Understanding Customers' Healthy Eating Behavior in Restaurants Using the Health Belief Model and Theory of Planned Behavior

by

Sangtak (Tak) Lee

Dissertation submitted to the faculty of the Virginia Tech

in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Hospitality and Tourism Management

Ken W. McCleary, Chair

Kathy W. Hosig

Vincent P. Magnini

Muzaffer Uysal

March 25, 2013

Blacksburg, Virginia

Understanding Customers' Healthy Eating Behavior in Restaurants Using the Health Belief Model and Theory of Planned Behavior

Sangtak (Tak) Lee

ABSTRACT

A large portion of the American public is overweight and many are classified as being obese. Obesity and unhealthy eating behavior are partially related to the increase in our society's consumption of foods away from home. Accordingly, the Food and Drug Administration (FDA) has suggested new menu labeling regulations to help educate customers on healthy items among menu selections. Few studies have tried to understand customers' healthy eating behavior in restaurants. Therefore, the purpose of this study was to understand and to predict customers' healthy eating behavior in casual dining restaurants, using the theory of planned behavior and the health belief model.

The results showed that attitude toward healthy eating behavior and subjective norm positively influenced intention to engage in healthy eating behavior in casual dining restaurants while perceived behavioral control did not. For healthy eating behavior in casual dining restaurants, perceived threat, self-efficacy, response to provision of nutrition information (cue to action) were significant predictors. However, perceived benefits and barriers were not statistically significant. Also, the study found that subjective nutrition knowledge influenced customers' response to provision of nutrition information whereas objective nutrition knowledge did not. Customers' healthy eating behavior positively influenced their willingness to patronize a restaurant that offers healthy menu items, which means that those who try to eat healthy menu items in casual dining restaurants are willing to

revisit restaurants where healthy menu choices are available and to recommend the

restaurants to others. Finally, this study generated socio-demographic profiles related to

healthy eating behavior in casual dining restaurants and willingness to patronize a restaurant

that provides healthy menu choices. The results revealed that education levels and BMI

(Body Mass Index) status influenced customers' healthy eating behavior. Also, customers'

willingness to patronize a restaurant that provides healthy menu items differed based on

gender, marital status, and education levels.

DEDICATION

I dedicate this work to my parents, Hyowoo Lee and Sangok Yoon,

and to my wife, Hyunjoo Kwon.

They are the biggest supporters in my life

ACKNOWLEGEMENTS

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER I

INTRODUCTION

Background of the Study

Diet has long been considered to have a critical influence on health. Many researchers claim that one of the main reasons for obesity and overweight with their accompanying problems in the general population is overconsumption of calories along with physical inactivity (U.S. Department of Agriculture, 2010). Over the past three decades there has been a steady increase in obesity among U.S. adults (Flegal, Carroll, Ogden, & Curtin, 2010). Studies found that about 67% of adults and 31.7% of children are currently overweight or obese (Centers for Disease Control and Prevention, 2010; Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). Moreover, unhealthy eating and obesity can enhance the risk of developing a large variety of maladies such as heart disease, type 2 diabetes, stroke, and some types of cancer (Centers for Disease Control and Prevention, 2009). The CDC also estimates that at least 400,000 deaths per year in the United States are directly or indirectly related to conditions associated with being overweight or obese (Centers for Disease Control and Prevention, 2004). Consequently, both of these are key leading health indicators that evaluate current health conditions for goals set by the United States Healthy People 2020 (U.S. Department of Health and Human Services, 2011). The Healthy People document comprises science-based 10-year national objectives for improving the health of all Americans.

Even though there is an increasing importance for studying individuals' eating behavior, few studies have tried to understand customers' healthy eating behavior in restaurants. Therefore, the major purpose of this study was to predict and understand

customers' healthy eating behavior in restaurants, using the Health Belief Model (HBM) and the Theory of Planned Behavior (TPB) simultaneously. This study also explored the relationship between customers' healthy eating behavior and willingness to patronize a restaurant that provides healthy menu choices. Finally, this study identified socio-demographic factors on customers' healthy eating behavior and intention to patronize the restaurants.

In order to educate customers on healthy items among menu selections and to encourage the restaurant industry to voluntarily introduce healthier menu items, the Food and Drug Administration (FDA) recently announced that the caloric value of each dish must be printed on the in-house menus and menu boards (Food and Drug Administration, 2010). Furthermore, additional nutrition information for each menu item, including total fat, saturated fat, cholesterol, sodium, total protein, etc., must be provided upon request. When the regulations are instituted, all restaurants and retail food establishments with 20 or more outlets operated under the same brand name will be subject to these regulations.

In addition to physical health issues, obesity and overweight caused by unhealthy food consumption could result in various consequences including social, psychological, and economic problems. Studies found that obesity can simultaneously create increased risks of lower life expectancy, diabetes, hypertension, stroke, and other cardiovascular diseases (Sullivan, Ghushchyan, & Ben-Joseph, 2008). There is also a relationship between obesity and social/psychological changes. For example, Ali, Amialchuk, and Renna (2010) found that an environment that exposes people to being overweight and obese leads to underestimating their obesity problem. Studies reported that weight could also influence dating and sexual activities (Cawley, Joyner, & Sobal, 2006) as well as mental health outcomes (e.g., depressive symptoms) (M. Ali, H. Fang, & J. Rizzo, 2010). Puhl and Brownell (2001) argued that there

are discriminatory attitudes and behaviors against obese individuals in various areas including employment, education, and health care. According to Cawley (2004), unhealthy eating habits can result in burgeoning health costs. In fact, one study found that there are increased health care costs and higher medical expenditures due to obesity (Finkelstein, Trogdon, Cohen, & Dietz, 2009). Costs for dealing with obesity were expected to reach approximately $117 billion for American families, businesses and government in 2010 (Y. Wang, Beydoun, Liang, Caballero, & Kumanyika, 2008).

This increasing rate of obesity and unhealthy eating behavior are partially related to the increase in our society's consumption of foods away from home. Indeed, according to some studies, Americans spend approximately half of their food dollars on food away from home (Stewart, Blisard, Bhuyan, & Nayga, 2004). The National Restaurant Association (NRA) estimates that total sales for the restaurant industry in the U.S. were expected to be $604 billion in 2011 (National Restaurant Association, 2011b). Also, the average household expenditure for food away from home in 2008 was $2,698 (National Restaurant Association, 2010). Foods away from home tend to have more calories and poorer nutritional quality compared to foods prepared at home (Guthrie, Lin, & Frazao, 2002; B. H. Lin, Guthrie, & Frazao, 1999). One study found that foods away from home account for one third of calories consumed annually by adults and children in the U.S. (B. H. Lin et al., 1999) and have 130 calories more on average than similar foods prepared at home (Mancino, Todd, & Lin, 2009). These differences for consumption of calories between foods away from home and those prepared at home could be even greater among people who are obese or overweight (Mancino et al., 2009). Another study also found that consumers are likely to underestimate the levels of calories, fat, and saturated fat of unhealthy menu items (Burton, Creyer, Kees, & Huggins, 2006). Accordingly, understanding behavior for the consumption of foods away from home is

necessary for improving public health status.

Theories Used in this Study

Researchers have used various theories to understand individual decision making processes in terms of health-related behaviors in health promotion and education (Karen Glanz, Rimer, & Viswanath, 2008). In order to predict individual health behavior, many studies have used the Theory of Planned Behavior (TPB) or the Health Belief Model (HBM), two of the most popular health behavior theories (K. Glanz & Bishop, 2010; Painter, Borba, Hynes, Mays, & Glanz, 2008). Therefore, this study will use the TPB and HBM to predict and understand customers' healthy eating behavior in restaurants.

Health Belief Model

The HBM was one of the first theories for understanding individuals' healthy behavior and remains one of most popular and widely used theories. It was originally developed by social psychologists in the U.S. Public Health Service in the 1950s (Hochbaum, 1958) in order to understand why people did or did not participate in programs offered by public health departments, which was helpful to prevent and detect disease. Later, the theory related to the HBM was extended and became one of the most widely used theories in health-related behavior studies, explaining how individuals maintain or change their health behaviors (Karen Glanz et al., 2008). The HBM theorizes that individuals' beliefs regarding whether he or she is at risk for a certain disease or health problem, and perceptions of the

4

benefits and barriers to taking action to reduce or avoid the risk, influence his/her readiness to take recommended actions. There are five major constructs including perceived susceptibility, severity, benefits, barriers, and self-efficacy (Karen Glanz et al., 2008). Other variables such as demographics and knowledge of health have been added to the HBM to improve explanations of health behaviors (Chen & Land, 1990; Karen Glanz et al., 2008) . In addition to the main constructs and added variables, the HBM considers a cue construct that can trigger actions. In the restaurant industry, advertising, education, and providing nutrition information could be examples of cue constructs influencing customers' healthy eating behavior. In this study, providing nutrition information in restaurants was used for the "cue to action" construct.

The HBM assumes that perceived benefits, self-efficacy, susceptibility, and severity of unhealthy behavior positively influence individual health-related behaviors, while perceived barriers play a role as a negative construct on healthy behavior. With these constructs, the HBM has been applied to a variety of health-related behavior studies (Karen Glanz et al., 2008). Most areas related to health behaviors have been used in this model to understand individuals' health behaviors and problems, including risky sexual behaviors (Hounton, Carabin, & Henderson, 2005), smoking behaviors (Balbach, Smith, & Malone, 2006), obesity and dietary behavior in general (Janelle K. O'Connell, James H. Price, Stephen M. Roberts, Stephen G. Jurs, & Robert McKinley, 1985; Stephen G. Sapp & Weng, 2007b), food safety (McArthur, Holbert, & Forsythe, 2006), and cancer screening behaviors (Champion, 1984).

Theory of Planned Behavior

The TPB is an individual-oriented theory extended from the Theory of Reasoned Action (TRA) by adding perceived behavioral control. The TPB concerns individual motivational constructs as determinants of the likelihood of performing a specific behavior. Focusing on rational, cognitive decision-making processes, the TPB explains that intentions to perform or engage in a specific behavior are formed as a response to three considerations: a person's attitude toward a specific behavior; his/her perception of subjective norms associated with that behavior; and perceived control over performance of the behavior (Ajzen, 1991). Attitude towards behavior is an individual's beliefs about outcomes or attributes of performing the behavior, weighted by evaluation of those outcomes or attributes. Subjective norm is an individual's normative beliefs about whether important referents approve or disapprove the behavior, weighted by his/her motivation to comply with these referents. Lastly, perceived behavioral control is determined by a person's perception of the ease or difficulty of behavioral performance.

The theory hypothesizes that a positive attitude toward the behavior, a favorable subjective norm, and strong perceived behavioral control are positively related to one's intention to perform the behavior. Then, eventually he/she will actually perform the behavior (Ajzen, 1991). While the HBM has been applied only to health-related behavior, the TPB is more generalized. This means that the TPB can be applied to various areas outside the health-related scope. Some health-related behavior studies that have employed the TPB include risky sexual behavior (Gu et al., 2009; Schaalma et al., 2009), smoking behavior (Hassandra et al., 2011; Rise, Kovac, Kraft, & Moan, 2008), exercise (Jones et al., 2007; Plotnikoff, Lippke, Courneya, Birkett, & Sigal, 2010), breast self-examination (Mason & White, 2008; Norman & Cooper, 2011), obesity (K. Andrews, K. Silk, & I. Eneli, 2010; Caperchione, Duncan, Mummery, Steele, & Schofield, 2008), and food safety (Mullan & Wong, 2009;

Pilling, Brannon, Shanklin, Howells, & Roberts, 2008).

Statement of the Problem

Understanding customers' healthy eating behavior is important for the restaurant industry to attract health conscious customers because healthy eating is among the current top twenty trends (National Restaurant Association, 2011a). Also, the restaurant industry has a growing responsibility for improving public health (Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008) since health advocators frequently blame the restaurant industry, especially fast food restaurants, for selling menu items with high calories and poor nutrition (Bates, Burton, Howlett, & Huggins, 2009). However, no studies have been conducted in order to predict and understand customers' healthy eating behavior in restaurants. Additionally, there is no study that tested the relationship between healthy eating behavior and patronizing behavior in restaurants. Thus, this study will test whether customers who choose healthy eating are willing to patronize a restaurant with healthy menu items.

Even though the TPB and HBM have been widely examined in various health behavior studies, few studies applied these theories in a restaurant setting. Thus, this study will use the TPB and HBM to understand customers' healthy eating behavior in restaurants because the relationships between and among the constructs have been varied, depending on study settings (Karen Glanz et al., 2008; Janz & Becker, 1984). Moreover, based on the literature review, there is only one study that applied both the TPB and HBM simultaneously. That study applied both the HBM and TPB simultaneously in order to predict iron-fortified soy sauce consumption (X. Sun, Guo, Wang, & Sun, 2006). Some researchers argue that each

theory has its own limitations such as low prediction power (Taylor et al., 2006), so applying only one theory is not enough to fully understand health behavior. In other words, if a study uses only the TPB or only the HBM, there are some dimensions that cannot be explained. Accordingly, using both theories at the same time could increase predictability and explanatory power for studying health behavior. Achterberg and Miller (2004) suggested that integrating distinctive constructs from competing theories into one or more polytheoretical model can be more effective for predicting and understanding individuals' diet-related behaviors, developing a more comprehensive and tailored theory. There are several other theories and models related to health behavior, including The Transtheoretical Model (TTM), Precaution Adoption Process Model (PAPM), Social Network Theory (SNT) and Social Cognitive Theory (SCT). However, these theories are less applicable in this study because they are either for community health behavior rather than individual health behavior or for longitudinal studies. Therefore, this study applied both theories simultaneously in order to understand customers' healthy eating behavior in restaurants.

The U.S. Food and Drug Administration (FDA) announced the issuance of a draft of a guidance document for the food service industry regarding the implementation of new menu labeling regulations in 2010. However, they have delayed finalizing those regulations because of the complexity of the issues. One of the issues concerns whether those regulations are actually helpful for customers' healthy eating behavior. Several studies have attempted to understand how the nutrition labeling of restaurant menu items influences customers' attitudes and purchase intentions toward healthy menu items (Harnack & French, 2008). The findings from these studies, however, have been inconsistent. Some studies found a significant relationship between the provision of nutrition labeling and food choices (Burton et al., 2006), while others found no statistical evidence of such an effect on healthy menu

selections (Elbel, Kersh, Brescoll, & Dixon, 2009). Thus, this study used disclosure of nutrition information as a "cue to action" for healthy eating behavior, applying the HBM.

Lastly, as a post-hoc test, this study explored the relationship between customers' socio-demographic factors, healthy eating behavior, and willingness to patronize a restaurant that provides healthy menu items, which is not included in a proposed theoretical model of this study. Socio-demographic factors have been identified as significant predictors of health behavior (Grembowski et al., 1993; Hallab, 2000; Taylor et al., 2006). However, there are no studies that have tested socio-demographic characteristics of healthy eating customers in restaurants. Thus, this study identified socio-demographic characteristics of customers who tend to eat healthy menu items in restaurants and who do not. This study also developed socio-demographic profiles for customers who are willing to patronize a restaurant that provides healthy menu choices and those who are not.

Research Questions

The research questions are as follows:

1. Can the HBM be applied to predict customers' healthy eating behavior in restaurants?

2. Can the TPB be applied to predict customers' healthy eating behavior in restaurants?

3. To what extent does each construct from the HBM and TPB influence customers' healthy eating behavior in restaurants?

4. What is the relationship between customers' nutrition knowledge (subjective and objective) and attitude toward provision of nutrition information or intention to use this information when selecting menu items in restaurants?

5. What is the relationship between customers' healthy eating behavior in restaurants and willingness to patronize a restaurant that provides healthy menu items?

6. Does disclosure of nutrition information influence customers' healthy eating behavior in restaurants and play a role as a "cue to action" from the HBM?

7. What is the relationship between socio-demographic factors and customers' healthy eating behavior in restaurants?

8. What is the relationship between socio-demographic factors and customers' willingness to patronize a restaurant that provides healthy menu items?

Objectives of this Study

The research objectives of this investigation are:

1. To apply the HBM to predict customers' healthy eating behavior in restaurants.

2. To apply the TPB to predict customers' healthy eating behavior in restaurants.

3. To examine the extent of the influence of each construct from the HBM and TPB on customers' healthy eating behavior in restaurants.

4. To examine the relationship between customers' nutrition knowledge (subjective and objective) and attitude toward provision of nutrition information or intention to use this information when selecting menu items in restaurants.

5. To investigate the relationship between customers' healthy eating behavior in restaurants and willingness to patronize a restaurant that provides healthy menu items.

6. To explore whether disclosure of nutrition information plays a role as a "cue to action", one of constructs in the HBM.

7. To test whether the proposed model is appropriate to predict customers' healthy eating behavior and patronizing behavior in a restaurant setting.

8. To identify the relationship between socio-demographic factors, customers' healthy eating behavior in restaurants, and willingness to patronize a restaurant that provides healthy menu items.

Figure 1-1 illustrates the proposed model of this study.

Figure 1-1: Proposed Model of this Study
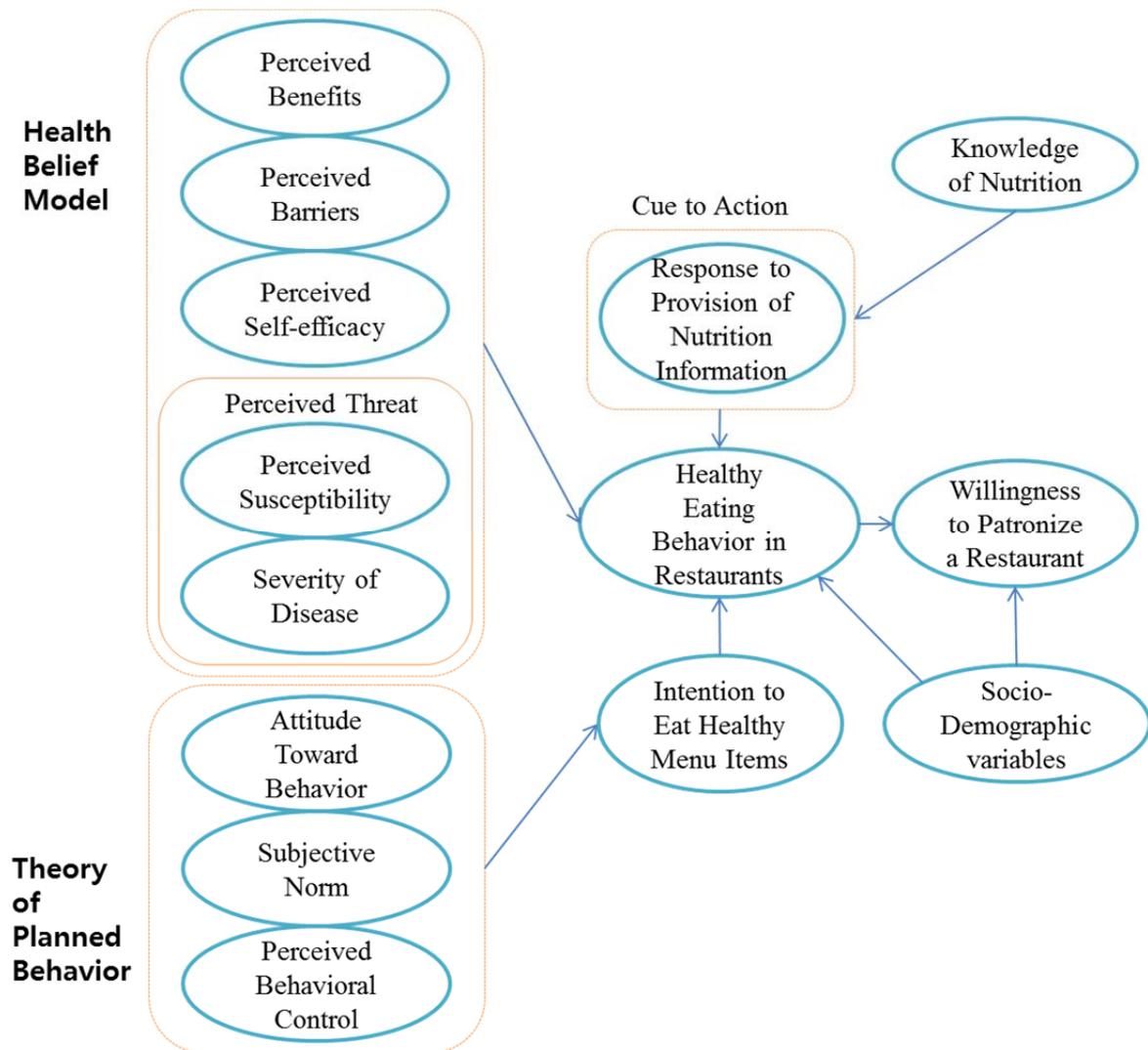
Contribution of this Study

Customers' healthy eating behavior in restaurants is closely related to improving public health. This means that there is an increasing responsibility for the restaurant industry in terms of public health (Story et al., 2008). Thus, understanding customers' healthy eating behavior in restaurants could improve public health. Additionally, there is a growing demand for healthy menu items from customers (National Restaurant Association, 2008), which means that it is a good opportunity to increase restaurants' revenue. Therefore, this study provided statistical evidence regarding whether health-concerned customers who tend to eat healthy menu items in restaurants are willing to patronize those restaurants that provide healthy menu choices. This information should be helpful for restaurant managers and operators to make decisions regarding whether healthy eating customers in restaurants are an attractive segment as well as to develop their marketing strategy and healthy menus. Moreover, by exploring the relationship between socio-demographics, healthy eating behavior in restaurants, and customers' willingness to patronize a restaurant, managers and operators in the restaurant industry can identify appropriate segments and target health-concerned customers.

This study contributes to theories of consumer behavior focusing on healthy eating behavior in a restaurant setting, using the HBM and TPB simultaneously. This will provide better information to understand customers' healthy eating behavior than using each theory separately. Moreover, this study tests the extent of the influence of constructs from the HBM and TPB on customers' healthy eating behavior in restaurants. These constructs are crucial not only for predicting their healthy menu selection but also for understanding customers' healthy eating behavior. Lastly, this study identifies the usefulness of nutrition information

for customers. Additionally, there is a theoretical contribution by testing whether disclosure of nutrition information plays a role as "cue to action" in the HBM.

Definitions of Terms

Health behavior

Gochman (1997) defines healthy behavior as "those personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements; personality characteristics, including affective and emotional states and traits; and overt behavior patterns, actions, and habits that are related to health maintenance, to health restoration, and to health improvement."

Healthy eating

A definition of healthy eating consists of seven themes: low fat, natural, balance, disease prevention, nutrient balance, disease management, and weight control (Falk, Sobal, Bisogni, Connors, & Devine, 2001).

Perceived Susceptibility

Perceived susceptibility is the degree to which an individual feels at risk for a health problem (Karen Glanz et al., 2008).

Perceived Severity

Perceived severity is the degree to which an individual believes that the

consequences of the health problems or conditions will be severe (Karen Glanz et al., 2008).

Perceived Benefits

Perceived Benefits are one's belief concerning the positive outcomes derived from the actions that reduce risks or seriousness of health problems and conditions (Karen Glanz et al., 2008).

Perceived Barriers

Perceived barriers are the negative aspects to taking the healthy actions or the negative outcomes of the actions (Karen Glanz et al., 2008).

Cues to Action

Cues to action are external events or forces that motivate an individual to take health actions (Karen Glanz et al., 2008).

Self-Efficacy

Self-efficacy is defined as "the conviction that one can successfully execute the behavior required to produce the outcomes" (A. Bandura, 1990).

Attitude

Attitude refers to one's evaluative response towards a certain action (M. Fishbein, 1979). Taking Fishbein and Ajzen's expectance-value model (M. Fishbein & Ajzen, 1975) into consideration, attitude is one's overall positive or negative evaluation of performing a specific behavior. According to the TPB (Ajzen, 1991), attitude is determined by an

individual's behavioral beliefs and evaluation of the possible outcome. Behavioral beliefs are the beliefs that performing a specific behavior will result in a specific outcome. The evaluation of outcome is one's overall evaluation of this specific outcome.

Subjective Norm

Subjective norm refers to what the person thinks that other people important to him/her want him/her to do (Ajzen, 1991). Subjective norm is determined by normative beliefs weighted by motivation to comply. A person's normative beliefs revolve around whether important referent individuals approve or disapprove of a certain behavior. Motivation to comply is the individual's motivation to comply with those referents that are important to him or her.

Perceived Behavioral Control

Perceived behavioral control basically accounts for external factors that may influence one's intention or behavior (Ajzen, 1991). According to the TPB, perceived behavioral control is determined by control beliefs and perceived power. Control beliefs refer to beliefs of the presence or absence of facilitators or barriers for performing a certain behavior. It also reflects the availability of tangible and intangible resources that are required to perform this behavior, including access to money, time, and other resources. Perceived power means one's confidence of abilities to perform this behavior.

Willingness to patronize a restaurant

The concept of patronizing behavior is not clearly defined. In this study, customers' willingness to patronize a restaurant refers to customers' perceived likelihood of patronizing a

specific restaurant. It includes intentions to revisit and intentions to recommend (Baker, Parasuraman, Grewal, & Voss, 2002)

CHAPTER II

LITERATURE REVIEW

This literature review is divided into four main sections. The first section explains what health behavior is and its categorization. The second and third sections review the Health Belief Model (HBM) and the Theory of Planned Behavior (TPB). Applications of these two theories, definitions of each construct, and the relationship among the constructs are explained. Moreover, these two sections include how the HTM and the TPB have been applied to dietary studies. The last section describes customers' patronizing behavior in restaurants.

Health Behavior

A primary cause of death in the U.S. is chronic disease, which includes heart disease, cancer, lung disease, and diabetes (Yach, Hawkes, Gould, & Hofman, 2004). Mathers and Loncar (2006) expected that HIV/AIDS and depressive disorders will be added to major causes of death by 2030. In order to promote public health and prevent diseases, many researchers have mainly looked at behavioral factors including tobacco use, diet and activity patterns, alcohol consumption, sexual behavior, and avoiding injuries because these are considered the most prominent contributors to mortality (Mokdad, Marks, Stroup, & Gerberding, 2004, 2005; Schroeder, 2007). Accordingly, health researchers and education aim toward any positive and informed behavioral changes such as quitting smoking, reducing alcohol consumption, and/or eating healthier meals.

Generally, health behavior refers to "the actions of individuals, groups, and organizations, as well as their determinants, correlates, and consequences, including social change, policy development and implementation, improved coping skills, and enhanced quality of life" (Parkerson Jr et al., 1993). Gochman (1982, 1997) also defined health behavior as "those personal attributes such as beliefs, expectations, motives, values, perceptions, and other cognitive elements; personality characteristics, including affective and emotional states and traits; and overt behavior patterns, actions, and habits that relate to health maintenance, to health restoration, and to health improvement." Kasl and Cobb (1966a, 1966b) categorized health behavior into three dimensions:

1. *Preventive health behavior: Any activity undertaken by an individual who believes himself/herself to be healthy, for the purpose of preventing or detecting illness in an asymptomatic state.*

2. *Illness behavior: Any activity undertaken by an individual who perceives himself to be ill, to define that state of health, and to discover a suitable remedy.*

3. *Sick-role behavior: Any activity undertaken by an individual who considers himself to be ill, for the purpose of getting well. It includes receiving treatment from medical providers, generally involves a whole range of dependent behaviors, and leads to some degree of exemption from one's usual responsibilities.*

Healthy Eating Behavior in Restaurants

There is no generally accepted definition of healthy eating behavior. However, Falk and her colleagues (2001) conducted a qualitative study to explore definitions and classifications of healthy eating, and found that individuals' self-defined healthy eating definitions consist of predominant and secondary themes. These themes eventually form one's belief system about how food consumption is related to his or her health condition. The authors of this study identified seven themes listed below:

1. Healthy eating is eating low fat.

2. Healthy eating is eating natural/unprocessed foods.

3. Healthy eating is balanced eating.

4. Healthy eating is eating to prevent disease.

5. Healthy eating is maintaining nutrient balance.

6. Healthy eating is eating to manage an existing disease.

7. Healthy eating is eating to control weight.

Most hospitality studies have focused on a food safety issue (Knight, Worosz, & Todd, 2009; Knight, Worosz, & Todd, 2007; Seaman & Eves, 2006). However, there are not many studies trying to understand customers' healthy eating behavior in restaurants. Lee and McCleary (2012) found a positive relationship between seniors' health condition, attitudes toward health, and restaurant selection criteria. They also found that health concerned seniors are willing to pay more money for healthy menu items in family restaurants. Using cluster analysis, another study explored what healthy food seekers want when selecting a restaurant

(Yüksel & Yüksel, 2003). This study found that healthy food choices, food quality, and hygiene are important for the cluster of healthy food seekers.

Some studies tested the influence of providing calorie/nutrition information on customers' menu item selection. Through segmentation, Josiam and Foster (2009) found that nutrition information is important for females, those aged 35 to 65, those with higher incomes, and who were college-educated. The study also found that customers who tend to eat healthy food at home are more likely to select healthy menu items in restaurants. Yoon and George (2012) and Wei and Miao (2012) also found that providing nutrition information influences customers' food choices in restaurants.

Theories of Health Behavior

Researchers, including psychologists and dietitians, have tried to understand how individuals make decisions in terms of health-related behaviors and what determines these behaviors (Karen Glanz et al., 2008). In order to predict individual health behavior, most studies have used the Theory of Planned Behavior (TPB) or the Health Belief Model (HBM), two of the most popular health behavior theories (Painter et al., 2008). One study investigated the use of theories in healthy behavior research from 200 to 2005 (Painter et al., 2008). This study found that the most frequently studied health behavior areas were "tobacco use (33.2%), physical activity (23.3%), alcohol use (18.7%), nutrition (16.1%), and disease testing/screening (14.5%)." This study also found that from 2000 to 2005, 20% of studies used the Health Belief Model (HBM) while 15.9% used either the Theory of Reasoned Action (TRA) or the Theory of Planned Behavior (TPB).

Health Belief Model

The HBM was originally developed by social psychologists in the U.S. Public Health Service in the 1950s (Hochbaum, 1958). At that time, researchers were trying to understand why people did not participate in programs that helped to prevent and detect disease. Later, the theory related to the HBM was extended and became one of the most widely used theories in health-related behavior studies, explaining how individuals maintain or change their health behaviors (Karen Glanz et al., 2008). The HBM is comprised of five major constructs including perceived susceptibility, severity, benefits, barriers, and self-efficacy (Karen Glanz et al., 2008). Other variables such as demographics and knowledge of health have been added to the HBM to improve explanations of health behaviors (Chen & Land, 1990; Karen Glanz et al., 2008) . In addition to the main constructs and added variables, the HBM considers a cue construct that can trigger actions. In the foodservice industry, advertising, education, and providing nutrition information could be examples of cue constructs influencing customers' healthy eating behavior. In this study, providing nutrition information in restaurants will be used for the "cue to action" construct. Table 2-1 explains key concepts and definitions of the Health Belief Model (HBM).

Table 2-1: Key Concepts and Definitions of the Health Belief Model

Concept	Definition	Application
Perceived Susceptibility	Belief about the chance of experiencing a risk or getting a condition or disease	• Define population(s) at risk, and their risk levels • Personalize risk based on a person's characteristics or behavior • Make perceived susceptibility more consistent with individual's actual risk
Perceived Severity	Belief about the seriousness of a condition and its consequences	• Specify the consequences of risks and conditions
Perceived Benefits	Belief in the efficacy of an advised action in reducing risk or the degree of impact	• Define action to take: how, where, when • Clarify the expected positive effect
Perceived Barriers	Belief about the tangible and psychological costs of the advised action	• Identify and reduce perceived barriers through reassurance, correction of misinformation, incentives, and assistance
Cues to Action	Strategies to activate "readiness"	• Provide how-to information, promote awareness, and use appropriate reminder systems
Self-efficacy	Confidence in one's ability to take action	• Provide training and guidance in performing recommended actions • Use progressive goal setting • Give verbal reinforcement • Demonstrate desired behaviors • Reduce anxiety

Source: Glanz et al., 2008; pp 48

Applications of the Health Belief Model

With these constructs, the HBM has been applied to a variety of health-related behavior studies (Karen Glanz et al., 2008). Most areas related to health behaviors have been used in this model in an attempt to understand individuals' health behaviors and problems, including risky sexual behaviors (Hounton et al., 2005), smoking behaviors (Balbach et al.,

2006), obesity, and dietary studies (Janelle K. O'Connell et al., 1985; Stephen G. Sapp & Weng, 2007b), food safety (McArthur et al., 2006), and cancer screening behaviors (Champion, 1984). However, there is no study applying the HBM for predicting and understand customers' healthy eating behavior in a restaurant setting.

Constructs of the HBM and the Relationship among the Constructs

The HBM assumes that perceived benefits, self-efficacy, susceptibility, and severity of unhealthy behavior positively influence individual health behaviors, while perceived barriers play a role as a negative construct on healthy behavior. In other words, if one believes that there is the likelihood of getting a disease or condition, believes that condition would lead to potentially serious consequences, believes that one's possible actions would be beneficial for reducing his/her susceptibility or severity, and believes that the anticipated benefits are higher than the barriers to or costs of actions, he or she is more likely to take action (i.e., healthy behavior) that could reduce health-related risks (Karen Glanz et al., 2008).

Perceived Susceptibility

Perceived susceptibility is the degree to which an individual feels at risk for a health problem. In other words, it is one's belief about the likelihood of getting a disease or condition. For example, restaurant customers must believe that there is a possibility of developing health problems caused by unhealthy eating behavior before he or she starts to make healthy eating choices in restaurants.

24

Perceived Severity

Perceived severity is the degree to which an individual believes that the consequences of the health problems or conditions will be severe. In other words, it is one's belief about how serious the consequences might be if they ignore health-related risks, problems, or conditions. The consequences include both medical consequences (e.g., death, disability, or pain) and social consequences (e.g., results of the conditions on work, family life, and social relations). For instance, if people believe illnesses or health problems caused by unhealthy eating behavior are severe for them, they will be interested in eating healthy menu items in restaurants. The combination of both perceived susceptibility and severity is typically labeled as perceived threat.

Perceived Benefits

Perceived benefits are one's belief concerning the positive outcomes derived from the actions that reduce risks or seriousness of health problems and conditions. One's changed behavior is influenced by his or her perceived benefits of the actions taken to reduce the disease risks, health problems, and conditions. Perceived benefits also include perceptions of non-health-related benefits such as the financial savings from treatments in hospitals or clinics, and social relations. For instance, the perceived benefits for healthy eating behavior could be preventing obesity that positively influences social relations (Puhl & Brownell, 2001), dating, and sexual activities (Cawley et al., 2006), as well as saving on medical expenditures due to obesity (Finkelstein et al., 2009), and mental health outcomes (M. M. Ali, H. Fang, & J. Rizzo, 2010). In sum, people have to realize that there are benefits to reducing

health risks and to taking any positive healthy action no matter their perception of susceptibility and severity (Karen Glanz et al., 2008, p. 47).

Perceived Barriers

Perceived barriers are the negative aspects of taking healthy actions or the negative outcomes of the actions. Before changing one's health behavior, one will compare perceived barriers to perceived benefits for taking actions that reduce health risks or threats. For example, if there are too many negative aspects, compared to perceived benefits, for taking the recommended health action, it is less likely that one will take the necessary actions. Perceived barriers include intangible or tangible aspects such as negative side effects, unpleasant experiences, inconvenience, as well as expenditures of time and money. Consequently, one's perceived barriers will act as impediments to recommended health behavior, compared to perceived benefits.

Cues to Action

Cues to action are external events or forces that motivate an individual to take health actions. This means that external factors such as advertisements or education programs can push people to change their behavior. For example, if one's friend or family member is diagnosed with a certain disease, he or she may consider this as a cue to trigger actions. Also, media publicity that provides information and promotes awareness of health risks could be a cue to action. In the restaurant industry, provision of nutrition information can be a cue to action for healthy eating behavior. However, cues to action have not been systematically

studied in health behavior research because of the difficulty of testing in explanatory surveys (Karen Glanz et al., 2008, p. 49). In this study, providing nutrition information will be used as a cue to action.

Self-Efficacy

Self-efficacy is defined as "the conviction that one can successfully execute the behavior required to produce the outcomes" (A. Bandura, 1990). In other words, it is an individual's belief about personal abilities to complete a certain action for expected outcomes. According to Bandura (1990), self-efficacy is important for initiating and maintaining behavioral change. Self-efficacy was not in the early formulation of the HBM because the original model (Hochbaum, 1958) was developed for preventive health actions such as receiving a screening test or an immunization. This indicates that the original HBM is only for simple individual health behavior. In 1988, Rosenstock, Strecher, and Becker (1988) suggested that adding self-efficacy would be better for explaining an individual's complex health behavior.

In sum, according to the HBM, an individual must believe that there are threats from his or her current behavioral patterns (perceived susceptibility and severity), that changing behavioral patterns will lead to valued outcomes (perceived benefits) with manageable costs (perceived barriers), and that he or she must feel competent (self-efficacy) to accomplish successful behavioral change by overcoming perceived barriers.

Figure 2-1 illustrates the HBM constructs and linkages.

Faure 2-1 Health Belief Model Components and Linkages
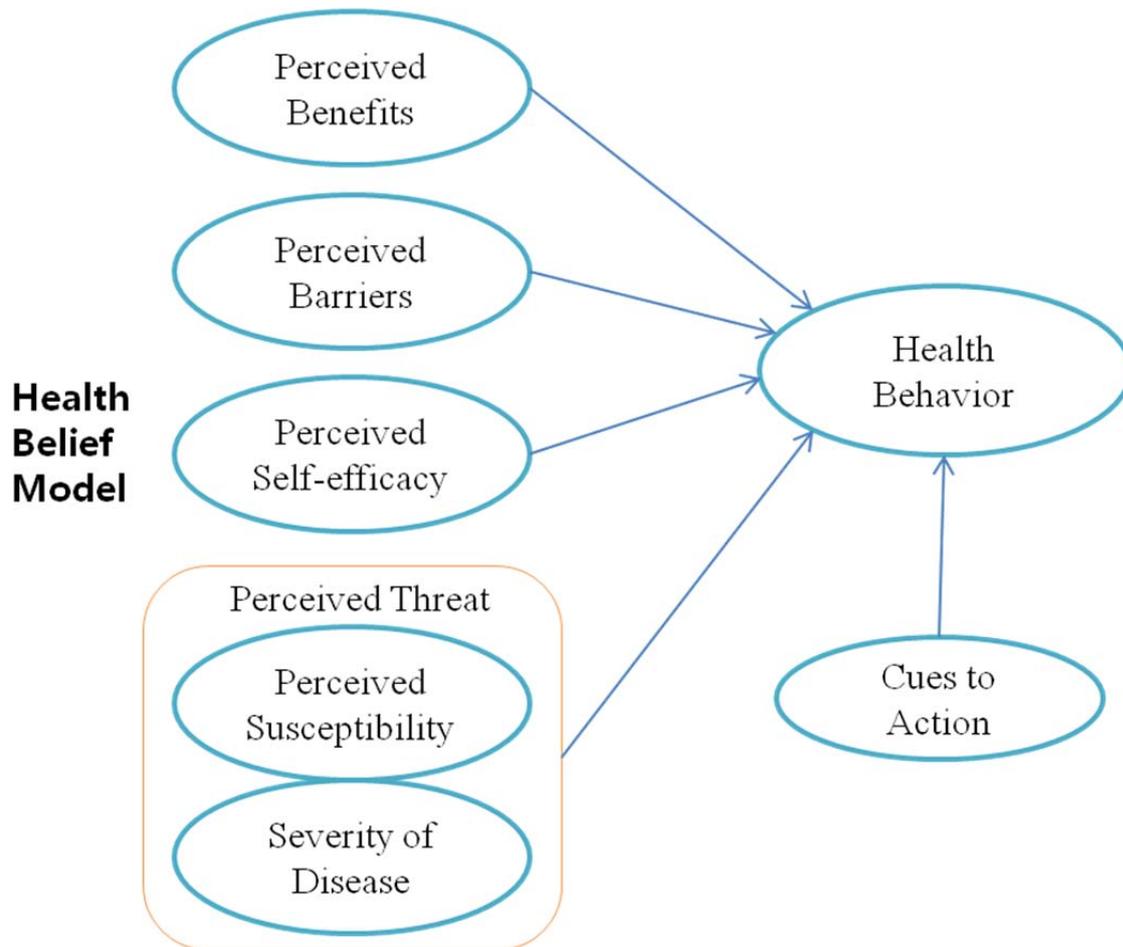
Health Belief Model in Dietary Studies

Deshpande, Basil, and Basil (2009) applied the HBM to understand college students'
healthy eating habits. They found that the data strongly supported the HBM, which means
that students were cognizant of the importance of eating a healthy diet (combination of
dietary status, perceived severity, and perceived susceptibility), and that barriers, benefits,
and self-efficacy influence the likelihood of eating a healthy diet. Interestingly, this study also

tested how each relationship in the HBM varied by gender and found that there are differences. Based on these results, the authors recommended that efforts to increase the likelihood of male students eating a healthy diet should include the introduction of a variety of social change campaigns. For male students, the campaigns should focus on the negatives of eating an unhealthy diet, while for female students, increasing the perceptions of susceptibility is more important.

Sapp and Jensen (2006) also used the HBM for predicting perceived and actual dietary quality with secondary data, collected by the U.S. Department of Agriculture in the 1991 Continuing Survey of Food Intakes by Individuals and the Diet and Health Knowledge Survey. The authors added socio-demographic variables such as gender, race, age, education level, and household income, and found that those variables influence perceived importance of eating a quality diet. This study confirmed that the HBM provided good prediction of perceived dietary quality, while it provided moderate to weak ability to predict actual dietary quality calculated from respondents' actual food intake records. However, this study failed to apply all constructs from the HBM to the model because it used secondary data. One year later, Sapp conducted another study using different nationwide secondary data and a similar model (Stephen G. Sapp & Weng, 2007a). In this study, the authors tested the ability of the HBM to predict both individuals' dietary quality and obese status. However, they failed to find statistical significances for all key relationships specified in the HBM. Moreover, these two studies did not apply all constructs from the HBM to the model because they used secondary data.

One study tested how the HBM can predict willingness to use functional breads, across four European countries including the U.K., Italy, Germany, and Finland (Vassallo et al., 2009). Functional breads refer to a bread that "affects beneficially one or more target

functions of the body, beyond adequate nutritional effects, in a way that is relevant to either an improved state of health and well-being and/or reduction of risk of disease" (Diplock et al., 1999). The authors found that perceived benefits and barriers were statistically significant to predict willingness to consume functional breads, and cues to action were marginal in the four countries. However, perceived susceptibility and severity were not significant in the model. The results were similar across four countries, which indicated that there were no cultural differences among these countries with the exception of self-efficacy which was significant only in Finland.

The HBM was also applied to dietary studies (AGHA, Eftekhar, & Mohammad, 2005; Kartal & Ozsoy, 2007; Sharifirad, Entezari, Kamran, & Azadbakht, 2009). With a quasi-experimental design, one study tested how the HBM influence on diet obedience in type 2 diabetic patients was based on education (Hamuleh, Vahed, & AR, 2010). The authors of this study found that after educating participants, predictability of the HBM for diet obedience among type 2 diabetic patients was significantly increased, especially for perceived susceptibility, severity, and barriers. Interpretation of this result is that education likely plays a role as a cue to action in the HBM.

There are several studies that used and tested the HBM partially to predict healthy eating behavior (Hayes & Ross, 1987; Kelly, Zyzanski, & Alemagno, 1991; J.K. O'Connell, J.H. Price, S.M. Roberts, S.G. Jurs, & R. McKinley, 1985). For example, Becker and Levine (1987) tested how perceived risk factors influenced premature coronary disease. Contento and Murphy (1990) explored changes in eating behavior by comparing grocery shoppers who reported making desirable substitutions in their diets with those who did not. Moreover, one study used perceived susceptibility to test one's attitudes and behaviors about consumption of fruits and vegetables (Dittus, Hillers, & Beerman, 1993). However, these studies have limited

30

contributions for evaluating the HBM in predicting and understanding individual's healthy eating behavior because they did not fully use all the constructs from the HBM (S.G. Sapp & Jensen, 2006).

Therefore, based on the HBM and literature review, hypotheses for this study are as follows:

H₁: Perceived benefits will positively influence customers' healthy eating behavior in restaurants.

H₂: Perceived barriers will negatively influence customers' healthy eating behavior in restaurants.

H₃: Perceived self-efficacy will positively influence customers' healthy eating behavior in restaurants.

H₄: Perceived threat (the combination of perceived susceptibility and severity of diseases) will positively influence customers' healthy eating behavior in restaurants.

Response to Provision of Nutrition Information

The U.S. Food and Drug Administration (FDA) announced the issuance of a draft of a guidance document for the food service industry regarding the implementation of new

menu labeling regulations (Food and Drug Administration, 2010). This legislation is part of the Patient Protection and Affordable Care Act that was passed on March 23, 2010, and the FDA is trying to finalize it. According to the new FDA regulations (Food and Drug Administration, 2010), all restaurants and retail food establishments with 20 or more outlets operated under the same brand name will be subject to these regulations. When the regulations are instituted, the caloric value of each dish must be printed on the in-house menus and menu boards. Furthermore, additional nutrition information for each menu item, including total fat, saturated fat, cholesterol, sodium, total protein, etc., must be provided upon request.

The FDA hopes that the implementation of these new regulations will help educate consumers. Perhaps armed with accurate, easily accessible, and easy-to-understand information, consumers will make healthier food choices, thereby improving their eating behaviors in restaurants and reducing the obesity rate and its associated health costs. Moreover, these regulations may encourage the restaurant industry to voluntarily introduce healthier menu items for their patrons. However, the FDA cannot finalize these new regulations because researchers have argued that the effectiveness of these regulations is questionable.

Nutrition advocates have argued that nutrition labeling is an important public policy tool that can positively influence customer eating behavior and food selection in restaurants. Some studies have indeed found a relationship between nutrition labeling and food selection (Burton et al., 2006; Yamamoto, Yamamoto, Yamamoto, & Yamamoto, 2005). For example, Burton et al. (2006) investigated the effects associated with providing nutrition information for healthy food items and less-healthy food items. They found that customers' product attitudes were changed and purchasing intentions for less healthy food items decreased when

nutrition information was provided. This indicates the tendency of customers to underestimate the numbers of calories for less-healthy food items.

However, other studies reported no effect or a weak effect from nutrition labeling on food choices (Elbel et al., 2009; Tandon, Wright, Zhou, Rogers, & Christakis, 2010). This confirms that findings from previous studies have been inconsistent. For example, Elbel and his colleagues examined how menu calorie labels influence customers' menu item selection in fast food restaurants (Elbel et al., 2009). In this study, New York City residents were used because providing calorie information in restaurants is mandatory in that city. The authors found that there is no statistical change in customers' calorie consumption after new calorie labeling was implemented. One recent study found that parents tend to be influenced by nutrition labeling when they select menu items for their children (Tandon et al., 2010). However, this influence does not seem to extend to the selection of their own menu items.

Customers' nutrition knowledge is important for the effectiveness of nutrition information disclosure for improving healthy eating behavior in restaurants. For example, Krukowsk and her colleagues reported that from 48% to 66% of the respondents in their study actually read food labels, and 64% to 74% did not have adequate knowledge of appropriate daily caloric needs (Krukowski, Harvey-Berino, Kolodinsky, Narsana, & DeSisto, 2006). In other words, customers in restaurants may not use or understand nutrition labeling when they select menu items. Consequently, Variyam (2005, p. 10) argued, "The benefits of labeling in terms of a change in consumer behavior leading to better nutritional outcomes may be small or uncertain at best" because of the lack of nutrition knowledge.

These mixed results indicate that more research is needed in order to close the gaps in our knowledge of how providing nutrition information influences consumers' healthy eating behavior in restaurants. Applying health-related theories may also be useful in order to

understand the effectiveness of nutrition information for healthy eating behavior in restaurants. According to the HBM, providing nutrition information for restaurant menu items could act as "cues to action" that help consumers make better food choices (Lando & Labiner-Wolfe, 2007). This means that nutrition information available on restaurants' menu boards or menus could trigger a choice to eat healthy menu items in restaurants.

Glanz, Rimer, and Viswanath (2008) argued that individuals' health-related knowledge influences behavior related to their health. This relationship can also be applied customers' use of nutrition information for food purchase (Grunert, Wills, & Fernández-Celemín, 2010). For example, Burton, Garretson, and Velliquette (1999) found a significant relationship between customers' nutrition knowledge and accurate nutrient information usage for food purchase. This also could be interpreted that the greater a person's knowledge of nutrition, the greater the likelihood of using nutrition information provided by restaurants. For measuring customers' nutrition knowledge, Palmer, Graham, Taylor, and Tatterson (2002) argued that researchers should use both self-reported (subjective) and objective measures in order to increase construct validity. Subjective knowledge refers to self-beliefs about individuals' own knowledge while objective knowledge is defined as accurately stored information (Moorman, Diehl, Brinberg, & Kidwell, 2004). Indeed, one study used both subjective and objective nutrition knowledge and found both of those types of knowledge were significantly related to respondents' positive dietary actions (Petrovici & Ritson, 2006).

Therefore, this study views response to provision of nutrition information as a cue to action in the HBM and the hypotheses are:

H_5: Using the nutrition information available in (or provided by) a restaurant (a cue to

action) will positively influence customers' healthy eating behavior in restaurants.

H₆: There is a positive relationship between nutrition knowledge and using the nutrition information available in (or provided by) a restaurant (a cue to action).

H₆₋₁: There is a positive relationship between customers' subjective nutrition knowledge and using the nutrition information available in (or provided by) a restaurant (a cue to action).

H₆₋₂: There is a positive relationship between customers' objective nutrition knowledge and using the nutrition information available in (or provided by) a restaurant (a cue to action).

Theory of Planned Behavior

Fishbein and Ajzen (1975) were the first to introduce the concepts of the Theory of Planned Behavior (TPB). To overcome limitations of the Theory of Reasoned Action (TRA), the TPB extended the model by including an additional construct: perceived control over performance of the behavior. The TPB concerns individual motivational constructs as determinants of the likelihood of performing a specific behavior (Ajzen, 1991). This means that it was designed to predict and explain one's behavior in specific contexts. Focusing on rational, cognitive decision-making processes, the TPB explains that intentions to perform or engage in a specific behavior are formed as a response to three considerations: a person's attitude toward a specific behavior; his/her perception of subjective norms associated with

that behavior; and perceived control over performance of the behavior (Ajzen, 1991). In the TPB, a main construct is intention to perform a specific behavior. Therefore, the TPB basically assumes that behavioral intention is the most likely of the three constructs to predict an individual's actual behavior.

Attitude towards behavior is an individual's beliefs about outcomes or attributes of performing the behavior, weighted by evaluation of those outcomes or attributes. Subjective norm is an individual's normative beliefs about whether important referents approve or disapprove the behavior, weighted by his/her motivation to comply with these referents. Perceived behavioral control is determined by a person's perception of the ease or difficulty of behavioral performance. Lastly, intention to perform a given behavior is how hard an individual is willing to try and how much he or she will exert an effort toward a given behavior. This means that the stronger the individual's intention, the more likely is the actual performance of that intention. However, there is one condition for actual performance and that is the behavior must be under volitional control (Ajzen, 1991). In sum, the theory hypothesizes that a positive attitude toward the behavior, the favorable subjective norm, and the strong perceived behavioral control are positively related to one's intention to perform the behavior. Then, eventually he/she will actually perform the behavior (Ajzen, 1991).

Figure 2-2 illustrates the TPB.

Figure 2-2 Theory of Planned Behavior Components and Linkages

Theory of Planned Behavior
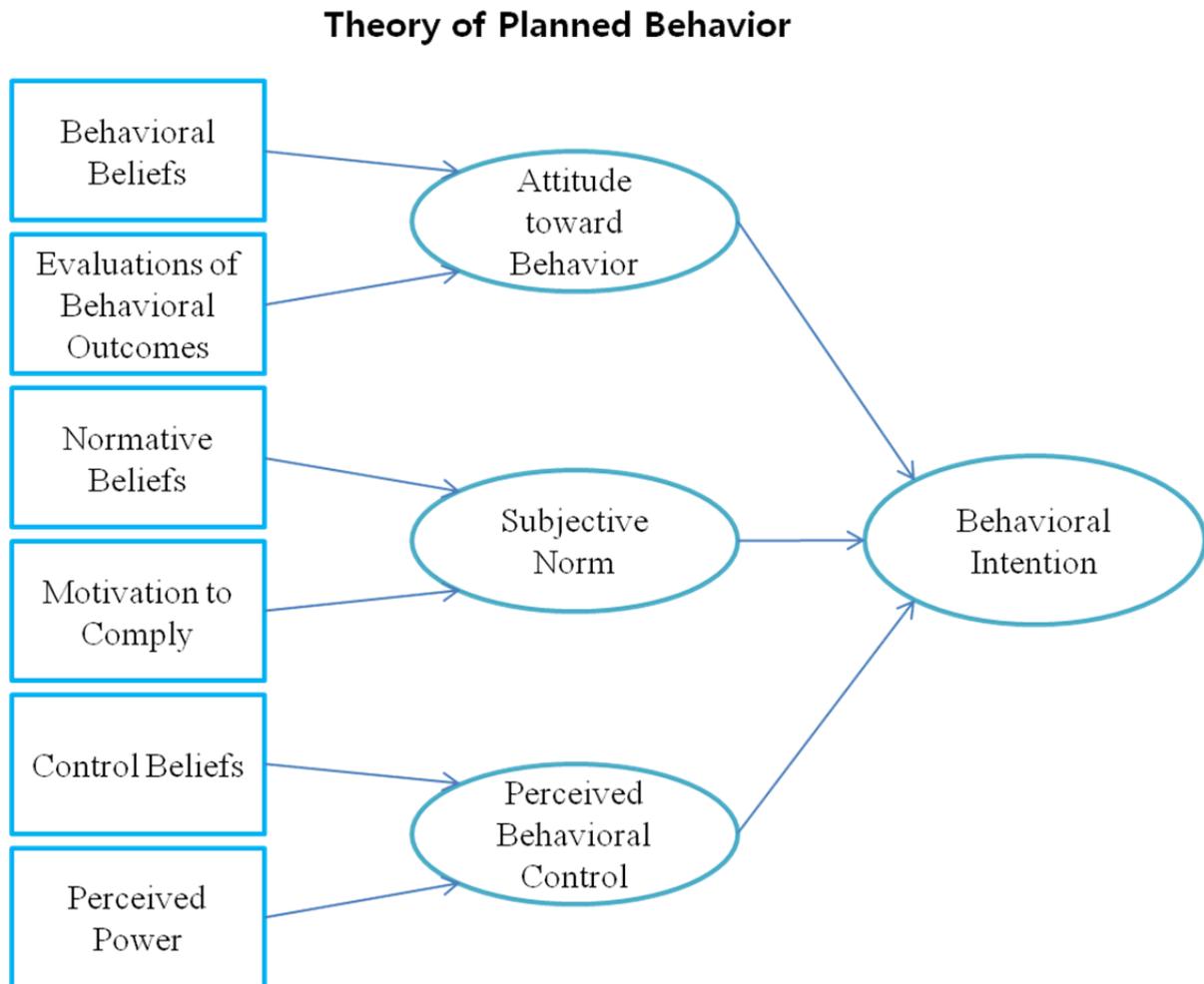
Applications of the Theory of Planned Behavior

While the HBM focuses only on health-related behavior, the TPB is more generalized. This means that the TPB can be applied to various areas outside the health-related scope. Ajzen (1991) also stated that the TPB could be applied to a variety of specific human behaviors. Some health-related behavior studies that have employed the TPB include risky sexual behaviors (Gu et al., 2009; Schaalma et al., 2009), smoking behavior (Hassandra

et al., 2011; Rise et al., 2008), exercise (Jones et al., 2007; Plotnikoff et al., 2010), breast self-examination (Mason & White, 2008; Norman & Cooper, 2011), obesity (K. Andrews et al., 2010; Caperchione et al., 2008), and food safety (Mullan & Wong, 2009; Pilling et al., 2008). These studies found that the TPB has successfully predicted and explained a wide range of healthy behaviors and intentions.

The TPB has also been applied to various hospitality studies about restaurant-related behaviors. These studies include intention of Word-Of-Mouth (WOM) (Cheng, Lam, & Hsu, 2006), intention to engage in different types of dissatisfaction responses (Cheng, Lam, & Hsu, 2005), intention to experience local cuisine in a travel destination (Ryu & Jang, 2006), intention to buy genetically modified foods (O'Fallon, Gursoy, & Swanger, 2007), intention to complain (Cheng & Lam, 2008), intention to use menu labels (Delvarani, Othman, & Ghazali, 2012), and intention to adopt green practices (Chou, Chen, & Wang, 2011). All of these can be interpreted as signifying that the TPB is useful for predicting and understanding customers' behavior in the restaurant setting.

Constructs of the TPB and the Relationship among the Constructs

Attitude

Fishbein (1967) discussed the differences between attitude toward an object and attitude toward a behavior. He argued that using attitude toward one's behavior is better for predicting and understanding a certain behavior than using attitude toward an object. In the TPB, attitude refers to one's evaluative response towards a certain action (M. Fishbein, 1979). Taking Fishbein and Ajzen's expectance-value model (M. Fishbein & Ajzen, 1975) into

consideration, attitude is one's overall positive or negative evaluation of performing a specific behavior. According to the TPB, attitude is determined by an individual's behavioral beliefs and evaluation of the possible outcome. Behavioral beliefs are the beliefs that performing a specific behavior will result in a specific outcome. The evaluation of outcome is one's overall evaluation of this specific outcome. Therefore, if an individual has strong beliefs that positively valued outcomes will result from performing a certain behavior, he or she will have a positive attitude toward this behavior.

Subjective Norm

According to the TPB, the individual's intention to perform a certain behavior is based not only on his or her attitude toward this behavior but also on subjective norm, which is what the person thinks that other people important to him/her want him/her to do. Subjective norm is determined by normative beliefs weighted by motivation to comply. A person's normative beliefs revolve around whether important referent individuals approve or disapprove of a certain behavior. Motivation to comply is the individual's motivation to comply with those referents that are important to him or her. Accordingly, if the person believes that important referent individuals think he or she should perform a certain behavior and is motivated to meet their expectation, he or she will have a positive subjective norm, influencing intention to take actions.

Perceived Behavioral Control

Perceived behavior control in the TPB is the most important construct to predict or

understand individual behavior because it accounts for significant amounts of variance in intention and behavior, compared to the other two constructs (i.e., attitude and subjective norm) (Armitage & Conner, 2001). Perceived behavioral control basically accounts for external factors that may influence one's intention or behavior. According to the TPB, perceived behavioral control is determined by control beliefs and perceived power. Control beliefs refer to beliefs of the presence or absence of facilitators or barriers for performing a certain behavior. Control beliefs also reflect the availability of tangible and intangible resources that are required to perform this behavior, including access to money, time, and other resources. Perceived power means one's confidence in his/her abilities to perform this behavior. Therefore, if one believes that there are resources that will make performing a certain behavior easy and if one feels confident in performing this behavior, then this individual will have highly perceived behavioral control.

Table 2-2 provides definitions of each construct in the TPB. In sum, attitude, subjective norms, and perceived behavioral control are positively related to behavioral intention, probably resulting in actual behavior. For example, if one has a positive attitude towards eating healthy menu items in restaurants, if one's friends or family members think it is a good idea to eat healthy meals in restaurants, and if one thinks that he or she has control over whether he or she can eat these menu items, then, the likelihood of selecting healthy menu items in restaurants is high.

Table 2-2: Definitions of Constructs in the Theory of Planned Behavior

Constructs		Definition
Attitude toward Behavior	Behavioral Beliefs	• A person's beliefs about what will happen if he or she performs the behavior
	Evaluations of Behavioral Outcomes	• A person's judgment of whether the expected outcomes is good or bad
Subjective Norm	Normative Beliefs	• A person's beliefs about what other people in his or her social group will think about the behavior
	Motivation to Comply	• A person's motivation to conform to these perceived norms
Perceived Behavioral Control	Control Beliefs	• A person's beliefs about factors that will make it easy or difficult to perform the behavior
	Perceived Power	• The amount of power a person believes he or she has over performing the behavior
Behavioral Intention		• A person's intention to perform a behavior • It is Influenced by attitude, subjective norms, and perceived behavioral control • It is most predictive of actual behavior

Source: Edberg, 2007; pp 41

Theory of Planned Behavior in Dietary Studies

Andrews, Silk, and Eneli (2010) conducted a study about how parents provide healthy foods and limit unhealthy foods to their children to prevent childhood obesity, using the TPB. The results supported the TPB, finding attitude, subjective norm, and perceived behavioral control were statistically significant influences on behavioral intention. This study

also tested the relationship between intention and actual behavior by tracking respondents' behavior and found that intention to provide healthy foods and limit unhealthy foods for their kids influenced actual behavior.

One study applied the TPB to predict the individual's decision of whether to eat healthy foods (Povey, Conner, Sparks, James, & Shepherd, 2000). The results showed that attitude, perceived norms, and perceived behavioral control explained 42% of the variance for intentions, which can be interpreted that the TPB has a good predictive power for healthy eating intentions. This study also tested moderating effects of social influence variables including injunctive norms, descriptive norms, and perceived social support. The authors found that only perceived social support played a role as a moderator on the relationship between perceived behavioral control and intention, and the relationship between attitude and intention. This result may give some ideas for improving and promoting individual's healthy eating behavior.

Lautenschlager and Smith (2007) explored the influence of a garden program, a newly developed nutrition curriculum, on fruit and vegetable consumption of youths (age 8–15), using the TPB. They found that attitude was the most significant construct to predict intention. They also found that there were differences between male and female youth in terms of the relationship between antecedents and intention. Finally, the authors concluded that the gardening program is a good intervening variable to improve healthy eating behavior in this age group.

Like the HBM, several studies have applied the TPB for behaviors related to diabetics (Omondi, Walingo, Mbagaya, & Othuon, 2012; Omondi, Walingo, Mbagaya, & Othuon, 2010). All studies found that the results supported the TPB for predicting diabetic-related behavior.

Therefore, based on the TPB and literature reviews, hypotheses for this study are as follows:

H₇: Attitude toward healthy eating behavior will positively influence customers' intention to engage in healthy eating behavior in restaurants.

H₈: Subjective norms will positively influence customers' intention to engage in healthy eating behavior in restaurants.

H₉: Perceived behavioral control will positively influence customers' intention to engage in healthy eating behavior in restaurants.

H₁₀: Intention to engage in healthy eating behavior will positively influence customers' healthy eating behavior in restaurants.

Patronizing Behavior

Definition of Patronizing Behavior

The concept of patronizing behavior is not clearly defined. Generally, researchers have argued that satisfied customers are more likely to establish loyalty (Cronin Jr & Taylor, 1992), resulting in repeat purchases (Fornell, 1992) and positive Word-Of-Mouth (WOM) to

others (Halstead & Page, 1992). Patronizing behavior mainly focuses on these post-purchase behaviors including subsequent purchase and positive WOM publicity (Choi & Chu, 2001). For example, one study used the concept of patronage intentions by including the likelihood of both intending to purchase and recommending it to others (Baker et al., 2002). Therefore, in this study, customers' willingness to patronize a restaurant refers to customers' perceived likelihood of patronizing a specific restaurant operationalized by intention to revisit and intentions to recommend (positive WOM).

Value of Patronage

Patronage in a certain company, product or brand generates benefits for businesses in several ways. In the restaurant industry, for example, patrons tend to visit their patronized restaurant more frequently than other customers who come to the restaurant occasionally. From the perspective of businesses, patronage is helpful for saving on their marketing costs. Research indicates that maintaining existing patrons is much cheaper than attracting new customers, and a 5% increase in customer retention leads to a 25-85% profit increase (Reichheld & Esasser, 1990; Shoemaker & Lewis, 1999). Haywood (1989) also argued that patrons may extend their purchasing base over time and create positive WOM to businesses, products, or brands. In addition to these benefits for companies, patronage also is beneficial for employees of the companies. According to Haywood (1988), employees prefer to deal with patrons more than other customers because they consider patrons as satisfied customers of their service. Employees believe that patrons are likely to have more predictable preferences and expectations so employees can easily serve them. Moreover, there could be rapport or friendship between employees and patrons.

Previous Studies about Patronizing Behavior

Many studies have found that providing good service and product quality to customers and differentiating facilities from competitors can increase customer loyalty, improve a company's image, maximize its revenues, retain existing customers, and lure new customers (Barber, Goodman, & Goh, 2011; Lewis, 1993; Susskind & Viccari, 2011; Watson, McKenna, & McLean, 1992). Sirgy and Tyagi (1986) stated that customers' repeat purchasing behavior and brand loyalty are closely related to their satisfaction level with their first purchase. This means that restaurant managers and operators have to fully understand what their customers want and need in order to satisfy them (Pizam, 1994).

In the tourism area, there are several studies that explored theoretical constructs predicting intentions to patronize a destination (Cai, Wu, & Bai, 2004; Gitelson & Crompton, 1984; C. Lin & Morais, 2009). However, there are few studies that tried to understand customers' patronizing behavior in restaurants. Hu, Parsa, and Self (2010) conducted a study in order to understand customers' patronizing behavior in green restaurants. They found that knowledge of green restaurants, environmental concern, and ecological behavior positively influenced patronizing a green restaurant.

In sum, this study assumes that if a restaurant provides what customers want and need, customers will patronize the restaurant showing intentions to revisit the restaurant and intentions to recommend (generating positive WOM). Therefore, the hypothesis for this study is:

H_{11}: Customers' healthy eating behavior in restaurants will positively influence their willingness to patronize a restaurant that provides healthy menu items.

The Relationship between Socio-demographic Characteristics and Health Behavior

Glanz, Rimer, Viswanath (2008) argued that individuals' socio-demographic characteristics can influence their perceptions. Accordingly, those personal characteristics may indirectly impact their health-related behavior. This relationship can be also applied to the area of healthy eating behavior in general. Many studies have found that eating related health behavior was influenced by socio-demographic variables including gender (Byrd-Bredbenner et al., 2008; Deshpande et al., 2009; Nayga, 2000; S.G. Sapp & Jensen, 2006; Y.-H. C. Sun, 2008), age (Petrovici & Ritson, 2006; S.G. Sapp & Jensen, 2006; Y.-H. C. Sun, 2008), income (Nayga, 2000; S.G. Sapp & Jensen, 2006), education levels (Petrovici & Ritson, 2006; S.G. Sapp & Jensen, 2006), employment status (Nayga, 2000) and BMI status (McFerran, Dahl, Fitzsimons, & Morales, 2010; Winett, Tate, Anderson, Wojcik, & Winett, 2005). Based on those previous studies, this study examined the relationship between customers' socio-demographic variables (gender, age, marital status, geographic area, income, education levels, employment status, and BMI status) and their healthy eating behavior and willingness to patronize a restaurant that provides healthy menu items. Therefore, the following hypotheses are:

H_{12}: Customers' socio-demographic characteristics will influence their healthy eating behavior in restaurants.

H₁₃: Customers' socio-demographic characteristics will influence their willingness to patronize a restaurant that provides healthy menu items.

Figure 2-3 illustrates a proposed model in this study. Hypotheses are also provided.

Figure 2-3: Proposed Model of this Study
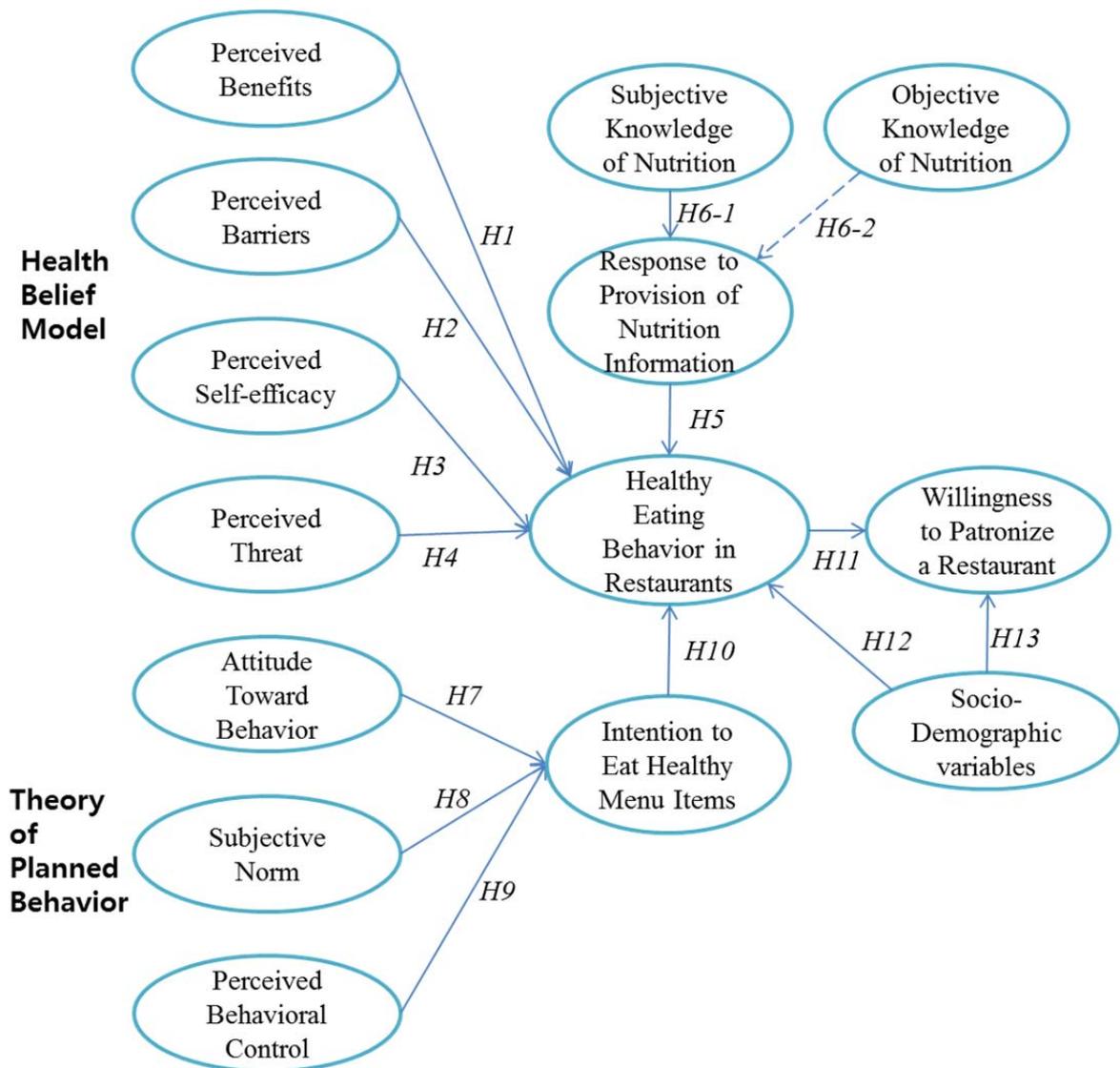
Summary

The beginning of this chapter focused on the definition of health behavior and categorization of health behavior. In order to apply the Health Belief Model (HBM) and the Theory of Planned Behavior (TPB) to customers' healthy eating behavior in restaurants, each theory was also discussed, including definitions of and relationships among constructs from the HBM and the TPB. At the same time, several previous studies that used the HBM and the TPB for predicting and understanding individuals' eating behavior were presented. Moreover, how provision of nutrition information could influence one's healthy eating behavior was discussed. This study expects that providing nutrition information can play a role as a cue to action positively influencing customers' healthy eating behavior in restaurants. Lastly, the concept of patronizing behavior and studies related to customers' patronizing intention and behavior were provided. Based on the literature review, thirteen hypotheses were suggested in this study.

CHAPTER III

METHODOLOGY

Applying the Health Belief Model (HBM) and the Theory of Planned Behavior (TPB), this chapter first revisits the research questions, the hypothesized model and constructs, and the relationships among constructs. The subsequent sections discuss the methodology and data analyses employed to answer the research questions and to test the hypotheses that this study proposed, which focused on predicting and understanding customers' healthy eating behavior and patronizing behavior in restaurants.

Research Questions

As presented in the chapter 1, the research questions of this study are listed below:

1. Can the HBM be applied to predict customers' healthy eating behavior in restaurants?

2. Can the TPB be applied to predict customers' healthy eating behavior in restaurants?

3. To what extent does each construct from the HBM and TPB influence customers' healthy eating behavior in restaurants?

4. What is the relationship between customers' nutrition knowledge (subjective and objective) and attitude toward provision of nutrition information or intention to use this information when selecting menu items in restaurants?

5. What is the relationship between customers' healthy eating behavior in restaurants

49

and willingness to patronize a restaurant that provides healthy menu items?

6. Does disclosure of nutrition information influence customers' healthy eating behavior in restaurants and play a role as a "cue to action" from the HBM?

7. What is the relationship between socio-demographic factors and customers' healthy eating behavior in restaurants?

8. What is the relationship between socio-demographic factors and customers' willingness to patronize a restaurant that provides healthy menu items?

Research Hypotheses and Proposed Model

This study attempts to utilize the HBM and TPB in order to predict and understand customers' healthy eating behavior and patronizing behavior in restaurant. The hypotheses are listed below:

H_1: Perceived benefits will positively influence customers' healthy eating behavior in restaurants.

H_2: Perceived barriers will negatively influence customers' healthy eating behavior in restaurants.

H_3: Perceived self-efficacy will positively influence customers' healthy eating behavior in restaurants.

H_4: Perceived threat (the combination of perceived susceptibility and severity of diseases) will positively influence customers' healthy eating behavior in restaurants.

H_5: Response to Provision of nutrition information (a cue to action) will positively influence customers' healthy eating behavior in restaurants.

H_6: There is a positive relationship between nutrition knowledge and using the nutrition information available in (or provided by) a restaurant (a cue to action).

H_{6-1}: There is a positive relationship between customers' subjective nutrition knowledge and using the nutrition information available in (or provided by) a restaurant (a cue to action).

H_{6-2}: There is a positive relationship between customers' objective nutrition knowledge and using the nutrition information available in (or provided by) a restaurant (a cue to action).

H_7: Attitude toward healthy eating behavior will positively influence customers' intention to engage in healthy eating behavior in restaurants.

H_8: Subjective norms will positively influence customers' intention to engage in healthy eating behavior in restaurants.

H_9: Perceived behavioral control will positively influence customers' intention to

engage in healthy eating behavior in restaurants.

H_{10}: Intention to engage in healthy eating behavior will positively influence customers' healthy eating behavior in restaurants.

H_{11}: Customers' healthy eating behavior in restaurants will positively influence their willingness to patronize a restaurant that provides healthy menu items.

H_{12}: Customers' socio-demographic characteristics will influence their healthy eating behavior in restaurants.

H_{13}: Customers' socio-demographic characteristics will influence their willingness to patronize a restaurant that provides healthy menu items.

Figure 3-1 revisits the model and the proposed relationships.

Figure 3-1: Proposed Model of this Study
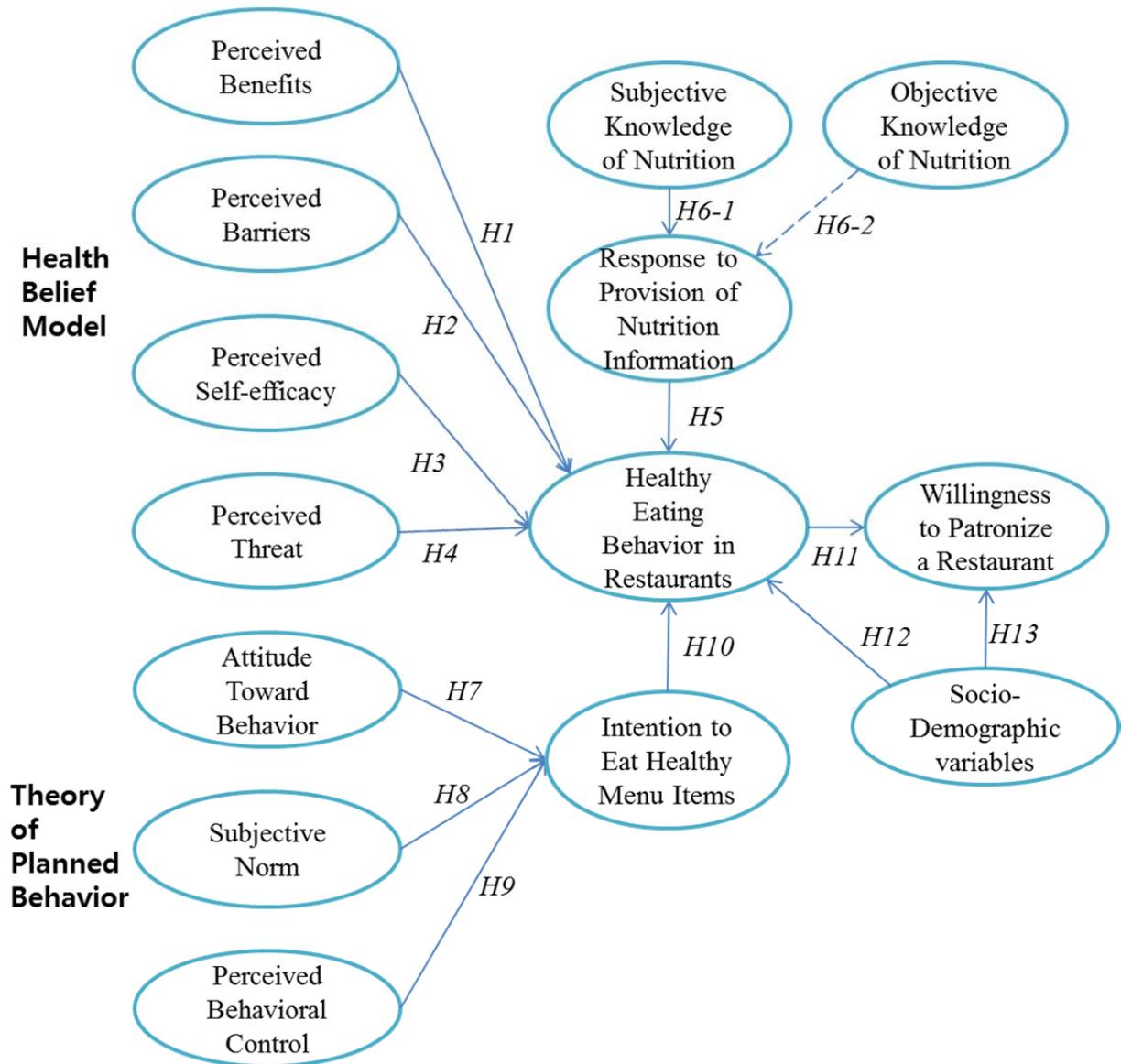
Instrumentation

The questionnaire used in this study consists of the following six major sections: (a) the constructs from the HBM; (b) the constructs from the TPB; (c) respondents' nutrition

knowledge and response to provision of nutrition information (a cue to action); (d) healthy

eating behavior; (e) willingness to patronize a restaurant that provides healthy menu choices;

and (f) respondents' socio-demographic information including gender, age, marital status,

education, occupational status, income, and height/weight (for calculating the BMI levels).

All items are from previous studies and modified in order to fit to the restaurant setting. Most

previously used scales are about individuals' general healthy eating behavior and some items

are not related to a restaurants setting. Therefore, some scales were selectively adapted from

multiple studies.

Perceived Benefits

Respondents' perceived benefits were measured using six items, which are adapted

from previous studies (Contento & Murphy, 1990; Deshpande et al., 2009; Vassallo et al.,

2009). A seven-point Likert scale (1 = strongly disagree; 7 = strongly agree) was used for

each of the items listed below:

1. I feel I am doing something good for my body when I eat healthy menu items in
   restaurants. (Contento & Murphy, 1990)
2. I feel my quality of life would be better if I make healthy food choices in restaurants.
   (Vassallo et al., 2009)
3. I feel I can save medical expenses if I make healthy food choices in restaurants.
   (Deshpande et al., 2009)
4. I feel I can improve my family life if I make healthy food choices in restaurants.
   (Deshpande et al., 2009)

54

5. I feel it will be beneficial to my career if I make healthy food choices in restaurants. (Deshpande et al., 2009)

6. I feel my social relationships will be better if I make healthy food choices in restaurants. (Deshpande et al., 2009)

Perceived Barriers

Perceived barriers was measured using seven items adapted from previous studies (Deshpande et al., 2009; Petrovici & Ritson, 2006; S.G. Sapp & Jensen, 2006). A seven-point Likert scale (1 = strongly disagree; 7 = strongly agree) was used for each of the items listed below:

1. It is hard to give up to the food I enjoy. (Petrovici & Ritson, 2006)

2. I think healthy menu items in restaurants are too expensive compared to other menu items. (Petrovici & Ritson, 2006)

3. Healthy menu items are not available in most restaurants. (Petrovici & Ritson, 2006)

4. I do not like the taste of most foods that are high in nutrition. (Deshpande et al., 2009)

5. Because of lack of my knowledge about healthy eating, it is hard to select healthy menu items in restaurants. (Petrovici & Ritson, 2006)

6. Because of lack of information about menu items in restaurants, it is hard to select healthy menu items. (Petrovici & Ritson, 2006)

7. Even though there are numerous recommendations about healthy ways to eat, it is hard to know what to believe. (Sapp & Jensen, 2006)

Perceived Self-efficacy

Respondents' perceived self-efficacy was measured by three items derived from two previous studies (Contento & Murphy, 1990; Deshpande et al., 2009). A seven-point Likert scale (1 = strongly disagree; 7 = strongly agree) was used for each of the items listed below:

1. If I try, I am confident that I can maintain a diet high in nutrition. (Deshpande et al., 2009)

2. If I want to, I feel that I would be able to follow a diet high in nutrition. (Deshpande et al., 2009)

3. Realistically speaking, I am confident that if I want to, I can reduce the amount of unhealthy restaurant menu items I consume. (Contento & Murphy, 1990)

Perceived Threat

Respondents' perceived threat was measured using seven items derived from two previous studies (Deshpande et al., 2009; Vassallo et al., 2009). A seven-point Likert scale (1 = strongly disagree; 7 = strongly agree) was used in the questionnaire and for each of the items listed below:

1. I feel my chances of getting serious health problems in the future are high if I eat unhealthy menu items in restaurants. (Deshpande et al., 2009)

2. If I get a disease/illness because of unhealthy eating habits, it will have a severe negative influence on my quality of life. (Vassallo et al., 2009)

3. I will have long-lasting negative effects if I do not make healthy food choices in restaurants. (Deshpande et al., 2009)

4. I will have medical expenses if I do not make healthy food choices in restaurants. (Deshpande et al., 2009)

5. I will hurt my family life if I do not make healthy food choices in restaurants. (Deshpande et al., 2009)

6. I will harm my career if I do not make healthy food choices in restaurants. (Deshpande et al., 2009)

7. My social relationships will suffer if I do not make healthy food choices in restaurants. (Deshpande et al., 2009)

Attitude toward Healthy Eating Behavior

Respondents' attitudes towards eating a healthy meal was measured by eight seven-point semantic differential scales in response to the following statement *"Overall, I think that eating healthy menu items in restaurants is..."* which is derived from two previous studies (Povey et al., 2000). The scales were from *"enjoyable" to "unenjoyable", "good" to "bad", "foolish" to "wise", "harmful" to "beneficial", "pleasant" to "unpleasant", "desirable" to "undesirable", "important" to "unimportant", and "favorable" to "unfavorable"*. Each scale was scored -3 to +3.

Subjective Norm

Subjective norm was measured by three items using a seven-point Likert scale for

each (1 = strongly disagree; 7 = strongly agree), which are derived from previous studies (Han, Hsu, & Sheu, 2010; Povey et al., 2000). Each item is listed below:

1. Most people who are important to me think I should choose healthy menu items in restaurants. (Povey et al., 2000)

2. Most people I know well think eating healthy menu items in restaurants is a good idea. (Povey et al., 2000)

3. People whose opinions I value would prefer that I choose healthy menu items in restaurants. (Han, Hsu, & Sheu, 2010)

Perceived Behavioral Control

Perceived behavioral control was measured by six questions using a seven-point Likert scale for each, which is derived from previous studies (Povey et al., 2000; X. Sun et al., 2006). The items are listed below:

1. How easy or difficult do you think it is to select healthy menu items in restaurants? (extremely difficult to extremely easy) (Povey et al., 2000)

2. How confident are you that you could eat a healthy diet in restaurants if you wanted to? (not at all confident to extremely confident) (Povey et al., 2000)

3. How much control do you feel you would have over eating a healthy diet in restaurants? (no control to complete control) (Povey et al., 2000)

4. To what extent is it up to you whether or not you eat a healthy diet in restaurants? (not at all to an great extent) (Povey et al., 2000)

58

5. It is my responsibility to decide whether or not to eat healthy menu items in restaurants (strongly disagree to strongly agree). (Sun et al., 2006)

6. Considering the price and the availability, I feel that it is up to me whether or not to eat healthy menu items in restaurants (strongly disagree to strongly agree). (Sun et al., 2006)

Response to Provision of Nutrition information (Cue to Action)

With the use of a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree), participants' response to the following six statements measured their response to provision of nutrition information as a cue to action. Since there is no study using nutrition information as a cue to action from the HBM, this study developed new items below:

1. I would pay more attention to my food choices if restaurants provided nutrition information on the menu or menu board.

2. I would use nutrition information on the menu or menu board when I select menu items in restaurants if it was provided.

3. Nutrition information would be useful when I select menu items in restaurants.

4. I would choose healthier food in restaurants if I had nutrition information.

5. I have used nutrition information for selecting menu items when restaurants provided nutrition information.

6. I have noticed that some restaurants currently provide nutrition information.

Knowledge of Nutrition

In order to measure respondents' nutrition knowledge, this study used the objective and subjective knowledge of nutrition as one latent construct because it is useful to measure both a self-reported and objective measure of the same latent construct (Palmer et al., 2002).

Subjective Knowledge of Nutrition

Respondents were given three statements to respond to using a seven-point Likert scale for each, which is adapted from previous studies (Brucks, 1985; Moorman et al., 2004). The responses measured respondents' subjective nutrition knowledge. Items are listed below:

1. Rate your knowledge of nutrition information compared to the average consumer (much less to much more).
2. Rate your confidence in using nutrition information for food choices compared to the average consumer (much less and much more).
3. I feel confident about my ability to comprehend nutrition information on product labels (strongly disagree to strongly agree).

Objective Knowledge of Nutrition

The eleven dichotomous true/false items listed below derived from the works of Petrovici and Ritson (2006), and measured the objective knowledge of nutrition. Items were randomly mixed in order to reduce the likelihood of respondents simply guessing the right answer. Axelson and Brinberg (1992) argued that the objective knowledge of nutrition must

include an assumption that items must cover all types of nutrition knowledge such as awareness of diet and disease relationships (item #4 and 5), knowledge of principles of nutrition (item # 7 and 8), and knowledge of food nutrient density (item # 1, 2, 3, 6, and 9).

1. Whole milk is a better source of calcium than skim milk. (False)

2. Removing the skin from chicken reduces the fat content. (True)

3. Eating more bread helps to increase protein in the diet. (False)

4. Any type of fat may damage a person's health. (False)

5. A high intake of salt may increase blood pressure. (True)

6. Butter contains more cholesterol than margarine. (True)

7. The daily calorie intake should not exceed in general 3200. (True)

8. No more than a third of calories should come from fat. (True)

9. White bread is more nutritious than whole wheat bread. (False)

10. Soya beans are a good source of protein. (True)

11. Cholesterol is found only in foods containing fat or oil. (False)

Intention to Engage in Healthy Eating Behavior in Casual Dining Restaurants

Three statements were provided to respondents in order to measure their intention to engage in healthy eating behavior in casual dining restaurants, using a seven-point Likert scale. These scales are adapted from a previous study (Han et al., 2010). The list of items is below:

1. I am willing to select healthy menu items in casual dining restaurants.

2. I plan to select healthy menu items when I go to casual dining restaurants.

3. I will make an effort to select healthy menu items in casual dining restaurants.

Healthy Eating Behavior in Restaurants

The eleven items below measured respondents' healthy eating behavior in casual dining restaurants using a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree). All items are adapted from previous studies (Lee & McCleary, 2012; Petrovici & Ritson, 2006).

1. I try to eat menu items with fresh ingredients in casual dining restaurants. (Lee & McCleary, 2012)

2. I try to eat menu items rich in fiber in casual dining restaurants. (Petrovici & Ritson, 2006)

3. I often choose menu items with low animal fat content in casual dining restaurants. (Petrovici & Ritson, 2006)

4. I try to eat menu items with low or no salt in casual dining restaurants. (Lee & McCleary, 2012)

5. I try to eat menu items with low cholesterol in casual dining restaurants. (Lee & McCleary, 2012)

6. I try to eat menu items with low calories in casual dining restaurants. (Lee & McCleary, 2012)

7. I try to avoid stimulants (coffee, cola) in casual dining restaurants. (Petrovici & Ritson, 2006)

8. I try to have a balanced diet in casual dining restaurants. (Petrovici & Ritson, 2006)

9. I do not eat some menu items in casual dining restaurants because they make me fat. (Petrovici & Ritson, 2006)

10. I do not care about selecting healthy menu items in casual dining restaurants. (Petrovici & Ritson, 2006)

11. I try to eat at least one fruit or vegetable when I eat at casual dining restaurants (new item)

Willingness to Patronize a Restaurant

Respondents' willingness to patronize a restaurant that provides healthy menu choices was measured by six items that are adapted from studies by Morais and Lin (2010). The six items used are listed below:

1. I am willing to frequently visit restaurants that provide healthy menu choices.

2. The likelihood of visiting restaurants that provide healthy menu choices is high.

3. When I dine out next time, I will visit a restaurant that provides healthy menu choices.

4. I am willing to recommend restaurants that offer healthy menu items, to people who seek advice

5. I will say positive things to other people about restaurants that offer healthy menu items.

6. I will recommend to my family and friends restaurants that offer healthy menu items

Procedures

The questionnaire was developed based on previous studies related to customers'
healthy eating behavior. A pilot study was subsequently conducted to detect and modify
potential problems in questionnaire design, clarity, and wording. To protect the rights of and
ensuring the safety of human subjects involved in this study, the instrument was reviewed by
the Institutional Review Board (IRB) at Virginia Tech before being distributed to respondents.
An online survey was used to collect data.

Pilot Study

Prior to distributing the questionnaire, a pilot study was conducted using graduate
students and faculty members in the Department of Hospitality and Tourism Management at
Virginia Tech. The pilot study was helpful for getting input regarding features such as
questionnaire design, wording, and comprehension of the listed items.

After adjustments of the questionnaire based on the results, the questionnaire was
distributed to 55 respondents by a commercial marketing company, using an online survey.
Exploratory factor analysis and a frequency test were conducted with collected data. Based
on the results, items were refined.

Sampling

The population of this study is restaurants' customers in the United States. This study
especially focuses on customers in casual dining restaurants. Even though there is no study

about how customers' healthy eating behavior is different based on restaurant categories, this study assumes that the relationship among the constructs in the proposed model varies depending on restaurant categories. For example, customers' healthy eating behavior may be more likely to be strong in fast food restaurants compared to other types of restaurants because it is more closely related to daily life than other restaurant categories. On the other hand, healthy eating behavior in fine dining restaurants may be weak since it is a more hedonic experience. This means that customers who visit upscale restaurants may not consider their healthy eating or nutritional values of menu items because visiting those types of restaurants may only be once a month or even once a year. Moreover, nutrition information for menu items in fast food restaurants is easily accessible online or through consumer reports, compared to other types of restaurants. Consequently, this study tested the model with customers in casual dining restaurants.

With the help of an online survey company, data was collected using convenience sampling. The online survey company retains a national database and has developed several panels based on demographic, lifestyle, occupation, and geography.

Data Collection

The data was collected using an online survey questionnaire distributed by the market research company. A Web address for the questionnaire was distributed to the panel members via email. The potential participants were guided to the introduction of the online questionnaire by clicking on the link presented in the email. The following screening question appeared at the start of the questionnaire: "Do you visit a casual dining restaurant at least once a month?" Also, what a casual dining restaurant is was explained. If a participant

answered "No," then he/she was forced to exit. The questionnaire Web link was closed when more than 400 complete questionnaires, excluding screened out respondents, were collected.

Data Analysis

The Statistical Package for the Social Sciences (SPSS) and Linear Structural Relationship (LISREL) programs were used to describe and analyze data for this study. Structural Equation Modeling (SEM) analysis was conducted to test the proposed model and hypotheses. Several multivariate analyses such as Analysis of Variance (ANOVA), t-test, and chi-square test were also employed in order to identify respondents' profiles regarding healthy eating behavior and patronizing intention.

Before testing hypotheses, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis were conducted in order to verify unidimensionality, validity, and reliability of constructs as well as model fit. To examine hypotheses 1 through 11, SEM was employed. For profiling respondents' socio-demographic characteristics (hypotheses 12 and 13), Pearson's correlation coefficient analysis, independent sample t-test and ANOVA were used.

Chapter IV

RESULTS

This chapter describes the results of the survey discussed in Chapter 3. The first section presents the results of the pilot study conducted with 55 responses. Exploratory factor analyses (EFA) were conducted and Cronbach's Alpha values were checked to see if the constructs had reliability. Based on the results of the pilot study, the items used to measure each construct were modified. The second section addresses the results of the main survey with 419 respondents.

First, EFA results with the pilot study sample that were used to finalize the questionnaire are presented. Next, with the main study sample, the results of descriptive analysis for socio-demographic characteristics of respondents are provided. The results of Confirmatory Factor Analysis (CFA) with loading score of all items are addressed in order to examines constructs' reliability and discriminate validity of the constructs. To investigate hypothesized paths, the results of Structural Equation Modeling (SEM) are illustrated. Finally, this study presents information of respondents' socio-demographic profiles regarding healthy eating behavior and willingness to patronize a restaurant that provides healthy menu choices.

Results of Pilot Study

The first version of the questionnaires was distributed to the four dissertation committee members and ten graduate students in the Department of Hospitality and Tourism Management at Virginia Tech to ensure the face validity of each construct in this study. This

is the process used to test that the measurement provides adequate coverage of the research purpose of the study (Blumberg, Cooper, & Schindler, 2008). Suggestions regarding features such as questionnaire design, wording, and comprehension of the listed items were incorporated into a revised questionnaire.

Modified questionnaires were distributed online to a survey panel of the commercial marketing company (SurveyMonkey) in February 5, 2013. With the screening question (*In the last six months, have you eaten at a casual dining restaurant at least two times?*), a total of 55 usable responses were collected. The company provided the results in an Excel file which were analyzed using the Statistical Package for the Social Sciences (SPSS) form.

Cronbach's Alpha reliability tests were conducted to examine inter-item reliability of twelve constructs: 1) perceived benefits, 2) perceived barriers, 3) perceived threat, 4) perceived self-efficacy, 5) attitude toward healthy eating behavior, 6) subjective norm, 7) perceived behavioral control, 8) Response to provision of nutrition information (cue to action), 9) subjective nutrition knowledge, 10) intention to eat healthy menu item, 11) healthy eating behavior in restaurants, and 12) willingness to patronize a restaurant. The reliability tests results revealed strong inter-item reliability scores ranging from .893 to .968.

Exploratory Factor analyses (EFA) were conducted to explore the interrelationships among variables and to offer an explanation about factors. Hair, Black, Babin, and Anderson (2008) stated that "factor analysis can be utilized to examine the underlying patterns or relationships for a large number of variables and to determine whether the information can be condensed or summarized in a smaller set of factors or components" (p. 91). In this study EFA was undertaken in order to detect the underlying factors of the 12 constructs.

Table 4.1 shows the results of EFA for the perceived benefits construct.

Table 4.1 Exploratory Factor Analysis for Perceived Benefits

Statement (N=55)	Factor Loading	Eigen-value	Explained variance by factors (%)
Perceived Benefits (α=.925)		4.500	74.99
I feel I can improve my family life if I make healthy food choices in restaurants	.910		
I feel I can decrease medical expenses if I make healthy food choices in restaurants	.895		
I feel my quality of life will be better if I make healthy food choices in restaurants	.892		
I feel my social relationships will be better if I make healthy food choices in restaurants	.855		
I feel it will be beneficial to my career if I make healthy food choices in restaurants	.843		
I feel I am doing something good for my body when I eat healthy menu items in restaurants	.796		
KMO=.854			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

As shown on Table 4.1, only one factor was extracted, which confirms the unidimensionality of the construct. Principal component factor analysis with Varimax rotation was used. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for six items was .925. Also, the eigenvalue of the factor was well above one at 4.50 and the single factor accounted for approximately 75% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .854, and Bartlett's test was significant at the .000 level. Thus, all items were kept for the main data collection.

Table 4.2 provides the result of EFA for the perceived barriers construct.

Table 4.2 Exploratory Factor Analysis for Perceived Barriers

Statement (N=55)	Factor Loading	Eigen-value	Explained variance by factors (%)
Perceived Barriers (α=.893)		4.604	57.55
I do not like the taste of most foods that are healthy	.883		
I do not know enough about healthy eating to select healthy menu items in restaurants.	.828		
Even though there are numerous recommendations about healthy ways to eat, it is hard to know what to believe	.782		
My friends do not eat healthy menu items in restaurants and I do not want to be different	.776		
Healthy menu items are not available in most restaurants	.708		
I think healthy menu items in restaurants are too expensive compared to other menu items	.704		
Because of lack of information about menu items in restaurants, it is hard to select healthy menu items	.690		
It is hard to give up to the food I enjoy	.673		
KMO=.893			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

Using the principal component factor analysis with Varimax rotation, one factor was extracted, which also confirms the unidimensionality of the construct. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for eight items was .893. Also, the eigenvalue of the factor was well above one at 4.60 and the single factor accounted for approximately 58% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .893, and Bartlett's test was significant at the .000 level.

Table 4.3 shows the results of EFA for the perceived self-efficacy construct.

Table 4.3 Exploratory Factor Analysis for Perceived Self-efficacy

Statement (N=55)	Factor Loading	Eigen -value	Explained variance by factors (%)
Perceived Self-efficacy (α=.926)		3.281	82.03
Realistically speaking, I am confident that if I want to, I can increase the amount of healthy restaurant menu items I consume	.914		
If I try, I am sure that I can maintain a diet high in nutrition	.911		
If I want to, I feel that I would be able to follow a diet high in nutrition	.902		
I feel I have the ability to select healthy foods in restaurants	.896		
KMO=.763			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

One factor was extracted, showing the unidimensionality of the construct. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for four items was .926. The eigenvalue of the factor was well above one at 3.281 and the single factor accounted for approximately 82% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .763, and Bartlett's test was significant at the .000 level.

Table 4.4 provides the results of EFA for the perceived threat construct.

Table 4.4 Exploratory Factor Analysis for Perceived Threat

Statement (N=55)	Factor Loading	Eigen-value	Explained variance by factors (%)
Perceived Threat (α=.961)		5.698	81.40
I will have higher medical expenses if I do not make healthy food choices in restaurants	.947		
I will hurt my family life if I do not make healthy food choices in restaurants	.946		
I will harm my career if I do not make healthy food choices in restaurants	.929		
My social relationships will suffer if I do not make healthy food choices in restaurants	.919		
I feel my chances of having serious health problems in the future are high if I eat unhealthy menu items in restaurants	.906		
I will have long-lasting negative effects if I do not make healthy food choices in restaurants	.894		
If I get a disease/illness because of unhealthy eating habits, it will have a severe negative influence on my quality of life	.760		
KMO=.893			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

The results show that one factor was extracted, which also confirms the unidimensionality of the construct. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for seven items was .961. Also, the eigenvalue of the factor was well above one at 5.698 and the single factor accounted for approximately 81% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .893, and Bartlett's test was significant at the .000 level.

Table 4.5 shows the results of EFA for the attitude toward healthy eating behavior construct.

Table 4.5 Exploratory Factor Analysis for Attitude toward Healthy Eating Behavior

Statement (N=55)	Factor Loading	Eigen-value	Explained variance by factors (%)
Attitude toward Healthy Eating Behavior (α=.953)		4.882	81.37
Desirable to Undesirable	.971		
Pleasant to Unpleasant	.961		
Favorable Unfavorable	.914		
Enjoyable to Unenjoyable	.875		
Important to Unimportant	.870		
Good to Bad	.810		
KMO=.872			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

The first EFA extracted two factors. Two items (*wise to foolish and beneficial to harmful*) were grouped into the second factor. This may be because those two items have too negative meanings compared to other items. Povey' study (2000), where the scale originally came from, also stated that these two items were excluded in the final scale because they were heavily skewed in the positive direction due to the negative meanings of the questions. Therefore, the current study also deleted those two items in the main data collection.

The second EFA was conducted with the remaining six items. Using principal component factor analysis with Varimax rotation, one factor was extracted, which also confirms the unidimensionality of the construct. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for the six items was .953. Also, the eigenvalue of the factor was well above one at 4.88 and the single factor accounted for approximately 81% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .872, and Bartlett's test was significant at the .000 level.

Table 4.6 shows the results of EFA for the perceived behavioral control construct.

Table 4.6 Exploratory Factor Analysis for Perceived Behavioral Control

Statement (N=55)	Factor Loading	Eigen-value	Explained variance by factors (%)
Perceived Behavioral Control (α=.896)		3.093	77.32
How much control do you feel you would have over eating a healthy diet in restaurants?	.929		
How confident are you that you could eat a healthy diet in restaurants if you wanted to?	.914		
How easy or difficult do you think it is to select healthy menu items in restaurants?	.861		
To what extent is it up to you whether or not you eat a healthy diet in restaurants?	.808		
KMO=.784			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

The initial EFA extracted two factors. Two items (*"It is my responsibility to decide whether or not to eat healthy menu items in restaurants"* and *"Considering the price and the availability, I feel that it is up to me whether or not to eat healthy menu items in restaurants"*) were loaded in the second factor and the remaining items loaded in the first factor. This result could be because those two items were from one study (X. Sun et al., 2006) and the other items were from the Povey et al. (2000) study. Therefore, in order to obtain unidimensionality, those two items were excluded.

A second EFA then extracted only one factor, which shows the unidimensionality of the construct. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for four items was .896. Also, the eigenvalue of the factor was well above one at 3.09 and the single factor accounted for approximately 77% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .784, and Bartlett's test was significant at the .000 level.

Table 4.7 provides the results of EFA for the subjective norm construct.

Table 4.7 Exploratory Factor Analysis for Subjective Norm

Statement (N=54)	Factor Loading	Eigen-value	Explained variance by factors (%)
Subjective Norm (α=.905)		2.577	85.89
People whose opinions I value would prefer that I choose healthy menu items in restaurants	.954		
Most people I know will think eating healthy menu items in restaurants is a good idea	.939		
Most people who are important to me think I should choose healthy menu items in restaurants	.886		
KMO=.719			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

EFA extracted one factor, which confirms the unidimensionality of the construct. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for three items was .905. Also, the eigenvalue of the factor was well above one at 2.58 and the single factor accounted for approximately 86% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .719, and Bartlett's test was significant at the .000 level.

Table 4.8 shows the results of EFA for the response to provision of nutrition information construct.

Table 4.8 Exploratory Factor Analysis for Response to Provision of Nutrition

Information

Statement (N=55)	Factor Loading	Eigen-value	Explained variance by factors (%)
<u>Response to Provision of Nutrition Information (α=.951)</u>		4.844	80.73
I would choose healthier food in restaurants if I had nutrition information	.968		
I would use nutrition information on the menu or menu board when I select menu items in restaurants if it was provided	.961		
Nutrition information would be useful when I select menu items in restaurants	.957		
I would pay more attention to my food choices if restaurants provided nutrition information on the menu or menu board	.945		
I have used nutrition information for selecting menu items when restaurants provided nutrition information.	.941		
I have noticed that some restaurants currently provide nutrition information	.538		
KMO=.875			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

Again, one factor was extracted, confirming the unidimensionality of the construct. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for six items was .951. Also, the eigenvalue of the factor was well above one at 4.84 and the single factor accounted for approximately 81% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .875, and Bartlett's test was significant at the .000 level.

Table 4.9 provides the results of EFA for the construct of the subjective knowledge of nutrition.

Table 4.9 Exploratory Factor Analysis for Subjective Knowledge of Nutrition

Statement (N=54)	Factor Loading	Eigen -value	Explained variance by factors (%)
Subjective Knowledge of Nutrition (α=.927)		2.624	87.48
How would you rate your confidence in using nutrition information for food choices compared to the average consumer?	.952		
I feel confident about my ability to understand nutrition information on product labels	.938		
How would you rate your knowledge of nutrition information compared to the average consumer?	.915		
KMO=.747			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

EFA extracted only one factor, which indicates the unidimensionality of the construct. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for three items was .927. Also, the eigenvalue of the factor was well above one at 2.62 and the single factor accounted for approximately 87% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .747, and Bartlett's test was significant at the .000 level.

Table 4.10 shows the results of EFA for the customers' intention to eat healthy menu items in casual restaurants.

Table 4.10 Exploratory Factor Analysis for Intention to Eat Healthy Menu Items

Statement (N=54)	Factor Loading	Eigen-value	Explained variance by factors (%)
Intention to Eat Healthy Menu Items (α=.952)		2.751	91.69
I will make an effort to select healthy menu items in restaurants	.974		
I plan to select healthy menu items when I go to casual dining restaurants	.973		
I am willing to select healthy menu items in casual dining restaurants	.925		
KMO=.731			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

Using the principal component factor analysis with Varimax rotation, one factor was extracted, which also confirms the unidimensionality of the construct. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for three items was .952. Also, the eigenvalue of the factor was well above one at 2.75 and the single factor accounted for approximately 92% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .731, and Bartlett's test was significant at the .000 level.

Table 4.11 provides the results of EFA for the construct of healthy eating behavior in casual dining restaurants.

Table 4.11 Exploratory Factor Analysis for Healthy Eating Behavior

Statement (N=54)	Factor Loading	Eigen-value	Explained variance by factors (%)
Healthy Eating Behavior (α=.934)		6.489	64.89
I try to have a balanced diet in casual dining restaurants	.887		
I do not eat some menu items in casual dining restaurants because they make me fat	.886		
I try to eat menu items with low cholesterol in casual dining restaurants	.885		
I try to eat menu items with low or no salt in casual dining restaurants	.846		
I try to eat menu items rich in fiber in casual dining restaurants	.794		
I try to eat menu items with low calories in casual dining restaurants	.791		
I try to eat at least one fruit or vegetable when I eat at casual dining restaurants	.784		
I often choose menu items with low animal fat content in casual dining restaurants	.748		
I try to eat menu items with fresh ingredients in casual dining restaurants	.722		
I try to avoid stimulants (coffee, cola) in casual dining restaurants	.683		
KMO=.863			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

The initial EFA extracted two factor solutions. Ten items loaded in the first factor and one item (*I do not care about selecting healthy menu items in casual dining restaurants*) loaded in the second factor. This single item was not from the scale of a previous study but was added due to a suggestion from a participant in the preliminary development of the questionnaire. Thus, this item was excluded for the remaining analysis of this study.

With the remaining ten items, EFA extracted one factor, confirming the unidimensionality of the construct. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for the ten items was .934. Also, the eigenvalue of the factor was

well above one at 6.489 and the single factor accounted for approximately 65% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .863, and Bartlett's test was significant at the .000 level.

Table 4.12 shows the results of EFA for customers' willingness to patronize a restaurant that provides healthy menu choices.

Table 4.12 Exploratory Factor Analysis for Willingness to Patronize a Restaurant

Statement (N=54)	Factor Loading	Eigen-value	Explained variance by factors (%)
Willingness to Patronize a Restaurant (α=.968)		5.183	86.39
I will recommend to my family and friends restaurants that offer healthy menu items	.955		
I will say positive things to other people about restaurants that offer healthy menu items	.944		
I am willing to recommend restaurants that offer healthy menu items, to people who seek advice	.928		
When I dine out next time, I will visit a restaurant that provides healthy menu choices	.927		
I am likely to visit restaurants that provide healthy menu choices	.914		
I am willing to frequently visit restaurants that provide healthy menu choices	.908		
KMO=.901			
Bartlett's test of significance=.000			

Note: KMO = Kaiser-Meyer-Olkin.

Like most of the other constructs, one factor was extracted, which verifies the unidimensionality of the construct. All items exhibited high factor loadings (>.40) and Cronbach's Alpha value for eight items was .968. Also, the eigenvalue of the factor was well above one at 5.183 and the single factor accounted for approximately 86% of the total variance. The Kaiser-Meyer-Olkin (KMO) value was .901, and Bartlett's test was significant

at the .000 level.

Results of the Main Study

Based on the results of the pilot study, questionnaires were modified and distributed online to the survey panels of the same commercial marketing company on February 11, 2013. Among 3,084 people who were invited to complete the survey, 1,147 people had accessed the survey in three days. Five hundred eighty-one participants did not complete the survey and 147 participants were forced to exit from the screening out question (*In the last six months, have you eaten at a casual dining restaurant at least two times?*). Finally, a total of 419 completed questionnaires were collected in February 13, 2013, showing about 13.6% response rate.

Profile of Respondents

The survey participants' demographic information is summarized in Table 4.13.

Table 4.13 Profile of Survey Respondents

	Variable	Frequency	Percent (%)
Gender (N=414)	Male	214	51.7
	Female	200	48.3
Age (N=411) (Mean=50.8)	20 – 29	22	5.4
	30 – 39	89	21.7
	40 – 49	105	25.6
	50 – 59	71	17.2
	60 – 69	59	14.4
	70 – 79	53	12.9
	80 and Over	12	2.9
Marital Status (N=414)	Married	257	62.1
	Single	157	37.9
Geographical Location (N=414)	Rural Area	57	13.8
	Small Town	73	17.6
	City Suburb	239	57.7
	City Downtown	45	10.9
Education (N=414)	Less Than High School	4	1.0
	High School Diploma	51	12.3
	Some College	116	28.0
	Bachelor's Degree	139	33.6
	Graduate Degree	104	25.1
Occupational Status (N=414)	Working Full-Time	234	56.5
	Working Part-Time	42	10.1
	Student	5	1.2
	Not Working (retired or unemployed)	133	32.1
Annual Income (N=414)	Less than $25,000	47	11.4
	$25,000 to $49,999	100	24.2
	$50,000 to $74,999	85	20.5
	$75,000 to $99,999	72	17.4
	$100,000 to $124,999	43	10.4
	$125,000 to $149,999	21	5.1
	$150,000 or above	46	11.1
Race (N=418)	White	362	86.4
	Black or African-American	19	4.5
	Asian	24	5.7
	Native Hawaiian or other Pacific Islander	2	.5
	American Indian or Alaska Native	7	1.7
	Others	4	1.0
BMI Status (N=410)	Underweight	11	2.7
	Normal Weight	118	28.8
	Overweight	150	36.6
	Obesity	131	32.0

(continued)

Table 4.13 Profile of Survey Respondents (continued)

	Variable	Frequency	Percent (%)
	1	81	19.6
	2	161	38.9
Household Size	3	70	16.9
	4	55	13.3
	5 or above	47	11.4

Note: Total number of respondents varied due to missing values

The respondents consisted of 214 males (51.7%) and 200 females (48.3%). About 5 percent of the respondents (n=22) were between the ages of 20 and 29, 21.7 percent (n=89) were between the ages of 30 and 39, 25.6 percent (n=105) were between the ages of 40 and 49, 17.2 percent (n=71) were between the ages of 50 and 59, 14.4 percent (n=59) were between the ages of 60 and 69; and 12.9 percent (n=53) were between the ages of 70 and 79. Of the remaining respondents, 12 (2.9%) were over the age of 80. In terms of marital status, the majority of the respondents (62.1%, n=257) were married while 37.9 percent of the respondents (n=157) were single. More than half of the respondents (57.7%, n=239) lived in a city suburb, 17.6% (n=73) lived in a small town, 13.8% (n=57) lived in a rural area, and only 10.9% (n=45) lived in a city downtown. In regards to education level, the majority of subjects reported they had completed a bachelor's degree (33.6%, n=139), followed by some college (28.0%, n=116), graduate degree (25.1%, n=104), high school diploma (12.3%, n=51), and less than high school level (1.0%, n=4).

In terms of occupational status, the largest number of respondents was currently working full-time (56.5%, n=234), 32.1 percent (n=133) were not working, 10.1 percent (n=42) had a part-time job, and 1.2 percent (n=5) were students. Regarding annual income, the largest number of respondents (24.2%, n=100) made between $25,000 and $49,999 per year, 20.5 percent (n=85) made between $50,000 and $74,999, 17.4 percent (n=72) made between $75,000 and $99,999, 11.4 percent (n=47) made less than $25,000, 11.1 percent

(n=46) made more than \$150,000, 10.4 percent (n=43) made between \$100,000 and \$124,999, and 5.1 percent (n=21) made between \$125,000 and \$149,999. Regarding race, most respondents (86.4%, n=362) were white, followed by Asian (5.7%, n=24), Black or African-American (4.5%, n=19), American Indian or Alaska Native (1.7%, n=7), and Native Hawaiian or other Pacific Islander (.5%, n=2).

Based on BMI (Body Mass Index) scores calculated by respondents'' height and weight, obesity status was categorized. The equation of BMI is below:

$$\text{BMI} = \frac{weight\ (lb) \times 703}{height^2(in.)}$$

If a BMI score was less than 18.5, it was categorized as "Underweight". If a BMI score was between 18.5 and 24.9, it belonged to the category "Normal Weight". On the other hand, if a BMI score was 25 or above, it was categorized as "Overweight" (between BMI of 25 and 29.9) or "Obesity" (BMI of 30 or greater). About 37 percent of the respondents (n=150) were overweight, 32.0 percent (n=131) were obese, 28.8 percent (n=118) had normal weight, and only 2.7 percent (n=11) were underweight. This ratio for respondents classified as overweight and obese (68.6%) is similar to the study from CDC (2010) (about 67%). In terms of household size, the largest number of respondents (38.9%, n=161) was in 2-person households, 19.6% (n=81) lived alone, 16.9 percent (n=70) were in 3-person households, 13.3 percent (n=55) were in 4-person households, and 11.4 percent (n=47) lived in 5-person or above households.

Figure 4.1 shows respondents' geographical distribution by states. The largest number of respondents was from California (14% n=58), followed by Florida (9.2%, n=38),

Texas (7.2%, n=30), New York (5.8%, n=24), and Michigan (5.6%, n=23). There were no participants from Alabama, American Samoa, Delaware, Guam, North Dakota, Northern Marianas Islands, Puerto Rico, South Dakota, Vermont, and Virgin Islands. However, the result shows that the sample was well distributed based on states and represented nationwide population.

Figure 4.1 Respondents' Geographical Characteristics
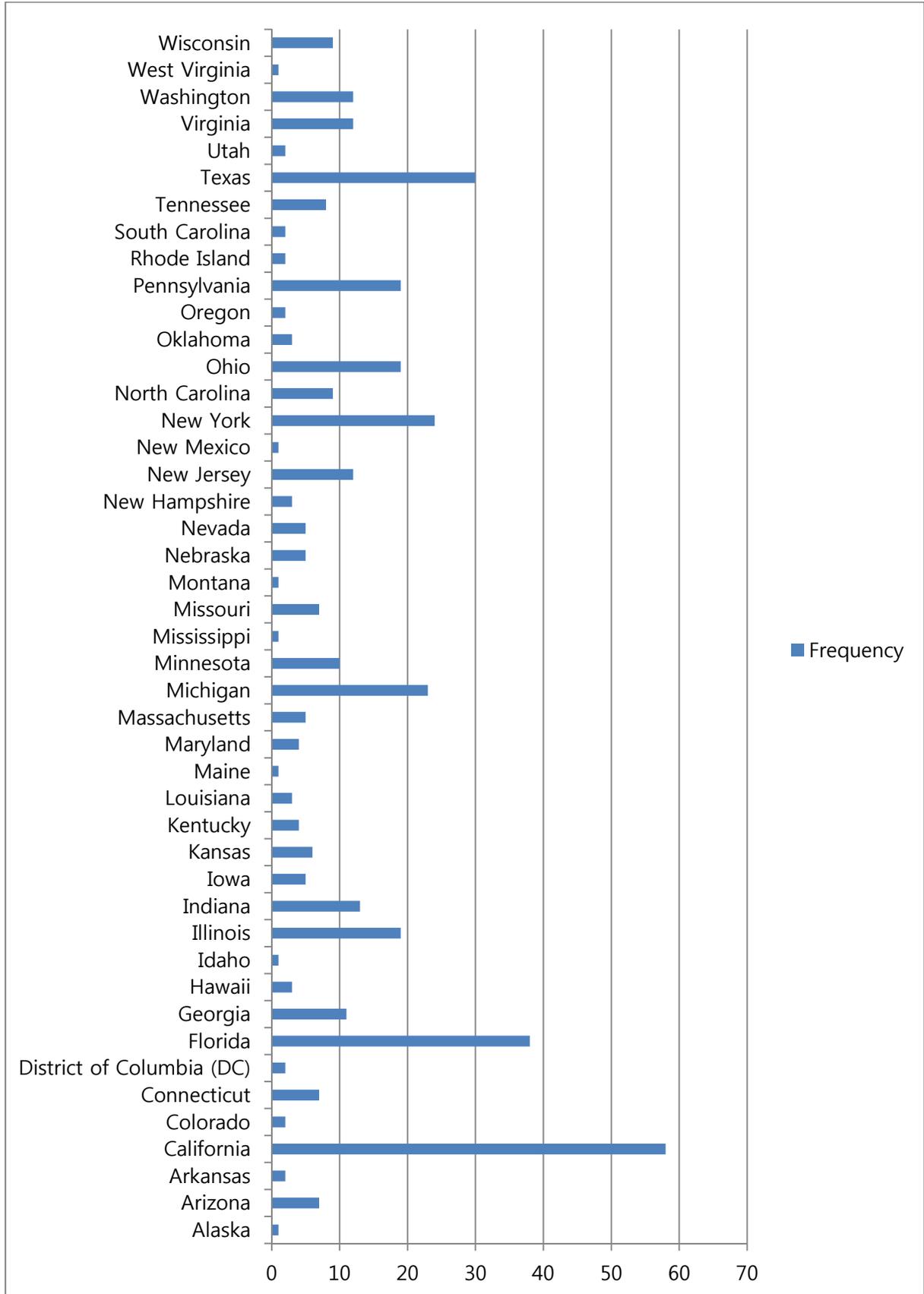
Testing the Model

In this section, the results of the first 11 hypothesis tests used to analyze significant relationship among constructs are reported. These 11 hypotheses were analyzed using Structural Equation Modeling (SEM) consisting of measurement model analysis and structural model analysis (Anderson & Gerbing, 1988). Maximum Likelihood (ML) was employed to estimate measurement model and structural model fits utilizing LISREL (version 8.80).

Pearson's Correlations for Measured Items

Pearson's correlation explores linear directional relationships between the variables and strengths of the relationships. A value close to the absolute value of one means greater strength (Pallant, 2010). Table 4.14 shows the results of mean values, Standard Deviations, and Pearson's correlation analysis of all items of the constructs.

Table 4.14 Means, Standard Deviations, and Correlations among Items

Constructs	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Benefits	4.83	1.23	1											
2. Barriers	4.08	1.15	.115[*]	1										
3. Self-efficacy	5.31	1.07	.483[**]	-.082	1									
4. Threat	4.37	1.29	.688[**]	.274[**]	.390[**]	1								
5. Reponse to Provision of Nutrition Information	4.85	1.37	.548[**]	.113[*]	.414[**]	.533[**]	1							
6. Subjective Knowledge of Nutrition	5.09	1.12	.346[**]	-.047	.600[**]	.301[**]	.408[**]	1						
7. Objective Knowledge of Nutrition	8.61	1.78	-.090	-.298[**]	.126[**]	-.077	.035	.034	1					
8. Attitude	5.16	1.12	.612[**]	-.165[**]	.428[**]	.456[**]	.553[**]	.355[**]	.058	1				
9. Subjective Norm	4.72	1.26	.566[**]	.031	.457[**]	.551[**]	.550[**]	.339[**]	.051	.562[**]	1			
10. Behavioral Control	4.85	1.17	.212[**]	-.335[**]	.550[**]	.093	.138[**]	.448[**]	.130[**]	.280[**]	.307[**]	1		
11. Intention to eat healthy menu items	5.05	1.33	.640[**]	-.055	.536[**]	.492[**]	.699[**]	.480[**]	.078	.756[**]	.590[**]	.260[**]	1	
12. Healthy Eating Behavior	4.67	1.18	.644[**]	.066	.513[**]	.570[**]	.702[**]	.518[**]	-.058	.667[**]	.601[**]	.230[**]	.824[**]	1
13. Willingness to Patronize	5.07	1.25	.653[**]	-.023	.543[**]	.518[**]	.689[**]	.485[**]	.024	.715[**]	.645[**]	.266[**]	.852[**]	.832[**]

*$p < .05$ **$p < .01$ (2-tailed)*

Overall Fit of the Measurement Model

Before investigating the relationships among constructs, the measurement model was tested using confirmatory factor analysis in order to validate the research constructs (Anderson & Gerbing, 1988). Considering measurement errors, the measurement model examines constructs' reliability and discriminate validity (Kline, 2010). Overall fit of the measurement model was evaluated by the chi-square statistic, by the degree of freedom ratio (χ^2/df) and fit indices including root mean square error of approximation (RMSEA), normed fit index (NFI), non-normed fit index (NNFI), incremental fit index (IFI), and comparative fit index (CFI) (L. Hu & Bentler, 1998). Cut-off values of .08 (or lower) for RMSEA and .95 (or higher) for NFI, NNFI, IFI, CFI indicate goodness of fits of the model (L. Hu & Bentler, 1999).

The measurement model of this study confirmed good fit to the data. A chi-square statistic by the degrees of freedom ratio less than 3.0 suggests a good fit model, even though there is no clear cut-off value (Kline, 2010). For the measurement model in this study, χ^2/degrees of freedom ratio was 2.7 (χ^2 = 5528.18, df = 2055), showing a fairly good model fit. Moreover, fit indices of the measurement model were acceptable (RMSEA = .076; NFI = .96; NNFI = .98; IFI = .98; CFI = .98). The covariance matrix among items is displayed in Appendix D.

Table 4.15 shows the result of confirmatory factor analysis with factor loadings of all items. The t-values indicate that all measurement items were significantly loaded and most standardized loadings were marginally acceptable (>.40). However, loading value for one item (*It is hard to give up to the food I enjoy*) onto the perceived barrier construct (loading value=.38) is lower than .40.

89

Table 4.15 Results of Confirmatory Factor Analysis

Statement (N=419)	Standardized Loadings	t-value	Error
Perceived Benefits (α=.918)			
I feel I am doing something good for my body when I eat healthy menu items in restaurants	.68	--	--
I feel my quality of life will be better if I make healthy food choices in restaurants	.76	21.98	.05
I feel I can decrease medical expenses if I make healthy food choices in restaurants	.83	15.63	.08
I feel I can improve my family life if I make healthy food choices in restaurants	.88	16.30	.09
I feel it will be beneficial to my career if I make healthy food choices in restaurants	.84	15.95	.10
I feel my social relationships will be better if I make healthy food choices in restaurants	.83	15.42	.10
Perceived Barriers (α=.863)			
It is hard to give up to the food I enjoy	.38	--	--
I think healthy menu items in restaurants are too expensive compared to other menu items	.55	6.72	.25
Healthy menu items are not available in most restaurants	.62	7.01	.26
I do not like the taste of most foods that are healthy	.63	7.07	.29
I do not know enough about healthy eating to select healthy menu items in restaurants.	.81	7.57	.35
Because of lack of information about menu items in restaurants, it is hard to select healthy menu items	.80	7.54	.34
Even though there are numerous recommendations about healthy ways to eat, it is hard to know what to believe	.73	7.38	.30
My friends do not eat healthy menu items in restaurants and I do not want to be different	.74	7.39	.34
Perceived Self-efficacy (α=.927)			
If I try, I am sure that I can maintain a diet high in nutrition	.83	--	--
If I want to, I feel that I would be able to follow a diet high in nutrition	.89	32.74	.03
Realistically speaking, I am confident that if I want to, I can increase the amount of healthy restaurant menu items I consume	.92	21.31	.05
I feel I have the ability to select healthy foods in restaurants	.79	17.26	.05

(continued)

Table 4.15 Results of Confirmatory Factor Analysis (continued)

Statement (N=419)	Standardized Loadings	t-value	Error
Perceived Threat (α=.934)			
I feel my chances of having serious health problems in the future are high if I eat unhealthy menu items in restaurants	.83	--	--
If I get a disease/illness because of unhealthy eating habits, it will have a severe negative influence on my quality of life	.66	14.92	.05
I will have long-lasting negative effects if I do not make healthy food choices in restaurants	.86	21.44	.05
I will have higher medical expenses if I do not make healthy food choices in restaurants	.90	23.11	.05
I will hurt my family life if I do not make healthy food choices in restaurants	.89	23.12	.05
I will harm my career if I do not make healthy food choices in restaurants	.78	19.35	.05
My social relationships will suffer if I do not make healthy food choices in restaurants	.76	18.38	.06
Response to Provision of Nutrition Information (α=.935)			
I would pay more attention to my food choices if restaurants provided nutrition information on the menu or menu board	.90	--	--
I would use nutrition information on the menu or menu board when I select menu items in restaurants if it was provided	.95	34.65	.03
Nutrition information would be useful when I select menu items in restaurants	.94	33.47	.03
I would choose healthier food in restaurants if I had nutrition information	.95	34.79	.03
I have used nutrition information for selecting menu items when restaurants provided nutrition information.	.83	24.29	.04
I have noticed that some restaurants currently provide nutrition information	.44	9.61	.04
Subjective Knowledge of Nutrition (α=.904)			
How would you rate your knowledge of nutrition information compared to the average consumer	.88	--	--
How would you rate your confidence in using nutrition information for food choices compared to the average consumer	.94	26.72	.04
I feel confident about my ability to understand nutrition information on product labels	.81	21.40	.04
Objective Knowledge of Nutrition (α=N/A)			
The number of right answers	.97	--	--

(continued)

Table 4.15 Results of Confirmatory Factor Analysis (continued)

Statement (N=419)	Standardized Loadings	t-value	Error
Attitude toward Healthy Eating Behavior (α=.945)			
Enjoyable to Unenjoyable	.79	--	--
Good to Bad	.83	19.16	.05
Pleasant to Unpleasant	.85	26.73	.04
Desirable to Undesirable	.87	20.47	.05
Important to Unimportant	.88	20.79	.05
Favorable Unfavorable	.91	22.08	.05
Subjective Norm (α=.911)			
Most people who are important to me think I should choose healthy menu items in restaurants	.87	--	--
Most people I know will think eating healthy menu items in restaurants is a good idea	.85	22.83	.04
People whose opinions I value would prefer that I choose healthy menu items in restaurants	.93	26.06	.04
Perceived Behavioral Control (α=.849)			
How easy or difficult do you think it is to select healthy menu items in restaurants?	.69	--	--
How confident are you that you could eat a healthy diet in restaurants if you wanted to?	.88	15.82	.08
How much control do you feel you would have over eating a healthy diet in restaurants?	.82	15.06	.07
To what extent is it up to you whether or not you eat a healthy diet in restaurants?	.68	12.71	.07
Intention to Eat Healthy Menu Items (α=.954)			
I am willing to select healthy menu items in casual dining restaurants	.89	--	--
I plan to select healthy menu items when I go to casual dining restaurants	.95	33.25	.03
I will make an effort to select healthy menu items in restaurants	.96	34.13	.03

(continued)

Table 4.15 Results of Confirmatory Factor Analysis (continued)

Statement (N=419)	Standardized Loadings	t-value	Error
Healthy Eating Behavior (α=.933)			
I try to eat menu items with fresh ingredients in casual dining restaurants	.73	--	--
I try to eat menu items rich in fiber in casual dining restaurants	.80	16.53	.07
I often choose menu items with low animal fat content in casual dining restaurants	.87	18.03	.08
I try to eat menu items with low or no salt in casual dining restaurants	.74	15.20	.09
I try to eat menu items with low cholesterol in casual dining restaurants	.89	18.55	.07
I try to eat menu items with low calories in casual dining restaurants	.87	18.03	.08
I try to avoid stimulants (coffee, cola) in casual dining restaurants	.60	12.28	.10
I try to have a balanced diet in casual dining restaurants	.83	17.19	.07
I do not eat some menu items in casual dining restaurants because they make me fat	.70	14.43	.09
I try to eat at least one fruit or vegetable when I eat at casual dining restaurants.	.71	14.64	.08
Willingness to Patronize a Restaurant (α=.965)			
I am willing to frequently visit restaurants that provide healthy menu choices	.82	--	--
I am likely to visit restaurants that provide healthy menu choices	.87	34.46	.03
When I dine out next time, I will visit a restaurant that provides healthy menu choices	.87	22.45	.05
I am willing to recommend restaurants that offer healthy menu items, to people who seek advice	.94	25.22	.05
I will say positive things to other people about restaurants that offer healthy menu items	.95	25.96	.05
I will recommend to my family and friends restaurants that offer healthy menu items	.96	26.37	.05

Note: Measures of model fit: $\chi^2(2,055) = 5,528.18$; Root Mean Square Error of Approximation (RMSEA) = .076; Normed Fit Index (NFI) = .96; Non-Normed Fit Index (NNFI) = .98; Incremental Fit Index (IFI) = .98; Comparative Fit Index (CFI) = .98.

Overall Fit of the Structural Equation Model

The proposed model with the relationships among the constructs was tested using the

Structural Equation Model (SEM). Maximum likelihood estimation analyses were conducted

with 13 constructs: 1) perceived benefits, 2) perceived barriers, 3) perceived self-efficacy, 4) perceived threat, 5) response to provision of nutrition information, 6) subjective knowledge of nutrition, 7) objective knowledge of nutrition, 8) attitude toward healthy eating behavior, 9) subjective norm, 10) perceived behavioral control, 11) intention to eat healthy menu items, 12) healthy eating behavior in casual dining restaurants, and 13) willingness to patronize a restaurant that provides healthy menu choices. The results of SEM showed a good fit to the model. Fit indices were $\chi^2 / df = 2.88$ ($\chi^2 = 6012.93$, $df = 2088$), RMSEA = .076; NFI = .96; NNFI = .97; IFI = .98; CFI = .97) which are all acceptable.

Hypotheses 1 to 11

With SEM, 11 hypothesized paths in the proposed model were tested. Table 4.16 summaries 11 hypotheses with paths among the constructs.

Table 4.16 Results of the Proposed Model for Hypothesis 1 to 11

Hypothesized Path	Standardized Coefficient	t-value	Hypotheses Testing
H_1 Perceived Benefits → Healthy Eating Behavior	.08	1.73	Not Supported
H_2 Perceived Barriers → Healthy Eating Behavior	.06	1.74	Not Supported
H_3 Perceived Self-efficacy → Healthy Eating Behavior	.09	2.60**	Supported
H_4 Perceived Threat → Healthy Eating Behavior	.12	2.53*	Supported
H_5 Response to Provision of Nutrition Information → Healthy Eating Behavior	.38	5.58**	Supported
H_{6-1} Subjective Nutrition Knowledge → Response to Provision of Nutrition Information	.17	7.64**	Partially Supported
H_{6-2} Objective Nutrition Knowledge → Response to Provision of Nutrition Information	.00	.05	Partially Supported
H_7 Attitude toward Behavior → Intention to Eat Healthy Menu Item	.64	12.40**	Supported
H_8 Subjective Norm → Intention to Eat Healthy Menu Item	.24	5.09**	Supported
H_9 Perceived Behavioral Control → Intention to Eat Healthy Menu Item	.01	0.37	Not Supported
H_{10} Intention to Eat Healthy Menu Item → Healthy Eating Behavior	.82	16.00**	Supported
H_{11} Healthy Eating Behavior → Willingness to Patronize a Restaurant	.81	12.79**	Supported

Note: *$p < .05$, **$p < .01$

As shown Table 4.16, customers' perceived benefits for eating healthy menu items in restaurants did not statistically influence their healthy eating behavior in casual dining restaurants ($\beta=0.08$, p>.05). Thus, *H_1 was not supported.*

The second hypothesis was to test a relationship between customers' perceived barriers and their healthy eating behavior in casual dining restaurants. However, SEM results showed that the relationship was not statistically significant ($\beta=0.06$, p>.05), which means *H_2 was not supported.*

Hypothesis three examined if perceived self-efficacy influences customers' healthy eating behavior. The result indicated that there was a significant relationship between

perceived self-efficacy and healthy eating behavior in casual dining restaurants (β=0.09, p<.01). Therefore, *H₃ was supported.*

Hypothesis four predicted that customers' perceived threat has a positive relationship with their healthy eating behavior in casual dining restaurants. The study found that perceived threat had a positive impact on healthy eating behavior (β=0.12, p<.05); thus, *H₄ was supported*

Hypothesis five investigated if providing nutrition information influences customers' healthy eating behavior in casual dining restaurants. The result indicated that there was a positive relationship between response to provision of nutrition information and customers' healthy eating behavior (β=0.38, p<.01). Therefore, *H₅ was supported*.

Hypothesis six examined the relationship between customers' nutrition knowledge (subjective and objective) and their response to provision of nutrition information. The result found that the relationship between subjective nutrition knowledge and providing nutrition information was statistically significant (β=0.17, p<.01). However, customers' objective knowledge of nutrition did not significantly influence their response to provision of nutrition information (β= 0.00, p> .05). Accordingly, *H₆ was partially supported.*

Hypothesis seven tested if customers' attitude toward healthy eating in restaurants impacts their intention to engage in healthy eating behavior in restaurants. The result indicated that there was a positive relationship between attitude toward healthy eating behavior and customers' intention to select healthy menu items (β=0.64, p<.01), which means *H₇ was supported.*

Hypothesis eight investigated if a positive relationship exists between customers' subjective norm and their intention to engage in healthy eating behavior in restaurants. The finding indicated that there was a positive relationship between those two constructs (β=0.24,

p<.01). Thus, *H₈ was supported.*

Hypothesis nine was examined to see if customers' perceived behavioral control has a positive relationship with their intention to engage in healthy eating behavior. The study could not find that a positive relationship between behavioral control and intention existed (β=0.01, p>.05). Accordingly, *H₉ was not supported.*

Hypothesis ten predicted that customers' intention to engage in healthy eating behavior positively influences their healthy eating behavior in casual dining restaurants. The study found that intention had a positive impact on healthy eating behavior (β=0.82, p<.01). Therefore, *H₁₀ was supported.*

Hypothesis eleven examined if customers' healthy eating behavior in casual dining restaurants predicts their willingness to patronize a restaurant that provides healthy menu choices. The result indicated that there was a significant positive relationship between healthy eating behavior and willingness to patronize a restaurant (β=0.81, p<.01); thus, *H₁₁ was supported.*

Squared multiple correlations for structural equations were checked to see how much each endogenous variable was explained by exogenous variables. Subjective and objective nutrition knowledge explained 14 percent of the variance in customers' response to provision of nutrition information (R^2=.14). About 77 percent of the variance in healthy eating behavior that was accounted for was explained by six exogenous variables including perceived benefits, barriers, self-efficacy, threat, response to provision of nutrition information, and intention to engage in healthy eating behavior (R^2=.77). Attitude toward healthy eating behavior, subjective norm, and perceived behavioral control explained 68 percent of the variance in respondents' intention to eat healthy menu items (R^2=.68). For willingness to patronize a

restaurant, 65 percent of the variance was explained by healthy eating behavior (R^2=.65). In sum, most endogenous variables, except response to provision of nutrition information, had strong explanatory powers.

Figure 4.2 shows the results of hypothesized paths in the proposed model.

Figure 4.2 Results of Hypothesized Paths in the Proposed Model
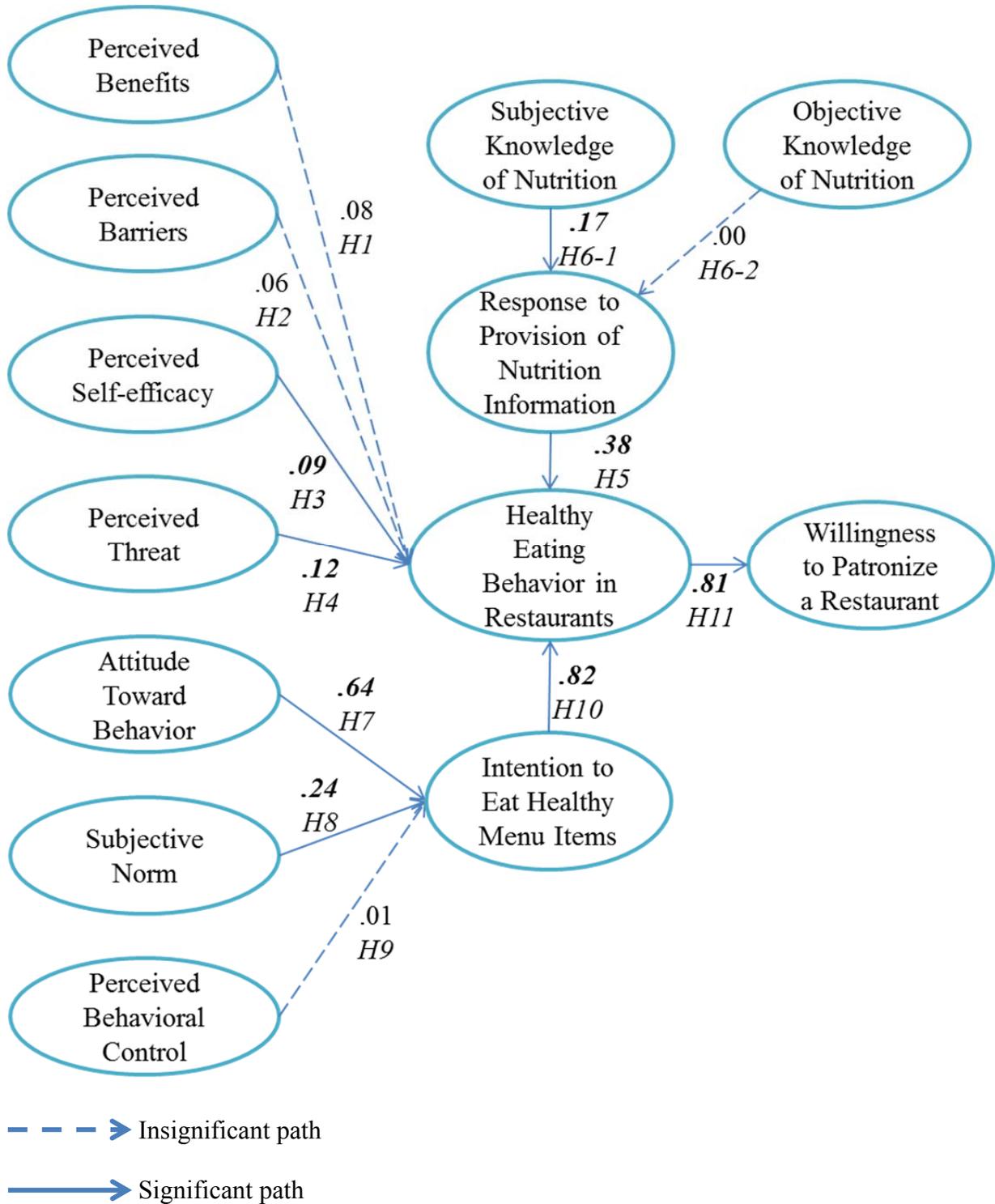
The Relationship between Socio-demographic Characteristics and Healthy Eating Behavior in Casual Dining Restaurants (Hypotheses 12 and 13)

Hypotheses 12 and 13 investigated if socio-demographic characteristics influence customers' healthy eating behavior in casual dining restaurant (H_{12}) and their willingness to patronize a restaurant that provides healthy menu choices (H_{13}). In order to explore respondents' socio-demographic profiles, Pearson's correlation analysis, ANOVA, and independent sample t-test were conducted with gender, age, marital status, geographic area, education level, employment status, income, and BMI status variables.

Table 4.17 shows the results of socio-demographic profiles with the healthy eating behavior construct.

Table 4.17 Socio-demographic Profiles with Healthy Eating Behavior

Socio-demographic Characteristics	n	M	SD	Healthy Eating Behavior Statistic Value	P
Gender				t=1.14	.26
Female	200	4.73	1.14		
Male	214	4.60	1.23		
Age				r=-.05	.31
	411	50.77	15.47		
Marital Status				t=-1.24	.22
Married	257	4.61	1.18		
Single	157	4.76	1.20		
Geographic Area				F=.74	.53
Rural area	57	4.88	1.18		
Small own	73	4.67	1.12		
City suburb	239	4.62	1.50		
City downtown	45	4.64	1.19		
Education Level*				F=3.53	.02
High school	55	4.87	1.28		
Some college	116	4.42	1.18		
Bachelor's degree	139	4.63	1.14		
Graduate degree	104	4.88	1.16		
Employment Status				F=2.62	.74
Working full-time	234	4.77	1.22		
Working part-time	42	4.39	1.05		
Not working	133	4.56	1.15		
Income				F=2.10	.12
Less than $50,000	147	4.55	1.16		
$50,000 to $99,999	157	4.64	1.20		
$100,000 or above	110	4.85	1.18		
BMI Categories**				F=4.40	.01
Underweight	11	4.57	1.46		
Normal	118	5.00	1.08		
Overweight	150	4.51	1.18		
Obesity	131	4.56	1.22		

Note: *p < .05, **p < .01

For healthy eating behavior, the study found that education levels and BMI categories were statistically significant. There was a statistical difference in healthy eating behavior for the four education levels: $F_{(3, 410)}$ =3.53, p=.02. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for some college level respondents

(M=4.42) was significantly different from those who had a graduate degree (M=4.88). This could be interpreted that the people with a graduate degree try to eat healthier menu items in casual dining restaurants than those who had some college education level. However, since the mean score for high school is higher than the "some college" and "Bachelor's degree" categories, it is hard to conclude that the higher the education level the greater customers try to eat healthy menu items in casual dining restaurants.

The study also found that there were significant differences in healthy eating behavior for the four BMI conditions: F (3, 406) =4.40, p=.01. Post-hoc analysis using the Tukey HSD test revealed that the mean score for normal weight respondents (M=5.00) was statistically different from those who were overweight (M=4.51) and who were obese (M=4.56). This means that normal weight customers tend to show more healthy eating behavior in casual dining restaurants compared to those who are currently overweight or obese.

Based on the results above, *hypothesis twelve (H₁₂) was partially supported*.

Table 4.18 shows the results of socio-demographic profiling analysis with the willingness to patronize a restaurant that provides healthy menu items construct.

Table 4.18 Socio-demographic Profiles with Willingness to Patronize a Restaurant That Provides Healthy Menu Items

Socio-demographic Characteristics	n	M	SD	Willingness to Patronize a Restaurant	
				Statistic Value	P
*Gender***				t=409.96	.01
Female	200	5.24	1.24		
Male	214	4.90	1.24		
Age				r=-.03	.58
	411	50.77	15.47		
*Marital Status**				t=-2.45	.02
Married	257	4.94	1.26		
Single	157	5.25	1.22		
Geographic Area				F=.17	.92
Rural area	57	5.14	1.28		
Small own	73	5.02	1.32		
City suburb	239	5.07	1.19		
City downtown	45	4.97	1.45		
*Education Level**				F=3.22	.02
High school	55	5.27	1.37		
Some college	116	4.86	1.28		
Bachelor's degree	139	4.96	1.21		
Graduate degree	104	5.31	1.17		
Employment Status				F=1.11	.33
Working full-time	234	5.13	1.27		
Working part-time	42	4.85	1.17		
Not working	133	5.00	1.26		
Income				F=.47	.63
Less than $50,000	147	5.04	1.18		
$50,000 to $99,999	157	5.01	1.29		
$100,000 or above	110	5.06	1.30		
BMI Categories				F=2.07	.10
Underweight	11	5.09	1.49		
Normal	118	5.30	1.26		
Overweight	150	4.95	1.22		
Obesity	131	4.95	1.27		

Note: *$p < .05$, **$p < .01$

The results revealed that gender, marital status, and education level influenced respondents' willingness to patronize a restaurant that provides healthy menu choices. There

was a statistically significant difference in willingness to patronize a restaurant that offers healthy menu items between males (M=4.90) and females (M=5.24); $t(412) = 409.96$, $p= .01$. This means that females are more likely to patronize healthy menu restaurants than males.

There was also a significant difference for marital status in respondents' willingness to patronize a restaurant; $t(412) = -2.45$, $p= .02$. The mean score for those who were married was 4.94 while single respondents' mean score was 5.25. It could be interpreted that those who are currently single tend to more patronize a restaurant with healthy menu choices, compared to the married group.

ANOVA test found that there was a statistical difference in willingness to patronize a restaurant that provides healthy menu choices for the four education levels: F (3, 410) =3.22, p=.02. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for "some college level" respondents (M=4.86) was significantly different from those who had a graduate degree (M=5.31), which means that customers who had a graduate degree are more likely to patronize a restaurant than those who had some college education if healthy menu items are available in the restaurant. However, like the relationship between education level and healthy eating behavior, it is hard to accept that the higher the education level the more customers are likely to patronize a restaurant that offers healthy menu choices because the mean score for high school is higher than the mean scores for some college and Bachelor's degree.

In sum, *hypothesis thirteen (H₁₃) was partially supported.*

Summary

This chapter presented the results of the pilot study and main study including Exploratory Factor Analysis (EFA), descriptive analysis of respondents' socio-demographic characteristics, Confirmatory Factor Analysis (CFA), Structural Equation Modeling (SEM), and respondents' socio-demographic profiling analysis with healthy eating behavior and willingness to patronize a restaurant that provides healthy menu items. A summary of the findings with the hypotheses tests is presented in Table 4.19.

Table 4.19 Summary of the results of Hypotheses Testing and Key Findings

	Hypotheses Testing and Key Findings	Statistical Decision
H_1	There was no statistical relationship between perceived benefits and customers' healthy eating behavior in restaurants.	Not Supported
H_2	There was no statistical relationship between perceived barriers and healthy eating behavior in restaurants.	Not Supported
H_3	Perceived self-efficacy positively influenced customers' healthy eating behavior in restaurants.	Supported
H_4	Perceived threat positively influenced customers' healthy eating behavior in restaurants.	Supported
H_5	Customers' response to provision of nutrition information (a cue to action) positively influenced customers' healthy eating behavior in restaurants.	Supported
H_6	There was a positive relationship between nutrition knowledge and using the nutrition information available in (or provided by) a restaurant (a cue to action).	Partially Supported
H_{6-1}	Subjective nutrition knowledge positively influenced response to provision of nutrition information.	Supported
H_{6-2}	There was no statistical relationship between objective nutrition knowledge and response to provision of nutrition information.	Not Supported

H7	Attitude toward healthy eating behavior positively influenced customers' intention to engage in healthy eating behavior in restaurants.	Supported
H8	Subjective norms positively influenced customers' intention to engage in healthy eating behavior in restaurants.	Supported
H9	There was no statistical relationship between perceived behavioral control and customers' intention to engage in healthy eating behavior in restaurants.	Not Supported
H10	Intention to engage in healthy eating behavior positively influenced customers' healthy eating behavior in restaurants.	Supported
H11	Customers' healthy eating behavior in restaurants positively influenced their willingness to patronize a restaurant that provides healthy menu items.	Supported
H12	There was a partial relationship between socio-demographic variables and healthy eating behavior.	Partially Supported
H13	There was a partial relationship between socio-demographic variables and willingness to patronize a restaurant that provides healthy menu choices.	Partially Supported

CHAPTER V

CONCLUSION AND IMPLICATIONS

The previous chapters provided a literature review related to this study, the research questions and hypotheses, the proposed model, the methods used to analyze the data, and the statistical results. This chapter contains the following elements: 1) a summary of the study, 2) discussion of hypothesis tests, 3) implications, 4) limitations of the study, and 5) recommendations for future research.

Summary of the Study

The purpose of this study was to investigate customers' healthy eating behavior in casual dining restaurants using the Healthy Belief Model (HBM) and Theory of Planned Behavior (TPB). Furthermore, this study examined the relationship between customers' healthy eating behavior and willingness to patronize a restaurant that offers healthy menu choices. Based on these two theories and the literature review, a model was proposed with 13 constructs and 13 hypotheses (see Figure 5.1). In order to increase the explanatory power of healthy eating behavior, response to provision of nutrition information as a cue to action was added to the proposed model.

Prior to conducting the main survey, a pilot study was conducted to verify the validity and reliability of the scales. Data for this study were collected using an online survey administered by a marketing research company between February 11 and February 13, 2013. Data from four thousand and nineteen respondents who have eaten at a casual dining

restaurant at least two times in the last six months were collected, yielding a response rate of about 13.6%. To test hypotheses against the data, Structural Equation Modeling (SEM), Pearson's correlation coefficient analysis, ANOVA, and independent sample t-tests were conducted.

The results showed that hypotheses 3, 4, 5, 7, 8, 10, and 11 were supported, whereas hypotheses 1, 2, and 9 were not supported. Hypotheses 6, 12, and 13 were partially supported (see Figure 5.1)

Figure 5.1 Proposed Model and Findings
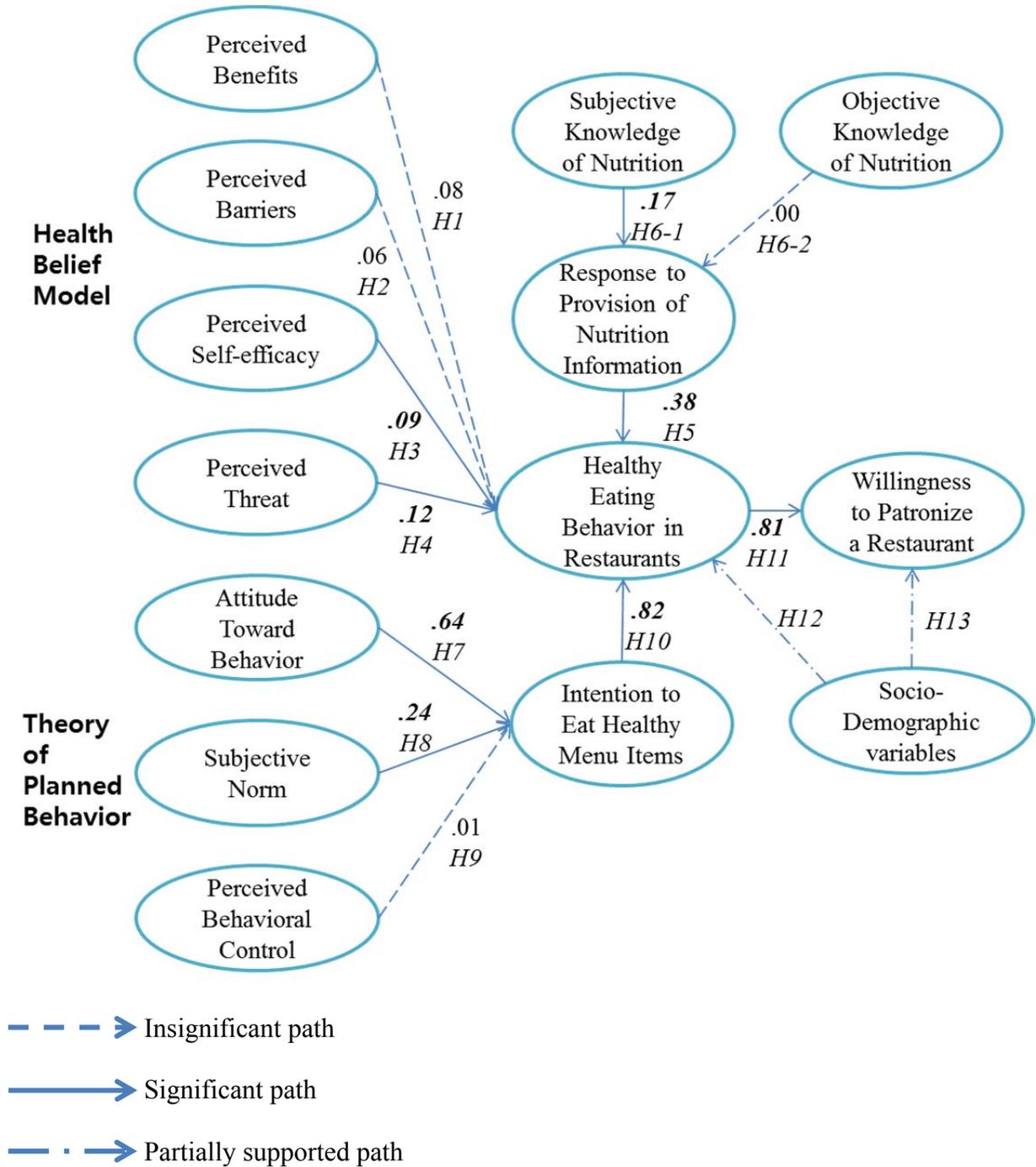
Discussion of the Study

Perceived Self-efficacy

This study revealed that there is a positive relationship between customers' perceived self-efficacy and healthy eating behavior. This means that if customers believe that they can successfully select healthy menu items in restaurants, they tend to actually demonstrate healthy eating behavior in casual dining restaurants. This result indicates that people's strong beliefs about their ability to eat healthy menu items are a key influence on actual healthy eating behavior in casual dining restaurants. Rosenstock, Strecher, and Becker (1988) argued that self-efficacy is an important construct for explaining an individual's complex health behavior. Moreover, this result is consistent with other healthy-eating related studies (Deshpande et al., 2009; Vassallo et al., 2009; S. L. Wang, Charron-Prochownik, Sereika, Siminerio, & Kim, 2006). Those studies also found that self-efficacy is a major predictor for healthy behavior.

Perceived Threat

Glanz, Rimer, and Viswanath (2008) argued that perceived threat is the most important construct in the HBM because individuals first need to be aware of the fact that failure to take healthy actions is a threat. Then, they will start to consider if there are ways to benefit by reducing the threat before taking health-related actions. As expected, this study found that there was a positive relationship between perceived threat and healthy eating

110

behavior in casual dining restaurants. It can be inferred that people who believe that there is a possibility of developing health problems caused by unhealthy eating behavior and believe that these health problems could be severe tend to select healthy menu items in casual dining restaurants.

Perceived Benefits and Barriers

This study found that both perceived benefits and barriers to eating healthy menu items did not statistically influence healthy eating behavior in casual dining restaurants even though other healthy eating related studies found a significant relationship among the constructs (Deshpande et al., 2009; X. Sun et al., 2006; S. L. Wang et al., 2006). There are a few possible justifications for the insignificance of these relationships. First, Glanz, Rimer, and Viswanath (2008) argued that perceived benefits and barriers may not be significant predictors of health behavior in the HBM when there is low perceived threat. In other words, if there is a weak threat, individuals may perceive the benefits and barriers to engaging in health-related actions are meaningless. This study found that there is a weak relationship between perceived threats and healthy eating behavior in casual dining restaurants ($\beta=0.12$) even though this relationship is statistically significant. It can be inferred that customers feel that perceived threats for not eating healthy menu items are not so high that the perceived benefits of reducing those threats and barriers by selecting healthy menu items in restaurants are not important. For example, because some customers may think that the health impact of unhealthy eating behavior in restaurants is low, benefits and barriers to healthy eating behavior might not be salient, especially for those customers who do not often go out for

111

meals.

Another possible reason for the insignificant relationships between perceived benefits and barriers and healthy eating behavior in casual dining restaurants could be that some customers are going to eat whatever they want when they dine out, regardless of the healthiness of the menu items they select. To further delve into this issue, this study asked respondents an open-ended question about their reasons for not selecting healthy menu items in restaurants. The results showed that among 359 respondents who answered this question, 15 percent of respondents said that they do so because they want to select whatever menu items they want. Realizing that 15 percent is a small portion, this can be interpreted to mean that some respondents may not care about perceived benefits and barriers to healthy eating behavior in restaurants.

Response to Provision of Nutrition Information

This study tested whether providing nutrition information influences customers' healthy eating behavior in restaurants. The results showed that there is a positive relationship between response to provision of nutrition information and healthy eating behavior in casual dining restaurants. This means that customers who have positive attitudes toward the availability of information about healthy menu items in restaurants, and who are willing to actively use this information, tend to demonstrate healthy eating behavior in casual restaurants. This result also verifies that providing nutrition information on menus or menu boards plays a role as a cue to action that promote better food choices for customers (Lando & Labiner-Wolfe, 2007).

Subjective and Objective Nutrition Knowledge

According to previous studies (Burton et al., 1999; Lee, Lee, & McCleary, 2013; Levy & Fein, 1998), customers' nutrition knowledge is important predictor of behaviors related to the use of nutrition information for food selection. This study also tested if both subjective and objective nutrition knowledge influences attitude towards the provision of nutrition information in restaurants. However, the findings were mixed. Subjective knowledge predicted attitude towards the provision of nutrition information in restaurants, which means that perceived ability to understand nutrition information leads to a more positive attitude toward provision of information on the menu and to increased intention to actively use this information when selecting menu items in restaurants. However, this study did not find a statistical relationship between objective nutrition knowledge and attitude towards provision of nutrition information in restaurants. This result is similar to Petrovici and Ritson's findings (2006). This could be interpreted to mean that customers' actual nutrition knowledge does not influence their use of nutrition information when selecting menu items in restaurants. This insignificant relationship is a somewhat surprising result, since previous studies argued that objective knowledge was a more accurate measure for predicting people's behavior than subjective knowledge (Brucks, 1985; Raju, Lonial, & Glynn Mangold, 1995). For example, it was argued that self-reported (subjective) knowledge scales may contain a social desirability bias (Palmer et al., 2002). Alba and Hutchinson (2000) also stated that customers tend to think that they know more than they actually know. However, it should be noted that some studies also did not find a relationship between customers' objective nutrition knowledge and nutrition label use (Nayga, 2000; Petrovici &

Ritson, 2006).

There could be a few possible explanations for these mixed results. As can be seen on Table 5.1, customers' level of objective nutrition knowledge was relatively high compared to a previous study by Pertrovici and Ritson (2006). Moreover, even though enormous resources have been spent on education to increase people's nutrition knowledge or awareness, levels of health problems caused by unhealthy eating behavior continue to increase (Nayga, 2000). Pearson's coefficient correlation analysis showed that there is no statistical relationship between objective and subjective nutrition knowledge (see Table 4.14). In sum, it can be inferred that increased objective nutrition knowledge does not necessarily improve individuals' subjective perception of nutrition knowledge, which influences customers' attitudes toward the provision and use of nutrition information. In other words, even though customers' actual nutrition knowledge is improved, they are still reluctant to use their knowledge in selecting menu items due to lack of confidence (subjective nutrition knowledge). Another possible explanation could be a problem of the scale itself. As shown in Table 5.1, the percentage of respondents answering correctly in this study is much higher than in a previous study conducted before 2006 with Romanians. Of course, it is hard to directly compare nutrition knowledge for Romanians before 2006 with Americans today based on these two studies. Also, since Petrovici and Ritson (2006) did not provide the respondents' demographic information, it is hard to directly compare these two studies in terms of demographic differences. However, it may indicate that this scale is too easy for the respondents of this study (Americans), so construct validity may have been limited.

Table 5.1 Difficulty Factors of Objective Nutrition Knowledge

Objective Nutrition Knowledge Items	% of Respondents Answering Correctly	
	Petrovici and Ritson (2006)	The Current Study
Whole milk is a better source of calcium than skimmed milk. (False)	39.4	63.8
Removing the skin from chicken reduces the fat content. (True)	68.8	92.5
Eating more bread helps to increase protein in the diet. (False)	49.2	78.0
Any type of fat may damage a person's health. (False)	39.6	65.5
A high intake of salt may increase blood pressure. (True)	87.7	93.1
Butter contains more cholesterol than margarine. (True)	87.9	53.1
The daily calorie intake should not exceed in general 2000. (True)	70.0	77.6
No more than a third of calories should come from fat. (True)	58.6	82.8
White bread is more nutritious than whole wheat bread. (False)	87.8	86.6
Soy beans are a good source of protein. (True)	80.1	89.5
Cholesterol is found only in foods containing fat or oil. (False)	22.1	77.0

Attitude toward Healthy Eating Behavior

Previous studies have found a positive relationship between attitudinal variables and

health behavior in a variety of health-related areas including risky sexual behavior (Gu et al.,

2009; Schaalma et al., 2009), smoking behavior (Hassandra et al., 2011; Rise et al., 2008),

exercise (Jones et al., 2007; Plotnikoff et al., 2010), breast self-examination (Mason & White,

2008; Norman & Cooper, 2011), obesity (K. Andrews et al., 2010; Caperchione et al., 2008),

and food safety (Mullan & Wong, 2009; Pilling et al., 2008). This study also found that this

relationship existed in a restaurant setting. As hypothesized, customers' attitudes toward

healthy eating behavior in restaurants significantly influenced their intention to engage in

healthy eating behavior in casual dining restaurants. Also, it was the strongest predictor

among other independent constructs. This may be explained by the fact that customers who

have positive attitudes toward healthy eating in restaurants are more willing to eat healthy

menu items in casual dining restaurants than those who have negative attitudes.

Subjective Norm

This study measured subjective norm as an individual's normative beliefs about whether important referents approve or disapprove of healthy eating behavior in restaurants. The results revealed that subjective norms positively influenced customers' intention to engage in healthy eating behavior in casual dining restaurants, which is consistent with findings from previous studies (K. R. Andrews, K. S. Silk, & I. U. Eneli, 2010; Povey et al., 2000). This means that the more favorable the subjective norm is, the more likely it is that customers are willing to select healthy menu items in restaurants. In other words, if an individual's close friend or family think that it is important for that person to eat healthy menu items in restaurants (i.e., there is increased social pressure to eat healthy menu items in restaurants), that individual will show strong intention to engage in healthy eating behavior in casual dining restaurants.

Perceived Behavioral Control

In this study, perceived behavioral control was used to measure how easy or difficult customers found it to select healthy menu items in restaurants. The result showed that there is no statistical relationship between customers' perceived behavioral control and intention to engage in healthy eating behavior in casual dining restaurants. The lack of a significant

relationship may be related to the level of customers' volitional control over the selection of healthy menu items in restaurants. Ajzen (1991) argued that perceived behavioral control could be less salient under conditions in which people's volitional control is high. In other words, in conditions of complete volitional control, the relationship between intention and behavior should be very strong without influences from perceived behavioral control, as in the Theory of Reasoned Action (TRA), the earlier version of the TPB. On the other hand, in conditions of less volitional control, perceived behavioral control influences both intention and behavior. In sum, this findings are logical, since there are no strong external constraints on healthy eating behavior in casual dining restaurants and the relationship between intention and healthy eating behavior in this study was very strong (β=.82). It can be inferred that since customers' healthy menu selection is within their volitional control, their intention to engage in healthy eating behavior is sufficient to predict actual healthy eating behavior in casual dining restaurants without controlling perceived behavioral control.

Another justification for this insignificant relationship could be related to Ajzen's statement (1991) that the relative importance of attitudes toward behavior, subjective norms, and perceived behavioral control in predicting behavioral intention could be dependent upon the type of behavior and the nature of the situation. For example, if attitude and subjective norms strongly influence behavioral intentions, perceived behavioral control may not be predictive of intentions (Armitage & Conner, 2001). Accordingly, the fact that the current study found attitudes toward healthy eating behavior in restaurants and subjective norms to be strong predictors of intention to engage in healthy eating behavior in casual dining restaurants (β=.64 and β=.24, respectively), could be one of the reasons why an insignificant relationship between perceived behavioral control and intention to engage in healthy eating behavior was found.

Intention to Engage in Healthy Eating Behavior in Casual Dining Restaurants

This study tested the relationship between intention to select healthy menu items in restaurants and healthy eating behavior in casual dining restaurants and found a strong relationship (β=.82). This can be interpreted to mean that in the context of healthy eating behavior in restaurants, intention is a powerful predictor of behavior, which means that customers who have a high intention to engage in healthy eating behavior in restaurants actually try to select healthy menu items in casual dining restaurants, such as menu items that offer fruits/vegetable, fresh ingredients or high fiber content, low animal fat content, low or no salt, low cholesterol, low calories, or no stimulants (coffee or cola).

Healthy Eating Behavior

This study tested the relationship between customers' healthy eating behavior in casual dining restaurants and their willingness to patronize a restaurant that offers healthy menu items and the result showed a strong relationship (β=.81). This means that customers who try to select healthy menu items in casual dining restaurants are willing to patronize a restaurant that provides healthy menu choices, demonstrating an intention to revisit the restaurant and to recommend the restaurant to their friends or family.

Socio-Demographic Profiles

In order to investigate customers' socio-demographic profiles, this study tested whether respondents' socio-demographic characteristics influence customers' healthy eating behavior in casual dining restaurants and their willingness to patronize a restaurant that offers healthy menu choices. For healthy eating behavior, the results showed that education levels and BMI (Body Mass Index) categories were statistically significant while there were no statistical relationships with gender, age, marital status, geographic area, employment status, or income level. Through post-hoc comparison tests, this study found that respondents with a graduate degree are more likely to eat healthy menu items in casual restaurants than respondents with some college education. However, it is hard to conclude that higher education levels increase the degree to which customers try to eat healthy menu items in casual dining restaurants, because the mean value on this measure for those with educations ending in high school or earlier was higher than the measure for those with some college or a bachelor's degree. In terms of obesity status, the study found that there is a significant relationship between healthy eating behavior and the four BMI conditions (i.e., underweight, normal, overweight, and obesity). Post-hoc analysis revealed that normal weight respondents are more likely to select healthy menu items in restaurants, which is consistent with a previous study (Czyzewska & Graham, 2008). This can be interpreted to mean that normal weight customers try to eat healthy foods in casual dining restaurants in order to maintain their weight condition while customers who are currently overweight or obese are less careful about selecting healthy menu items in casual dining restaurants. This could be one of the reasons why they have weight control problems.

In terms of customers' willingness to patronize a restaurant that provides healthy

menu items, this study found that gender, marital status, and education level were statistically significant while age, geographic area, employment status, income level, and BMI status were not significant. The results showed that female customers are more willing than male customers to patronize a restaurant that offers healthy menu items. This means that women are more likely to revisit healthy restaurants and to recommend these restaurants to others. This result also revealed that singles are more willing than married couples to patronize a restaurant that provides healthy offerings. Similar to the result with healthy eating behavior, post-hoc tests showed that customers with a graduate degree are more willing to patronize a restaurant in which healthy menu items are available than those who have some college. However, this result is also ambiguous, since the mean value for willingness to patronize a restaurant that offers healthy menu items for those with education ending in high school or earlier was higher than the value for those with some college or a bachelor's degree.

Using the Theory of Planned Behavior and Healthy Belief Model Separately

Perceived benefits, barriers, and threat could be conceptually a part of attitude toward behavior even though operational definitions of those constructs are not. In other words, there could be overlaps among constructs in the model. This means that the proposed model in this study may have multicollinearity issues and this could be a reason why there were several insignificant relationships in the model. Therefore, this study ran the TPB and HBM separately in order to check if the results of the study might be different using the models separately.

The results showed that there was no difference between using a model with the TPB alone and the model with both the TPB and HBM (see Appendix E). Perceived behavioral

control still did not statistically influence intention to engage in healthy eating behavior in casual dining restaurants. However, the results revealed that there was a difference between a model using only the HBM and the model with the TPB and HBM (see Appendix F). When using the HBM only, the relationship between perceived benefits and healthy eating behavior was statistically significant, while the proposed model in this study did not find the significant relationship for this path. This means that without controlling other variables, perceived benefits was a predictor of healthy eating behavior. A multicollinearity issue could be a reason for these results. In detail, the correlation score between perceived benefits and intention is very high ($r=.64$). It could be interpreted to mean that with controlling for intention, the relationship between perceived benefits and healthy eating behavior was not statistically significant because of the strong relationship between perceived benefits and intention to engage in healthy eating behavior. Therefore, since there is only one difference between the results of the proposed model with both the TPB and HBM and the results using the TPB and HBM separately, the proposed model could be better in terms of increasing an explanatory power of customers' healthy eating behavior in restaurants.

Implications

The results of this study have several implications for researchers, marketers/operators of casual dining restaurants, health behavior practitioners, and nutritionists.

Theoretical Implications

Understanding and predicting customers' healthy eating behavior in restaurants is increasingly important since the restaurant industry is increasingly being held responsible for improving public health (Story et al., 2008). However, few studies have tried to understand customers' healthy eating behavior in casual dining restaurants. This study applied both the Health Belief Model (HBM) and Theory of Planned Behavior (TPB) to examine customers' healthy eating behavior in casual dining restaurants. The results of this study showed that both theories are applicable in restaurant settings. Moreover, the results indicated that the TPB seems to be better than the HBM for predicting customers' healthy eating behavior in restaurants.

Regarding the HBM, this study found that perceived self-efficacy and perceived threat are predictors of healthy eating behavior in casual dining restaurants, while perceived benefits and barriers are not. This may imply that even though customers perceive failure to select healthy menu items in restaurants to be threatening, this threat is weak. Accordingly, the benefits and barriers (M=4.08, see Appendix C) to healthy eating behavior do not significantly influence choices that might reduce these threats. This may indicate that it is necessary to further educate restaurant customers about the risks of unhealthy eating behavior.

For the TPB, the study revealed that attitudes toward healthy eating behavior and subjective norm are strong predictors of customers' intention to engage in healthy eating behavior in casual dining restaurants. Also, healthy eating behavior in casual dining restaurants is mostly explained by intention. However, the study failed to verify a relationship between perceived behavioral control and customers' intention. These results may indicate that healthy menu selection is a situation in which customers exercise volitional control,

which means that customers perceive no significant external factors as impediments to their healthy eating behaviors. This finding can also be interpreted to mean that the Theory of Reasoned Action (TRA) could be sufficient to predict customers' healthy eating behavior, rather than the TPB.

Researchers are at odds over the question of similarities and differences between self-efficacy and perceived behavioral control. Ajzen (1991) insisted that the two constructs are interchangeable, while Terry (1993) disagreed. According to Bandura (1986, 1992), self-efficacy focuses on an individual's cognitive perceptions of control, i.e., internal control factors, while perceived behavioral control focuses on perceptions of control as influenced by external factors. Accordingly, many researchers have compared the effectiveness of self-efficacy to that of perceived behavioral control in predicting intention and behavior. For example, through a meta-analysis, Armitage and Conner (2001) argued that self-efficacy is a better construct for predicting intention, whereas for predicting behavior, both are equally important. Considering the assumption that selecting healthy menu items in restaurants is a situation of volitional control, the current study confirms that perceived behavioral control is not a good predictor of customers' intention to engage in healthy eating behavior, while self-efficacy is a predictor of their healthy eating behavior in casual dining restaurants..

In terms of comparing the effectiveness of the TPB to the HBM, the TPB found three significant paths among four hypothesized paths, and the HBM found three significant paths among five paths. Moreover, β values of the significance of the relationships in the TPB are much higher than those in the HBM. R^2 values also indicated that the TPB explained more variances than the HBM. These results indicate that the TPB may have more predictive and explanatory power than the HBM (Taylor et al., 2006). Therefore, it can be concluded that the TPB is a better theory than the HBM for predicting and understanding customers' healthy

eating behavior in casual dining restaurants. This means that even though the HBM is a good theory for preventive health behavior such as condom use, eating at home, cancer screening behavior, food safety, or smoking behavior (Karen Glanz et al., 2008), the HBM may not be appropriate in restaurant settings, since customers' perceived threat for not selecting healthy menu items in restaurants is low.

Managerial Implications

This study found that there is a weak relationship between perceived threat and healthy eating behavior (β=.12), compared to other significant relationships (see Figure 5.1). Also, the mean score for perceived threat is lower (M=4.37) than for other independent constructs (see Table C.1). This could be interpreted to mean that customers in the restaurant industry are not fully aware of the danger of unhealthy eating behavior. According to the CDC (2004, 2009), unhealthy eating behavior can increase the risk of developing various health problems including heart disease, type 2 diabetes, stroke, and some types of cancer. Moreover, conditions associated with being overweight or obese are directly or indirectly related to at least 400,000 deaths per year in the United States. Therefore, policymakers should try to educate people about how much unhealthy eating behavior can enhance the risks of developing a variety of health problems.

The results of this study showed that customers' attitude toward healthy eating behavior was the strongest predictor of their intention to engage in healthy eating behavior in casual dining restaurants. This means that policymakers and health advocates have to focus on improving people's attitude toward healthy eating behavior. However, it could be a challenging task for them. Currently, government has tried to regulate adolescents' unhealthy

eating behavior in schools by removing vending machines in schools (Nixon, 2012). Also, government has introduced several child nutrition programs such as the Fresh Fruit and Vegetable Program, National School Lunch Program, Child and Adult Care Food Program, and so on (U.S. Department of Agriculture, 2013). With these regulations and programs, government hopes to improve children and adolescent's attitude toward healthy eating as well as actually providing healthy meals in schools. Moreover, people's attitude toward healthy eating behavior can be changed by education. For example, if policymakers and nutritionists educate people in terms of the risks of unhealthy eating behavior, people's attitude may be improved.

This study found a significant relationship between subjective nutrition knowledge and attitude towards provision of nutrition information, but no significant relationship was detected between objective nutrition knowledge and attitude toward provision of nutrition information. This means that if customers are confident about their ability to understand nutrition information, they tend to have a positive attitude toward the provision of nutrition information, and actively use this information when selecting menu items in restaurants. However, their actual knowledge of nutrition did not influence their attitude towards or use of nutrition information. A few implications may be drawn from this finding. Since there is no correlation between subjective and objective perceptions of nutrition information (see Table 4.14), educating individuals about nutrition is not necessary to improve their confidence in understanding nutrition information, which is a predictor of attitude toward the provision of nutrition information and use of this information. This means that the enormous time and effort invested in educating people about health could be ineffective (Nayga, 2000) in restaurant settings. Therefore, policymakers and nutritionists need to spend more resources on making people feel confident about understanding nutrition information and making

nutrition information on the restaurants' menu easy to understand for customers in order to encourage them to use the information when selecting menu items in restaurants.

This study assumed that if a restaurant provides items that health concerned customers want and need (i.e., healthy menu items) they will patronize the restaurant, demonstrating an intention to revisit the restaurant and to recommend it (generating positive WOM) to others. The results of this study provide statistical evidence that health-concerned customers who try to eat healthy menu items in casual dining restaurants are willing to patronize restaurants that provide healthy menu choices. This information may be helpful to restaurant managers and operators. If a restaurant offers healthy menu choices, customers who try to eat healthy menu items in restaurants will revisit the restaurant and provide positive WOM to others. Today, many restaurants provide healthy menu items such as those on a "low calorie menu" to lure health concerned customers. Therefore, those restaurants should expand their healthy menu items offerings and make healthy item information easy to understand for customers in order to attract the health concerned segment and develop their marketing strategy for targeting this segment.

This study investigated respondents' socio-demographic profiles in relations to their healthy eating behavior and willingness to patronize a restaurant that offers healthy menu items. Policymakers and nutritionists should focus on those who are currently overweight and obese to improve their healthy eating behavior in restaurants. Similarly, managers and operators of restaurants that offer healthy menu choices should target segments made up of those who are married females. For example, those restaurants can develop healthy menu items that female customers like. Also, the restaurants can advertise their healthy menu items in magazines where married females are the main readers.

Limitations of the Study

There are four limitations to the present study. The four limitations are explained below:

1. This study used an online survey platform, which means that all respondents were Internet users. This may have caused sample bias, because all of the respondents were familiar enough with Internet use to complete an online survey. Even though the respondents are geographically well distributed (see Figure 4.1), there could be a discrepancy between the sample and the general population.

2. This study measured respondents' self-reported healthy eating behavior, which can be difficult to correctly and honestly answer. Even though the BMI ratio of this study is similar to that of a previous study (Centers for Disease Control and Prevention, 2010), respondents' answers could be biased.

3. The study found no significant relationship between objective nutrition knowledge and response to provision of nutrition information. However, this insignificant relationship could be due to the limited construct validity for objective nutrition knowledge. This is because respondents answered a very high level of questions correctly, compared to a previous study. This may indicate that there are low variations within the construct.

4. The last limitation is that the results of this study cannot be applied to other restaurant categories such as fast food restaurants or fine dining restaurants. For example,

customers' healthy eating behavior in fast food restaurants could be different from their healthy eating behavior in fine dining restaurants. This is because visiting fast food restaurants is a utilitarian experience while visits to fine dining restaurants focus on hedonic experience.

Recommendations for Future Research

Based on the findings and implications of this study, the following recommendations for future research are presented below:

1. This study only tested the casual dining restaurant category and the results cannot be taken as representative of all restaurant categories. This means that the relationship among the constructs in the proposed model could vary depending on restaurant categories. For example, customers' healthy eating behavior may be more likely to be stronger in fast food restaurants than in other types of restaurants because fast food is more closely related to daily life than other restaurant categories. On the other hand, healthy eating behavior in fine dining restaurants may be weak since they offer a more hedonic experience. This means that customers who visit upscale restaurants may not consider healthy eating or the nutritional values of menu items because visits to those types of restaurants may occur only once a month or even once a year. Therefore, an examination of the proposed model in different restaurant categories is necessary.

2. This study did not fully explain why people who know they should eat healthy menu items in restaurants still did not select healthy menu items. In other words, it is hard to understand why those who have a positive attitude toward healthy eating in restaurants and high subjective norm still did not select healthy meals in restaurants. Therefore, it is necessary to explore what could be reasons for not selecting healthy menu items in restaurants even though customers are aware of the importance of healthy eating behavior. The possible reasons could be taste, high price, or availability of healthy choices in restaurants. Hence, future study should investigate what could be other reasons and which barrier is the most significant to impede customers' healthy eating behavior in restaurants.

3. Based on the results, this study found that customers' subjective nutrition knowledge was a predictor of their response to provision of nutrition information, while there was no relationship between objective nutrition knowledge and response to provision of nutrition information. This study concluded that this insignificant relationship could be due to the limited validity of the objective nutrition knowledge construct this study used. Therefore, it is necessary to use a better construct for measuring customers' objective nutrition knowledge to understand their healthy eating behavior. Moreover, it would be interesting to explore the relationship between people's objective and subjective nutrition knowledge and how those constructs influence their behavior.

4. This study found that subjective norm is a predictor of intention to engage in healthy eating behavior in casual dining restaurants. This means that creating a social

pressure can lead to an increase in healthy eating behavior. Therefore, it could be interesting to explore what types of social pressure is more effective than others. For example, changing children's attitude toward healthy eating behavior in restaurants can play a role as a social pressure for their parents. Or, parents' attitude can be a social pressure for children to improve their healthy eating behavior in restaurants. Moreover, it is necessary to investigate if providing nutrition information in restaurants can create a social pressure for customers to select healthy menu items.

5. This study explored demographic profiles in terms of customers' healthy eating behavior and willingness to patronize a restaurant that provides healthy menu items. However, this study did not test how respondents' demographic characteristics fit into the proposed model. Therefore, investigating how customers' demographic characteristics influence other constructs in the model would be needed.

6. This study used self-efficacy to predict healthy eating behavior in casual dining restaurants and found a significant relationship. However, there was no statistical relationship between perceived behavioral control and intention to engage in healthy eating behavior in casual dining restaurants. Therefore, it would be interesting to test the relationship between perceived self-efficacy and intention in the TPB.

References

Achterberg, C., & Miller, C. (2004). Is one theory better than another in nutrition education? A viewpoint: more is better. *Journal of Nutrition Education and Behavior, 36*(1), 40-42.

AGHA, M.T., Eftekhar, H., & Mohammad, K. (2005). Application of health belief model to behavior change of diabetic patients. *Payesh*.

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes, 50*(2), 179-211.

Alba, Joseph W, & Hutchinson, J Wesley. (2000). Knowledge calibration: What consumers know and what they think they know. *Journal of Consumer Research, 27*(2), 123-156.

Ali, M.M., Amialchuk, A., & Renna, F. (2010). Social Network and Weight Misperception among Adolescents. *Southern Economic Journal, Forthcoming*.

Ali, M.M., Fang, H., & Rizzo, JA. (2010). Body weight, self-perception and mental health outcomes among adolescents. *The journal of mental health policy and economics, 13*(2), 53.

Ali, MM, Fang, H., & Rizzo, JA. (2010). Body weight, self-perception and mental health outcomes among adolescents. *The journal of mental health policy and economics, 13*(2), 53.

Anderson, James C, & Gerbing, David W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin, 103*(3), 411.

Andrews, K., Silk, K., & Eneli, I. (2010). Parents as Health Promoters: A Theory of Planned Behavior Perspective on the Prevention of Childhood Obesity. *Journal of health communication, 15*(1), 95-107.

Andrews, Kyle R., Silk, Kami S., & Eneli, Ihuoma U. (2010). Parents as Health Promoters: A Theory of Planned Behavior Perspective on the Prevention of Childhood Obesity.

Journal of Health Communication: International Perspectives, 15(1), 95 - 107.

Armitage, C.J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British journal of social psychology, 40*(4), 471-499.

Axelson, M.L., & Brinberg, D. (1992). The measurement and conceptualization of nutrition knowledge. *Journal of Nutrition Education, 24*(5), 239-246.

Baker, J., Parasuraman, A., Grewal, D., & Voss, G.B. (2002). The influence of multiple store environment cues on perceived merchandise value and patronage intentions. *The Journal of Marketing*, 120-141.

Balbach, Edith D., Smith, Elizabeth A., & Malone, Ruth E. (2006). How the health belief model helps the tobacco industry: individuals, choice, and "information". *Tobacco Control, 15*(4), iv37-iv43. doi: 10.1136/tc.2005.012997

Bandura, A. (1990). Perceived self-efficacy in the exercise of control over AIDS infection. *Evaluation and program planning, 13*(1), 9-17.

Bandura, Albert. (1986). *Social foundations of thought and action: A social cognitive theory*: Prentice-Hall, Inc.

Bandura, Albert. (1992). On rectifying the comparative anatomy of perceived control: Comments on 'Cognates of personal control'. *Applied and Preventive Psychology, 1*(2), 121-126.

Barber, N., Goodman, R.J., & Goh, B.K. (2011). Restaurant consumers repeat patronage: A service quality concern. *International Journal of Hospitality Management, 30*(2), 329-336.

Bates, K., Burton, S., Howlett, E., & Huggins, K. (2009). The Roles of Gender and Motivation as Moderators of the Effects of Calorie and Nutrient Information Provision on Away-from-Home Foods. *Journal of Consumer Affairs, 43*(2), 249-273.

Becker, DM, & Levine, DM. (1987). Risk perception, knowledge, and lifestyles in siblings of people with premature coronary disease. *American journal of preventive medicine,*

3(1), 45.

Blumberg, Boris, Cooper, Donald R, & Schindler, Pamela S. (2008). *Business research methods* (Vol. 2): McGraw-Hill Higher Education London.

Brucks, Merrie. (1985). The effects of product class knowledge on information search behavior. *Journal of consumer Research*, 1-16.

Burton, Scot, Creyer, Elizabeth H., Kees, Jeremy, & Huggins, Kyle. (2006). Attacking the Obesity Epidemic: The Potention Health Benefits of Providing Nutrition Information in Restaurants. *American Journal of Public Health, 96*(9), 1669-1675.

Burton, Scot, Garretson, Judith A, & Velliquette, Anne M. (1999). Implications of accurate usage of nutrition facts panel information for food product evaluations and purchase intentions. *Journal of the Academy of Marketing Science, 27*(4), 470-480.

Byrd-Bredbenner, Carol, Abbot, Jaclyn Maurer, Wheatley, Virginia, Schaffner, Donald, Bruhn, Christine, & Blalock, Lydia. (2008). Risky eating behaviors of young adults— implications for food safety education. *Journal of the American Dietetic Association, 108*(3), 549-552.

Cai, L.A., Wu, B., & Bai, B. (2004). Destination image and loyalty. *Tourism Review International, 7*, 153-162.

Caperchione, C.M., Duncan, M.J., Mummery, K., Steele, R., & Schofield, G. (2008). Mediating relationship between body mass index and the direct measures of the Theory of Planned Behaviour on physical activity intention. *Psychology, health & medicine, 13*(2), 168-179.

Cawley, J. (2004). The impact of obesity on wages. *Journal of Human Resources, 39*(2), 451-474.

Cawley, J., Joyner, K., & Sobal, J. (2006). Size Matters. *Rationality and Society, 18*(1), 67-94.

Centers for Disease Control and Prevention. (2004). *Physical Activity and Good Nutrition: Essential Elements to Prevent Chronic Disease and Obesity*. Centers for Disease Control and Prevention Retrieved from

http://www.healthdome.net/downloads/USDeptHealth.CDC.PhysicalActivityGoodNutrition.pdf.

Centers for Disease Control and Prevention. (2009). Health Consequences. http://www.cdc.gov/obesity/causes/health.html

Centers for Disease Control and Prevention. (2010). Obesity and Overweight. Retrieved Oct 15, 2010 http://www.cdc.gov/nchs/fastats/overwt.htm

Champion, V. L. (1984). Instrument Development for Health Belief Model Constructs. *Advances in Nursing Science, 6*(3), 73.

Chen, M. S., & Land, K. C. (1990). Socioeconomic-status (Ses) And the health belief
model - lisrel analysis of unidimensional versus multidimensional formulations. *Journal of Social Behavior and Personality, 5*(5), 263.

Cheng, S., & Lam, T. (2008). The role of the customer–seller relationship in the intention of the customer to complain: A study of Chinese restaurateurs. *International Journal of Hospitality Management, 27*(4), 552-562.

Cheng, S., Lam, T., & Hsu, C.H.C. (2005). Testing the sufficiency of the theory of planned behavior: a case of customer dissatisfaction responses in restaurants. *International Journal of Hospitality Management, 24*(4), 475-492.

Cheng, S., Lam, T., & Hsu, C.H.C. (2006). Negative word-of-mouth communication intention: An application of the theory of planned behavior. *Journal of Hospitality & Tourism Research, 30*(1), 95-116.

Choi, T.Y., & Chu, R. (2001). Determinants of hotel guests' satisfaction and repeat patronage in the Hong Kong hotel industry. *International Journal of Hospitality Management, 20*(3), 277-297.

Chou, C.J., Chen, K.S., & Wang, Y.Y. (2011). Green practices in the restaurant industry from an innovation adoption perspective: Evidence from Taiwan. *International Journal of Hospitality Management*.

Contento, I.R., & Murphy, B.M. (1990). Psycho-social factors differentiating people who

reported making desirable changes in their diets from those who did not. *Journal of Nutrition Education, 22*(1), 6-14.

Cronin Jr, J.J., & Taylor, S.A. (1992). Measuring service quality: a reexamination and extension. *The Journal of Marketing*, 55-68.

Czyzewska, Maria, & Graham, Reiko. (2008). Implicit and explicit attitudes to high-and low-calorie food in females with different BMI status. *Eating behaviors, 9*(3), 303-312.

Delvarani, S., Othman, M., & Ghazali, H. (2012). Influential factors effecting fast food consumers' intention to use menu labels in fast food restaurants: A conceptual framework. *Hospitality and Tourism*, 111.

Deshpande, Sameer, Basil, Michael D., & Basil, Debra Z. (2009). Factors Influencing Healthy Eating Habits Among College Students: An Application of the Health Belief Model. *Health Marketing Quarterly, 26*(2), 145 - 164.

Diplock, A.T., Aggett, PJ, Ashwell, M., Bornet, F., Fern, EB, & Roberfroid, MB. (1999). Scientific Concepts in Functional Foods in Europe: Consensus Document. *British Journal of Nutrition, 81*.

Dittus, K.L., Hillers, V.N., & Beerman, K.A. (1993). Attitudes and behaviors about pesticide residues, susceptibility to cancer, and consumption of fruits and vegetables. *Journal of Nutrition Education, 25*(5), 245-250.

Elbel, Brian, Kersh, Rogan, Brescoll, Victoria L., & Dixon, L. Beth. (2009). Calorie Labeling and Food Choices: A First Look at the Effects on Low-Income People in New York City. *Health Affairs, October*(web exclusive), w1110.

Falk, L.W., Sobal, J., Bisogni, C.A., Connors, M., & Devine, C.M. (2001). Managing healthy eating: definitions, classifications, and strategies. *Health Education & Behavior, 28*(4), 425-439.

Finkelstein, E.A., Trogdon, J.G., Cohen, J.W., & Dietz, W. (2009). Annual medical spending attributable to obesity: payer-and service-specific estimates. *Health Affairs, 28*(5), w822-w831.

Fishbein, M. (1979). A theory of reasoned action: Some applications and implications.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*.

Fishbein, M.E. (1967). Readings in attitude theory and measurement.

Flegal, K.M., Carroll, M.D., Ogden, C.L., & Curtin, L.R. (2010). Prevalence and trends in obesity among US adults, 1999-2008. *JAMA: the journal of the American Medical Association, 303*(3), 235.

Food and Drug Administration. (2010). Draft Guidance for Industry: Questions and Answers Regarding Implementation of Menu Labeling Provisions of Section 4205 of the Patient Protection and Affordable Care Act of 2010. http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/FoodLabelingNutrition/ucm223266.htm

Fornell, C. (1992). A national customer satisfaction barometer: the Swedish experience. *The Journal of Marketing*, 6-21.

Gitelson, R.J., & Crompton, J.L. (1984). Insights into the repeat vacation phenomenon. *Annals of Tourism Research, 11*(2), 199-217.

Glanz, K., & Bishop, D.B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual review of public health, 31*, 399-418.

Glanz, Karen, Rimer, Barbara K., & Viswanath, K. (2008). *Health Behavior and Health Education*. San Francisco, CA: Jossey-Bass.

Gochman, D.S. (1982). Labels, systems and motives: some perspectives for future research and programs. *Health Education & Behavior, 9*(2-3), 167-174.

Gochman, D.S. (1997). *Handbook of health behavior research I: Personal and social determinants* (Vol. 1): Springer.

Grembowski, David, Patrick, Donald, Diehr, Paula, Durham, Mary, Beresford, Shirley, Kay,

Erica, & Hecht, Julia. (1993). Self-Efficacy and Health Behavior Among Older Adults. *Journal of Health and Social Behavior, 34*(2), 89-104.

Grunert, Klaus G, Wills, Josephine M, & Fernández-Celemín, Laura. (2010). Nutrition knowledge, and use and understanding of nutrition information on food labels among consumers in the UK. *Appetite, 55*(2), 177-189.

Gu, J., Lau, J.T.F., Chen, X., Liu, C., Liu, J., Chen, H., . . . Li, Z. (2009). Using the Theory of Planned Behavior to investigate condom use behaviors among female injecting drug users who are also sex workers in China. *AIDS care, 21*(8), 967-975.

Guthrie, J.F., Lin, B.H., & Frazao, E. (2002). Role of food prepared away from home in the American diet, 1977-78 versus 1994-96: changes and consequences. *Journal of Nutrition Education and Behavior, 34*(3), 140-150.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2008). *Multivariate data analysis*: Upper Saddle River, NJ: Prentice Hall, Inc.

Hallab, Zaher A. A. (2000). *An exploratory study of the relationship between healthy-living and travel behavior.* (Ph.D. Ph.D.), Virginia Polytechnic Institute and State University, Blacksburg, Virginia. Retrieved from http://ezproxy.lib.vt.edu:8080/login?url=http://proquest.umi.com/pqdweb?did=732056211&Fmt=7&clientId=8956&RQT=309&VName=PQD

Halstead, D., & Page, T.J. (1992). The effects of satisfaction and complaining behavior on consumer repurchase intentions. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior, 5*(1), 1-11.

Hamuleh, Mardani, Vahed, Shahraki, & AR, Piri. (2010). Effects of Education Based on Health Belief Model on Dietary Adherence in Diabetic Patients. *Iranian Journal of Diabetes and Lipid Disorders (Continued from 2012 by: Journal of Diabetes and Metabolic Disorders), 9.*

Han, H., Hsu, L.T.J., & Sheu, C. (2010). Application of the theory of planned behavior to green hotel choice: Testing the effect of environmental friendly activities. *Tourism Management, 31*(3), 325-334.

Harnack, Lisa, & French, Simone. (2008). Effect of point-of-purchase calorie labeling on restaurant and cafeteria food choices: A review of the literature. *International Journal of Behavioral Nutrition and Physical Activity, 5*(1), 51.

Hassandra, M., Vlachopoulos, S.P., Kosmidou, E., Hatzigeorgiadis, A., Goudas, M., & Theodorakis, Y. (2011). Predicting students' intention to smoke by theory of planned behaviour variables and parental influences across school grade levels. *Psychology & Health, 26*(9), 1241-1258.

Hayes, D., & Ross, C.E. (1987). Concern with appearance, health beliefs, and eating habits. *Journal of Health and Social Behavior*, 120-130.

Haywood, K.M. (1988). Repeat patronage: cultivating alliances with customers. *International Journal of Hospitality Management, 7*(3), 225-237.

Haywood, K.M. (1989). Managing word of mouth communications. *Journal of Services Marketing, 3*(2), 55-67.

Hochbaum, G. M. (1958). *Public participation in medical screening programs: A sociopsychological study*. Washington, D.C.: Dept. of Health, Education, and Welfare.

Hounton, S. H., Carabin, H., & Henderson, N. J. (2005). Towards and Understanding of Barriers to Condom Use in Rural Benin Using the Health Belief Model: A Cross Sectional Survey. *BMC Public Health, 5*, 8.

Hu, H.H., Parsa, HG, & Self, J. (2010). The dynamics of green restaurant patronage. *Cornell Hospitality Quarterly, 51*(3), 344-362.

Hu, L., & Bentler, Peter M. (1998). Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychological methods, 3*(4), 424.

Hu, L., & Bentler, Peter M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55.

Janz, Nancy K., & Becker, Marshall H. (1984). The Health Belief Model: A Decade Later. *Health Educ Behav, 11*(1), 1-47. doi: 10.1177/109019818401100101

Jones, L.W., Guill, B., Keir, S.T., Carter, K., Friedman, H.S., Bigner, D.D., & Reardon, D.A. (2007). Using the theory of planned behavior to understand the determinants of exercise intention in patients diagnosed with primary brain cancer. *Psycho Oncology, 16*(3), 232-240.

Josiam, B., & Foster, C. (2009). Nutritional information on restaurant menus: Who cares and why restauranteurs should bother. *International Journal of Contemporary Hospitality Management, 21*(7), 876-891.

Kartal, A., & Ozsoy, S.A. (2007). Validity and reliability study of the Turkish version of Health Belief Model Scale in diabetic patients. *International journal of nursing studies, 44*(8), 1447.

Kasl, S.V., & Cobb, S. (1966a). Health behavior, illness behavior, and sick-role behavior. II. Sick-role behavior. *Archives of environmental health, 12*(4), 531.

Kasl, S.V., & Cobb, S. (1966b). Health behavior, illness behavior, and sick role behavior. I. Health and illness behavior. *Archives of environmental health, 12*(2), 246.

Kelly, R.B., Zyzanski, S.J., & Alemagno, S.A. (1991). Prediction of motivation and behavior change following health promotion: Role of health beliefs, social support, and self-efficacy. *Social science & medicine, 32*(3), 311-320.

Kline, Rex B. (2010). *Principles and practice of structural equation modeling*: Guilford press.

Knight, A.J., Worosz, M.R., & Todd, E.C.D. (2009). Dining for safety: Consumer perceptions of food safety and eating out. *Journal of Hospitality & Tourism Research, 33*(4), 471-486.

Knight, A.J., Worosz, M.R., & Todd, ECD. (2007). Serving food safety: consumer perceptions of food safety at restaurants. *International Journal of Contemporary Hospitality Management, 19*(6), 476-484.

Krukowski, Rebecca A., Harvey-Berino, Jean, Kolodinsky, Jane, Narsana, Rashmi T., & DeSisto, Thomas P. (2006). Consumers May Not Use or Understand Calorie Labeling in Restaurants. *Journal of the American Dietetic Association, 106*(6), 917-920. doi:

DOI: 10.1016/j.jada.2006.03.005

Lando, Amy M., & Labiner-Wolfe, Judith. (2007). Helping Consumers Make More Healthful Food Choices: Consumer Views on Modifying Food Labels and Providing Point-of-Purchase Nutrition Information at Quick-service Restaurants *Journal of Nutrition Education and Behavior, 39*(3), 157.

Lautenschlager, L., & Smith, C. (2007). Understanding gardening and dietary habits among youth garden program participants using the Theory of Planned Behavior. *Appetite, 49*(1), 122-130.

Lee, Sangtak, Lee, Gyumin, & McCleary, Ken. (2013). *Impacts of Calorie Information on Consumers' Decisions at the Point of Purchase in Fast Food Restaurants.* Paper presented at the Annual Graduate Student Research Conference in Hospitality and Tourism, Seattle, WA.

Lee, Sangtak, & McCleary, Ken. (2012). The Relationship between Perceived Health, Health Attitude, and Healthy Offerings for Seniors at Family Restaurants. *Cornell Hospitality Quarterly*. doi: 10.1177/1938965512460344

Levy, Alan S, & Fein, Sara B. (1998). Consumers' ability to perform tasks using nutrition labels. *Journal of Nutrition Education, 30*(4), 210-217.

Lewis, B.R. (1993). Service quality measurement. *Marketing Intelligence & Planning, 11*(4), 4-12.

Lin, B.H., Guthrie, J., & Frazao, E. (1999). Nutrient contribution of food away from home. *America's eating habits: Changes and consequences*, 213-242.

Lin, C., & Morais, D.B. (2009). Transactional versus relational patronizing intentions. *Annals of Tourism Research, 36*(4), 726-730.

Mancino, L., Todd, J., & Lin, B.H. (2009). Separating what we eat from where: Measuring the effect of food away from home on diet quality. *Food Policy, 34*(6), 557-562.

Mason, T.E., & White, K.M. (2008). Applying an extended model of the theory of planned behaviour to breast self-examination. *Journal of health psychology, 13*(7), 946.

Mathers, C.D., & Loncar, D. (2006). Projections of global mortality and burden of disease from 2002 to 2030. *PLoS medicine, 3*(11), e442.

McArthur, Laura H., Holbert, Donald, & Forsythe, William A., III. (2006). Compliance With Food Safety Recommendations Among University Undergraduates: Application of the Health Belief Model. *Family and Consumer Sciences Research Journal, 35*(2), 160-170. doi: 10.1177/1077727x06292932

McFerran, Brent, Dahl, Darren W, Fitzsimons, Gavan J, & Morales, Andrea C. (2010). I'll have what she's having: Effects of social influence and body type on the food choices of others. *Journal of Consumer Research, 36*(6), 915-929.

Mokdad, A.H., Marks, J.S., Stroup, D.F., & Gerberding, J.L. (2004). Actual causes of death in the United States, 2000. *JAMA: the journal of the American Medical Association, 291*(10), 1238-1245.

Mokdad, A.H., Marks, J.S., Stroup, D.F., & Gerberding, J.L. (2005). Correction: actual causes of death in the United States, 2000. *JAMA: the journal of the American Medical Association, 293*(3), 293-294.

Moorman, Christine, Diehl, Kristin, Brinberg, David, & Kidwell, Blair. (2004). Subjective Knowledge, Search Locations, and Consumer Choice. *Journal of Consumer Research, 31*(3), 673-680.

Morais, D.B., & Lin, C.H. (2010). Why do first-time and repeat visitors patronize a destination? *Journal of Travel & Tourism Marketing, 27*(2), 193-210.

Mullan, B.A., & Wong, C.L. (2009). Hygienic food handling behaviours. An application of the Theory of Planned Behaviour. *Appetite, 52*(3), 757-761.

National Restaurant Association. (2008). Industry Forecast Predicts Trends in Healthier Options and "Greener" Restaurants in 2009.   Retrieved April 5, 2009, from National Restaurant   Association http://www.restaurant.org/pressroom/pressrelease.cfm?ID=1726

National   Restaurant   Association.   (2010).   Top   10   Facts   in   2010.

http://www.restaurant.org/research/facts/

National Restaurant Association. (2011a). Chef Survey: What's Hot in 2011. http://www.restaurant.org/pdfs/research/whats_hot_2011.pdf

National Restaurant Association. (2011b). Facts at Glance. Retrieved October 1, 2011, from http://www.restaurant.org/research/facts/

Nayga, Rodolfo M. (2000). Nutrition knowledge, gender, and food label use. *Journal of Consumer Affairs, 34*(1), 97-112.

Nixon, Ron. (2012). New Guidelines Planned on School Vending Machines, *The New York Times*. Retrieved from http://www.nytimes.com/2012/02/21/us/politics/new-rules-planned-on-school-vending-machines.html?_r=0

Norman, P., & Cooper, Y. (2011). The theory of planned behaviour and breast self-examination: Assessing the impact of past behaviour, context stability and habit strength. *Psychology & Health*, 1.

O'Connell, J.K., Price, J.H., Roberts, S.M., Jurs, S.G., & McKinley, R. (1985). Utilizing the health belief model to predict dieting and exercising behavior of obese and nonobese adolescents. *Health Education & Behavior, 12*(4), 343-351.

O'Connell, Janelle K., Price, James H., Roberts, Stephen M., Jurs, Stephen G., & McKinley, Robert. (1985). Utilizing the Health Belief Model to Predict Dieting and Exercising Behavior of Obese and Nonobese Adolescents *Health Education & Behavior, 12*(4), 343.

O'Fallon, M.J., Gursoy, D., & Swanger, N. (2007). To buy or not to buy: Impact of labeling on purchasing intentions of genetically modified foods. *International Journal of Hospitality Management, 26*(1), 117-130.

Ogden, Cynthia L., Carroll, Margaret D., Curtin, Lester R., Lamb, Molly M., & Flegal, Katherine M. (2010). Prevalence of High Body Mass Index in US Children and Adolescents, 2007-2008. *Journal of American Medical Association, 303*(3), 242-249.

Omondi, DO, Walingo, GM, Mbagaya, GM, & Othuon, LO. (2012). Predicting dietary

practice behavior among type 2 diabetics using the theory of planned behavior and mixed methods design. *International Journal of Biological and Life Sciences*, 117-125.

Omondi, DO, Walingo, MK, Mbagaya, GM, & Othuon, LOA. (2010). Advancing the theory of planned behavior within dietary and physical domains among type 2 diabetics: a mixed methods approach. *International Journal of Human and Social Sciences, 5,* 559-566.

Painter, J.E., Borba, C.P.C., Hynes, M., Mays, D., & Glanz, K. (2008). The use of theory in health behavior research from 2000 to 2005: a systematic review. *Annals of Behavioral Medicine, 35*(3), 358-362.

Pallant, Julie. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS*: Open University Press.

Palmer, R.F., Graham, J.W., Taylor, B., & Tatterson, J. (2002). Construct validity in health behavior research: Interpreting latent variable models involving self-report and objective measures. *Journal of behavioral medicine, 25*(6), 525-550.

Parkerson Jr, G.R., Connis, R.T., Broadhead, W.E., Patrick, D.L., Taylor, T.R., & Tse, C.K.J. (1993). Disease-specific versus generic measurement of health-related quality of life in insulin-dependent diabetic patients. *Medical care*, 629-639.

Petrovici, D.A., & Ritson, C. (2006). Factors influencing consumer dietary health preventative behaviours. *BMC Public Health, 6*(1), 222.

Pilling, V.K., Brannon, L.A., Shanklin, C.W., Howells, A.D., & Roberts, K.R. (2008). Identifying specific beliefs to target to improve restaurant employees' intentions for performing three important food safety behaviors. *Journal of the American Dietetic Association, 108*(6), 991-997.

Pizam, A. (1994). Monitoring customer satisfaction. *Food and beverage management: A selection of readings*, 231-247.

Plotnikoff, R.C., Lippke, S., Courneya, K., Birkett, N., & Sigal, R. (2010). Physical activity

and diabetes: An application of the theory of planned behaviour to explain physical activity for Type 1 and Type 2 diabetes in an adult population sample. *Psychology and Health, 25*(1), 7-23.

Povey, R., Conner, M., Sparks, P., James, R., & Shepherd, R. (2000). The theory of planned behaviour and healthy eating: examining additive and moderating effects of social influence variables. *Psychology & Health, 14*(6), 991-1006.

Puhl, R., & Brownell, K.D. (2001). Bias, Discrimination, and Obesity. *Obesity, 9*(12), 788-805.

Raju, Puthankurissi S, Lonial, Subhash C, & Glynn Mangold, W. (1995). Differential effects of subjective knowledge, objective knowledge, and usage experience on decision making: An exploratory investigation. *Journal of Consumer Psychology, 4*(2), 153-180.

Reichheld, F, & Esasser, E. (1990). Zero, defection: quality comes to service. *Harvard business review, 68*(1), 105-111.

Rise, J., Kovac, V., Kraft, P., & Moan, IS. (2008). Predicting the intention to quit smoking and quitting behaviour: Extending the theory of planned behaviour. *British journal of health psychology, 13*(2), 291-310.

Rosenstock, Irwin M., Strecher, Victor J., & Becker, Marshall H. (1988). Social Learning Theory and the Health Belief Model. *Health Education Behavior, 15*(2), 175-183. doi: 10.1177/109019818801500203

Ryu, K., & Jang, S.C.S. (2006). Intention to experience local cuisine in a travel destination: The modified theory of reasoned action. *Journal of Hospitality & Tourism Research, 30*(4), 507-516.

Sapp, S.G., & Jensen, H.H. (2006). An Evaluation of the Health Belief Model for Predicting Perceived and Actual Dietary Quality1. *Journal of Applied Social Psychology, 28*(3), 235-248.

Sapp, Stephen G., & Weng, Chih-Yuan. (2007a). Examination of the health-belief model to

predict the dietary quality and body mass of adults. *International Journal of Consumer Studies, 31*(3), 189-194. doi: 10.1111/j.1470-6431.2006.00500.x

Sapp, Stephen G., & Weng, Chih-Yuan. (2007b). Examination of the health-belief model to predict the dietary quality and body mass of adults. *International Journal of Consumer Studies, 31*(3), 189.

Schaalma, H., Aarø, L.E., Flisher, A.J., Mathews, C., Kaaya, S., Onya, H., . . . Klepp, K.I. (2009). Correlates of intention to use condoms among Sub-Saharan African youth: The applicability of the theory of planned behaviour. *Scandinavian journal of public health, 37*(2 suppl), 87.

Schroeder, S.A. (2007). We can do better—improving the health of the American people. *New England Journal of Medicine, 357*(12), 1221-1228.

Seaman, P., & Eves, A. (2006). The management of food safety—the role of food hygiene training in the UK service sector. *International Journal of Hospitality Management, 25*(2), 278-296.

Sharifirad, G., Entezari, M.H., Kamran, A., & Azadbakht, L. (2009). The effectiveness of nutritional education on the knowledge of diabetic patients using the health belief model. *Journal of research in medical sciences: the official journal of Isfahan University of Medical Sciences, 14*(1), 1.

Shoemaker, S, & Lewis, R. C. (1999). Customer lotalty: The future of hospitality marketing. *international journal of hospitality management, 18*, 345-370.

Sirgy, Joseph , & Tyagi, P.K. (1986). An attempt toward an integrated theory of consumer psychology and decision-making. *Systems Research, 3*(3), 161-175.

Stewart, H, Blisard, N, Bhuyan, S, & Nayga, R. (2004). The Demand for Food Away from Home: Full-Service or Fast Food? *USDA: Economic Research Service.*

Story, Mary, Kaphingst, Karen M., Robinson-O'Brien, Ramona, & Glanz, Karen. (2008). Creating Healthy Food and Eating Environments: Policy and Environmental Approaches. *Annual Reviews Public Health, 29*(April), 253-272.

Sullivan, P.W., Ghushchyan, V., & Ben-Joseph, R.H. (2008). The effect of obesity and cardiometabolic risk factors on expenditures and productivity in the United States. *Obesity, 16*(9), 2155-2162.

Sun, Xinying, Guo, Yan, Wang, Sisun, & Sun, Jing. (2006). Predicting Iron-Fortified Soy Sauce Consumption Intention: Application of the Theory of Planned Behavior and Health Belief Model. *Journal of Nutrition Education and Behavior, 38*(5), 276-285. doi: DOI: 10.1016/j.jneb.2006.04.144

Sun, Yu-Hua Christine. (2008). Health concern, food choice motives, and attitudes toward healthy eating: The mediating role of food choice motives. *Appetite, 51*(1), 42-49. doi: DOI: 10.1016/j.appet.2007.11.004

Susskind, A., & Viccari, A. (2011). A Look at the Relationship between Service Failures, Guest Satisfaction, and Repeat-Patronage Intentions of Casual Dining Guests. *Cornell Hospitality Quarterly, 52*(4), 438-444.

Tandon, Pooja S., Wright, Jeffrey, Zhou, Chuan, Rogers, Cara Beth, & Christakis, Dimitri A. (2010). Nutrition Menu Labeling May Lead to Lower-Calorie Restaurant Meal Choices for Children. *Pediatrics*, peds.2009-1117. doi: 10.1542/peds.2009-1117

Taylor, David, Bury, Michael, Campling, Natasha, Carter, Sarah, Garfied, Sara, Newbould, Jenny, & Rennie, Tim. (2006). *A Review of the use of the Health Belief Model (HBM), the Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB) and the Trans-Theoretical Model (TTM) to study and predict health related behaviour change*. London, UK: National Institute for Health and Clinical Excellence.

Terry, DJ. (1993). Self-efficacy expectancies and the theory of reasoned action. *The theory of reasoned action: Its application to AIDs-preventive behaviour*, 135-151.

U.S. Department of Agriculture. (2010). *Dietary Guidelines for Americans*.   Washington DC: U.S. Government Printing Office.

U.S. Department of Agriculture. (2013). *Child Nutrition Programs*.   Retrieved from http://www.fns.usda.gov/child-nutrition-programs.

U.S. Department of Health and Human Services. (2011). Nutrition, Physical Activity, and Obesity.   Retrieved Feb. 15, 2011

Variyam, Jayachandran N. (2005). Nutrition Labeling in the Food-Away-From-Home Sector: An Economic Assessment. http://www.ers.usda.gov/Publications/ERR4/

Vassallo, Marco, Saba, Anna, Arvola, Anne, Dean, Moira, Messina, Federico, Winkelmann, Markus, . . . Shepherd, Richard. (2009). Willingness to use functional breads. Applying the Health Belief Model across four European countries. *Appetite, 52*(2), 452-460. doi: DOI: 10.1016/j.appet.2008.12.008

Wang, Shiaw-Ling, Charron-Prochownik, Denise, Sereika, Susan M, Siminerio, Linda, & Kim, Yookyung. (2006). Comparing three theories in predicting reproductive health behavioral intention in adolescent women with diabetes. *Pediatric diabetes, 7*(2), 108-115.

Wang, Y., Beydoun, M.A., Liang, L., Caballero, B., & Kumanyika, S.K. (2008). Will all Americans become overweight or obese? Estimating the progression and cost of the US obesity epidemic. *Obesity, 16*(10), 2323-2330.

Watson, H.E., McKenna, M.A., & McLean, GM. (1992). TQM and Services: Implementing Change in the NHS. *International Journal of Contemporary Hospitality Management, 4*(2).

Wei, W., & Miao, L. (2012). Effects of calorie information disclosure on consumers' food choices at restaurants. *International Journal of Hospitality Management*.

Winett, Richard A, Tate, Deborah F, Anderson, Eileen S, Wojcik, Janet R, & Winett, Sheila G. (2005). Long-term weight gain prevention: a theoretically based Internet approach. *Preventive Medicine, 41*(2), 629-641.

Yüksel, A., & Yüksel, F. (2003). Measurement of tourist satisfaction with restaurant services: A segment-based approach. *Journal of Vacation Marketing, 9*(1), 52-68.

Yach, D., Hawkes, C., Gould, C.L., & Hofman, K.J. (2004). The global burden of chronic diseases. *JAMA: the journal of the American Medical Association, 291*(21), 2616-

2622.

Yamamoto, Julienne A., Yamamoto, Joelle B., Yamamoto, Brennan E., & Yamamoto, Loren G. (2005). Adolescent fast food and restaurant ordering behavior with and without calorie and fat content menu information. *Journal of Adolescent Health, 37*(5), 397-402. doi: DOI: 10.1016/j.jadohealth.2004.10.002

Yoon, H.J., & George, T. (2012). Nutritional information disclosure on the menu: Focusing on the roles of menu context, nutritional knowledge and motivation. *International Journal of Hospitality Management*.

APPENDIX A: SURVEY QUESTIONNAIRE AND COVER LETTER

Cover Letter

January 12, 2013

Dear Survey Participant,

Thank you for participating in this study. The purpose of this study is to help us understand

how people make choices on what they eat while dining out in restaurants.

The questionnaire will only take about fifteen minutes to complete. Some questions are about

restaurants in general while others are about casual dining restaurants. A casual dining

restaurant is a restaurant that serves moderately-priced food in a casual atmosphere with table

service. Examples of casual dining restaurants include Applebee's, Denny's, IHOP, Chili's,

T.G.I Friday's, and Outback Steakhouse.

Your participation in this study is greatly appreciated. Your responses will be completely

confidential and used only for academic research purposes. If you have any questions, please

feel free to contact me by phone (540)808-7714 or email plustak@vt.edu

Again, thank you for your time and participation!

Sincerely,

Sangtak (Tak) Lee
Ph.D. Candidate/Graduate Instructor
Department of Hospitality and Tourism Management
Pamplin College of Business
342 Wallace Hall (0429)
Virginia Tech
Blacksburg, VA

Do you visit a casual dining restaurant at least once every month?

Yes _____   No _____

1. The following statements are about possible reasons you might eat healthy foods in restaurants in general. **Please select the number that best indicates how much you agree or disagree with each statement.**

Questions	← Strongly Disagree				Strongly Agree →		
I feel I am doing something good for my body when I eat healthy menu items in restaurants	1	2	3	4	5	6	7
I feel my quality of life will be better if I make healthy food choices in restaurants	1	2	3	4	5	6	7
I feel I can decrease medical expenses if I make healthy food choices in restaurants	1	2	3	4	5	6	7
I feel I can improve my family life if I make healthy food choices in restaurants	1	2	3	4	5	6	7
I feel it will be beneficial to my career if I make healthy food choices in restaurants	1	2	3	4	5	6	7
I feel my social relationships will be better if I make healthy food choices in restaurants	1	2	3	4	5	6	7

2. The following statements are about possible reasons you might not eat healthy foods in restaurants in general. **Please select the number that best indicates how much you agree or disagree with each statement.**

Questions	← Strongly Disagree				Strongly Agree →		
It is hard to give up to the food I enjoy	1	2	3	4	5	6	7
I think healthy menu items in restaurants are too expensive compared to other menu items	1	2	3	4	5	6	7
Healthy menu items are not available in most restaurants	1	2	3	4	5	6	7
I do not like the taste of most foods that are healthy	1	2	3	4	5	6	7
I do not know enough about healthy eating to select healthy menu items in restaurants.	1	2	3	4	5	6	7
Because of lack of information about menu items in restaurants, it is hard to select healthy menu items	1	2	3	4	5	6	7
Even though there are numerous recommendations about healthy ways to eat, it is hard to know what to believe	1	2	3	4	5	6	7
My friends do not eat healthy menu items in restaurants and I do not want to be different	1	2	3	4	5	6	7

3. The following statements are about whether you think you can healthy foods in restaurants in general. **Please select the number that best indicates how much you agree or disagree with each statement.**

Questions	← Strongly Disagree				Strongly Agree →		
If I try, I am sure that I can maintain a diet high in nutrition	1	2	3	4	5	6	7
If I want to, I feel that I would be able to follow a diet high in nutrition	1	2	3	4	5	6	7
Realistically speaking, I am confident that if I want to, I can increase the amount of healthy restaurant menu items I consume	1	2	3	4	5	6	7
I feel I have the ability to select healthy foods in restaurants	1	2	3	4	5	6	7

4. The following statements are about negative things that you may think could happen if you do not eat healthy foods in restaurants in general. **Please select the number that best indicates how much you agree or disagree with each statement.**

Questions	← Strongly Disagree				Strongly Agree →		
I feel my chances of having serious health problems in the future are high if I eat unhealthy menu items in restaurants	1	2	3	4	5	6	7
If I get a disease/illness because of unhealthy eating habits, it will have a severe negative influence on my quality of life	1	2	3	4	5	6	7
I will have long-lasting negative effects if I do not make healthy food choices in restaurants	1	2	3	4	5	6	7
I will have higher medical expenses if I do not make healthy food choices in restaurants	1	2	3	4	5	6	7
I will hurt my family life if I do not make healthy food choices in restaurants	1	2	3	4	5	6	7
I will harm my career if I do not make healthy food choices in restaurants	1	2	3	4	5	6	7
My social relationships will suffer if I do not make healthy food choices in restaurants	1	2	3	4	5	6	7

5. The following questions are about what you think about eating healthy foods in restaurants in general. **Please select the number that best indicates your agreement with the words below.**

Overall, I think that eating healthy menu items in restaurants is…

← *Enjoyable*					*Unenjoyable* →	
1	2	3	4	5	6	7

← *Good*					*Bad* →	
1	2	3	4	5	6	7

← *Foolish*					*Wise* →	
1	2	3	4	5	6	7

← *Harmful*					*Beneficial* →	
1	2	3	4	5	6	7

← *Pleasant*					*Unpleasant* →	
1	2	3	4	5	6	7

← *Desirable*					*Undesirable* →	
1	2	3	4	5	6	7

← *Important*					*Unimportant* →	
1	2	3	4	5	6	7

← *Favorable*					*Unfavorable* →	
1	2	3	4	5	6	7

---

6. The following statements are about what others think. **Please select the number that best indicates how much you agree or disagree with each statement.**

Questions	← Strongly Disagree					Strongly Agree →	
Most people who are important to me think I should choose healthy menu items in restaurants	1	2	3	4	5	6	7
Most people I know will think eating healthy menu items in restaurants is a good idea	1	2	3	4	5	6	7
People whose opinions I value would prefer that I choose healthy menu items in restaurants	1	2	3	4	5	6	7

7. The following statements are about whether you have control over eating healthy foods in restaurants in general. **Please select the number that best fits with each statement.**

Questions							
How easy or difficult do you think it is to select healthy menu items in restaurants?	← Extremely difficult				Extremely easy →		
	1	2	3	4	5	6	7
How confident are you that you could eat a healthy diet in restaurants if you wanted to?	← Not at all confident			Extremely confident →			
	1	2	3	4	5	6	7
How much control do you feel you would have over eating a healthy diet in restaurants?	← No control				Complete control →		
	1	2	3	4	5	6	7
To what extent is it up to you whether or not you eat a healthy diet in restaurants?	← Not at all				Great extent →		
	1	2	3	4	5	6	7
It is my responsibility to decide whether or not to eat healthy menu items in restaurants	← Strongly Disagree				Strongly Agree →		
	1	2	3	4	5	6	7
Considering the price and the availability, I feel that it is up to me whether or not to eat healthy menu items in restaurants	← Strongly Disagree				Strongly Agree →		
	1	2	3	4	5	6	7

8. The following statements are about providing nutrition information in restaurants in general. **Please select the number that best indicates how much you agree or disagree with each statement.**

Questions	← Strongly Disagree				Strongly Agree →		
I would pay more attention to my food choices if restaurants provided nutrition information on the menu or menu board	1	2	3	4	5	6	7
I would use nutrition information on the menu or menu board when I select menu items in restaurants if it was provided	1	2	3	4	5	6	7
Nutrition information would be useful when I select menu items in restaurants	1	2	3	4	5	6	7
I would choose healthier food in restaurants if I had nutrition information	1	2	3	4	5	6	7
I have used nutrition information for selecting menu items when restaurants provided nutrition information.	1	2	3	4	5	6	7
I have noticed that some restaurants currently provide nutrition information	1	2	3	4	5	6	7

9. The following statements are about how much you know about nutrition. **Please select the number that best fits with each statement.**

Questions							
How would you rate your knowledge of nutrition information compared to the average consumer	← Much less 1	2	3	4	5	Much more → 6	7
How would you rate your confidence in using nutrition information for food choices compared to the average consumer	← Much less 1	2	3	4	5	Much more → 6	7
I feel confident about my ability to understand nutrition information on product labels	← Strongly Disagree 1	2	3	4	5	Strongly Agree → 6	7

10. The following statements are more about your knowledge of nutrition. **Please select the number that best indicates how much you agree or disagree with each statement.**

Questions	True	False
Whole milk is a better source of calcium than skimmed milk		
Removing the skin from chicken reduces the fat content		
Eating more bread helps to increase protein in the diet		
Any type of fat may damage a person's health		
A high intake of salt may increase blood pressure		
Butter contains more cholesterol than margarine		
The daily calorie intake should not exceed in general 3200		
No more than a third of calories should come from fat		
White bread is more nutritious than whole wheat bread		
Soy beans are a good source of protein		
Cholesterol is found only in foods containing fat or oil		

11. The following statements are about whether you intend to eat healthy foods when you eat at casual dining restaurants. Examples of casual dining restaurants include Applebee's, Denny's, IHOP, Chili's, T.G.I Friday's, and Outback Steakhouse. **Please select the number that best indicates how much you agree or disagree with each statement.**

Questions	← Strongly Disagree				Strongly Agree →		
I am willing to select healthy menu items in casual dining restaurants	1	2	3	4	5	6	7
I plan to select healthy menu items when I go to casual dining restaurants	1	2	3	4	5	6	7
I will make an effort to select healthy menu items in restaurants	1	2	3	4	5	6	7

12. The following statements are about your healthy eating behavior in casual dining restaurants. Examples of casual dining restaurants include Applebee's, Denny's, IHOP, Chili's, T.G.I Friday's, and Outback Steakhouse. **Please select the number that best indicates how much you agree or disagree with each statement.**

Questions	← Strongly Disagree				Strongly Agree →		
I try to eat menu items with fresh ingredients in casual dining restaurants	1	2	3	4	5	6	7
I try to eat menu items rich in fiber in casual dining restaurants	1	2	3	4	5	6	7
I often choose menu items with low animal fat content in casual dining restaurants	1	2	3	4	5	6	7
I try to eat menu items with low or no salt in casual dining restaurants	1	2	3	4	5	6	7
I try to eat menu items with low cholesterol in casual dining restaurants	1	2	3	4	5	6	7
I try to eat menu items with low calories in casual dining restaurants	1	2	3	4	5	6	7
I try to avoid stimulants (coffee, cola) in casual dining restaurants	1	2	3	4	5	6	7
I try to have a balanced diet in casual dining restaurants	1	2	3	4	5	6	7
I do not eat some menu items in casual dining restaurants because they make me fat	1	2	3	4	5	6	7
I do not care about selecting healthy menu items in casual dining restaurants	1	2	3	4	5	6	7
I try to eat at least one fruit or vegetable when I eat at casual dining restaurants.	1	2	3	4	5	6	7

13. The following statements are about your willingness to patronize a casual dining restaurant that provides healthy menu items. Examples of casual dining restaurants include Applebee's, Denny's, IHOP, Chili's, T.G.I Friday's, and Outback Steakhouse. **Please select the number that best indicates how much you agree or disagree with each statement.**

Questions	← Strongly Disagree				Strongly Agree →		
I am willing to frequently visit restaurants that provide healthy menu choices	1	2	3	4	5	6	7
I am likely to visit restaurants that provide healthy menu choices	1	2	3	4	5	6	7
When I dine out next time, I will visit a restaurant that provides healthy menu choices	1	2	3	4	5	6	7
I am willing to recommend restaurants that offer healthy menu items, to people who seek advice	1	2	3	4	5	6	7
I will say positive things to other people about restaurants that offer healthy menu items	1	2	3	4	5	6	7
I will recommend to my family and friends restaurants that offer healthy menu items	1	2	3	4	5	6	7

14. Please answer following questions about yourself.

On average, how many times do you go to casual dining restaurants per month? _____

Gender: __ Male   __ Female

In what year were you born (year): _____

How many people are in your household (include yourself): ____

Marital Status: __ Married   __ Single

In which state do you currently live?   _____

In which area do you currently live? Rural _____   Suburban _____   Urban _____

Highest Education Level Completed:
__ Less than High School   __ High School diploma   __ Some college
__ Bachelor's degree   __ Graduate degree

How would you describe your current occupational status?
__ Working full-time   __ Working part-time   __ Not working (Retired or unemployed)

Please tell me how much income you have per month? Please include all sources such as stocks, pension, wages, and etc. (This is anonymous)
__ Less than $ 1,000
__ $ 1,000 to $ 3,999
__ $ 4,000 to $ 6, 999
__ $ 7,000 to $ 9,999
__ $ More than $ 10,000

What is your height?   _____ Feet _____ Inches

What is your weight? (This is anonymous)   _____ Pounds

What is your ethnic background?
___ African American   ___ Asian
___ Hispanic   ___ Caucasian/White
___ Other (Please specify) _____

Which type of restaurant do you go to most often? (check only one)
__ Fast-food restaurants   __ Fast casual-dining restaurants
__ Family restaurants   __ Casual dining restaurants
__ Fine dining restaurants   __ Others
(   )

APPENDIX B: HUMAN SUBJECT APPROVAL LETTER

VirginiaTech

Office of Research Compliance
Institutional Review Board
2000 Kraft Drive, Suite 2000 (0497)
Blacksburg, VA 24060
540/231-4606 Fax 540/231-0959
email irb@vt.edu
website http://www.irb.vt.edu

MEMORANDUM

DATE:	February 5, 2013
TO:	Ken McCleary, Sang Tak Lee
FROM:	Virginia Tech Institutional Review Board (FWA00000572, expires May 31, 2014)
PROTOCOL TITLE:	Healthy eating behavior in restaurants
IRB NUMBER:	13-109

Effective February 5, 2013, the Virginia Tech Institution Review Board (IRB) Chair, David M Moore, approved the New Application request for the above-mentioned research protocol.

This approval provides permission to begin the human subject activities outlined in the IRB-approved protocol and supporting documents.

Plans to deviate from the approved protocol and/or supporting documents must be submitted to the IRB as an amendment request and approved by the IRB prior to the implementation of any changes, regardless of how minor, except where necessary to eliminate apparent immediate hazards to the subjects. Report within 5 business days to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subjects or others.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

http://www.irb.vt.edu/pages/responsibilities.htm

(Please review responsibilities before the commencement of your research.)

PROTOCOL INFORMATION:

Approved As:	**Exempt, under 45 CFR 46.110 category(ies) 2**
Protocol Approval Date:	**February 5, 2013**
Protocol Expiration Date:	**N/A**
Continuing Review Due Date*:	**N/A**

*Date a Continuing Review application is due to the IRB office if human subject activities covered under this protocol, including data analysis, are to continue beyond the Protocol Expiration Date.

FEDERALLY FUNDED RESEARCH REQUIREMENTS:

Per federal regulations, 45 CFR 46.103(f), the IRB is required to compare all federally funded grant proposals/work statements to the IRB protocol(s) which cover the human research activities included in the proposal / work statement before funds are released. Note that this requirement does not apply to Exempt and Interim IRB protocols, or grants for which VT is not the primary awardee.

The table on the following page indicates whether grant proposals are related to this IRB protocol, and which of the listed proposals, if any, have been compared to this IRB protocol, if required.

Invent the Future

Date*	OSP Number	Sponsor	Grant Comparison Conducted?

* Date this proposal number was compared, assessed as not requiring comparison, or comparison information was revised.

If this IRB protocol is to cover any other grant proposals, please contact the IRB office (irbadmin@vt.edu) immediately.

APPENDIX C: DESCRIPTIVE STATISTICS OF CONSTRUCTS

Table C.1 Descriptive Statistics of Constructs

Constructs and Items	*M*	*SD*
Perceived Benefits (α=.918)	*4.83*	*1.23*
I feel I am doing something good for my body when I eat healthy menu items in restaurants	5.21	1.31
I feel my quality of life will be better if I make healthy food choices in restaurants	5.27	1.29
I feel I can decrease medical expenses if I make healthy food choices in restaurants	5.00	1.37
I feel I can improve my family life if I make healthy food choices in restaurants	4.85	1.45
I feel it will be beneficial to my career if I make healthy food choices in restaurants	4.34	1.66
I feel my social relationships will be better if I make healthy food choices in restaurants	4.30	1.65
Perceived Barriers (α=.863)	*4.08*	*1.15*
It is hard to give up to the food I enjoy	5.30	1.36
I think healthy menu items in restaurants are too expensive compared to other menu items	4.23	1.59
Healthy menu items are not available in most restaurants	4.26	1.54
I do not like the taste of most foods that are healthy	3.87	1.66
I do not know enough about healthy eating to select healthy menu items in restaurants.	3.41	1.68
Because of lack of information about menu items in restaurants, it is hard to select healthy menu items	3.94	1.64
Even though there are numerous recommendations about healthy ways to eat, it is hard to know what to believe	4.30	1.58
My friends do not eat healthy menu items in restaurants and I do not want to be different	3.32	1.74
Perceived Self-efficacy (α=.927)	*5.31*	*1.07*
If I try, I am sure that I can maintain a diet high in nutrition	5.31	1.18
If I want to, I feel that I would be able to follow a diet high in nutrition	5.23	1.22
Realistically speaking, I am confident that if I want to, I can increase the amount of healthy restaurant menu items I consume	5.32	1.16
I feel I have the ability to select healthy foods in restaurants	5.38	1.16

(Continued)

Table C.1 Descriptive Statistics of Constructs (continued)

Constructs and Items	*M*	*SD*
Perceived Threat (α=.934)	*4.37*	*1.29*
I feel my chances of having serious health problems in the future are high if I eat unhealthy menu items in restaurants	4.77	1.50
If I get a disease/illness because of unhealthy eating habits, it will have a severe negative influence on my quality of life	5.09	1.33
I will have long-lasting negative effects if I do not make healthy food choices in restaurants	4.56	1.43
I will have higher medical expenses if I do not make healthy food choices in restaurants	4.49	1.44
I will hurt my family life if I do not make healthy food choices in restaurants	4.23	1.58
I will harm my career if I do not make healthy food choices in restaurants	3.76	1.67
My social relationships will suffer if I do not make healthy food choices in restaurants	3.70	1.70
Response to Provision of Nutrition Information (α=.935)	*4.85*	*1.37*
I would pay more attention to my food choices if restaurants provided nutrition information on the menu or menu board	4.64	1.64
I would use nutrition information on the menu or menu board when I select menu items in restaurants if it was provided	4.82	1.62
Nutrition information would be useful when I select menu items in restaurants	4.96	1.55
I would choose healthier food in restaurants if I had nutrition information	4.72	1.67
I have used nutrition information for selecting menu items when restaurants provided nutrition information.	4.72	1.67
I have noticed that some restaurants currently provide nutrition information	5.25	1.35
Subjective Knowledge of Nutrition (α=.904)	*5.09*	*1.12*
How would you rate your knowledge of nutrition information compared to the average consumer	4.91	1.30
How would you rate your confidence in using nutrition information for food choices compared to the average consumer	4.99	1.23
I feel confident about my ability to understand nutrition information on product labels	5.37	1.14
Objective Knowledge of Nutrition (α=N/A)	*8.61*	*1.78*
The number of right answers		

(Continued)

Table C.1 Descriptive Statistics of Constructs (continued)

Constructs and Items	*M*	*SD*
Attitude toward Healthy Eating Behavior (α=.945)	*5.16*	*1.12*
Enjoyable to Unenjoyable	4.89	1.32
Good to Bad	5.38	1.15
Pleasant to Unpleasant	5.06	1.31
Desirable to Undesirable	5.19	1.31
Important to Unimportant	5.28	1.26
Favorable Unfavorable	5.17	1.23
Subjective Norm (α=.911)	*4.72*	*1.26*
Most people who are important to me think I should choose healthy menu items in restaurants	4.49	1.43
Most people I know will think eating healthy menu items in restaurants is a good idea	4.99	1.28
People whose opinions I value would prefer that I choose healthy menu items in restaurants	4.67	1.37
Perceived Behavioral Control (α=.849)	*4.85*	*1.17*
How easy or difficult do you think it is to select healthy menu items in restaurants?	4.28	1.52
How confident are you that you could eat a healthy diet in restaurants if you wanted to?	4.79	1.42
How much control do you feel you would have over eating a healthy diet in restaurants?	4.84	1.37
To what extent is it up to you whether or not you eat a healthy diet in restaurants?	5.47	1.34
Intention to Eat Healthy Menu Items (α=.954)	*5.05*	*1.33*
I am willing to select healthy menu items in casual dining restaurants	5.22	1.32
I plan to select healthy menu items when I go to casual dining restaurants	4.92	1.44
I will make an effort to select healthy menu items in restaurants	5.01	1.40

(Continued)

Table C.1 Descriptive Statistics of Constructs (continued)

Constructs and Items	*M*	*SD*
Healthy Eating Behavior (α=.933)	*4.67*	*1.18*
I try to eat menu items with fresh ingredients in casual dining restaurants	5.27	1.23
I try to eat menu items rich in fiber in casual dining restaurants	4.67	1.63
I often choose menu items with low animal fat content in casual dining restaurants	4.68	1.45
I try to eat menu items with low or no salt in casual dining restaurants	4.54	1.57
I try to eat menu items with low cholesterol in casual dining restaurants	4.62	1.39
I try to eat menu items with low calories in casual dining restaurants	4.60	1.47
I try to avoid stimulants (coffee, cola) in casual dining restaurants	3.98	1.90
I try to have a balanced diet in casual dining restaurants	4.91	1.32
I do not eat some menu items in casual dining restaurants because they make me fat	4.44	1.70
I try to eat at least one fruit or vegetable when I eat at casual dining restaurants.	5.00	1.46
Willingness to Patronize a Restaurant (α=.965)	*5.07*	*1.25*
I am willing to frequently visit restaurants that provide healthy menu choices	5.19	1.30
I am likely to visit restaurants that provide healthy menu choices	5.12	1.37
When I dine out next time, I will visit a restaurant that provides healthy menu choices	4.86	1.35
I am willing to recommend restaurants that offer healthy menu items, to people who seek advice	5.07	1.36
I will say positive things to other people about restaurants that offer healthy menu items	5.11	1.37
I will recommend to my family and friends restaurants that offer healthy menu items	5.06	1.38

APPENDIX D: COVARIANCE MATRIX OF MEASUREMENT MODEL

Table D.1 Covariance Matrix of Measurement Model

	Benef_1	Benef_2	Benef_3	Benef_4	Benef_5	Benef_6	Barri_1	Barri_2	Barri_3	Barri_4	Barri_5
Benef_1	1.72										
Benef_2	1.34	1.65									
Benef_3	1.26	1.34	1.89								
Benef_4	1.18	1.27	1.42	2.1							
Benef_5	0.98	1.11	1.44	1.84	2.75						
Benef_6	1.03	1.15	1.37	1.79	2.38	2.73					
Barri_1	0.2	0.16	0.15	0.01	-0.04	0.09	1.86				
Barri_2	-0.19	-0.14	0.06	0.1	0.29	0.33	0.66	2.53			
Barri_3	0.04	0.14	0.28	0.42	0.68	0.64	0.3	1.16	2.39		
Barri_4	-0.52	-0.59	-0.27	-0.08	0.14	0.12	0.78	1.22	0.87	2.77	
Barri_5	-0.28	-0.23	0.08	0.29	0.53	0.63	0.58	1.04	1.17	1.52	2.83
Barri_6	0.03	0.12	0.35	0.38	0.62	0.6	0.62	0.93	1.44	1.13	1.83
Barri_7	0.08	0.11	0.22	0.24	0.36	0.45	0.82	0.94	1.16	1.1	1.56
Barri_8	-0.16	-0.1	0.11	0.37	0.75	0.79	0.77	1.18	1.08	1.56	1.84
Effica_1	0.64	0.68	0.61	0.59	0.65	0.6	0.12	0.03	0.07	-0.27	-0.21
Effica_2	0.65	0.72	0.63	0.63	0.68	0.64	0.07	0.04	0.14	-0.35	-0.28
Effica_3	0.69	0.67	0.65	0.59	0.59	0.55	0.09	-0.05	0.01	-0.29	-0.33
Effica_4	0.71	0.69	0.61	0.58	0.53	0.53	0.17	-0.07	-0.08	-0.28	-0.39
Threat_1	0.84	1.04	1.17	1.01	1.17	1.1	0.22	0.34	0.48	-0.24	0.24
Threat_2	0.68	0.82	0.79	0.75	0.78	0.71	0.27	0.12	0.28	-0.2	-0.02
Threat_3	0.82	0.99	1.16	1.02	1.24	1.12	0.15	0.35	0.47	-0.27	0.24
Threat_4	0.83	0.99	1.21	1.04	1.26	1.18	0.18	0.4	0.52	-0.21	0.28
Threat_5	0.76	0.93	1.12	1.47	1.73	1.65	0.03	0.48	0.63	0.06	0.58
Threat_6	0.57	0.76	1.05	1.29	1.98	1.82	0.1	0.69	0.87	0.31	0.92
Threat_7	0.54	0.74	1.02	1.35	1.93	1.93	0.12	0.76	0.81	0.41	0.98
N_Info_1	0.87	0.98	0.96	0.96	0.93	0.92	0	0.18	0.55	-0.4	0.28
N_Info_2	0.98	1.08	1.05	0.97	0.92	0.97	-0.04	0.07	0.5	-0.55	0.09
N_Info_3	0.95	1.07	0.99	0.95	0.88	0.87	0.12	0.14	0.43	-0.45	0.08
N_Info_4	0.96	1.1	1.03	1.03	1	1.01	0.03	0.19	0.54	-0.45	0.17
N_Info_5	0.99	1.09	1.12	1.04	1.14	1.11	-0.14	0.16	0.44	-0.4	-0.02
N_Info_6	0.56	0.51	0.44	0.51	0.46	0.54	0.12	0.01	0.02	-0.09	-0.23
Sub_K_1	0.52	0.47	0.56	0.58	0.69	0.66	-0.02	0.09	0.28	-0.15	-0.21
Sub_K_2	0.47	0.44	0.46	0.47	0.55	0.58	0.02	0.07	0.23	-0.25	-0.28
Sub_K_3	0.4	0.42	0.38	0.31	0.31	0.35	0.12	0	0.1	-0.26	-0.4
Obj_K_T	0.25	0.18	-0.13	-0.34	-0.6	-0.7	0.05	-0.43	-0.44	-0.74	-1.03
Atti_1	0.84	0.93	0.84	0.84	0.78	0.82	-0.19	-0.3	0.1	-0.84	-0.17
Atti_2	0.81	0.81	0.73	0.66	0.6	0.61	-0.08	-0.31	-0.06	-0.66	-0.4
Atti_3	0.85	0.94	0.86	0.86	0.76	0.81	-0.2	-0.28	0.04	-0.81	-0.26
Atti_4	0.86	0.9	0.82	0.78	0.71	0.77	-0.15	-0.27	0.11	-0.75	-0.25
Atti_5	0.92	0.99	0.92	0.92	0.85	0.89	-0.02	-0.24	0.06	-0.64	-0.3
Atti_6	0.91	0.96	0.91	0.83	0.76	0.87	-0.07	-0.22	0.04	-0.76	-0.33
Sub_No_1	0.74	0.78	0.8	0.97	1.06	1.1	0.11	0.18	0.26	-0.09	0.04
Sub_No_2	0.83	0.9	0.77	0.8	0.73	0.79	0.15	-0.07	-0.04	-0.41	-0.11
Sub_No_3	0.75	0.83	0.83	0.91	1.06	1.07	0.09	0.1	0.13	-0.19	0.02
Beh_Co_1	0.43	0.33	0.28	0.3	0.25	0.27	-0.3	-0.4	-0.48	-0.47	-0.56
Beh_Co_2	0.61	0.47	0.37	0.28	0.22	0.26	-0.13	-0.4	-0.4	-0.6	-0.7
Beh_Co_3	0.5	0.36	0.36	0.24	0.13	0.18	-0.02	-0.38	-0.4	-0.48	-0.59
Beh_Co_4	0.51	0.39	0.27	0.12	-0.06	-0.03	0.17	-0.32	-0.31	-0.49	-0.59
WillM_1	1.1	1.14	0.97	0.9	0.73	0.78	0.03	-0.19	0.12	-0.81	-0.4
WillM_2	1.13	1.2	1.09	1.01	1	1.04	-0.05	-0.15	0.3	-0.71	-0.14
WillM_3	1.09	1.2	1.08	1.04	1	1.06	-0.1	-0.13	0.21	-0.78	-0.19
HealM_1	0.76	0.85	0.76	0.72	0.67	0.65	-0.03	-0.12	0.13	-0.53	-0.36
HealM_2	0.76	0.85	0.86	1.04	1.11	1.11	-0.12	-0.06	0.47	-0.32	0.08
HealM_3	1	1.06	1.09	0.96	1.03	1.1	-0.1	-0.04	0.41	-0.47	-0.02
HealM_4	0.74	0.94	0.88	0.9	1.01	1	-0.1	-0.05	0.36	-0.51	0.24
HealM_5	0.91	0.99	1.03	0.98	1.05	1.07	-0.06	0.02	0.37	-0.43	0.09
HealM_6	0.98	1.06	1.08	1.08	1.12	1.11	-0.06	0.11	0.37	-0.44	0.11
HealM_7	0.67	0.73	0.87	1.04	1.31	1.31	-0.31	0.31	0.63	-0.19	0.64
HealM_8	0.81	0.88	0.9	0.76	0.82	0.83	-0.1	0.08	0.29	-0.43	-0.12
HealM_9	0.77	0.94	0.99	0.85	1.1	1.09	0.04	0.31	0.61	-0.31	0.26
HealM_10	0.74	0.82	0.77	0.74	0.79	0.88	-0.12	0.06	0.39	-0.58	-0.14
Patro_1	0.99	1.04	0.89	0.86	0.74	0.83	0.05	-0.16	0.2	-0.63	-0.26
Patro_2	1.03	1.12	0.99	0.96	0.87	0.95	0	-0.15	0.25	-0.76	-0.23
Patro_3	0.96	1.03	1.04	1.01	1.03	1.1	-0.07	-0.03	0.3	-0.54	-0.06
Patro_4	0.93	1.02	0.99	0.95	1.04	1.12	0.03	-0.02	0.3	-0.57	-0.2
Patro_5	0.97	1.01	0.97	0.97	1.03	1.11	0.01	0.01	0.33	-0.56	-0.23
Patro_6	1.02	1.07	1.02	1.02	1.07	1.15	0	-0.01	0.3	-0.58	-0.27

(continued)

	Barri_6	Barri_7	Barri_8	Effica_1	Effica_2	Effica_3	Effica_4	Threat_1	Threat_2	Threat_3	Threat_4	Threat_5
Barri_6	2.7											
Barri_7	1.77	2.51										
Barri_8	1.48	1.35	3.04									
Effica_1	-0.03	0	0	1.4								
Effica_2	-0.07	-0.06	-0.08	1.26	1.49							
Effica_3	-0.15	-0.07	-0.13	1.05	1.16	1.34						
Effica_4	-0.28	-0.06	-0.22	0.88	0.97	1.04	1.35					
Threat_1	0.63	0.27	0.34	0.56	0.62	0.63	0.59	2.25				
Threat_2	0.39	0.21	0.15	0.66	0.7	0.71	0.64	1.33	1.77			
Threat_3	0.51	0.27	0.38	0.58	0.66	0.63	0.57	1.65	1.2	2.05		
Threat_4	0.57	0.34	0.4	0.52	0.58	0.55	0.54	1.64	1.2	1.79	2.07	
Threat_5	0.68	0.39	0.77	0.5	0.59	0.51	0.46	1.64	1.11	1.67	1.79	2.51
Threat_6	0.94	0.59	1.13	0.42	0.52	0.36	0.33	1.47	0.9	1.53	1.63	2.13
Threat_7	0.95	0.64	1.26	0.39	0.48	0.32	0.32	1.39	0.87	1.47	1.61	2.13
N_Info_1	0.86	0.45	0.35	0.56	0.64	0.59	0.44	1.14	0.77	1.1	1.1	1.07
N_Info_2	0.73	0.32	0.15	0.7	0.81	0.69	0.53	1.1	0.86	1.08	1.07	1.01
N_Info_3	0.71	0.32	0.12	0.59	0.68	0.61	0.49	1.1	0.86	1.06	1.07	1.03
N_Info_4	0.84	0.47	0.27	0.7	0.81	0.66	0.52	1.11	0.82	1.14	1.12	1.12
N_Info_5	0.61	0.19	0.17	0.63	0.76	0.65	0.5	1.09	0.78	1.17	1.2	1.14
N_Info_6	-0.12	-0.06	-0.1	0.53	0.57	0.6	0.54	0.52	0.57	0.58	0.53	0.52
Sub_K_1	-0.03	-0.14	0.1	0.77	0.82	0.7	0.61	0.51	0.52	0.54	0.54	0.51
Sub_K_2	-0.13	-0.16	0.08	0.74	0.79	0.71	0.63	0.46	0.51	0.51	0.45	0.4
Sub_K_3	-0.12	-0.09	-0.09	0.74	0.75	0.71	0.65	0.4	0.5	0.43	0.4	0.23
Obj_K_T	-0.59	-0.53	-1.08	0.26	0.25	0.24	0.22	0.03	0.36	-0.01	-0.07	-0.32
Atti_1	0.05	-0.02	-0.3	0.52	0.61	0.49	0.45	0.67	0.44	0.63	0.66	0.66
Atti_2	-0.1	-0.19	-0.42	0.44	0.49	0.46	0.47	0.63	0.62	0.61	0.64	0.56
Atti_3	0.01	-0.03	-0.39	0.51	0.62	0.45	0.53	0.7	0.51	0.66	0.69	0.65
Atti_4	0.09	0.04	-0.35	0.52	0.62	0.5	0.49	0.68	0.56	0.69	0.7	0.6
Atti_5	0.05	0.01	-0.33	0.45	0.56	0.5	0.53	0.95	0.66	0.85	0.85	0.83
Atti_6	0.01	-0.03	-0.38	0.47	0.58	0.5	0.53	0.83	0.55	0.74	0.77	0.73
Sub_No_1	0.28	0.17	0.2	0.55	0.59	0.55	0.56	0.94	0.8	0.87	0.94	1.06
Sub_No_2	0.01	0.05	-0.15	0.63	0.69	0.65	0.71	0.91	0.83	0.83	0.82	0.82
Sub_No_3	0.16	0.16	0.1	0.58	0.61	0.6	0.63	0.99	0.83	0.92	0.93	0.99
Beh_Co_1	-0.8	-0.5	-0.36	0.58	0.56	0.63	0.66	0.02	0.18	0.16	0.1	-0.01
Beh_Co_2	-0.69	-0.42	-0.56	0.79	0.84	0.89	0.86	0.27	0.43	0.38	0.31	0.23
Beh_Co_3	-0.73	-0.45	-0.53	0.57	0.61	0.67	0.72	0.1	0.34	0.2	0.16	0.03
Beh_Co_4	-0.46	-0.26	-0.61	0.6	0.58	0.68	0.79	0.31	0.54	0.26	0.21	0.04
WillM_1	0.11	0.07	-0.3	0.72	0.84	0.74	0.64	0.88	0.75	0.85	0.8	0.67
WillM_2	0.3	0.27	-0.04	0.77	0.87	0.77	0.71	1.01	0.81	1.03	0.98	0.9
WillM_3	0.24	0.23	-0.12	0.77	0.87	0.76	0.7	1.03	0.8	1.05	1	0.94
HealM_1	-0.04	-0.02	-0.25	0.7	0.73	0.68	0.61	0.69	0.6	0.65	0.6	0.53
HealM_2	0.27	0.22	0.15	0.58	0.7	0.6	0.51	0.77	0.6	0.82	0.81	0.86
HealM_3	0.38	0.16	0.14	0.7	0.79	0.69	0.65	1.05	0.76	1.07	1.05	0.98
HealM_4	0.46	0.24	0.37	0.59	0.68	0.55	0.52	0.9	0.63	0.96	0.84	0.87
HealM_5	0.42	0.23	0.24	0.65	0.74	0.62	0.61	0.97	0.65	1	0.97	0.97
HealM_6	0.36	0.28	0.27	0.7	0.78	0.66	0.6	0.99	0.63	1.11	1.06	1.07
HealM_7	0.68	0.35	0.66	0.5	0.65	0.46	0.51	1.03	0.51	0.99	1.09	1.37
HealM_8	0.25	0.2	0.02	0.7	0.74	0.69	0.62	0.92	0.69	0.85	0.87	0.8
HealM_9	0.69	0.3	0.28	0.6	0.72	0.52	0.5	1.13	0.72	1.13	1.08	1.14
HealM_10	0.23	0.1	-0.19	0.68	0.75	0.6	0.59	0.83	0.62	0.7	0.78	0.71
Patro_1	0.19	0.12	-0.24	0.71	0.79	0.73	0.64	0.84	0.73	0.76	0.78	0.64
Patro_2	0.24	0.13	-0.19	0.73	0.85	0.77	0.71	0.98	0.82	0.91	0.91	0.81
Patro_3	0.3	0.24	-0.06	0.69	0.81	0.74	0.71	0.94	0.76	0.95	0.95	0.9
Patro_4	0.25	0.13	-0.11	0.66	0.76	0.71	0.62	1	0.8	0.93	0.92	0.91
Patro_5	0.27	0.21	-0.11	0.7	0.78	0.75	0.62	0.94	0.76	0.92	0.92	0.88
Patro_6	0.23	0.18	-0.15	0.71	0.8	0.79	0.69	0.98	0.78	0.92	0.94	0.9

(continued)

Table D.1 Covariance Matrix of Measurement Model (continued)

	Threat_6	Threat_7	N_Info_1	N_Info_2	N_Info_3	N_Info_4	N_Info_5	N_Info_6	Sub_K_1	Sub_K_2	Sub_K_3	Obj_K_T
Threat_6	2.81											
Threat_7	2.53	2.88										
N_Info_1	0.98	0.97	2.69									
N_Info_2	0.94	0.91	2.31	2.63								
N_Info_3	0.9	0.84	2.14	2.24	2.39							
N_Info_4	1.04	1.02	2.29	2.33	2.22	2.59						
N_Info_5	1.09	1.05	1.95	2.13	1.98	2.15	2.8					
N_Info_6	0.32	0.32	0.75	0.87	0.92	0.86	1.16	1.83				
Sub_K_1	0.56	0.48	0.62	0.72	0.59	0.71	0.81	0.58	1.68			
Sub_K_2	0.41	0.4	0.56	0.66	0.53	0.63	0.78	0.6	1.33	1.51		
Sub_K_3	0.17	0.18	0.59	0.66	0.58	0.65	0.64	0.63	1.02	1.06	1.3	
Obj_K_T	-0.61	-0.75	-0.07	0.05	0.27	-0.05	-0.01	0.4	-0.04	0.02	0.21	3.17
Atti_1	0.64	0.62	0.88	1	0.91	0.97	0.94	0.36	0.53	0.43	0.37	-0.03
Atti_2	0.47	0.41	0.68	0.78	0.76	0.71	0.75	0.43	0.46	0.35	0.38	0.28
Atti_3	0.59	0.58	0.83	0.97	0.83	0.93	0.89	0.37	0.55	0.43	0.4	0.04
Atti_4	0.57	0.54	0.99	1.06	0.93	1	0.98	0.49	0.58	0.47	0.48	0.1
Atti_5	0.7	0.7	1.03	1.1	1.07	1.08	1.03	0.53	0.45	0.36	0.37	0.14
Atti_6	0.63	0.62	0.92	0.99	0.96	0.99	0.92	0.42	0.52	0.47	0.44	0.15
Sub_No_1	1	1.02	1.1	1.08	1.04	1.11	1.11	0.62	0.61	0.55	0.42	0.02
Sub_No_2	0.66	0.67	0.94	0.95	0.98	0.97	0.84	0.61	0.49	0.43	0.42	0.29
Sub_No_3	0.94	0.98	1.07	1.02	1.01	1.08	1.02	0.56	0.56	0.45	0.38	0.02
Beh_Co_1	-0.02	-0.08	-0.07	0.04	-0.07	0.02	0.1	0.23	0.54	0.51	0.52	-0.15
Beh_Co_2	0.05	0	0.31	0.38	0.32	0.36	0.45	0.61	0.67	0.79	0.76	0.28
Beh_Co_3	-0.09	-0.09	0.06	0.18	0.12	0.12	0.2	0.53	0.5	0.64	0.67	0.21
Beh_Co_4	-0.2	-0.21	0.18	0.23	0.33	0.2	0.17	0.58	0.31	0.45	0.62	0.71
WillM_1	0.49	0.43	1.17	1.28	1.24	1.26	1.18	0.61	0.72	0.68	0.65	0.43
WillM_2	0.81	0.74	1.42	1.55	1.4	1.52	1.47	0.67	0.84	0.74	0.67	0.06
WillM_3	0.8	0.78	1.44	1.55	1.4	1.55	1.49	0.7	0.78	0.71	0.67	0.05
HealM_1	0.38	0.34	0.89	0.98	0.94	1.01	0.95	0.7	0.74	0.74	0.67	0.31
HealM_2	0.83	0.84	1.03	1.06	0.98	1.11	1.03	0.55	0.74	0.63	0.52	-0.19
HealM_3	0.95	0.93	1.32	1.39	1.25	1.37	1.32	0.6	0.79	0.73	0.64	-0.17
HealM_4	0.89	0.85	1.33	1.29	1.21	1.29	1.24	0.49	0.71	0.71	0.55	-0.26
HealM_5	0.92	0.9	1.32	1.35	1.24	1.38	1.32	0.57	0.74	0.7	0.62	-0.25
HealM_6	1.01	1.01	1.4	1.46	1.31	1.5	1.49	0.66	0.79	0.72	0.6	-0.3
HealM_7	1.56	1.5	1.23	1.2	1.03	1.25	1.39	0.54	0.79	0.71	0.44	-0.78
HealM_8	0.67	0.68	1.09	1.22	1.11	1.23	1.25	0.59	0.78	0.68	0.62	0.07
HealM_9	1.2	1.2	1.31	1.43	1.35	1.53	1.42	0.58	0.74	0.63	0.59	-0.2
HealM_10	0.66	0.66	1.16	1.29	1.2	1.27	1.23	0.72	0.74	0.68	0.65	0.27
Patro_1	0.51	0.51	1.19	1.29	1.24	1.32	1.25	0.68	0.66	0.64	0.62	0.11
Patro_2	0.67	0.65	1.32	1.41	1.34	1.43	1.34	0.69	0.72	0.69	0.65	0.08
Patro_3	0.81	0.79	1.23	1.31	1.23	1.35	1.35	0.67	0.74	0.68	0.6	-0.11
Patro_4	0.85	0.78	1.14	1.23	1.19	1.26	1.31	0.64	0.74	0.67	0.62	0.09
Patro_5	0.8	0.75	1.19	1.29	1.24	1.36	1.33	0.65	0.76	0.7	0.66	0.07
Patro_6	0.82	0.78	1.2	1.31	1.25	1.35	1.38	0.68	0.75	0.71	0.66	0.08

(continued)

|	Atti_1	Atti_2	Atti_3	Atti_4	Atti_5	Atti_6	Sub_No_1	Sub_No_2	Sub_No_3	Beh_Co_1	Beh_Co_2	Beh_Co_3
Atti_1	1.75											
Atti_2	1.02	1.33										
Atti_3	1.42	1.12	1.72									
Atti_4	1.27	1.08	1.34	1.71								
Atti_5	1.11	1.02	1.16	1.21	1.58							
Atti_6	1.15	1.06	1.24	1.26	1.29	1.52						
Sub_No_1	0.69	0.71	0.69	0.77	0.87	0.77	2.06					
Sub_No_2	0.75	0.8	0.81	0.86	0.91	0.86	1.34	1.65				
Sub_No_3	0.74	0.71	0.76	0.78	0.88	0.78	1.6	1.38	1.87			
Beh_Co_1	0.43	0.38	0.37	0.31	0.17	0.24	0.3	0.43	0.48	2.32		
Beh_Co_2	0.5	0.55	0.52	0.45	0.41	0.47	0.48	0.64	0.52	1.38	2.03	
Beh_Co_3	0.42	0.45	0.41	0.29	0.3	0.33	0.35	0.45	0.41	1.18	1.4	1.87
Beh_Co_4	0.23	0.39	0.27	0.22	0.3	0.31	0.31	0.56	0.44	0.8	1.1	1.15
WillM_1	1.04	0.93	1.09	1.1	1.1	1.1	0.88	0.94	0.85	0.31	0.62	0.41
WillM_2	1.14	0.96	1.19	1.24	1.21	1.19	1	1.01	1	0.34	0.58	0.33
WillM_3	1.16	0.92	1.17	1.27	1.24	1.2	1.02	1.06	1.09	0.33	0.56	0.34
HealM_1	0.7	0.62	0.74	0.75	0.82	0.81	0.65	0.68	0.66	0.26	0.5	0.43
HealM_2	0.9	0.68	0.89	0.9	0.91	0.88	0.91	0.86	1.03	0.33	0.45	0.32
HealM_3	0.97	0.82	1.02	1.07	1.1	1.09	0.97	0.92	1.04	0.33	0.48	0.36
HealM_4	0.91	0.63	0.85	0.87	0.85	0.9	0.85	0.76	0.9	0.32	0.36	0.33
HealM_5	0.93	0.74	0.92	0.99	1	0.96	0.92	0.87	0.98	0.33	0.51	0.38
HealM_6	0.95	0.74	0.98	1.06	1.1	1.03	0.97	0.94	1.07	0.42	0.48	0.33
HealM_7	0.91	0.58	0.87	0.93	0.84	0.79	0.87	0.77	0.95	0.25	0.25	0.07
HealM_8	0.82	0.76	0.88	0.92	0.93	0.91	0.84	0.79	0.93	0.28	0.48	0.34
HealM_9	0.8	0.67	0.84	1	0.97	0.92	1.04	0.84	1.05	-0.02	0.26	0.06
HealM_10	0.8	0.71	0.84	0.88	0.86	0.88	0.94	0.78	0.84	0.24	0.44	0.28
Patro_1	1.01	0.85	0.91	0.98	0.98	0.97	0.91	0.96	0.95	0.3	0.54	0.42
Patro_2	1.08	0.92	1.07	1.16	1.15	1.14	0.95	1.05	0.99	0.27	0.55	0.39
Patro_3	1.03	0.81	1.03	1.06	1.09	1.05	0.94	0.94	1	0.34	0.54	0.37
Patro_4	0.93	0.9	1	1.06	1.05	1.04	1.06	1.01	1.08	0.29	0.49	0.32
Patro_5	0.94	0.83	0.98	1.03	1.06	1.01	1.09	1.02	1.08	0.24	0.53	0.37
Patro_6	0.97	0.84	0.99	1.05	1.07	1.07	1.09	1	1.11	0.28	0.56	0.37

(continued)

Table D.1 Covariance Matrix of Measurement Model (continued)

	Beh_Co_4	WillM_1	WillM_2	WillM_3	HealM_1	HealM_2	HealM_3	HealM_4	HealM_5	HealM_6	HealM_7	HealM_8
Beh_Co_4	1.8											
WillM_1	0.43	1.75										
WillM_2	0.26	1.63	2.06									
WillM_3	0.29	1.58	1.85	1.97								
HealM_1	0.44	1.11	1.14	1.18	1.52							
HealM_2	0.16	1.06	1.35	1.33	1.05	1.86						
HealM_3	0.28	1.27	1.56	1.52	1.11	1.41	2.09					
HealM_4	0.15	1.07	1.34	1.32	1.04	1.4	1.55	2.47				
HealM_5	0.24	1.19	1.46	1.45	1.01	1.37	1.59	1.7	1.93			
HealM_6	0.2	1.21	1.54	1.54	1.02	1.34	1.59	1.54	1.67	2.17		
HealM_7	-0.02	0.89	1.31	1.29	0.67	1.28	1.32	1.5	1.5	1.59	3.6	
HealM_8	0.32	1.14	1.33	1.3	1.1	1.16	1.34	1.12	1.29	1.39	1.21	1.76
HealM_9	0.07	1.14	1.43	1.45	0.95	1.14	1.49	1.29	1.45	1.6	1.75	1.39
HealM_10	0.3	1.11	1.19	1.25	1.19	1.08	1.25	1.17	1.23	1.15	1.04	1.34
Patro_1	0.46	1.29	1.4	1.38	1.01	1.04	1.22	1.06	1.18	1.25	0.94	1.16
Patro_2	0.36	1.42	1.58	1.56	1.12	1.2	1.39	1.25	1.36	1.4	1.1	1.27
Patro_3	0.25	1.31	1.56	1.56	1.12	1.31	1.38	1.27	1.4	1.45	1.22	1.26
Patro_4	0.35	1.24	1.4	1.42	1.03	1.18	1.27	1.16	1.28	1.29	1.11	1.24
Patro_5	0.33	1.29	1.43	1.47	1.08	1.19	1.28	1.13	1.28	1.34	1.11	1.24
Patro_6	0.35	1.31	1.43	1.5	1.13	1.2	1.3	1.2	1.33	1.36	1.07	1.28

	HealM_9	HealM_10	Patro_1	Patro_2	Patro_3	Patro_4	Patro_5	Patro_6
HealM_9	2.91							
HealM_10	1.3	2.12						
Patro_1	1.08	1.2	1.7					
Patro_2	1.3	1.28	1.57	1.88				
Patro_3	1.34	1.26	1.39	1.59	1.83			
Patro_4	1.2	1.17	1.32	1.49	1.47	1.86		
Patro_5	1.22	1.18	1.36	1.49	1.49	1.67	1.86	
Patro_6	1.2	1.25	1.38	1.54	1.52	1.72	1.76	1.92

APPENDIX E: USING THE THEORY OF PLANNED BEHAVIOR BY ITSELF

**Figure E.1 Using the Theory of Planned Behavior by Itself**
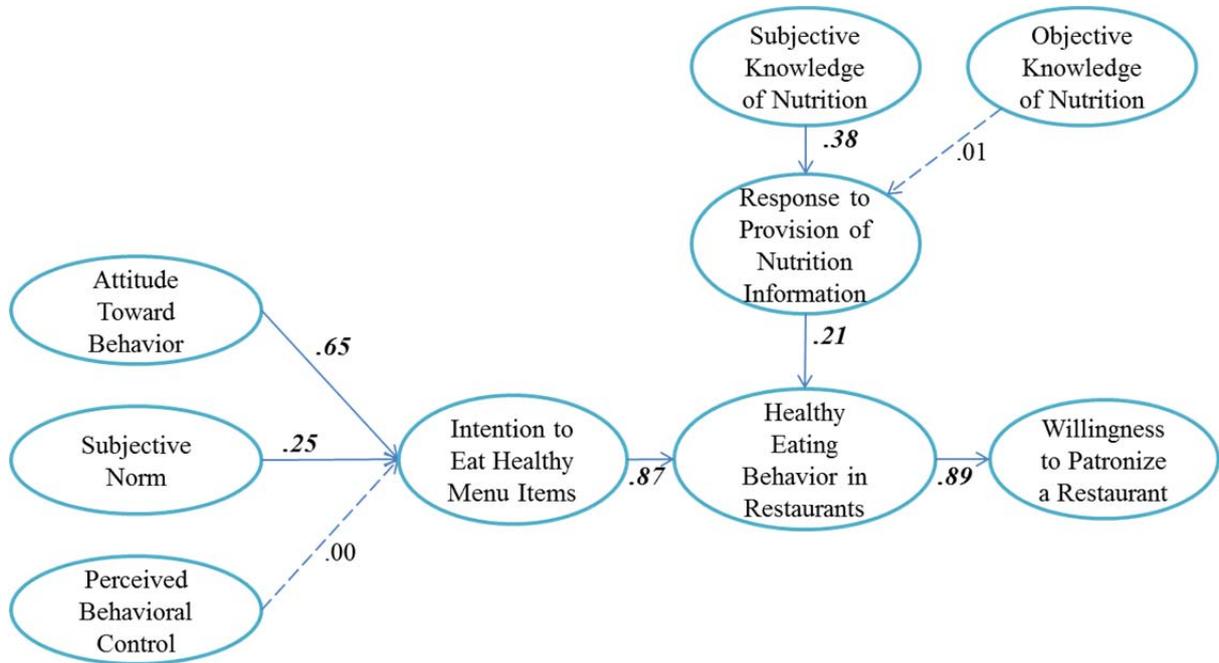
Note: Measures of model fit: $\chi^2(796) = 2{,}651.80$; Root Mean Square Error of Approximation (RMSEA) = .078; Normed Fit Index (NFI) = .97; Non-Normed Fit Index (NNFI) = .98; Incremental Fit Index (IFI) = .98; Comparative Fit Index (CFI) = .98.

- - - - ▶ Insignificant path
———————▶ Significant path

APPENDIX F: USING THE HEALTHY BELIEF MODEL BY ITSELF

Figure F.1 Using the Health Belief Model by Itself
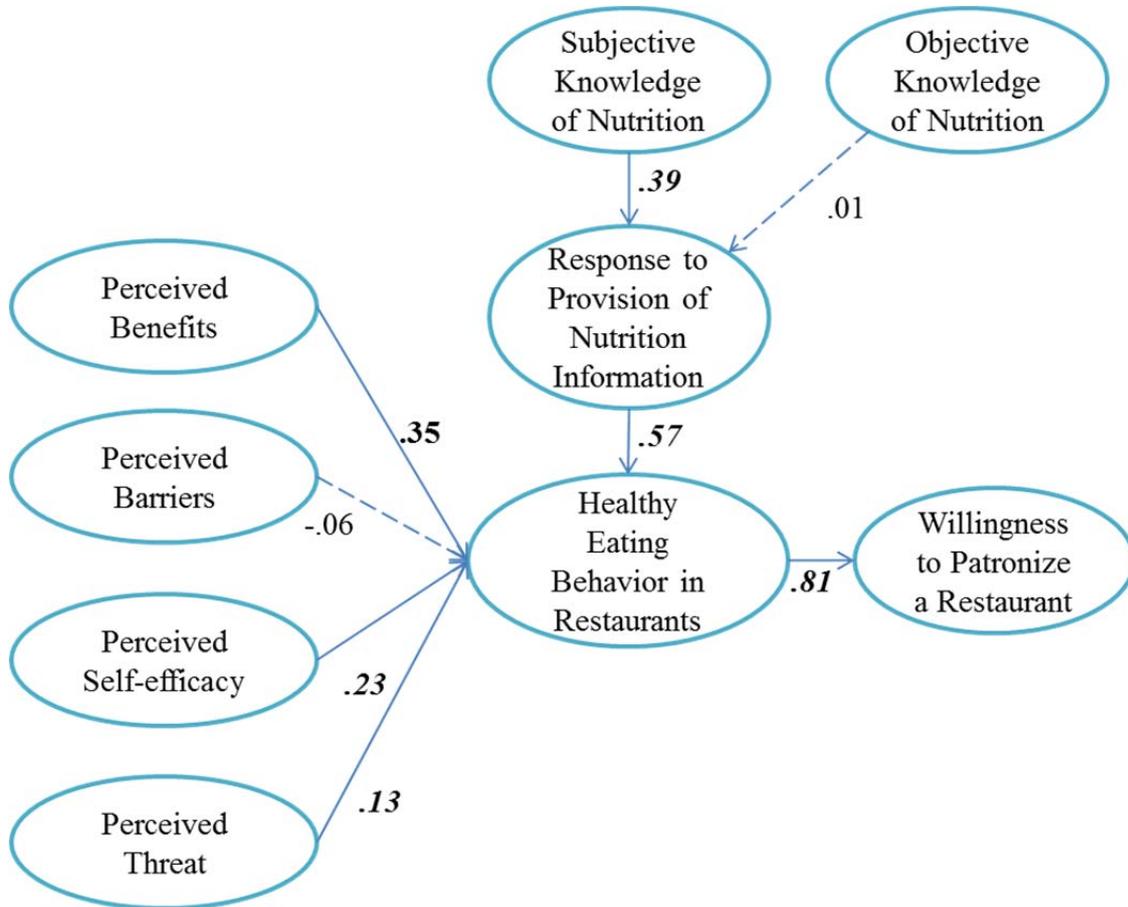
Note: Measures of model fit: $\chi^2(1,210)$ = 5,545.77; Root Mean Square Error of Approximation (RMSEA) = .079; Normed Fit Index (NFI) = .97; Non-Normed Fit Index (NNFI) = .97; Incremental Fit Index (IFI) = .98; Comparative Fit Index (CFI) = .98.

– – – ➤ Insignificant path
———➤ Significant path