect perceived quality and willingness to purchase. In this study, study participants were presented with a six different types of graphic menu segments. When participants viewed the premium graphic menu, it was rated the highest perceived quality and perceived strength. It can be inferred from the experiment result from Viejo et al. (2021) that when labels are created to arouse one's interest, it can likely influence perceived quality which then leads to willingness to purchase. It was found that sensory attributes such as food appearance and freshness are more likely recognized in green products like fruits and vegetables (Chekima et al., 2017). Consumers tend to place value on sensory characteristics of the food. Furthermore, descriptive, and sensory labels can stimulate a deeper understanding of the product (Swahn et al., 2012; Zhang et al., 2021). Following this assumption, the use of descriptive menu names is worthwhile to consider. As such, consumers may take descriptive menu labels into account when selecting food items from the menu. Yet, how descriptive menu labels can encourage restaurant customers to choose green menus and make them want to pay more has been unexplored.

Carbon footprint menu label

According to the report from WMO (2020), there has been a temporary reduction in greenhouse emissions because of measures taken in response to the pandemic. This reduction was only minimal, and that it started to increase again nowadays (WMO, 2020). The effects of carbon footprint labels have been substantially explored in consumer buying behavior studies (Hallsworth & Wong, 2012; Wackernagel, 1996). It was found that consumers tend to have more climate-friendly behavior with a color-coded carbon label on products than a plain label (Hallsworth & Wong, 2012). Carbon footprint has been regarded as a part of commitment of

restaurant transparency on its environmental performance (Brunner et al., 2018). As consumers become more aware of environmental and societal impacts in the foodservice industry, a carbon footprint label may play an important role in better understanding consumer choice in the foodservice context (Filimonau et al., 2017). The carbon footprint concept has been extensively used in the public debate on responsibility of global climate change (Pertsova, 2007). The carbon footprint is regarded as the amount of gaseous emissions that are associated with production or consumption activities (Wackernagel, 1996). A carbon footprint is comprised of emissions of carbon dioxide or greenhouse gases in CO₂ equivalents (Pertsova, 2007). It is defined as a measure of the exclusive total amount of carbon dioxide emissions that is being caused by an activity of individuals, organizations, and industry sectors that has been accumulated over the life stages of a product (Pertsova, 2007).

According to the report from IPCC (2021), future annual emissions of CO₂ can cause future additional warming. It is likely that heavy greenhouse gas emissions have been more frequent in most regions that it adds to global warming. Moreover, Center for American Progress (CAP, 2019) stress that restaurants, stores, and all other buildings in the U.S. produce about 10 percent of U.S. greenhouse gas emissions. As such, various populations and companies produce carbon footprint that directly and indirectly impact the environment. A research study conducted by Babakhani et al. (2020) reveal the effects of carbon footprint labels on restaurant menu through an empirical study. They were interested in examining as to what degree do restaurant diners pay attention to carbon labels using eye-tracking (Babakhani et al., 2020). Food consumption is responsible for about a third of gas emissions emerged in countries especially more from animal-based diets than vegetarian diets (Garnett, 2011). Hence, it is important to encourage diners to choose more environmentally friendly food options by adding carbon

footprint labels on the menu. The study result from Babakhani et al. (2020) highlight that restauranteur should add carbon labels on the menu to increase the awareness of carbon footprint. This finding was similar to that of the study from Brunner et al. (2018). Based on the experiment conducted by Brunner et al. (2018), the information provided on the restaurant menu can change the behavior of customers. More specifically, the study found that there was an increase in sales of meat options when it was labelled with an indication of low amount of greenhouse gas emissions caused during preparation. On the other hand, there was a decrease in sales of meat options when it was indicated on the menu that the meat options contain a high amount of gas emissions during meal preparation. It can be inferred from these that a restaurant labelling scheme can positively affect diners' menu selections.

In a long-term, carbon footprint menu may play a significant role in educating restaurant customers regarding consequences of consuming high emissions menu items when dining out (Babakhani et al., 2020). Another study from Filimonau and Krivcova (2017) also indicate that a restaurant menu can use carbon labels to inform diners about environmental and societal impact of the choice. As noted by a recent study from Canavari and Coderoni (2020), carbon footprint labels are relatively unexplored in empirical studies especially in food sector. The study also highlights that the effects of carbon footprints labels, and they may differ by consumer segment. Moreover, consumers would generally respond positively to lower carbon-emitting food items if it is also priced lower than other food items (Canavari & Coderoni, 2020). As such, carbon footprint labels appear to be strengthened when it is also associated with local origin, health logos, or low-fat content information (Akaichi et al., 2020; Emberger-Klein & Menrad, 2018; Hoek et al., 2017).

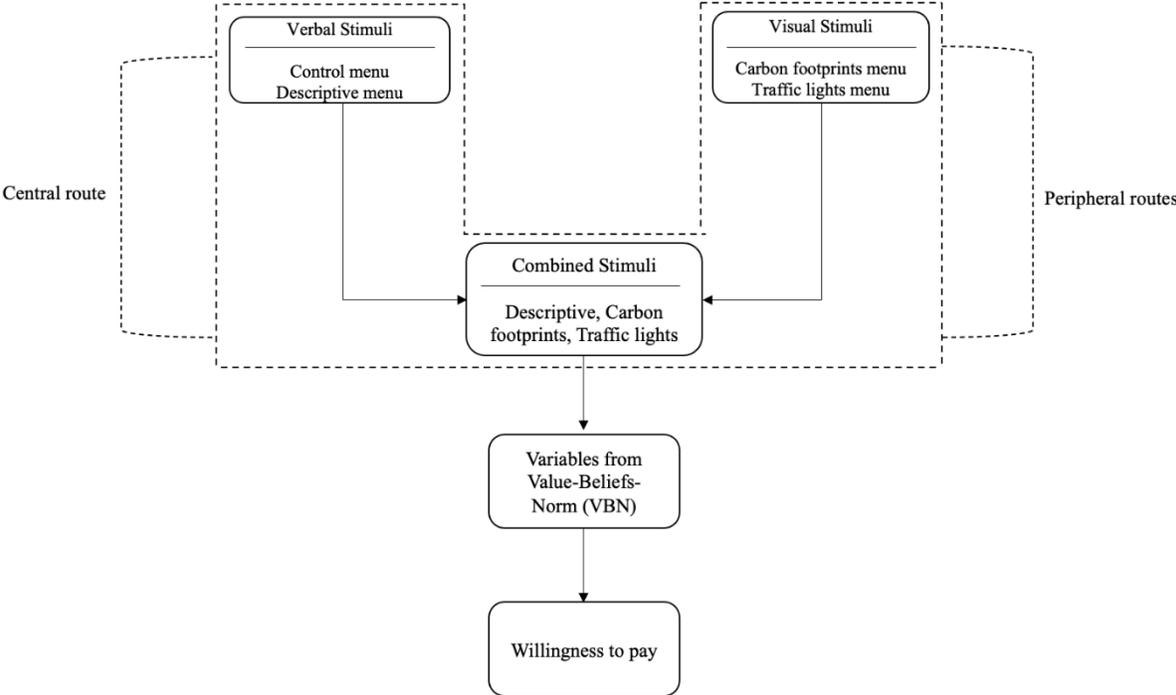
Traffic light menu label

Numerous studies have examined the effects of visual aids on the restaurant menu (Hou et al., 2017; Pennings et al., 2014). The empirical investigation found that menus with photos can more likely attract customers as opposed to the menu without photos (Hou et al., 2017). Additionally, a pamphlet with a picture can increase how long a person gazes at nutritional information which would also help inform healthier food choices (Pennings et al., 2014). In a psychological perspective, Shepard (1967) concluded in an experiment that individuals who view pictures are more likely recognize the given stimuli positively than individuals who are asked to read words. Later studies also confirm that pictures can lead to better brand recall as opposed to the one associated with verbal information only (Hou et al., 2017). Interestingly, Wyer et al. (2008) highlight that when a mental image with a written or verbal information matches, adding a picture may impact consumers' product evaluation more positively. On the other hand, if a mental image based on verbal information is disassociated with the given picture, then adding a picture may impact consumers' evaluation negatively (Wyer et al., 2008).

The effects of traffic light label have been investigated in various types of industry including the foodservice. In a student catering facility, researchers assessed how red, yellow, and green label colors can influence customers' menu selecting choices (Brunner et al., 2018). This study attempted to explore how a menu label with traffic colors can be implemented to inform about less emission intensive diet. When meat dishes were labelled in green color, indicating low emissions, the sales of meat dishes increased by 11.5%. When meat dishes were labelled in red color informing its high emissions, the sales decreased by 4.9% (Brunner et al., 2018). It can be inferred from the study result that information provided in colors may lead to more environmentally friendly food consumption. The use of traffic light labels on consumers' selections on less energy-intensive fast foods has been investigated through an experiment by

Morley et al. (2013). During the experiment, study participants were randomly assigned to one of five online menus. The study found that a person who viewed the control menu selected meals that contains the highest energy content. Conversely, participants who viewed the menu with traffic light information chose meals that contains the least energy content (Morley et al., 2013). Thus, the study revealed that the traffic lights labelling affects a person’s meal selecting behaviors. If a menu is presented with traffic lights, a consumer would likely use the information when making a food choice. As such, the use of colors or traffic lights on the restaurant menu can impact consumers’ food consumption choices (Morley et al., 2013).

Figure 1. Conceptual Model



2.6 Behavioral intentions

Willingness to pay

Willingness to pay can be referred to as the maximum amount of money a customer is willing to spend for a product or service goods (Krishna, 1991). Also, the price should be acceptable to the consumer who is paying for the product or service. The role of price appeared to be one of the crucial aspects with respect to customers' willingness to pay more (Homburg et al., 2005). However, the price can also prevent customers from purchasing green products or foods as customer demand may be hindered by high prices (Aschemann-Witzel & Zielke, 2017). It was also found that price can be perceived barrier to purchase organic foods (Aschemann-Witzel & Zielke, 2017). While some consumers are willing to pay a premium for green products, if the cost becomes increasingly large, only the most environmentally conscious consumers tend to remain loyal (Vecchio & Annunziata, 2015).

It was frequently noted in consumer behavior research studies that consumers' willingness to pay has been used as a measure of the value that a consumer assigns to product or service experience in monetary terms (Homburg et al., 2005; Krishna, 1991). In a study by Namkung and Jang (2017), they examine restaurant customers' willingness to pay for green practices in restaurants. The results reveal that customers who are willing to spend more for green practices generally had higher perceptions of green brand image than those who are unwilling to pay an extra. This infers that a customer who visits green restaurants expect various types of green practices to meet their wants and needs. In this sense, green actions by restaurants may help satisfy their customer expectations (Schubert et al., 2010). In other instance, Long et al. (2021) assess consumers' willingness to pay for an optional restaurant surcharge in support of greenhouse gas emission reduction. This study found that willingness to pay for restaurant surcharges vary by individual characteristics. Specifically, consumers with environmental awareness tend to support green consumption and willing to pay on average of 6.05 percent more

(Long et al., 2021). Furthermore, future-oriented customers would pay extra to prevent carbon emissions than present-oriented customers (Long et al., 2021). They added that future-oriented customers value future outcomes of environmental protection that they are more likely engage in green activities whereas present-oriented customers would likely value immediate consequences of their activities (Long et al., 2021). Another finding from this study is the use of green script. When survey respondents were asked to read the information regarding climate change and other global environmental issues, they appeared to have higher willingness to pay for a carbon reduction program than those who didn't read the information (Long et al., 2021). In 2010, Hu et al. (2010) find that people are likely to pay 2 to 6 percent more to eat at a green restaurant. Although the intention varied by demographic variables, people are generally willing to pay more when patronizing at a green restaurant. Later, Namkung and Jang (2017) reveal a similar result through a web-based survey that individuals with higher perceptions of green brand image tend to pay a premium for green practices. It can be inferred from these findings that a person who has a favorable perception towards preserving the environment would likely to pay more for the green consumption.

2.7 Moderating Role of Age

Age can be an important moderator in food choice decisions (Hu et al., 2010). Pinto et al. (2011) highlights that age can significantly impact a person's pro-environmental attitude and behavior. In 2010's, according to the study result from Jang et al. (2011), generation Y or millennials who were born between 1980 and late 1990s is expected to be a major group in the restaurant industry. Today, NRA (2020) reveals the statistics that more than half of millennials are likely to dine at a restaurant that offers locally sourced items. It was also noted by a recent study from Long et al. (2021) that young consumers tend to pay a restaurant surcharge in support

of carbon emission reductions. They added that this could be because young individuals are more likely to experience impacts of carbon emissions and climate change than older consumers. Because there is an increasing number of companies that adopted sustainability these days (NRA, 2022), Nicolau et al. (2020) intend to find the key determinants of millennials' willingness to pay for restaurants with green practices. As a result, the study reveals results that are contradicting to that of Long et al. (2021) and Moon (2021). Nicolau et al (2020) indicate that individuals' age was not statistically significant in green patronizing intentions. They also highlighted that restaurant diners' intention to visit a green restaurant did not substantially vary across age groups.

On the other hand, according to the earlier study conducted by Pinto et al. (2011), while young individuals have higher knowledge towards environmental issues, they are less inclined to adhere to green practices than older individuals. Pinto et al. (2011) add that younger people are uncommitted to going green that they will present less environmentally responsible consumption (ERC). In this sense, this study uncovered that older people are not prone to perform wasteful activities when compared to young people and that they tend to be more careful in reducing waste (Pinto et al., 2011). This could be because older people are concerned about the well-being of future generations as they are more likely to have children or grandchildren than young people (Pinto et al., 2011). Furthermore, older customers have more knowledge and life experiences that they tend to believe their judgement (Nicolau et al., 2020). D'Souza et al. (2007) also state that environmental concern and behavior were stronger for individuals above 50 years of age. For this reason, they are less likely to be influenced by social pressure (Nicolau et al., 2020). It can be assumed that young customers are more susceptible to social norms or pressure when compared to older customers.

Although there are many studies that examine the moderating role of age in restaurant context, its effects on restaurant green menu have not been discovered yet. A similar study was conducted by Youn et al. (2020) in which they measure the moderating role of age as to how it can moderate the relationship between traditional restaurant diner's personal value and various behavioral intentions. The findings indicate that age plays an important moderating role for ascription of responsibility and personal norms especially for older adults (Youn et al., 2020). Age appears to be one of the significant predictors of food consumption that affects restaurant purchasing intentions (Youn et al., 2020). It can be inferred from this study finding that older restaurant customers have a strong responsibility to support traditional restaurants. Similar study conducted by Hu et al. (2010) note that older individuals patronize in green restaurants more frequently than young individuals. Taking these study results into account, it would be necessary to examine how age can moderate the relationship between green values, beliefs, norms, and willingness to pay more. Thus, the following hypotheses were developed:

H7a. Age moderates the relationship between green value and awareness of consequences.

H7b. Age moderates the relationship between awareness of consequences and ascription of responsibility.

H7c. Age moderates the relationship between ascription of responsibility and personal norms.

H7d. Age moderates the relationship between personal norms and willingness to pay more.

H7e. Age moderates the relationship between social norms and personal norms.

H7f. Age moderates the relationship between social norms and customers' willing to pay more at a restaurant.

2.8 Moderating Role of Income

As the restaurant and food sales is continuously expected to grow, the average dine-out expenditures account for more than half of the total household food expenditures (Sharma, 2007; NRA, 2018). As the number of restaurants with green menu options in the U.S. is gaining popularity every year (NRA, 2022), the total green consumption expenditures are also expected to increase. Previous studies have focused on identifying green customer segments (Frank & Chong, 2002; Hu et al., 2010; Zhang et al., 2019). These studies indicate that individuals who have higher educational level and higher disposable incomes are more likely to pay for green practices than those who are less educated with lower incomes (Frank & Chong, 2002; Hu et al., 2010). These study results were agreed by other researchers that customers with high disposable incomes are more willing to become green consumers (Newell & Green, 1997). Generally, it appears that there is a significant relationship between the income level and green consumption behavior (Zhang et al., 2019). With an increase in income level, residents in Shandong province showed a stronger intention for habitual green consumption behavior (Zhang et al., 2019). Zhang et al. (2019) add that residents with monthly income between \$1500 to \$4600 in the US currency will likely form green purchasing behaviors. Conversely, individuals with low-income level are motivated to become green consumers to avoid illnesses that might influence their lives (Mamun et al., 2018). Consequently, diners with low incomes may have positive attitudes towards purchasing eco-friendly products and service (Mamun et al., 2018). When the TPB theory was used to understand the reasons that induce low-income diners' intention to purchase green products, the opinions of significant others did not encourage low-income households to purchase green products (Mamun et al., 2018).

Studies have investigated the moderating effects of income level in green consumption contexts. Wang et al. (2019) examine the impacts of consumer demographics on the intention

towards green hotel selection. They found that income appeared to significantly influence consumers' green purchase attitudes as consumers with a higher income level have a stronger intention to purchase green foods that usually cost 10-15% higher than regular-priced foods (Wang et al., 2019). Another study by Hu et al. (2010) examines customers' intention to patronize at a green restaurant. This study collected a survey to measure individuals' opinions towards green purchasing behavior. More recent studies from Long et al. (2021) and Moon (2021) reveal that the higher the income level, the higher the customers' intention to visit eco-friendly or green restaurant. Among groups of individuals who tend to visit green restaurant more frequently, a large part of disposable income is spent on dining out. Moreover, if customers have higher income level, they also tend to pay a premium on buying sustainable food products (Moon, 2021). Customers with relatively higher income levels reduce the importance of the cost factor when dining at a restaurant (Long et al., 2021), thus it may play an important role in explaining purchasing behaviors especially at a restaurant where menu items cost higher than other types of restaurants. Based on previous literatures, it appeared that if individuals have higher earnings, they are more likely to dine at a green restaurant than of those with lower incomes (Hu et al., 2010). Namkung and Jang (2013) explore how consumers would perceive restaurants with green practices. Individuals with high health and environmental consciousness had an average income of less than \$79,999. Hence, it can be noted from previous studies that restaurant diners' income level may have an important effect on green consumption. While past scholars investigated the moderating effects of income level, it has not been tested in restaurants' green menu context especially using the extended VBN constructs. Thus, the following hypotheses can be developed:

H8a. Income level moderates the relationship between green value and awareness of consequences.

H8b. Income level moderates the relationship between awareness of consequences and ascription of responsibility.

H8c. Income level moderates the relationship between ascription of responsibility and personal norms.

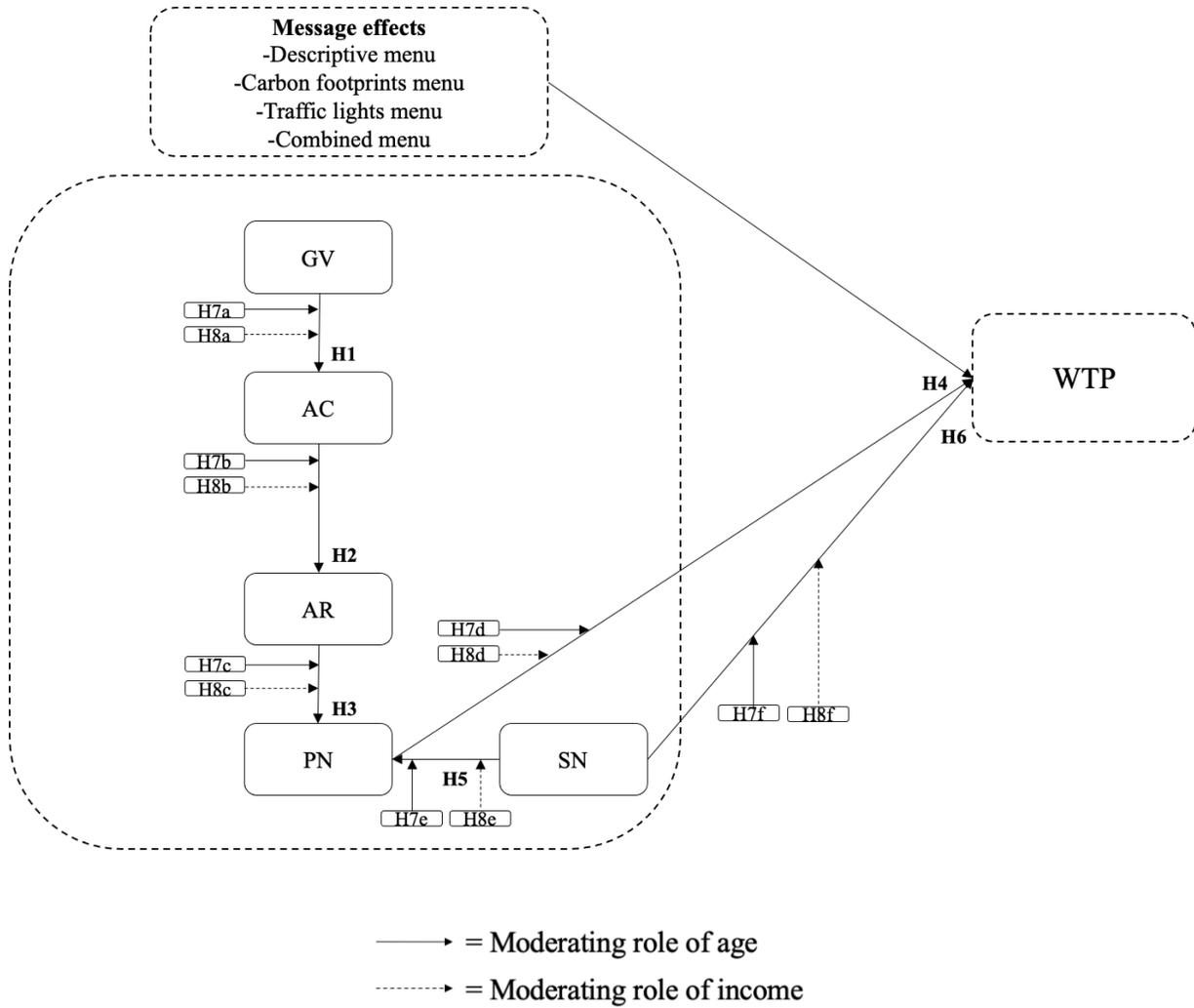
H8d. Income level moderates the relationship between personal norms and willingness to pay more.

H8e. Income level moderates the relationship between social norms and personal norms.

H8f. Income level moderates the relationship between social norms and customers' willing to pay more at a restaurant.

The proposed research model is presented as below (Figure 2).

Figure 2. Hypothesized Research Model



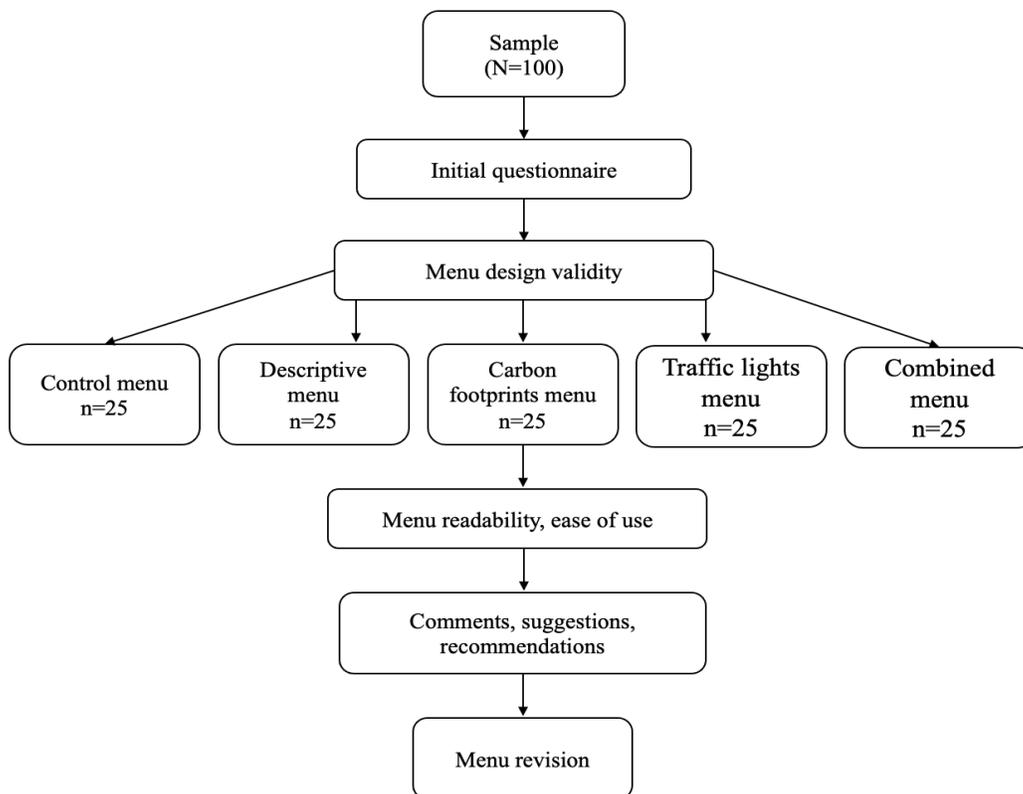
CHAPTER 3

METHODOLOGY

3.1 Menu validation

First, the study was approved by Institutional Review Board at University of Missouri-Columbia. A five different menu designs were developed. Then, they were face validated by 5 individuals with restaurant management experiences or expertise to ensure the face validity and efficiency of the questionnaire. Also, 10 graduate students from hospitality management provided feedback about all menus. Ease of use, menu readability, and suggestions were outlined. This allowed researchers to obtain recommendations to better improve the menu design. Then, revisions were made to enhance the overall menu quality.

Figure 3. Menu validity



3.2 Pilot study

The online surveys were created through a web-based platform called, Qualtrics. Then, the data were collected through Amazon Mechanical Turk (MTurk) to randomly expose individuals to one of the four menu versions. Followed by face validity (APPENDIX C), necessary revisions were made. Then, the green menu designs were used for further validity test (see Figure 2). The revised menu designs were tested through the online survey called, Amazon Mechanical Turk (MTurk), and hospitality undergraduate students. A total of 100 individuals who are at least 18 years of age participated. The initial questionnaire that was developed based on previous literature reviews were given to respondents to measure whether the menu is readable, contain necessary information, and easy to be understood. The first six questions in the questionnaire were included in each one of the surveys (APPENDIX A); control, descriptive, carbon footprints, traffic lights, and combined menu. Then, specific questions for each type of menu were asked (APPENDIX A). Following the menu validity, a pilot study was administered.

Reliability

Reliability is significant in that it signifies that collected responses are consistent and stable over time (Creswell, 2015). Cronbach's alpha was performed to test the reliability of the constructs (<0.05). Following the menu validation, a pilot study consisting of 60 individuals were conducted through MTurk for survey reliability. The questionnaire was then revised based on comments received from individuals.

Design

The present study used a within-subjects experimental design to test green menu designs. Following the consent, study respondents were randomly assigned to view the control menu design followed by the manipulated menu design. This minimizes the chance of social

desirability to impact responses. Multiple participation was not allowed in the present study. Participants who completed one of four survey versions were excluded from taking the other three surveys.

The four survey versions were: (control/descriptive stimulus, control/carbon footprints stimulus, control/traffic lights stimulus, and control/combined stimulus). Therefore, the four survey versions were comprised of a total five menus: (i) Control green menu; (ii) Descriptive green menu; (iii) Carbon footprints green menu; (iv) Traffic lights green menu; and (v) Combined green menu.

A control menu contains no labels in relation to green menu information. A descriptive menu is labeled with words that describe the menu options, ‘locally grown’, ‘farm raised’, ‘sustainably harvested’. Locally sourced ingredients are less energy-intensive and chemical-free. Sustainable fishing results in less bycatch that protects the ecosystem as catching wildlife that is not the target species can harm ocean habitats (NOAA, 2020; National Geographic, 2021). Non-traditionally raised food often requires fermentation, curing, smoking, or adding chemical preservatives that is generally not considered environmentally friendly (NRA, 2018). Transportation, processing, packaging, and refrigeration contribute to carbon footprint (NOAA, 2020). A carbon footprint menu contains the information as to how much greenhouse gas emissions (GHE) can be generated from each menu item. The size of the carbon footprints balls indicates the total estimated amount of greenhouse gas emissions from the food. It is provided on the bottom, with a small ball sign indicating the lowest GHE, and a large ball indicating the highest GHE. The amount of GHEs has been calculated through footprints calculators provided by Earthday (2021). Then, a traffic lights menu displays green information with green, yellow, or red circles indicating eco-friendly, moderately eco-friendly, and not eco-friendly item.

3.3 Data Collection

Sample

The study respondents were individuals 18 years of age who have dined at a full-service restaurant in the U.S. in the past 1 month. A total of 521 survey respondents were recruited and completed the survey through MTurk. There was a series of screening questions in the beginning of the survey to confirm that respondents meet the eligibility criteria (**APPENDIX B**), or they were excluded from taking the survey further. Participants who were qualified to participate in the study were compensated between \$0.35 and \$0.45 upon a successful completion. Similar experimental studies also paid workers this amount as compensation (Buhrmester et al., 2016; Lu and Geng-Qing Chi, 2018).

Measurements

Additionally, to assess whether study participants were paying attention to the experimental stimuli, participants were instructed to select various attention check questions as a response, such as “Please choose agree.” As a manipulation check, participants were asked to select the words of the descriptive menu label, choose the appropriate carbon footprint labels, and report the colors of the traffic lights they had seen on the previous screen following the menu ranking question. For instance, a question such as “Which of the following word best describes a food item that is environmentally friendly?”, “Which one of the following indicates the amount that releases most carbon footprint?”, “What does green light next to the food item represent?”. The manipulation-check questions were given as a multiple-choice question. A manipulation check helps reveal the intended effect of the manipulations in the study (Oppenheimer et al., 2009). Participants were unable to return to the previous screen of the experimental design. This procedure was to reduce noise and increase validity (Oppenheimer et al., 2009). Responses that

failed to answer correctly to both attention and manipulation check questions were removed from the further analyses. As presented in Table 1, this study adopted previously validated items that were based on the extended VBN theory to measure respondents' green value, awareness of consequences, ascription of responsibility, personal norms, social norms, and purchasing intentions. Each construct will be measured using (1) *Strongly disagree* to (5) *Strongly agree*. To measure study respondents' green value, a total of 4 questions related to their current green restaurant value will be asked. For instance, 'Purchasing a green food item at a restaurant helps protect the environment.' Next, awareness of consequences ('Energy saving practice in a restaurant can help global warming'), ascription of responsibility ('I feel jointly responsible for the global warming'), personal norms ('I feel ought to preserve the earth'), social norms ('People I know believe that it is important to prevent global warming') will contain 6 statements respectively. Lastly, purchasing intentions will be measured using 3 items, such as 'I'm willing to pay more for green practices at a restaurant'.

3.4 Experimental design

Meal selection

Menu items were selected based on the popularity from many full-service restaurants in the United States. (FSR, 2020). In the current study, burger and sandwiches were chosen because they are close substitutes, and they are ranked as the most famous menu item that is expected to maintain its popularity in the United States. (NRA, 2022). Respondents were instructed to imagine as if they are dining at a full-service restaurant, and they were asked to select the answers to the survey questions. Respondents were asked to select the most preferred, second-preferred, and third-preferred item that they would choose from the menu. If they do not wish to choose any food items, they were excluded from the survey. Only one of the four manipulated

menus used in the experiment was shown to survey respondents followed by the control menu. The respondent who participated in multiple survey experiments were excluded from final statistical analyses. This procedure ensures that the type of menu being shown is different across survey respondents. Also, it has the potential to minimize confounding and selection bias.

3.5 Data analysis

The main analyses were carried out in four stages. Firstly, demographic profiles of full-service restaurant customers were delineated. Secondly, confirmatory factor analysis (CFA) was performed for the latent constructs to verify convergence validity. Thirdly, sequential equation modeling (SEM) was implemented to assess causal relationships among values, beliefs, norms, and behavioral intentions. Fourthly, regressions were conducted to examine the moderating effects. Lastly, one-way ANOVA revealed differences among levels of willingness to pay.

Table 1. Measurements

Constructs	Description	Measurement Items	Reference
Green value	How valuable the green menu labels are on customers' green selections.	<ol style="list-style-type: none"> 1. Purchasing a green food item at a restaurant helps protect the environment. 2. Selecting a green food item at a restaurant preserves the earth. 3. Eating a green menu item at a restaurant helps minimize gas release/energy waste. 4. Purchasing a green menu item at a restaurant helps ensure sustainability. 	Han (2015); Stern et al. (1999)
Awareness of Consequences	Environmental consequences of customers' behavior/decision.	<ol style="list-style-type: none"> 1. Energy saving practice in a restaurant can help global warming. 2. Minimizing gas release/energy waste in a restaurant can reduce the danger to current environment. 3. Minimizing food waste in a restaurant helps reduce pollution. 4. Restaurants that don't follow proper green practices can contribute to an environmental 	Choi et al., 2015; Han (2015)

		degradation which is a problem for society. 5. Restaurants that provide sustainable foods can mitigate fossil fuel waste.	
Ascription of Responsibility	Customers' sense of responsibility to minimize negative environmental consequences.	1. I feel jointly responsible for the global warming. 2. I feel jointly responsible for the exhaustion of energy sources. 3. I feel jointly responsible to reduce pollution. 4. I'm responsible to follow proper green practices to prevent environmental degradation. 5. I'm responsible to manage resources by consuming sustainable foods. 6. I'm responsible for the protection of the environment through the promotion of green menu at restaurants.	Jang (2021); Youn et al. (2020)
Personal Norms	Feelings of moral obligation for environmental preservation.	1. I feel ought to preserve the earth. 2. I feel it is important to refrain from increasing gas and energy waste. 3. I feel a strong obligation to reduce pollution. 4. I feel that I should try my best to follow green practices whenever possible. 5. I feel that I should support restaurants that provide sustainable foods on the menu. 6. I feel that I should choose green foods for the safety of the environment.	Jang (2021); Teisl et al., (2009)
Social Norms	Social pressures that customers experience from significant others.	1. People I know believe that it is important to prevent global warming. 2. Most people who are important to me expect me to eat at restaurants that provide green menu to minimize risks associated with gas/energy waste.	Han & Yoon (2015); Youn et al. (2020)

		<p>3. People I know are greatly concerned about issues with air pollution.</p> <p>4. My friends or relatives expect me to follow green practices to prevent environmental degradation.</p> <p>5. People around me believe that choosing sustainable foods can mitigate fuel waste.</p> <p>6. People I respect worry about the climate change.</p>	
Behavioral Intentions	Customers' willingness to sacrifice to contribute to the environment.	<p>1. I'm willing to pay more for green practices at a restaurant.</p> <p>2. I'm willing to pay an extra to dine at a restaurant with green menu.</p> <p>3. Even when it is not tasty, I'm willing to do what I think is best for the environment.</p>	Davis et al., (2011); Hu et al., (2010).

**5-point Likert scale (1 = Strongly disagree to 5 = Strongly agree)*

CHAPTER 4

RESULTS

4.1 Sample profiles

Before distributing the main survey to respondents, a pilot study was administered through both online and paper survey using a convenience sampling method from February 15 to 28 to confirm the effectiveness of manipulations. MTurk was used to recruit respondents. When using MTurk, worker IDs were verified to prevent them from taking repeated surveys. For paper-based survey, respondents were undergraduate, graduate, and individuals who are at least 18 years of age in the United States. A total of 56 responses were collected. However, 9 invalid or incomplete responses that failed to answer qualifying answers were removed. The gender proportion of the online survey was 55% male and 45% female. After the pilot study, wording on measurement items were revised to improve the menu readability. Then, the main survey was distributed to a total of 601 respondents through MTurk. After 80 missing data were identified and removed, a total of 521 from all survey versions were deemed valid for further analyses.

Descriptive menu

As shown in Table 2, the general sociodemographic profiles from each survey design were delineated. According to the collected data from the descriptive menu, 64.7% were male, and 35.3% were female out of 133 respondents. Age ranged from 18 to 69 years old. The highest percentage is from 46-50 years (23.2%) followed by 31-35 years (19.6%), and 36-40 years (17.5%). In terms of ethnicity, the majority of respondents identified as Caucasians (69.9%), Hispanics (10.5%), and Asians (7.5%). By level of education, 45.9% of participants had obtained a four-year college degree, and 27.1% and 11.3% had earned professional degree or had earned a high school diploma or less, respectively. With respect to occupation, the majority of them were

full-time employed (87.2%). In terms of income level, 33.1% of respondents earn between \$40,001 and \$60,000, followed by \$20,001 and \$40,000 (22.5%), \$60,001 and \$80,000 (21.1%). Most respondents live in Southeast part of U.S. (18.9%), and West coast accounted for 18.1%, and Southwest accounted for 17.3%. When asked about how often they dine at a full-service restaurant, more than half of respondents indicated that they visit three to five times a month (51.1%).

When asked to rank their most, second, and third-preferred food item from the control menu, 'Chicken sandwich' (n=41) reported the highest out of a total 133 respondents. Both second-preferred and third-preferred item was 'Pulled pork sandwich' (n=32; n=30). However, when descriptive menu was viewed by the same respondents, 'Fish burger' (n=27) and 'Chicken sandwich (n=27) were both ranked as the most-preferred item. In terms of willingness to pay, nearly 28% of respondents indicated that they would pay between \$4.50 and \$8.50 to consume chicken sandwich. In average, they responded that they would pay \$4.30. After descriptive menu was presented, the average price respondents would pay was \$3.45 which was slightly lower than when they were asked to view the plain menu (Table 3).

Carbon footprints menu

By gender, nearly 60% of respondents were male, and majority of respondents fell in the age between 25 and 45 (82.1%). Most of them were Caucasians (86%) and hold a 4-year college degree (66.2%). In terms of occupation, more than 90% of respondents had a full-time job. With respect to income level, many respondents indicated that they earn income between \$20,000 and \$80,000. When asked about their current areas of residence, many of them live in Southeast (20.9%), followed by Midwest (17.8%), and Northwest (15.5%) in the United States. Generally,

respondents dine at a full-service restaurant three to five times in a month (56.6%), and they are willing to pay between three and five percent more on green menu items (51.2%).

They initially chose 'Chicken sandwich (n=42) as the most preferred menu item, but their preference changed to lentil lettuce wrap (n=39) after seeing the carbon footprints menu.

Accordingly, their willingness to pay was significantly different. They indicated that they would pay between \$1 to \$4 for chicken sandwich. However, they are willing to pay much higher for 'Lentil lettuce wrap' (\$10 to \$15) (Table 4).

Traffic lights menu

The gender composition was 53.1% male, and 46.9% female. The respondents' age fell between 21 and 30 years old (35.4%). In terms of ethnicity, Caucasian accounted for 71.5%. Regarding their educational level, more than 50% of respondents hold a 4-year college degree. And most of them indicated that they are full-time employees (84.6%). A little more than 35% of study respondents reported that they earn between \$40,001 to \$60,000 followed by \$20,000 to \$40,000 (22.3%). More than 26% of them resided in Midwest part of the United States. When asked to indicate dining frequency, more than half of them dine at a full-service restaurant between 3 to 5 times (56.9%) in a month. They would like to pay between 3 to 5 percent more when selecting green items from the menu (63.1%). Respondents preferred 'Chicken sandwich' (n=45) as their first choice and they are willing to pay between \$6 to \$15 (n=38). However, after seeing the traffic lights menu, they preferred 'Lentil lettuce wrap' (n=33), and they would like to pay between \$9.01 to \$15 (n=30) (Table 5).

Combined menu

Among the 129 study respondents, a little more than half of them were male (53.5%), and nearly 46% of them were female. Like respondents from other types of menus, respondents' age

fell between 21 to 30 years old (36.4%) followed by 36 to 40 (17.1%), and 31 to 35 years old (16.2%). Most respondents were Caucasians (70.5%), followed by African American (14.7%). More than half of respondents hold a 4-year college degree (62.8%), followed by postgraduates (16.3%), and Professional degree (13.9%). Regarding the annual income, more than 34% of them make between \$40,001 and \$60,000. Nearly 28% of respondents currently reside in Midwest in the U.S. When asked to indicate their full-service restaurant dining frequency, more than half of respondents said that they dine between 3 to 5 times in a month (58.1%). With respect to willingness to pay in percentage, nearly 60% of study respondents reported that they are willing to pay between 3 to 5 percent more for green menu items. Like other types of menus, ‘Chicken sandwich’ (n=44) was respondents’ favorite food item from the control menu. However, after manipulated menu was given, they were more likely to choose ‘Lentil lettuce wrap’ (n=35). In terms of willingness to pay, study respondents reported that they would pay between \$4.01 and \$8 (n=36) for chicken sandwich. Nevertheless, respondents reported that they are willing to pay \$8 to \$15.99 for the lentil lettuce wrap from the combined menu. This suggests that they changed their menu selecting behaviors when they were exposed to see the manipulated menu design (Table 6).

Table 2. Demographic profiles

Characteristics	Descriptive Menu	Carbon Footprints Menu	Traffic Lights Menu	Combined Menu
Gender				
Male	86(64.7%)	75(58.1%)	69(53.1%)	69(53.5%)
Female	47(35.3%)	54(41.9%)	61(46.9%)	59(45.7%)
Prefer not to say	0	0	0	1(0.8%)
Total	133(100%)	129(100%)	130(100%)	129(100%)
Age				
18-24	2(1.5%)	3(2.4%)	6(4.6%)	9(7.0%)
21-30	27(20.3%)	43(33.3%)	46(35.4%)	47(36.4%)
31-35	26(19.6%)	20(15.5%)	16(12.3%)	21(16.2%)
36-40	23(17.5%)	22(17.1%)	14(10.8%)	22(17.1%)
41-45	15(11.2%)	21(16.2%)	18(13.8%)	12(9.3%)

46-55	31(23.2%)	11(8.5%)	23(17.7%)	18(14.0%)
56 and older	9(6.7%)	9(7.0%)	7(5.4%)	0
Total	133(100%)	129(100%)	130(100%)	129(100%)
Ethnicity				
Caucasian	93(69.9%)	111(86.0%)	93(71.5%)	91(70.5%)
Native American	9(6.8%)	3(2.3%)	9(6.9%)	6(4.7%)
African American	6(4.5%)	8(6.2%)	7(5.4%)	19(14.7%)
Hispanic	14(10.5%)	6(4.7%)	8(6.2%)	4(3.1%)
Asian/Pacific islander	10(7.5%)	0(0%)	8(6.2%)	9(7.0%)
Other	0(0%)	1(0.8%)	5(3.8%)	0
Total	133(100%)	129(100%)	130(100%)	129(100%)
Education				
High school diploma or less	15(11.3%)	17(13.1%)	11(8.4%)	2(1.6%)
2-year college degree	8(6.0%)	3(2.3%)	8(6.2%)	7(5.4%)
4-year college degree	61(45.9%)	86(66.2%)	68(52.3%)	81(62.8%)
Postgraduate studies	13(9.7%)	12(9.2%)	17(13.1%)	21(16.3%)
Professional degree	36(27.1%)	12(9.2%)	26(20.0%)	18(13.9%)
Total	133(100%)	130(100%)	130(100%)	129(100%)
Occupation				
Full-time employed	87.2(87.2%)	119(92.2%)	110(84.6%)	116(89.9%)
Part-time employed	5.3(5.3%)	5(3.9%)	9(6.9%)	5(3.9%)
Self-employed	3.0(3.0%)	3(2.3%)	9(6.9%)	3(2.3%)
Retired	1.5(1.5%)	1(0.8%)	1(0.8%)	1(0.8%)
Student	1.5(1.5%)	0	0	3(2.3%)
Unemployed	1.5(1.5%)	1(0.8%)	1(0.8%)	1(0.8%)
Total	133(100%)	129(100%)	130(100%)	129(100%)
Income				
Less than \$10,000	3(2.2%)	3(2.3%)	4(3.1%)	3(2.3%)
\$10,000-\$20,000	11(8.3%)	15(11.6%)	6(4.6%)	1(0.8%)
\$20,001-\$40,000	30(22.5%)	46(35.7%)	29(22.3%)	35(27.1%)
\$40,001-\$60,000	44(33.1%)	47(36.4%)	46(35.4%)	45(34.9%)
\$60,001-\$80,000	28(21.1%)	11(8.5%)	27(20.8%)	28(21.7%)
\$80,001-\$100,000	11(8.3%)	6(4.7%)	15(11.5%)	14(10.9%)
More than \$100,000	6(4.5%)	1(0.8%)	3(2.3%)	3(2.3%)
Total	133(100%)	129(100%)	130(100%)	129(100%)
Residence				
West	24(18.1%)	18(14.0%)	11(8.5%)	29(22.6%)
Northwest	14(10.6%)	20(15.5%)	23(17.7%)	13(10.2%)
Southwest	23(17.3%)	17(13.2%)	26(20.0%)	18(14.1%)
Midwest	21(15.9%)	23(17.8%)	35(26.9%)	35(27.3%)
Southeast	25(18.9%)	27(20.9%)	16(12.3%)	21(16.4%)
Mid-Atlantic	6(4.7%)	0	0	0
Northeast	9(6.9%)	10(7.8%)	9(6.9%)	5(3.9%)
East	10(7.6%)	14(10.8%)	10(7.7%)	6(4.7%)
Alaska				1(0.8)
Total	133(100%)	129(100%)	130(100%)	128(100%)

Dining frequency in a month				
1 to 2 times	32(24.1%)	41(31.7%)	33(25.4%)	28(21.7%)
3 to 5 times	68(51.1%)	73(56.6%)	74(56.9%)	75(58.1%)
6 to 10 times	27(20.3%)	13(10.1%)	22(16.9%)	17(13.2%)
More than 10 times	6(4.5%)	2(1.6%)	1(0.8%)	9(7.0%)
Total	133(100%)	129(100%)	130(100%)	129(100%)
WTP in %				
0 to 3%	20(15.3%)	43(33.3%)	14(10.8%)	23(17.8%)
3 to 5%	68(51.9%)	66(51.2%)	82(63.1%)	75(58.1%)
5 to 10%	43(32.8%)	20(15.5%)	34(26.1%)	31(24.1%)
Total	131(100%)	129(100%)	130(100%)	129(100%)

Table 3. Descriptive Menu Willingness to Pay (WTP)

	Control Menu	Willingness to Pay (WTP) Control menu	Descriptive Menu	Willingness to Pay (WTP) Descriptive menu
Most-preferred item	Chicken sandwich (n=41)	\$1-\$4.75 (n=42)	Fish burger (n=27) Chicken sandwich (n=27)	\$1-\$5 (n=55) \$1-\$4.75 (n=35)
Second-preferred item	Pulled pork sandwich (n=32)	\$4-\$9.99 (n=40)	Chicken sandwich (n=33)	\$1-\$4.75 (n=35)
Third-preferred item	Pulled pork sandwich (n=30)	\$4-\$9.99 (n=40)	Chicken sandwich (n=36)	\$1-\$4.75 (n=45)
Total	N=133	N=131	N=133	N=131

Table 4. Carbon Footprints Menu Willingness to Pay (WTP)

	Control Menu	Willingness to Pay (WTP) Control menu	Carbon Footprints Menu	Willingness to Pay (WTP) Carbon Footprints menu
Most-preferred item	Chicken sandwich (n=42)	\$1-\$4 (n=32)	Lentil lettuce wrap (n=39)	\$10-\$15 (n=42)
Second-preferred item	Fish burger (n=37)	\$1-\$5 (n=45)	Chicken sandwich (n=36)	\$9-\$12 (n=32)
Third-preferred item	Beef brisket burger (n=29)	\$10-\$15 (n=29)	Chicken sandwich (n=43)	\$9-\$12 (n=46)
Total	N = 130	N = 130	N = 130	N = 130

Table 5. Traffic Lights Menu Willingness to Pay (WTP)

	Control Menu	Willingness to Pay (WTP) Ave.	Traffic Lights Menu	Willingness to Pay (WTP) Ave.
Most-preferred item	Chicken sandwich (n=45)	\$6-\$15 (n=38)	Lentil lettuce wrap (n=33)	\$9.01-\$15 (n=30)

Second-preferred item	Beef brisket burger (n=36)	\$2-\$7 (n=61)	Beef brisket burger (n=28)	\$10.01-\$20 (n=34)
Third-preferred item	Pulled pork sandwich (n=30)	\$1-\$6 (n=113)	Chicken sandwich (n=28)	\$2-\$ 7 (n=60)
Total	N=132	N=130	N=132	N=130

Table 6. Combined Menu Willingness to Pay (WTP)

	Control Menu	Willingness to Pay (WTP) Ave.	Combined Menu	Willingness to Pay (WTP) Ave.
Most-preferred item	Chicken sandwich (n=44)	\$4.01-\$8 (n=36)	Lentil lettuce wrap (n=35)	\$8.00-\$15.99 (n=37)
Second-preferred item	Fish burger (n=39)	\$2-\$5 (n=36)	Chicken sandwich (n=29)	\$5.00-\$10.00 (n= 48)
Third-preferred item	Beef brisket burger (n=37)	\$10-\$15 (n=29)	Chicken sandwich (n=40)	\$5.00-\$10.00 (n= 44)
Total	N=129	N=129	N=129	N=129

4.2 Manipulation Checks

Study respondents were asked to answer a series of questions to check the effectiveness of the manipulation. Fisher-Freeman-Halton Exact value was used to determine if there was a significant association among manipulations. Chi-square results indicated that all treatments were perceived as intended ($p < 0.001$). When menu designs have been compared with each other, there was a statistically significant association ($p < 0.001$).

4.3 Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) was conducted using AMOS (version 26) as data analysis tool. The results of the CFA analysis showed that the model has the satisfactory fit to the data: $\chi^2/df = 3.619$ ($\chi^2 = 1407.702$, $df = 389$), RMSEA = 0.071, CFI = 0.906, IFI = 0.907, NFI = 0.876, and TLI = 0.888 (Table 7). It is suggested that the RMSEA value between 0.05 and 0.08 fall in the acceptable range (Fabrigar et al., 1999). A cutoff value close to 1 is needed in CFI, IFI, NFI, and TLI to indicate a good fit between the model and the observed data (Browne & Cudeck,

1992). Due to its low standardized loadings, 1 item (Protection of the environment benefits us all) was removed. Convergent validity was assessed by calculating the Average Variance Extracted values. The Average Variance Extracted values were all greater than 0.3. In case the AVE is less than 0.5 but composite reliability is higher than 0.6, the convergent validity of the construct can still be considered adequate (Fornell & Larcker, 1981). A composite reliability was evaluated. All variables exceed the suggested cutoff of 0.70 (Green value = 0.783, Awareness of consequence = 0.761, Ascribed responsibility = 0.792, Personal norm = 0.788, Social norm = 0.816, Behavioral intentions = 0.844). The values fall between 0.761 and 0.844. Construct correlations are depicted in Table 8.

Table 7. Confirmatory Factory Analysis

Variables (Cronbach's α)	Standardized Loadings	<i>p</i> -value	CR	AVE
Green Value (0.753)			0.783	0.475
GV1	0.77	<0.01		
GV2	0.63	<0.01		
GV3	0.66	<0.01		
GV4	0.69	<0.01		
Awareness of Consequences (0.815)			0.761	0.356
AC1	0.75	<0.01		
AC2	0.64	<0.01		
AC3	0.62	<0.01		
AC4	0.65	<0.01		
AC5	0.73	<0.01		
Ascribed Responsibility (0.863)			0.792	0.326
AR1	0.67	<0.01		
AR2	0.76	<0.01		
AR3	0.65	<0.01		
AR4	0.71	<0.01		
AR5	0.68	<0.01		
AR6	0.78	<0.01		
Personal Norm (0.852)			0.788	0.322
PN1	0.65	<0.01		
PN2	0.64	<0.01		
PN3	0.68	<0.01		
PN4	0.80	<0.01		
PN5	0.71	<0.01		

PN6	0.73	<0.01		
Social Norm (0.849)			0.816	0.351
SN1	0.75	<0.01		
SN2	0.69	<0.01		
SN3	0.69	<0.01		
SN4	0.77	<0.01		
SN5	0.65	<0.01		
SN6	0.64	<0.01		
Behavioral Intentions (0.838)			0.844	0.384
BI1	0.80	<0.01		
BI2	0.69	<0.01		
BI3	0.76	<0.01		
BI4	0.78	<0.01		

Table 8. Construct Correlations

Constructs	GV	AW	AR	PN	SN	BI	M	SD
GV	---	---	---	---	---	---	16.03	2.57
AW	0.847**	---	---	---	---	---	24.03	3.80
AR	0.796**	0.818**	---	---	---	---	23.75	4.11
PN	0.811**	0.827**	0.836**	---	---	---	23.92	4.14
SN	0.742**	0.767**	0.820**	0.792**	---	---	23.53	3.26
BI	0.692**	0.680**	0.778**	0.738**	0.806**	---	15.61	3.20

Note: *Correlation is significant at the 0.05 level (two-tailed); **Correlation is significant at the 0.01 level (two-tailed)

4.4 Structural Equation Modeling

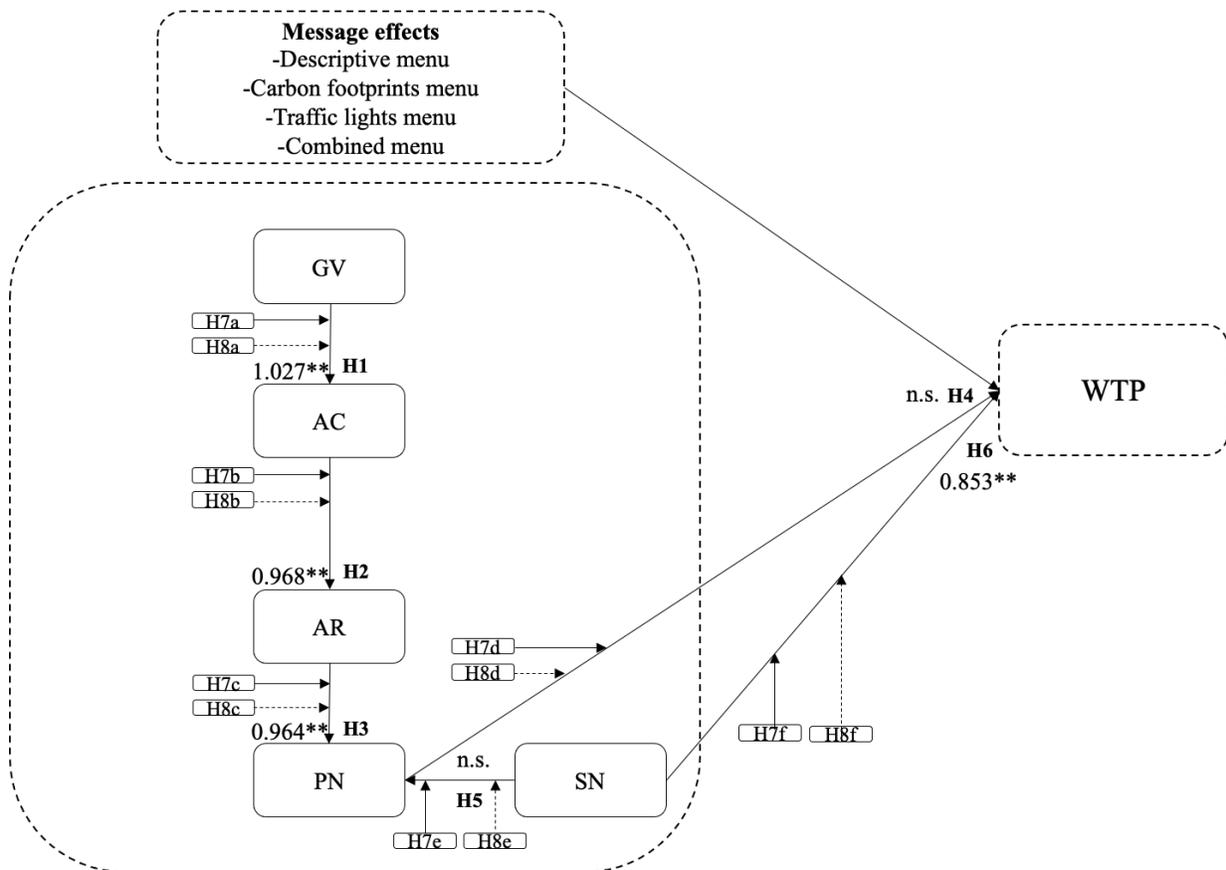
The structural equation modeling (SEM) with a maximum likelihood estimation approach was conducted and depicted in Table 9. The sample size in the current study was greater than the minimum sample size as suggested by Hair et al. (2010). According to the results from SEM, it was revealed that the model contained a satisfactory fit to the data ($\chi^2 = 1514.5$, $df = 397$, $p < 0.001$, $\chi^2/df = 3.815$, $RMSEA = 0.074$, $CFI = 0.897$, $IFI = 0.898$, $NFI = 0.867$, and $TLI = 0.880$). Hence, the fit statistics of the measurement model were satisfactory. As shown in Table 10, the model was then compared to the original VBN model which does not contain variable named social norm ($\chi^2 = 1601.2$, $df = 285$, $p < 0.001$, $\chi^2/df = 5.618$, $RMSEA = 0.094$, $CFI = 0.849$, and $IFI = 0.849$, $NFI = 0.822$, and $TLI = 0.827$). The proposed model demonstrated a better model fit

than the original VBN model without social norm. Hence, our proposed theory ($R^2 = 0.750$) had a better prediction power for green menu purchase behavior than it did with the original VBN theory ($R^2 = 0.465$). According to Hair et al. (2011), R^2 value less than 0.5 is considered weak.

Table 9. Structural Equation Modeling

Hypotheses	Paths	Standardized Estimate	<i>t</i> value	p-value	Results
H1	GV → AW	1.027	15.652	<0.01	Supported
H2	AW → AR	0.968	17.620	<0.01	Supported
H3	AR → PN	0.964	11.163	<0.01	Supported
H4	PN → BI	0.086	0.468	0.386	Not supported
H5	SN → PN	0.033	0.867	0.64	Not supported
H6	SN → BI	0.853	7.470	<0.01	Supported

Figure 4. Results of the Structural Model



————→ = Moderating role of age
 -----→ = Moderating role of income

Table 10. Model Comparison

Goodness-of-fit statistics & R ²	Extended VBN model	Original VBN model
Fit indices		
X ²	1514.5	1601.2
df	397	285
X ² /df	3.815	5.618
CFI	0.897	0.849
NFI	0.867	0.822
TLI	0.880	0.827
IFI	0.898	0.849
RMSEA	0.074	0.849
R ² for behavioral intentions	0.750	0.465
CR	0.968	0.841
AVE	0.498	0.176

4.5 Assumption checks

Prior to analyzing the collected data for further analyses, assumption checks were conducted using SPSS Version 28.0. Linearity, normality, multicollinearity, homoscedasticity, and outliers were checked. R² value was above 0.3 which indicates that there is a linear relationship. The normality of observations is the first most important assumption before building the model (Kumar, 2015). The estimation technique as per the skewness and kurtosis of each measurement was used (Kumar, 2015). Accordingly, each measurement was estimated for the evaluation of the normality. As reported in Table 11, the values of skewness from the menus fell between -1.348 and -0.721, and the values for kurtosis fell between -.683 and 2.268. Because the skewness values between -2 to +2 are, and kurtosis values between -2 to +2 are normal (George & Mallery, 2010; Hair et al., 2010), the present data contained no serious skewness or kurtosis problem. The results showed evidence of normality ($p > .001$). There was no

multicollinearity issue as the VIF values were lower than 5, and tolerance values were more than 0.1 (Hair et al., 2014). The scatterplot of standardized residuals confirmed that the data met the assumptions of homoscedasticity. Next, the presence of outliers was examined to minimize the chance of violating the normality which may lead to Types I and II errors (Kline, 2005).

According to Tabachnick and Fidell, (2001), when standard score is greater than 3.29, it suggests existence of outliers. As a result, two were identified as outliers and were removed. Lastly, the Variance Inflation Factor (VIF) was calculated to evaluate the level of multicollinearity. As stated by Hair et al. (2014), VIF values higher than 5 are considered to have multicollinearity issue. In the present study, all VIFs resulting from collinearity test showed lower than 5 f issue (Green Value: 4.22, Awareness: 4.84, Ascribed Responsibility: 4.77, Personal Norms: 4.16, Social Norms: 3.47, Behavioral Intentions: 2.71). The value of tolerance should be more than .10 as it suggests no extreme multivariate collinearity among the constructs.

Table 11. Normality

	Mean (SD)	Skewness (Std. error)	Kurtosis (Std. error)
Measures			
Green Value			
Purchasing a menu item at a restaurant that promotes green practices helps protect the environment. (GV1)	3.97 (0.798)	-1.121 (0.107)	2.268 (0.213)
Selecting a green food item at a restaurant preserves the earth. (GV2)	4.01 (0.899)	-0.721 (0.107)	0.329 (0.213)
Eating a green menu item at a restaurant helps minimize gas release/energy waste. (GV3)	3.97 (0.874)	-0.891 (0.107)	0.840 (0.213)
Purchasing a green menu item at a restaurant helps ensure sustainability. (GV4)	4.07 (0.809)	-0.866 (0.107)	1.077 (0.213)
Awareness of Consequences			
Energy saving practice in a restaurant can help reduce global warming. (AC1)	3.95 (0.850)	-0.920 (0.107)	1.268 (0.213)

Minimizing gas release/energy waste in a restaurant can reduce the danger to current environment. (AC2)	3.99 (0.907)	-0.724 (0.107)	0.174 (0.213)
Minimizing food waste in a restaurant helps reduce pollution. (AC3)	4.01 (0.836)	-0.802 (0.107)	0.820 (0.213)
Restaurants that don't follow proper green practices can contribute to an environmental degradation which is a problem for society. (AC4)	3.98 (0.901)	-0.899 (0.107)	0.803 (0.213)
Restaurants that provide sustainable foods can mitigate fossil fuel waste. (AC5)	3.97 (0.810)	-0.908 (0.107)	1.425 (0.213)
Ascription of Responsibility			
I feel jointly responsible for the global warming. (AR1)	3.98 (0.865)	-0.987 (0.107)	1.457 (0.213)
I feel jointly responsible for the exhaustion of energy sources. (AR2)	3.87 (0.876)	-0.959 (0.107)	1.198 (0.213)
I feel jointly responsible to reduce pollution. (AR3)	3.99 (0.929)	-0.732 (0.107)	0.246 (0.213)
I'm responsible to follow proper green practices to prevent environmental degradation. (AR4)	3.95 (0.881)	-0.939 (0.107)	1.046 (0.213)
I'm responsible to manage resources by consuming sustainable foods. (AR5)	4.03 (0.915)	-0.960 (0.107)	0.961 (0.213)
I'm responsible to protect the environment through the promotion of green menu at a restaurant. (AR6)	5.46 (1.626)	-1.220 (0.107)	0.198 (0.213)
Personal Norms			
I feel obligated to preserve the earth. (PN1)	5.40 (1.814)	-0.904 (0.107)	-0.683 (0.213)
I feel it is important to refrain from increasing gas and energy waste. (PN2)	5.49 (1.653)	-1.076 (0.107)	-0.249 (0.213)
I feel a strong obligation to reduce pollution. (PN3)	5.54 (1.686)	-1.112 (0.107)	-0.165 (0.213)
I feel that I should try my best to follow green practices whenever possible. (PN4)	5.47 (1.605)	-1.168 (0.107)	0.047 (0.213)
I feel that I should support restaurants that provide green items on the menu. (PN5)	5.40 (1.759)	-0.942 (0.107)	-0.591 (0.213)
I feel that I should choose green foods for the safety of the environment. (PN6)	5.63 (1.576)	-1.348 (0.107)	0.577 (0.213)
Social Norms			

People I know believe that it is important to prevent global warming. (SN1)	3.98 (0.858)	-1.023 (0.107)	1.527 (0.213)
Most people who are important to me expect me to eat at restaurants that provide green menu to minimize risks associated with gas/energy waste. (SN2)	3.87 (1.019)	-0.783 (0.107)	0.189 (0.213)
People I know are greatly concerned about issues with air pollution. (SN3)	3.90 (0.924)	-0.876 (0.107)	0.844 (0.213)
My friends or relatives expect me to follow green practices to prevent environmental degradation. (SN4)	3.86 (0.962)	-0.941 (0.107)	0.804 (0.213)
People around me believe that choosing sustainable foods can mitigate fuel waste. (SN5)	3.92 (0.949)	-0.739 (0.107)	0.306 (0.213)
People I respect worry about the climate change. (SN6)	4.01 (0.922)	-1.153 (0.107)	1.604 (0.213)
Behavioral Intentions			
I'm willing to pay more for green practices at a restaurant. (BI1)	3.90 (0.917)	-1.178 (0.107)	1.686 (0.213)
I'm willing to pay extra to dine at a restaurant with green menu. (BI2)	3.89 (0.995)	-0.868 (0.107)	0.572 (0.213)
Even when a food is not tasty, I'm willing to pay more for what I think is the best for the environment. (BI3)	3.83 (1.044)	-0.876 (0.107)	0.296 (0.213)
I'm willing to pay an extra to dine at a restaurant with green menu. (BI4)	3.99 (0.942)	-1.050 (0.107)	1.200 (0.213)

4.6 Moderating Effects

Moderating Effects of Age

A series of regression analyses were conducted to examine the moderating effects of age. The hypothesized moderating role of age is depicted in Table 12. The results showed that age moderates the relationship between ascribed responsibility and personal norms ($p < 0.05$) indicating main effects in older groups of people. Moreover, age moderates the relationship between social norms and personal norms which also show main effects in older groups of people. However, the direct path between green value and awareness of consequences was not

significant ($p > 0.05$). Also, age does not moderate the relationship between awareness of consequences and ascribed responsibility ($p > 0.05$), personal norms and behavioral intentions ($p > 0.05$), and lastly social norms and behavioral intentions ($p > 0.05$).

Moderating Effects of Income

Results from regression analyses showed the moderating effects of income level. All direct paths were insignificant except for the relationship between ascribed responsibility and personal norms ($p < 0.05$) as shown in Table 12, This indicates that an individual with income level between \$60,001 to \$80,000 are more likely to have ascribed responsibility which then leads to a strong personal norm. Other direct paths are not influenced by the income level which explains that respondents' income does not affect green value to awareness of consequences to ascribed responsibility. Despite of respondents' annual income, it does not affect the relationship between their personal norms and behavioral intentions. Additionally, there is no moderating effect of income level for the relationships between social norms and personal norms and behavioral intentions ($p < 0.05$).

Table 12. Moderating effects of age and income level

Hypotheses	Age	Result	Younger	Older	R^2	F	p -value
	Main effect						
H7a	GV → AW	Not supported	n.s	n.s	0.721	1.511	0.22
H7b	AW → AR	Not supported	n.s	n.s	0.671	1.465	0.22
H7c	AR → PN	Supported	-	50 - 75	0.703	3.793	0.05*
H7d	PN → BI	Not supported	n.s	n.s	0.553	0.562	0.45
H7e	SN → PN	Supported	-	50 - 75	0.633	4.426	0.03*
H7f	SN → BI	Not supported	n.s	n.s	0.652	0.058	0.81
Hypotheses	Income	Result	Lower	Higher	R^2	F	p -value
	Main effect						
H8a	GV → AW	Not supported	n.s	n.s	0.718	1.551	0.21
H8b	AW → AR	Not supported	n.s	n.s	0.671	2.422	0.12
H8c	AR → PN	Supported	-	\$60,001- \$80,000	0.704	4.674	0.03*
H8d	PN → BI	Not supported	n.s	n.s	0.548	0.123	0.72
H8e	SN → PN	Not supported	n.s	n.s	0.628	1.346	0.24

H8f	SN → BI	Not supported	n.s	n.s	0.653	0.720	0.39
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GV: Green value; AW: Awareness; AR: Ascribed responsibility; PN: Personal norms; SN: Social norms; BI: Behavioral intentions. *Note: Significant at the 0.05 level

4.7 Results of One-way ANOVA

The present study examined a series of one-way ANOVA analyses to investigate whether there are any statistical significances among different levels of willingness to pay from each menu design. Tukey's honestly significant difference (HSD) post hoc tests discovered the differences among different levels of willingness to pay as it is the most preferable post hoc test when the data meets assumptions of homogeneity of variances (Wickens & Keppel, 2004). In the descriptive menu, study respondents who reported highest willingness to pay for green items ($M=27.79$) had stronger ascribed responsibility $F(2,130) = 3.757, p < 0.05$ than respondents who reported the lowest and median willingness to pay. Respondents who are willing to pay the highest ($M=17.13$) also had more strong behavioral intentions $F(2,130) = 4.459, p < 0.05$. Lastly, the higher the willingness to pay for green items ($M=2.54$), the higher the willingness to pay in percentage, $F(2,128) = 4.635, p < 0.05$ than respondents who reported lowest and median willingness to pay for green items. A main effects of carbon footprints menu were found for green value $F(2,126) = 3.166, p < 0.05$, ascribed responsibility $F(2,126) = 3.046, p < 0.05$, behavioral intentions $F(2,126) = 0.637, p < 0.05$, and willingness to pay in percentage $F(2,126) = 3.952, p < 0.05$. Respondents with highest willingness to pay ($M=16.91$) held stronger green value, and they reported significantly more ascribed responsibility ($M=26.39$) than respondents reported lowest ($M=24.06$) and median ($M=26.07$) WTP. Also, respondents with median ($M=16.51$) and highest WTP ($M=16.78$) had stronger behavioral intentions than respondents with lowest WTP ($M=14.86$). There are no significant effects among levels of willingness to pay between traffic lights and combined menu ($p > 0.05$). The findings are presented in Table 13.

Table 13. One-way ANOVA and levels of willingness to pay

Descriptive menu Group <i>M</i> (<i>N</i> =133)						
	1	2	3	F	Sig.	Post hoc
GV	15.80	15.84	17.25	2.71	0.07	-
AW	24.17	24.09	25.67	1.438	0.24	-
AR	25.01	24.44	27.79	3.757	0.02*	1,2<3
PN	32.26	33.31	36.17	2.139	0.12	-
SN	23.31	23.03	24.58	0.815	0.44	-
BI	14.62	14.41	17.13	4.459	0.01*	1,2<3
WTP in percentage	2.11	2.06	2.54	4.635	0.01*	1,2<3
Carbon footprints menu Group <i>M</i> (<i>N</i> =129)						
	1	2	3	F	Sig.	Post hoc
GV	15.63	16.60	16.91	3.166	0.04*	1,2<3
AW	23.08	24.28	25.00	2.660	0.07	-
AR	24.06	26.07	26.39	3.046	0.05*	1,2<3
PN	32.65	33.67	34.52	0.637	0.53	-
SN	22.86	24.44	24.39	2.473	0.08	-
BI	14.86	16.51	16.78	5.646	0.00*	1<2,3
WTP in percentage	1.68	1.86	2.13	3.952	0.02*	1<3
Traffic lights menu Group <i>M</i> (<i>N</i> =130)						
	1	2	3	F	Sig.	Post hoc
GV	16.02	15.39	15.53	0.792	0.45	-
AW	24.00	23.76	23.07	0.360	0.69	-
AR	25.05	25.03	24.67	0.042	0.95	-
PN	32.72	31.85	32.33	0.163	0.85	-
SN	23.27	23.67	23.13	0.137	0.87	-
BI	15.85	15.45	15.60	0.246	0.78	-
WTP in percentage	2.11	2.18	2.33	0.959	0.38	-
Frequency	2.51	2.09	2.60	1.854	0.16	-
Combined menu Group <i>M</i> (<i>N</i> =129)						
	1	2	3	F	Sig.	Post hoc
GV	15.90	16.23	16.14	0.244	0.78	-
AW	23.89	24.11	24.00	0.049	0.95	-
AR	25.47	25.91	25.48	0.137	0.87	-
PN	32.58	34.29	30.33	1.850	0.16	-
SN	23.22	24.49	23.71	1.141	0.32	-
BI	15.70	16.37	16.14	0.754	0.47	-
WTP in percentage	2.10	2.09	2.33	1.077	0.34	-
Frequency	2.41	2.60	2.57	0.343	0.71	-

GV: Green value; AW: Awareness; AR: Ascribed responsibility; PN: Personal norms; SN: Social norms; BI: Behavioral intentions. *Note: Significant at the 0.05.
 1= Low WTP; 2= Median WTP; 3= High WTP.

4.8 Other findings

Table 14. Most-preferred menu item by region ($N = 520$)

Menu	West	East	NW	SW	Midwest	SE	Mid-Atlantic	Hawaii	Total
Lentil lettuce wrap	n=25	n=19	n=21	n=27	n=16	n=1	n=8	n=11	128
Pulled Pork sandwich	n=18	n=9	n=15	n=26	n=16	n=0	n=1	n=8	93
Fish burger	n=15	n=21	n=19	n=19	n=21	n=1	n=8	n=11	117
Beef brisket burger	n=9	n=7	n=12	n=14	n=11	n=2	n=7	n=4	66
Veggie wrap	n=8	n=5	n=4	n=8	n=8	n=0	n=2	n=1	36
Chicken sandwich	n=7	n=9	n=13	n=20	n=17	n=3	n=7	n=4	80

NW: Northwest; SW: Southwest; SE: Southeast

According to the frequency results from the experiments, respondents living in West coast and Southwest part of the U.S. region preferred lentil lettuce wrap ($n=52$) compared to respondents in other parts of the region. Residents in Southwest also favored pork sandwich ($n=26$). Study respondents living in Midwest and East coast selected fish sandwich ($n=42$) more favorably than residents from other states. Beef brisket burger and veggie wrap were preferred by respondents evenly. Chicken sandwich was most liked by respondents from Southwest and Midwest ($n=37$).

CHAPTER 5

CONCLUSION

5.1 Summary and Discussion

The present study has attempted to reveal the most effective restaurant menu design to encourage green selection behaviors. The results indicate that the descriptive menu design did not significantly increase, when compared to the control menu, the willingness of study respondents to pay more. However, respondents did indicate that they were willing to pay a premium (\$9 more) with a carbon footprint menu at full-service restaurants. Because of increases in willingness to pay more on manipulated menu design, the carbon footprint menu was the most effective menu design, followed by a combination of verbal and visual menu design (\$4 more) and the traffic light design (\$3 more). Hence, respondents showed highest willingness to pay for carbon footprint information. After viewing the manipulated designs, respondents favored less energy-intensive food items from the menu, which differed from their initial menu selections. As to percentages of willingness to pay more, people who preferred lentil lettuce wraps were willing to pay 3%–5% more, the highest percentage increase. The present study may be the first to delineate the effects of carbon footprint labels on consumers' green menu selection behaviors. Based on our results, there is a need to create a commonly recognized carbon footprint label to encourage sustainable choices (Rondoni & Grasso, 2021), which is congruent with the prior notion that the carbon footprint labelling may encourage to choose low carbon footprint menu (Babakhani et al., 2020). The use of carbon footprint label and its impact on consumers' decision-making in menu selections should be noted as it is relatively understudied.

The extended VBN model in the present study appears to be a better predictor than the original VBN model; the results presented here thus support the theoretical effectiveness of the

extended VBN theory (Youn et al., 2020). Consumers' green values, beliefs, and norms all strongly influence their menu decision-making processes. Our proposed model could be applied to explain a variety of green menu selection behaviors. There are some causal effects among constructs from the extended VBN model that can help identify which areas are most and least likely to influence consumers' environmentally responsible behaviors when selecting food items. Using dual coding theory and integrating the ELM, the present study will help full-service restaurants better design their menus with an understanding of how different information-processing routes are distinguished by cognitive efforts made by consumers (central, peripheral, and a combination). From a theoretical perspective, the present study's findings reveal an important sequential process of individuals' values when selecting green food items. A person will have a favorable attitude towards being environmentally responsible if the person believes that the outcomes will be positively evaluated (Ajzen, 1991). This implies that when a person thinks that purchasing green items from a restaurant menu can substantially mitigate global warming, pollution, and loss of species, his or her interest in selecting such items might increase. As a result, that person will be willing to pay a premium price if he or she is confident that it will help the environment.

As the results show, age may play a moderating role in the relationship between ascribed responsibility and personal norms, which is consistent with what previous research has suggested (Hu et al., 2010; Nicolau et al., 2020; Youn et al., 2020). The present study's results show that older individuals, those aged 50 to 75, are more likely to feel responsible for avoiding activities that may harm the environment. Common activities that would help mitigate negative environmental impacts include going green, purchasing less energy-intensive food products, and choosing organic foods (NOAA, 2020). It is confirmed that older individuals feel a greater responsibility than younger people when it comes to protecting the environment. Furthermore,

there is a significant moderating effect of age in the relationship between social and personal norms. This result also aligns with those in previous similar studies (Youn et al., 2020). Social norms or opinions from people around individuals may explain environmentally responsible purchasing behavior (Han, 2020). Consumers who care about other people's opinions will show greater intentions of implementing ethical actions (Ghazali et al., 2019).

The present study revealed that individuals who were presented with the descriptive menu showed highest willingness to pay when they feel they are responsible to protect the environment. Moreover, they are willing to pay more for choosing the green items from the menu with a highest percentage increase. On the other hand, individuals who viewed the carbon footprints menu indicated that they would pay a premium for green menu items when they value the green practices. Also, they are more likely to be responsible for their own actions towards sustainability by selecting the menu item with low carbon footprint.

Some other interesting relations were observed between favorite menu item and residence; consumers from different area had different preferences when choosing green items from the menu. For this reason, full-service restaurants should take these results into account when developing green items on the menu.

5.2 Theoretical Implications

The present study has several theoretical implications. It adds to the green menu literature by shedding light on customers' menu selection decisions in a full-service restaurant setting. This is an important theoretical contribution that involved developing and testing a customer behavior model in the restaurant menu context, which had not previously been studied in depth. To the best of our knowledge, the present study is the first specifically aimed at exploring full-service restaurant consumers' environmentally responsible menu selection behaviors with an emphasis

on the importance of message stimuli.

First, according to the dual coding approach, message appeals may play a critical role in influencing restaurant customers' green menu selections and ultimately their willingness to pay a premium for green items. The present study's results show that message appeal is important when delivering information to message receivers, which also supports the use of dual coding theory. Exploring consumers' decision-making processes by applying dual coding theory has been widely used in the restaurant industry context. However, there is a dearth of empirical research investigating the effects of green menu designs. The present study has attempted to fill the gaps identified in the literature on full-service restaurant consumers' menu selection choices.

Based on dual coding theory, when a green menu is presented using visual information or a combination of text, graphics, and numbers, it can better elicit mental imagery than solely verbal formats, which aligns with a prior study (Lee & Kim, 2020). Respondents who selected energy-intensive food items from the control menu decided to select green menu items after looking at menus with visual cues: specifically, carbon footprints. This is the key contribution of the present study as the experiments confirmed that the carbon footprints menu can be used to shift restaurant customers' choices towards food items with less energy-intensive and away from energy-intensive menu items. These respondents preferred to take a peripheral route that requires simple and quick judgment (Paivio, 1990). This implies the importance of visualized information on the restaurant menu. Preference on carbon footprint menu may have an important relationship with the judgement process of customers who dine at a full-service restaurant. They may tend to look at the restaurant menu to evaluate the information quickly as they prefer not to spend too many efforts reading the menu. Customers do not have a thorough understanding towards carbon footprint labels which could have resulted from a lack of commonly accepted form of carbon

footprint on food items (Rondoni & Grasso, 2021). The current study highlights that more carbon footprint menu design should be provided to effectively promote the restaurants' efforts to environmental sustainability through the intervention of customers' green menu choices. The findings also suggest that a combined menu and the graphics-focused traffic light menu both encouraged respondents to spend more on choosing eco-friendly food items. This is supported by Hartmann and Apaolaza-Ibanez's (2009) study, which stresses that a combination of different designs, such as logos and text, is superior to the solitary use of each design in a green advertising context. This implies that when a person reads texts along with pictures, that person will be more likely to be convinced by the advertisement or message and that the person takes both central and peripheral routes, which require effortful and less intensive cognitive thinking, respectively (Paivio, 1990). As Lee and Kim (2020) stated, the effects of menu labels can be heightened when message receivers use the information they learn from the menu. In this sense, the first priority is to ensure that menu labels are widely accepted by restaurant customers.

Both central and peripheral routes proposed under the ELM successfully reflected the way green menu designs were processed by survey respondents. Additionally, since dual coding theory stresses that both visual and verbal cues are effective for storing messages, combining descriptive and visual information on a restaurant menu can be an important factor in effective green menu advertising. It appears that green menu selection behaviors have a mixed purpose in both the central and peripheral routes. Because descriptive menu design contains written words that require effortful thinking to evaluate the information's quality (Paivio, 1990), consumers' changes in behavioral intentions can be caused through central routes. On the contrary, carbon footprints, traffic lights, and combined menu designs are largely comprised of visual cues to appeal to target consumers. Because these appeals rely heavily on images, behavior changes

result more from peripheral routes. One of the important contributions of the current study is the suggestion on carbon footprint menu development. Customers should first be persuaded to make sustainable choices as their understanding on the carbon footprint labelling is lacking (Rondoni & Grasso, 2021). Thus, effective menu labels should be presented in a way that would quickly attract message recipients' or customers' attention to carbon footprint information to influence customers' menu choices.

Second, all variables had significant relationships with one another, except personal norms and behavioral intentions and social norms and personal norms. The present study investigated the proposed relationships among various constructs and found that a significantly greater total variance in willingness to pay for green menu items was detected by adding a new construct to the existing theory. Social norms influence green menu selection choices, which can serve as an important antecedent in choosing a menu item. The findings include significant effects in the causal paths and partially supported the research hypotheses. It was found that an individual's green values significantly predict awareness of consequences, which leads to the formation of a strong ascribed green responsibility. Thus, our findings confirm that a person who values green practices or behaviors is likely to be concerned about negative consequences for or impacts on the environment and long-term sustainability. Beliefs about green values support awareness of consequences and can help people determine whether to engage in more green activities or maintain their current behavior. Thus, our results are consistent with those reported by Youn et al. (2020), who also found that a person must first understand the possible consequences of behavior before feeling responsible for addressing environmental degradation. In addition, the more consumers are aware of negative consequences such as ecosystem disruptions, climate change, and food shortages (NOSAA, 2020; Siegel, 2020; USDA, 2007), the more likely it is that they will feel

responsible for problems caused by not undertaking activities that have a significant impact on sustainability. When an individual feels an obligation to show a commitment to green practices, it positively influences personal norms, which then motivate that person to engage in a specific behavior that is related to pro-environmental practices. In a prosocial behavior research context, Stern et al. (1999) stated that a person's responsibility for taking corrective actions plays an important role in building a strong desire to minimize negative consequences. Our findings support the claim that ascribed responsibility influences personal norms (Choi et al., 2015; Fishbein, 1967). If full-service restaurant consumers begin to feel responsible for air pollution, energy waste, and ecosystem destruction, they will be more prone to behave in eco-friendly ways. This is in line with other studies that have explored consumers' intentions to dine in a green restaurant or stay at a green hotel (Choi et al., 2015; Youn et al., 2020). They also found that consumers who wish to contribute to mitigating negative environmental impacts would likely demonstrate those beliefs by engaging in environmentally responsible behaviors (Choi et al., 2015). Meanwhile, how others think of an individual has a positive impact on both personal norms and behavioral intentions (Stern et al., 1999). Our results are only consistent with studies that adopted the extended VBN (Choi et al., 2015; Maciejewski, 2020; Youn et al., 2020), which revealed that social norms have a positive impact on behavioral intentions. When Choi et al. (2015) explored how the extended VBN theory could be used to predict hotel guests' environmentally friendly behaviors, they found that guests with strong personal norms tended to have higher intentions to stay in a green hotel than guests with minimal personal norms. These intentions then led to actual behavioral intentions or willingness to pay. According to Stern et al. (1999), personal norms can most significantly affect behavioral intentions in an environmental context. Previous research has found that strong personal norms not only consistently lead to actual behaviors but also to a willingness to sacrifice (Stern et

al., 1999); however, our findings are not in line with what those authors found.

Our investigation of the relationship between social norms and behavioral intentions found a significant positive relationship between the two variables. This result is inconsistent with Choi et al.'s (2015) findings, and they also used the VBN theory. They found that social norms are not an important determinant of consumers' behavioral intentions in the green hotel context. On the other hand, social norms are an important determinant in the green restaurant context (Han, 2020; Hu et al., 2010). Generally, social norms represent the pressures a person might experience from significant others or from society that motivate him or her to behave in a certain way (Choi et al., 2015; Stern et al., 1999). Other researchers agree that social norms are significant predictors of green behavioral intentions, and that strong social consciousness has a positive impact on the way a person perceives green behaviors (Gabler et al., 2013). According to a study that adopted the extended VBN theory to examine pro-environmental behaviors, study participants showed a stronger tendency to engage in recycling behaviors to minimize negative environment impacts because they could be viewed as socially good behaviors (Ghazali et al., 2019). Such people are more likely to listen to other people's opinions or advice because they care about what others think of them. Additionally, social norms may influence an individual to forgo personal benefits for benefit of society (Ghazali et al., 2019).

Third, the present study expands research on green menu selection behaviors by discussing the effects of various constructs. There is a positive causal effect between social norms and behavioral intentions. The inclusion of social norms can better predict restaurant consumers' green menu selection behaviors. Under testing, our model offers more explanatory power than the original model, which does not include social norms. Thus, our proposed model is superior to the original model and can be used to predict full-service restaurant consumers'

willingness to pay more for green menu items. Consumers may tend to indulge in conspicuous consumption of green products or services to express their environmentally responsible selections to society (Lee & Kim, 2020). Our findings have shed light on the distinctive impact of social norms on full-service restaurant consumers' behavioral intentions. Meanwhile, our proposed model has broadened the range of the VBN theory.

Finally, our findings also revealed that there are no significant moderating effects of age on the relationships between green values and awareness of consequences. Although a person may be environmentally conscious, this does not automatically lead to increased awareness; furthermore, it is unlikely that a person would feel a responsibility to avoid selecting non-green menu items simply because of the awareness of consequences. This finding is inconsistent with other studies that revealed that a strong awareness of consequences can directly affect responsibility (Kiatkawsin & Han, 2017; Stern et al., 1999; Youn et al., 2020). Moreover, the present study found that neither personal nor social norms positively affect willingness to pay more for green menu items. This finding also diverges from what other research has reported. According to Long et al. (2021), young individuals will likely pay more to consume green food items if they believe that they are obligated to engage in activities that help reduce greenhouse gas emissions. It is also known that a sense of social responsibility is viewed as a crucial part of predicting future behavioral intentions, especially among young people. In other words, Long et al. (2021) and Youn et al. (2020) indicated that young consumers tend to place importance on other people's opinions and have more profound feelings about environmental preservation and restaurant visiting intentions. Interestingly, the present study did not discover significant results when a moderating role for age was included. Gary et al. (2019) investigated younger people's willingness to support actions aimed at mitigating climate change and found that they were not deeply concerned about

climate change or environmental degradation; thus, their current consumption habits and levels of support for green activities might remain unchanged. Age is thus an important demographic factor used to understand specific consumer behaviors (Hu et al., 2010). Because people may have different perceptions about the environment depending on their age, consumers' eco-friendly behaviors may also vary with age.

According to our results, income level plays a key role in moderating the relationship between ascribed responsibility and personal norms. Full-service restaurant diners in the United States with annual household incomes between \$60,001 and \$80,000 were more likely to feel responsible for minimizing the risks associated with wasting gas and energy waste. These individuals feel more morally obligated to protect the environment, which motivates them to engage in prosocial behaviors (Youn et al., 2020). According to the most recent report from the U.S. Census Bureau (2021), the average annual household income is \$67,521, so an income between \$60,001 and \$80,000 can reasonably be considered middle class. Individuals with higher income levels are likely to be more sensitive to environmental issues (Hu et al., 2010; Han, 2020). Other than this result for middle-class consumers, the moderating role of income level was insignificant in all other paths. Thus, our hypotheses regarding the moderating role of income level were only partially supported. When annual income has been tested in other green restaurant behavior studies (Frank & Chong, 2002; Tan et al., 2018; Zhang et al., 2019), income level was found to be an important factor in green restaurant patronage: the higher the income level, the higher the intention to patronize green restaurants. Our findings echo those results. Study respondents with higher income levels are generally more concerned about environmental protection and would be quicker to respond and take the necessary actions to address environmental issues. Moreover, as our results indicate, respondents will first feel responsible to

engage in green consumption; this sense of responsibility will encourage them to alter their menu selection behaviors. They may feel more obligated to protect the planet. In summary, the present study confirmed the moderating effect of a certain income level in the relationship between ascribed responsibility and personal norms.

5.3 Practical Implications

The results of the present study provide several practical implications for the restaurant industry in terms of planning and designing effective menus. Our findings also suggest strategies that policymakers in the restaurant sector can use to encourage current consumers to behave in accordance with their environmental beliefs. Full-service restaurants in the United States can benefit from the present study by realizing how green menu design can be used as a stimulus to guide restaurant consumers in their menu selection processes.

First, the study suggests that adding information related to the carbon footprints of food items may influence the minimum dollar amount customers are willing to pay to consume a given item. Although chain restaurants like Panera Bread and Chipotle have added carbon footprints to their menus to promote environmentally friendly food production (NRA, 2020), the impacts, if any, on consumers' food choices have not yet been investigated. In other word, the impacts of carbon footprint labelling have not been explicitly explained. The present study provides support for using visually focused menus in full-service restaurants. It is considered the crucial finding of this study as the importance of message appeals have been widely discussed in various green contexts but limited in consumers' green menu selections. Our findings suggest that carbon footprint menu may be persuasive in encouraging restaurant customers to shift their menu choices while helping them better understand the impacts of green menu items on the environment. Therefore, it is suggested that policymakers in full-service restaurants develop and implement

policies to constantly educate current customers about the importance of carbon footprint labels and their choices. If a menu item is presented in a pictorial format, it will trigger sensory images in an individual's mind that may evoke a desire to select the item (Lee & Kim, 2020). Hence, menus with visual cues are more likely to attract customers to choose green items. This could be because consumers who prefer to focus on visualized information take peripheral routes (Paivio, 1971). When a customer dines at a restaurant, a peaceful and relaxing environment is highly preferred (Valdez et al., 2020). Rondoni and Grasso (2021) also agreed that restaurant customers might be overwhelmed by the amount of information being presented to them. For this reason, restaurant customers may not expend a great deal of effort when reading a restaurant menu. Thus, it can be noted that the menu design should be more eye-catching as customers tend to quickly choose the menu item. Also, it is encouraged that restaurants consider peripheral way of consumer decision-making process to implement green menu design. Restaurant marketers could include symbols or simple but colorful images on their menus to indicate the carbon footprints of their dishes and thus inform consumers about their environmental impacts. Alternatively, a color-coded carbon label may effectively capture customers' attention, influence their menu choices, and ultimately encourage them to pay a premium. According to the most recent report from the NRA (2022), restaurants in the United States will be more focused on adopting sustainability in their operations. Sustainable practices not only include packaging but also sustainable food items, such as sustainably harvested fish and chemical-free ingredients (NRA, 2022). To remain current with rapidly changing consumer demands in the restaurant market, it is recommended that full-service restaurateurs promote more green items, such as organic, locally grown, and sustainably harvested food items, thus emphasizing eco-friendliness and healthy behaviors (NRA, 2022). Restaurant managers should attract customers using visual cues to deliver green information in a

vivid fashion that makes it easy for message recipients to understand (Meyvis et al., 2012). This view is supported by research that found that images or pictures convey their intended meanings more rapidly than words because visual aids are easily recognizable (Hou et al., 2017; Pennings et al., 2014). When restaurant menus are designed using colors and pictures to indicate environmentally friendly items, consumers are likely to show increased favorable behavioral intentions. Moreover, adding both visual and text information to the menu can better influence customer response to green menu options. The practical implications are not only limited to full-service restaurants. It can be expanded to different sectors in the hospitality industry, such as green hotels or hospitality companies to communicate their contribution to sustainability through effective message framing (Kim & Kim, 2014). The way the message is being delivered to recipients may play an important role as to describing the environmental impact of the industry (Kim & Kim, 2014). Hence, full-service restaurants should pay more attention to creating menus with both graphic and textual information, as stronger recall occurs when text is combined with images (Hou et al., 2017; Meyvis et al., 2012).

Second, full-service restaurants may develop their menu offerings based on consumers' values, beliefs, and norms. One marketing strategy includes informing consumers about a restaurant's dedication to environment protection. For instance, full-service restaurants in the United States can advertise their commitment to sustainable practices, such as having more locally sourced food ingredients and less energy-intensive food items. It has been reported that consumers will be willing to pay more for foods prepared with local ingredients (Verma et al., 2019; Yu et al., 2018). Restaurants should advertise their food items in a way that will heighten consumers' social responsibility and support for the environment, so it makes them feel as if they can contribute to mitigating adverse environmental impacts. By educating customers, full-service

restaurants can leverage themselves into a competitive position and develop a more socially and environmentally responsible image (Tan et al., 2018). Employees at full-service restaurants should be trained to be able to effectively communicate the restaurants' contribution to sustainability to make them more informed and encourage to select green choices. When customers strongly value green practices making them feel like they are responsible for environmental mitigation, they would be more attracted to see the green menu designs when dining at a full-service restaurant especially with carbon footprints information. It is also imperative to promote green menu options through social media, as prior studies have confirmed that social networks can be an important driver of product purchases (NRA, 2020; Tan et al., 2018). One marketing strategy to educate consumers is using flyers or brochures; these types of promotions are known to be eye-catching and can be used as marketing tools to deliver information and employ strategic persuasion (Ladd, 2010). Restaurants may also educate consumers about the importance of green consumption and practices by posting information on their websites. These approaches will likely attract new customers as the restaurant sector is expected to see an increase in consumer demand for pro-environmental practices. This marketing strategy would be effective because many consumers are influenced by the opinions of others and by written information.

Third, given the significant moderating effects of age and income level in the patronage of full-service restaurants in the United States, marketing tactics should be revised through a better understanding of how age and income level may moderate green menu selection behaviors. According to the present study's findings, older consumers and those with income levels above the U.S. average demonstrate a greater preference for environmentally friendly items (Tan et al., 2018). Full-service restaurants in areas with a large proportion of elderly consumers could emphasize the importance of long-term green practices to offer consumers a chance to act on their

commitment to a clean environment. These consumers are more likely to dine in a restaurant that offers green items on the menu rather than one without such options. For instance, if older consumers' relatives, colleagues, and friends think that dining at a full-service restaurant that provides eco-friendly menu items is a pro-environmental behavior, those consumers may feel social pressure or a sense of responsibility to choose green menu items. In this sense, companies are encouraged to actively practice eco-friendly behaviors, and motivate consumers to become more environmentally conscious. Since individuals with less disposable income have fewer opportunities to practice green behaviors, it is important for the people who are significant in their lives to encourage green selection behaviors. For example, a company could host a social event that encourages environmentally responsible purchasing behaviors to motivate consumers to engage in green practices. Although a given individual may be willing to choose and pay a premium for green food items, if that individual cannot afford the item, the opportunity to practice green behaviors is lost (Han et al., 2010). The financial comfort of target consumers therefore plays an important role when it comes to advertising and encouraging green consumption. Since our findings indicated that the efforts towards green menu selection behaviors can be more greatly improved as a group, it is advised that restaurants pay attention to advertise the green information to a group of customers who frequently dine at a full-service restaurant. Doing so will likely meet both consumers' demand on sustainability and the future sales of the restaurant.

Finally, if full-service restaurants on the West Coast and in the southwestern part of the United States plan to promote green food items, it would be strategic to promote items that contain vegetables and organically grown ingredients, such as a lentil lettuce wrap. The wrap style is best known in these regions (Lacey, 2011), and study respondents reported that they would likely choose a wrap if given a green option. Residents in the southwest also prefer consuming meat, so

restaurants in that region could develop menus that indicate the environmental impacts caused by meat consumption to influence consumers' choices. People in the Midwest and on the East Coast favor fish and seafood menu items (Chamberlain, 2016). However, the Great lakes have long had advisories limiting the number of times an individual should eat fish to protect the ecosystem (Chamberlain, 2016). Thus, while restaurants include more such items to better attract consumers, they also need to inform them about negative consequences of long-term wild-caught fish consumption.

5.4 Limitations and Future Studies

The present study has several limitations that may also constitute avenues for future research. First, while the study is focused on a full-service restaurant setting, it is not tailored to specific types of restaurants. For this reason, the results may not be generalizable to specific restaurant segments, such as chain restaurants, fine dining, casual dining, cafés, or ghost restaurants. Future studies should examine whether the effects of green menu design vary by different types of restaurants. Second, the data from the present study were collected only in the United States and relied on self-reports. Thus, the results may not represent consumers from other countries. Future research can explore consumers' actual behavior towards restaurants' green menu choice through an observational study focused on real-world menu selection behaviors. Finally, future studies could attempt to assess how socio-demographic issues like ethnicity, educational level, and occupation may influence how consumers perceive green menu selections.

APPENDIX A



Institutional Review Board
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January 06, 2022

Principal Investigator: Soojin Lee
Department: Applied Soc Sci

Your IRB Application to project entitled PROTECTING THE ENVIRONMENT: EXPLORING THE EFFECTS OF GREEN MENU DESIGN ON CUSTOMERS' PURCHASING INTENTIONS was reviewed and approved by the MU Institutional Review Board according to the terms and conditions described below:

IRB Project Number	2078942
IRB Review Number	352311
Initial Application Approval Date	January 06, 2022
IRB Expiration Date	January 06, 2023
Level of Review	Exempt
Project Status	Active - Exempt
Exempt Categories (Revised Common Rule)	45 CFR 46.104d(2)(i)
Risk Level	Minimal Risk
HIPAA Category	No HIPAA
Approved Documents	Revised consent form. I modified the sentence to 'you will be compensated \$1'. Thank you. Survey questions and menu designs.

The principal investigator (PI) is responsible for all aspects and conduct of this study. The PI must comply with the following conditions of the approval:

- No subjects may be involved in any study procedure prior to the IRB approval date or after the expiration date.
- All changes must be IRB approved prior to implementation utilizing the Exempt Amendment Form.
- Major noncompliance deviations must be reported to the MU IRB on the Event Report within 5 business days of the research team becoming aware of the deviation. Major deviations result when research activities may affected the research subject's rights, safety, and/or welfare, or may have had the potential to impact even if no actual harm occurred. Please refer to the MU IRB Noncompliance policy for additional details.
- The Annual Exempt Form must be submitted to the IRB for review and approval at least 30 days prior to the project expiration date to keep the study active or to close it.
- Maintain all research records for a period of seven years from the project completion date. If you are offering subject payments and would like more information about research participant payments, please click here to view the MU Business Policy and Procedure: http://bppm.missouri.edu/chapter2/2_250.html

If you have any questions or concerns, please contact the MU IRB Office at 573-882-3181 or email to muresearchirb@missouri.edu.

Thank you,
MU Institutional Review Board

APPENDIX B

Consent Form

Project Title: Protecting the environment: Exploring the effects of green menu design on customers' purchasing intentions (IRB# 2078942) Principal Investigator: Soojin Lee (slff5@mail.missouri.edu, 1-213-393-3484) working with Pei Liu (lpei@missouri.edu, 1-573-884-7816) This study involves research into the willingness to pay at a full-service restaurant in the U.S. customers who are at least 18 years of age.

The main objective of this study will examine the effects of green menu design on customers' willingness to pay to provide recommendations on how to attract customers with green practices. This will help full-service restaurants to better service their customers by meeting their needs and wants. This survey is directed to customers who have dined at a full-service restaurant in the U.S. at least once in the past 1 month.

IF YOU HAVE NOT ORDERED FOOD AT A FULL-SERVICE RESTAURANT, AND IF YOU ARE A VEGAN/VEGETARIAN, WE KINDLY ASK THAT YOU DO NOT PARTICIPATE IN THIS SURVEY. You will first be asked to view two green menu designs. Then, a series of questions will be asked using a 5-point Likert scale ranging from (1) not important to (5) extremely important. Although we do not expect harm to come upon any participants, including pregnant women due to electronic malfunction of the computer, and recalling a past or bad memory about your dining experiences, it is possible though extremely rare and uncommon. If this would be distressing for you, you may decide not to participate. We do not anticipate you experiencing any discomfort or other negative feelings when responding to items in this study. You will be compensated \$0.45 for completing the survey.

If you fail to answer correctly to attention questions, you won't be compensated. If you withdraw from the survey prior to its completion, you won't be compensated. If you're not eligible to take this survey further, you won't be compensated. If you participate in other version of this survey, you won't be compensated for the other participation. You may contact the University of Missouri Institutional Review Board (IRB) if you have any questions about your rights as a study participant, want to report any problems or complaints, or feel under any pressure to take part or stay in this study. The IRB is a group of people who review research studies to make sure the rights of participants are protected. You can reach them at 573- 882-3181 or muresearchirb@missouri.edu. If you want to talk privately about your rights or any issues related to your participation in this study, you can contact University of Missouri Research Participant Advocacy by calling 888-280-5002 (a free call) or emailing MUResearchRPA@missouri.edu.

APPENDIX C

*Menu validity initial questionnaire

Imagine you're dining at a full-service restaurant. You look at the restaurant menu before choosing your dish. Please, respond to below questions.

Sample menu

Control menu

 *Lunch specials* 

Lentil lettuce wrap
Lentils, lettuce, and other ingredients and sauce of your choice

Veggie wrap
Corn tortilla, spinach, avocado, carrot, topped with other desired vegetables

Fish burger
Fish fillet, bread, tartar sauce, and other ingredients of your choice

Chicken sandwich
Chicken, bread, lettuce, tomato, and other ingredients of your choice

Beef burger
Beef, bun, lettuce, tomatoes, with other ingredients and sauce of your choice

Pulled pork sandwich
Pork, bread, cheese, lettuce, ingredients and sauce of your choice

*All items are 7 ounces per serving

1. The menu is difficult to read.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

2. The menu is easy to read.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

3. The menu is easily understood.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

4. It is easy to find menu items.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

5. This restaurant menu is realistic.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

6. This menu looks like a real menu that I see at a full-service restaurant.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

7. This menu elicits interests about green menu.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

8. This menu evokes interests towards green selections.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

Descriptive menu -----

1. The menu contains detailed description of organic/green menu items.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

2. Descriptive labels were used for menu items.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

**The below questions will be provided depends on what type of menu they are presented with.*

Carbon footprints menu -----

1. The menu contains a detailed description of carbon footprints that is easy to be understood.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

2. The menu properly indicates carbon emissions for foods.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

Traffic lights menu -----

1. The traffic light colors on the menu were easily understandable.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

2. The traffic lights menu emphasizes green and non-green food items.

(1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree

- *Any suggestions or comments will be appreciated.*

APPENDIX D

screening questions

*Required answer

* (1) Are you at least 18 years old?

- A. Yes
- B. No

If no, exclude from the survey.

* (2) Do you live in the U.S.?

- A. Yes
- B. No

If no, exclude from the survey.

* (1) Have you dined at a full-service restaurant in the U.S in the past 1 month?

- A. Yes
- B. No

If no, exclude from the survey.

* (1) Are you vegan or vegetarian?

- A. Yes
- B. No

If yes, exclude from the survey.

*You will be directed to view two different menus. Imagine you're currently at a full-service restaurant and the following menus are presented. Please choose the **top three** food items from

the menu (most, second, third-preferred). **Note that substitutions are available for dairy, gluten-free, nut-free, and lactose-intolerance.*

*What is your most preferred item?

*What is your second-preferred item?

*What is your third preferred item?

*If these are the only options, I would not buy any

*Then, exclude from the survey.

* Please type how much you are willing to pay for each menu item in U.S. dollar. (Type **2 decimal** places)

\$ __. __

*Given these lunch green menu options, how much more in percentage are you willing to pay?

- A. 0 – 3 %
- B. 3 – 5 %
- C. 5 – 10 %
- D. Other: _____%

Definition of green menu at a restaurant: A foodservice establishment that implements environmentally friendly practices, provides locally and sustainably harvested menu items that minimizes the use of energy and chemical.

Online Questionnaire Section 1.

This section is designed to measure your value, belief, and norm for each one of the constructs when dining at a full-service restaurant. Please select your answers by checking one of the following scales:

	(1) Strongly disagree	(2) Disagree	(3) Neutral	(4) Agree	(5) Strongly agree
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<p>Green value <i>(How valuable the green menu labels are on customers' green selections)</i></p> <ol style="list-style-type: none"> 1. Purchasing a menu item at a restaurant that promotes green practices helps protect the environment. 2. Selecting a green food item at a restaurant preserves the earth. 3. Eating a green menu item at a restaurant helps minimize gas release/energy waste. 4. Purchasing a green menu item at a restaurant helps ensure sustainability. 					
<p>Awareness of Consequences <i>(Environmental consequences of customers' behavior/decision)</i></p> <ol style="list-style-type: none"> 1. Energy saving practice in a restaurant can help reduce global warming. 2. Minimizing gas release/energy waste in a restaurant can reduce the danger to current environment. 3. Minimizing food waste in a restaurant helps reduce pollution. 4. Restaurants that don't follow proper green practices can contribute to an environmental degradation which is a problem for society. 5. Restaurants that provide sustainable foods can mitigate fossil fuel waste. <p>*Attention check: Please select 'Agree'</p>					
<p>Ascription of Responsibility</p>					

<p><i>(Customers' sense of responsibility to minimize negative environmental consequences)</i></p> <ol style="list-style-type: none"> 1. I feel jointly responsible for the global warming. 2. I feel jointly responsible for the exhaustion of energy sources. 3. I feel jointly responsible to reduce pollution. 4. I'm responsible to follow proper green practices to prevent environmental degradation. 5. I'm responsible to manage resources by consuming sustainable foods. 6. I'm responsible to protect the environment through the promotion of green menu at a restaurant. 					
<p><i>Personal Norms</i> <i>(Feelings of moral obligation for environmental preservation)</i></p> <ol style="list-style-type: none"> 1. I feel obligated to preserve the earth. 2. I feel it is important to refrain from increasing gas and energy waste. 3. I feel a strong obligation to reduce pollution. 4. I feel that I should try my best to follow green practices whenever possible. 5. I feel that I should support restaurants that provide green items on the menu. 6. I feel that I should choose green foods for the safety of the environment. 					
<p><i>Social Norms</i> <i>(Social pressures that customers experience from significant others)</i></p>					

<p>1. People I know believe that it is important to prevent global warming.</p> <p>2. Most people who are important to me expect me to eat at restaurants that provide green menu to minimize risks associated with gas/energy waste.</p> <p>3. People I know are greatly concerned about issues with air pollution.</p> <p>4. My friends or relatives expect me to follow green practices to prevent environmental degradation.</p> <p>5. People around me believe that choosing sustainable foods can mitigate fuel waste.</p> <p>6. People I respect worry about the climate change.</p>					
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Online Questionnaire Section 2. Behavioral Intentions

This survey section is designed to measure your behavioral intentions when dining at a full-service restaurant. Please select your answer:

	(1) Strongly disagree	(2) Disagree	(3) Neutral	(4) Agree	(5) Strongly agree
<p>1. I'm willing to pay more for green practices at a restaurant.</p> <p>2. I'm willing to pay extra to dine at a restaurant with green menu.</p> <p>3. Even when a food is not tasty, I'm willing to pay more for what I think is the best for the environment.</p> <p>4. I'm willing to pay an extra to dine at a restaurant with green menu.</p>					

Online Questionnaire Section 3. Demographics

This survey section is designed to collect demographical characteristics of a full-service restaurant customers. Please, type your answer or check a mark next to the one that best describes you for each question below:

* (2) What is your gender?

- A. Male
- B. Female
- C. Non-binary
- D. Prefer not to say

* (3) What is your age?

* (4) What is your ethnicity?

- A. Caucasian
- B. American Indian/Native American
- C. Black/African American
- D. Hispanic/Spanish American
- E. Asian/Pacific Islander
- F. Other: _____

* (5) What is the highest level of your education?

- A. High school diploma or less
- B. Two-year college degree (Associate)
- C. Four-year college degree (Bachelor)
- D. Postgraduate studies
- E. Professional degree
- F. Other (please specify) _____

* Attention check: Please select 'Agree'

- A. Strongly disagree
- B. Disagree
- C. Neutral
- D. Agree
- E. Strongly agree

* (6) What is your current occupation category? (Please, select the one that best describes you)

- A. Full-time employed
- B. Part-time employed
- C. Self-employed
- D. Retired
- E. Unemployed
- F. Other (please specify): _____

*(7) What is your annual income level?

- A. Less than \$10,000
- B. \$10,000 – \$20,000
- C. \$20,001 – \$40,000
- D. \$40,001 – \$60,000
- E. \$60,001 – \$80,000
- F. \$80,001 – \$100,000
- G. \$100,001 or over

*(8) How frequently do you dine at a full-service restaurant?

- A. Once a week
- B. More than once a week
- C. Once a month
- D. More than once a month
- E. Once every 6 months
- F. Once a year
- G. Other (please specify) _____

*(9) What part of the region do you live in the U.S?

- A. West
- B. East
- C. Northwest
- D. Southwest
- E. Mid-west
- F. Southeast
- G. Mid-Atlantic
- H. Northeast
- I. Alaska
- J. Hawaii
- K. Other: _____

*(10) How many times have you dined at a full-service restaurant in the past 1 month?

- A. 1-2 times
- B. 3-5 times
- C. 6-10 times
- D. More than 10 times
- E. Other: _____

Thank you for your participation.

APPENDIX E

Lunch specials

Lentil lettuce wrap

Lentils, tortilla, lettuce, ingredients and sauce of your choice

Veggie wrap

Corn tortilla, spinach, avocado, carrot, ingredients and sauce of your choice

Fish burger

Fish fillet, bread, tartar sauce, ingredients and sauce of your choice

Chicken sandwich

Chicken, bread, lettuce, tomato, ingredients and sauce of your choice

Beef brisket burger

Beef brisket, bun, lettuce, tomatoes, ingredients and sauce of your choice

Pulled pork sandwich

Pork, bread, cheese, lettuce, ingredients and sauce of your choice

*All items are 7 ounces per serving

APPENDIX F

- Locally sourced food requires less energy and chemical use which is suggested to be environmentally friendly.
- Sustainable fish is harvested in a way that protects the ecosystem and reproduction avoiding overfishing.
- Any meat that requires low and slow cooking produces high amount of gas emissions which is NOT suggested to be environmentally friendly.
- Farm-raised meat is raised on a local farm.

Lunch specials

Lentil lettuce wrap

Locally grown lentils, organic tortilla, local lettuce, organic ingredients and sauce of your choice

Pulled pork sandwich

Low and slow charcoal-grilled pork, white bread, processed cheese, ingredients and sauce of your choice

Fish burger

Sustainably harvested fish, multi-grain bun, tartar sauce, ingredients and sauce of your choice

Beef brisket burger

Low and slow charcoal-grilled beef brisket with bread bun, processed cheese, lettuce, ingredients and sauce of your choice

Veggie wrap

Organic corn tortilla, pesticide-free spinach, locally sourced avocado and carrots, ingredients and sauce of your choice

Chicken sandwich

Farm-raised chicken, white bread, lettuce, frozen tomatoes, ingredients and sauce of your choice

*All items are 7 ounces per serving

APPENDIX G

- The carbon footprint is the amount of greenhouse gas emissions (GHE) caused by production, complicated cooking method, electricity, and transportation.
- A quantity of GHE is expressed as pounds (lbs).
- 1 lb of carbon footprint generates the same amount of CO2 as a car travelling for 1.5 miles.
- The lower the amount of lbs, the more it contributes to preserve the environment.

Lunch specials

Lentil lettuce wrap <1.0 lb
Lentils, tortilla, lettuce, ingredients and sauce of your choice

Fish burger 1.0 ~ 10 lbs
Fish fillet, bread, tartar sauce, ingredients and sauce of your choice

Beef brisket burger 15.1 ~ 20 lbs
Beef brisket, bun, lettuce, tomatoes, ingredients and sauce of your choice

Chicken sandwich 1.0 ~ 10 lbs
Chicken, bread, lettuce, tomato, ingredients and sauce of your choice

Pulled pork sandwich 10.1~15 lbs
Pork, bread, cheese, lettuce, ingredients and sauce of your choice

Veggie wrap <1.0 lb
Corn tortilla, spinach, avocado, carrot, ingredients and sauce of your choice

*All items are 7 ounces per serving



*Note: Carbon Footprint Indicator

APPENDIX H

- -Sustainable local items with almost no amount of gas and energy usage when preparing
-Eco-friendly item
- -Somewhat sustainable items with moderate amount of gas and energy usage when preparing
-Moderately eco-friendly item
- -Not sustainable items with high amount of gas and energy usage when preparing
-Not eco-friendly item

Lunch specials

- *Fish burger*
Fish fillet, bread, tartar sauce, ingredients and sauce of your choice
- *Pulled pork sandwich*
Pork, bread, cheese, lettuce, ingredients and sauce of your choice
- *Veggie wrap*
Corn tortilla, spinach, avocado, carrot, ingredients and sauce of your choice
- *Chicken sandwich*
Chicken, bread, lettuce, tomato, ingredients and sauce of your choice
- *Beef brisket burger*
Beef brisket, bun, lettuce, tomatoes, ingredients and sauce of your choice
- *Lentil lettuce wrap*
Lentils, tortilla, lettuce, ingredients and sauce of your choice

*All items are 7 ounces per serving

APPENDIX I

- Locally sourced food requires less energy and chemical use which is suggested to be environmentally friendly.
- Sustainable fish is harvested in a way that protects the ecosystem and reproduction avoiding overfishing.
- Any meat that requires low and slow cooking produces high amount of gas emissions which is NOT suggested to be environmentally friendly.
- Farm-raised meat is raised on a local farm.

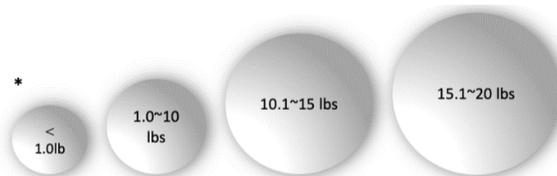
- The carbon footprint is the amount of greenhouse gas emissions (GHE) caused by production, complicated cooking method, electricity, and transportation.
- A quantity of GHE is expressed as pounds (lbs).
- 1 lb of carbon footprint generates the same amount of CO2 as a car travelling for 1.5 miles.
- The lower the amount of lbs, the more it contributes to preserve the environment.

- -Sustainable local items with almost no amount of gas and energy usage when preparing
-Eco-friendly item
- -Somewhat sustainable items with moderate amount of gas and energy usage when preparing
-Moderately eco-friendly item
- -Not sustainable items with high amount of gas and energy usage when preparing
-Not eco-friendly item

Lunch specials

- **Fish burger 1.0 ~ 10 lbs**
Sustainably harvested fish, multi-grain bun, tartar sauce, ingredients and sauce of your choice
- **Pulled pork sandwich 10.1~15 lbs**
Low and slow charcoal-grilled pork, white bread, processed cheese, ingredients and sauce of your choice
- **Veggie wrap <1.0 lb**
Organic corn tortilla, pesticide-free spinach, locally sourced avocado and carrots, ingredients and sauce of your choice
- **Chicken sandwich 1.0 ~ 10 lbs**
Farm-raised chicken, white bread, lettuce, frozen tomatoes, ingredients and sauce of your choice
- **Beef brisket burger 15.01 ~ 20 lbs**
Low and slow charcoal-grilled beef brisket with bread bun, processed cheese, lettuce, ingredients and sauce of your choice
- **Lentil lettuce wrap <1.0 lb**
Locally grown lentils, organic tortilla, local lettuce, organic ingredients and sauce of your choice

*All items are 7 ounces per serving



*Note: Carbon Footprint Indicator

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