

**Understanding customers' healthful menu item selection behaviors at casual dining  
restaurants**

by

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**ABSTRACT**

Recognizing that psychological factors affect customers' healthy eating behaviors, this study investigated psychological factors which might affect customers' healthful menu item selections at casual dining restaurants based on the extended theory of planned behavior (TPB). While TPB consists of attitudes, subjective norms, perceived behavioral control, and behavioral intentions, the extended version includes two new constructs (prototype and behavioral willingness). The extended TPB also subdivided the original TPB constructs of attitudes and subjective norms into affective and cognitive attitudes and injunctive and descriptive norms, respectively.

An online survey was used; 744 responses were analyzed using structural equation modeling and hierarchical regression. Results indicated that customers' healthful menu item selection behaviors were affected by intentional (behavioral intention) and reactive (behavioral willingness) decision making processes. Affective attitudes (feelings or emotions) and injunctive norms (perceived social pressure from others) regarding healthful menu item consumption had positive effects on intention and willingness to choose those menu items, whereas cognitive attitudes (rational assessment) and descriptive norms (perception of what others commonly do) had positive effects only on behavioral intention. In addition, the prototype image of unhealthy eaters had a negative effect on willingness to choose healthful menu items, indicating that when people hold negative viewpoints about unhealthy eaters, they are more willing to choose healthful menu items. Finally, the findings confirmed the importance of alignment between descriptive and injunctive norms in forming intentions to choose healthful items. In other words, when an individual perceives that most other people consume healthful menu items and that

others expect him/her to do so also, the individual is likely to have stronger intention to choose those menu items.

There are theoretical and practical implications. From the theoretical perspective, to the best of our knowledge this is the first known empirical study to investigate customers' healthful menu item selections at restaurants within an extended TPB framework. Moreover, this study confirmed the importance of alignment between descriptive and injunctive norms in promoting healthy eating at restaurants, which had not previously been investigated. From the practical perspective, this study suggests strategies for developing effective promotional and marketing materials.

## CHAPTER 1. INTRODUCTION

With the increasing concern about obesity, public attention has focused on preventing obesity. In a 2010 report, the Centers for Disease Control and Prevention (CDC) estimated the number of obese adults in the United States was 72.5 million; no state had an obesity rate less than 15% (which is the national goal) and in nine states, more than 30% of the population was classified as obese. Obesity imposes a heavy economic burden on the health care system, resulting in \$147 billion per year in medical costs. From an individual perspective, obesity lowers the quality of life by contributing to various chronic diseases, such as coronary heart disease, stroke, and Type 2 diabetes (CDC, 2010).

Because consumption of excess calories has been found to be one of the leading contributors to the obesity epidemic, along with physical inactivity (Swinburn et al., 2004; U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010), researchers have emphasized the importance of dietary changes in preventing or reducing obesity. Governments, foodservice industries, and academic institutions attempt to encourage people to eat healthy. The Nutrition Labeling and Education Act enacted in 1990 mandated nutrition labeling on all packaged food products, and menu-labeling requirements were passed under the Affordable Care Act in 2010 which required “restaurants and similar retail food establishments with 20 or more locations”, and “vending machine operators who own or operate 20 or more vending machines” to provide calorie content information for food items (U.S. Food and Drug Administration, 2013). In addition, restaurants have begun to incorporate healthful menu items into their existing menus and scholars have tried to identify the factors that encourage people to choose healthier restaurant foods. Cohen et al. (2013) proposed standards for healthier restaurants, above and beyond the Affordable Care Act regulations, and argued that

the additional standards should be imposed via a certification program in order to help people more easily obtain healthful menu items at restaurants. Two general approaches to keeping people healthy can be used: a societal-level responsibility and a personal responsibility approach. While regulations may be enacted and recommended standards for healthier restaurants may be put in place, customers will still have the freedom to choose and consume what they want. Therefore, it is important to investigate individual-level factors related to food choices.

### **Statement of Problem**

Emphasizing the important role of a healthy diet in combating the obesity epidemic, numerous studies have been conducted to identify factors that encourage healthy eating behaviors (Baker, Schootman, Barnidge, & Kelly, 2006; Beaudoin, Fernandez, Wall, & Farley, 2007; de Bruijin, 2010; Dickson-Spillmann & Siegrist, 2011; Mishra, Mishra, & Masters, 2012). However, many of these previous studies focused on consumers' purchasing behaviors toward specific types of foods (e.g., seafood, cheese, fruits and vegetables) (de Bruijin, 2010; Olsen, 2003; Pollard, Kirk, & Cade, 2002; Yeh et al., 2008) or on general healthy eating behaviors (Å strøm & Rise, 2001; Stevenson, Doherty, Barnett, Muldoon, & Trew, 2007). Relatively limited research has been done specific to a restaurant setting, despite the fact that restaurants are considered an important element in preventing obesity because of the poor nutritional quality of many restaurant meals and the frequency that people eat out (Guthrie, Lin & Frazao, 2002; Mancino, Todd, & Lin, 2009; Stewart, Blisard, & Jolliffe, 2006; Todd, Mancino, & Lin, 2010).

Previous studies have also focused on effects of menu labeling on food selection behavior at restaurants (Burton, Creyer, Kees, & Huggins, 2006; Dumanovsky et al., 2011; Elbel, Kersh, Brescoll, & Dixon, 2009; Howlett, Burton, Bates, & Huggins, 2009; Hwang & Cranage, 2011; Hwang & Lorenzen, 2008; Pulos & Leng, 2010; Roberto, Larsen, Agnew, Baik, &



Brownell, 2010; Sharma, Wagle, Sucher, & Bugwadia, 2011; Verbeke, 2010). Results were inconclusive; some studies found that providing nutrition information (e.g., calorie content, fat content, and micronutrient content) had a positive effect. (Burton et al., 2006; Cranage, Conklin, & Lambert, 2004; Hwang & Cranage, 2011; Pulos & Leng, 2010) whereas other studies did not find any significant effects (Elbel et al., 2009; Harnack & French, 2008; Harnack et al., 2008; Yamamoto, Yamamoto, Yamamoto, & Yamamoto, 2005). In short, there is little evidence that nutrition information alone can do much to improve people's diets. Therefore, it is important to understand and consider other factors that may help improve customers' diets. According to Senauer (2001), understanding consumers' food consumption behaviors requires accounting for the role of complicated psychological factors that shape their preferences and behaviors. Noting the potential role of restaurant foods in improving people's diet and the psychological factors in the food selection process, this proposed study will examine the psychological factors which may impact customers' menu item selection when they eat at casual dining restaurants.

### **Purpose of the Study**

The purpose of this current study was to examine effects of psychological factors on customers' healthful menu item selections at casual dining restaurants. To achieve this purpose, this study extended the theory of planned behavior (TPB) suggesting that behaviors are influenced by behavioral intentions which in turn, are affected by attitudes, subjective norms, and perceived behavioral control (Ajzen, 2006). The extension was implemented by adding two new constructs and by subdividing the original TPB constructs of attitudes and social norms. The two new constructs included prototype (one's viewpoints about a typical person who engage in a certain behavior) and behavioral willingness (one's willingness to perform a certain behavior in situations encouraging or discouraging the behaviors) (Gibbons, Gerrard, Blanton, & Russell,

1998; Ohtomo and Hirose, 2007). Also, the attitudes were subdivided into affective and cognitive attitudes; and social norms were subdivided into injunctive and descriptive norms. Affective attitude refers to one's feelings or emotions toward a behavior under consideration, whereas cognitive attitude refers to one's rational evaluations of the behavior (Keer, van den Putte, Neijens, & de Wit, 2013). Regarding social norms, while injunctive norm references social pressures to performing a behavior which results from perceiving others want him/her to do that, descriptive norm references social pressures to engage in a behavior which results from observing others' behaviors (Manning, 2009). The specific study objectives were to:

- 1) explore effects of customers' attitudes (cognitive and affective) toward consuming healthful menu items on behavioral intention and willingness to select those menu items;
- 2) examine influences of customers' social norms (injunctive and descriptive) related to consuming healthful menu items on behavioral intention and willingness to select those menu items;
- 3) investigate impacts of customers' perceived behavioral control over consuming healthful menu items on behavioral intention and willingness to select such menu items and on self-reported selection behavior;
- 4) explore the effects of customers' perceived prototype images on behavioral intention and willingness to select those menu items;
- 5) determine the relationship between behavioral intention and willingness to select healthful menu items and self-reported selection behavior;
- 6) determine whether there is a misalignment of descriptive and injunctive norms, and if existence of misalignment of the two norms occurs, explore effects of this misalignment

of injunctive and descriptive norms related to consuming healthful menu items on behavioral intention to select such menu items.

### **Definition of Terms**

The definitions of key terms used in the study are listed below.

*Affective attitudes* – refers to “one’s feelings associated with an attitude object, for example, the degree to which it is regarded as pleasurable or enjoyable” (Keer, van den Putte, Neijens, & de Wit 2013, p. 896). In this study, affective attitudes are one’s feelings toward consuming healthful menu items (specifically, low calorie menu items) at casual dining restaurants.

*Behavioral intention* – is defined as “indication of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior” (Ajzen, 1991, p. 181). In this study, behavioral intention is specific to selecting healthful menu options; thus, it refers to one’s conscious plan to choose healthful menu items at casual dining restaurants.

*Behavioral willingness* – is described as “an individual’s openness to opportunity; that is, his or her willingness to perform a certain behavior in situations that are conducive to that behavior” (Pomery, Gibbons, Reis-Bergan, & Gerrard, 2009, p. 895-896). In this study, behavioral willingness is defined as one’s willingness to choose or not to choose healthful menu items in situations that are conducive to unhealthy menu selections.

*Casual dining restaurants* – are defined as restaurants where the server takes the customer’s order at the table and food is then served to the customer (Yusop, Tiong, Aji, & Kasiran, 2011, p. 353). The average check per person for casual dining restaurants is under \$15

(Fredman, n.d.). Examples of casual dining restaurants include: Applebee's, Red Lobster, The Cheesecake Factory, Chili's, and Perkins.

*Cognitive attitudes* – refers to “rational assessment of an attitude object, encompassing, for example, whether the attitude object is useful or useless, valuable or worthless” (Keer et al., 2013, p. 896). In this study, cognitive attitudes refer to rational evaluations of consuming healthful menu items at restaurants.

*Descriptive norms* – are defined as “social pressures based on the observed or inferred behavior of others” (Manning, 2009, p. 651). In this study, descriptive norms refer to social pressures to consume healthful menu items; these norms result from observing or inferring others' consumption of healthful menu items at restaurants.

*Healthful menu items* – refer to menu items that are low in calories. Healthful food has been defined in various ways without a unanimous definition (Croll, Neumark-Sztainer, & Story, 2001; Martínez-González, Holgado, Gibney, Kearney, & Martínez, 2000; Martínez-González et al., 1998). However, given that along with physical inactivity, high calorie intake is one of the leading causes of obesity (Swinburn et al., 2004; U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010) and obesity is one of the contributors to chronic diseases (Hu et al., 2001; Kencanaiah et al., 2002), foods that are in low in calories may be defined as healthful foods. Calorie content is one objective criterion to determine whether a certain menu item is healthful or unhealthful; most restaurants offer healthful menu items in the form of low calorie menu items (Brandau, 2011a, b). In addition, menu items that are lower in calories, as compared to “regular menu items”, have been commonly defined as healthful menu items (Cranage, Conklin, & Lambert, 2004; Glanz et al., 2007).

*Injunctive norms* – are described as “social pressures to engage in a behavior based on the perception of what other people want you to do” (Manning, 2009, p. 651). In this study, injunctive norms refer to one’s social pressures to consume healthful menu items at restaurants, which result from perceiving that others want one to consume those menu items.

*Perceived behavioral control* – is defined as “perceived ease or difficulty of performing a behavior” (Ajzen, 1991, p. 188). In this study, perceived behavioral control is described as one’s perceived ease or difficulty of consuming healthful menu items at restaurants.

*Prototype* – refers to “an individual’s image of the typical person who belongs to a group or engages in a certain behavior” (Ouellette, Hessling, Gibbons, Reis-Bergan, & Gerrard, 2005, p. 610). In this study, prototype is defined as an individual’s image of the typical unhealthy eater consuming high calorie foods.

*Social norms* – is defined as “socially shared and enforced attitudes - specifying what to do and what not to do in a given situation” (Prentice, 2012, p. 23). Social norms include both injunctive and descriptive norms.

### **Dissertation Organization**

This dissertation is presented using the journal paper format which includes the traditional first three chapters, two manuscripts, and general conclusions. The chapters are provided in the following order: 1) introduction, 2) review of literature, 3) methods, 4) first manuscript, 5) second manuscript, and 6) general conclusions. Reference lists are presented at the end of each chapter, and appendices are shown after the last chapter. For both journal manuscripts, I was involved in all the research stages including: idea conception, research design

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## **CHAPTER 2. REVIEW OF LITERATURE**

This chapter provides both a general background and a theoretical background for the conceptual model presented at the end of Chapter 2. The general background section begins with an overview of food prepared away from home and public health concerns related to dining out. The literature on definitions of healthy foods, healthy menu trends in the restaurant industry, and governmental efforts to promote healthy eating, particularly menu labeling regulations, is presented. The theoretical background section reviews the theoretical frameworks and the constructs constituting the conceptual model used for this study. Specifically, the extended version of the theory of planned behavior (TPB) using concepts of both prototype perceptions and behavioral willingness from the prototype/willingness (PMW) are explained and applied.

### **General Background**

#### **Food Prepared Away From Home (FAFH) and Public Health Concerns**

FAFH is defined as “any food or meal consumed that is prepared or purchased outside of the home. This definition is based on where the food is prepared and does not take into account where the food is eaten” (Williams, 2011, p. 7). Any food eaten in either commercial (e.g., restaurants) or non-commercial (e.g., schools) retail foodservice operations is included in the FAFH definition (U.S. Department of Agriculture Economic Research Service, 2014).

Researchers have found that the nutritional quality of FAFH is inferior to that of food prepared at home due to higher calorie, fat, sodium, and added sugar content (Guthrie, Lin & Frazao, 2002; Mancino, Todd, & Lin, 2009; Stewart, Blisard, & Jolliffe, 2006; Todd, Mancino, & Lin, 2010); this low nutritional quality may be contributing to the obesity epidemic (Bowman & Vinyard, 2004; McCrory et al., 1999; Satia, Galanko, & Siega-Riz, 2004). Obesity is recognized as a major public health concern in the United States because more than one-third of adults in the

United States are classified as obese (Ogden, Carroll, Kit, & Flegal, 2014), and obese people are more susceptible to a variety of chronic diseases (Hu et al., 2001; Kenchaiah et al., 2002; Wang, Mi, Shan, Wang, & Ge, 2007).

Todd et al. (2010) investigated effects of FAFH consumption on U.S. adults' dietary quality in two national surveys using two non-consecutive days of dietary intake information from the 1994-1996 Continuing Survey of Food Intakes by Individuals (CSFII) and the 2003-2004 National Health and Nutrition Examination Survey (NHANES). The definition of FAFH from Mancino et al. (2009) – meals from fast food or table service restaurants, cafeterias, or taverns – was utilized for their study. Findings indicated that by consuming one FAFH meal, 134 calories were added to daily calorie intake and diet quality decreased. It was found that FAFH decreased the percentage of calories from fruit in the diet by 15.5 to 22.5% and increased the percentage from saturated fat (2.6% to 8.4%), solid fat, alcohol, and added sugar.

A number of studies have focused on the effects of fast food consumption on people's dietary quality and the influence of such a poor quality diet on obesity (Bowman & Vinyard, 2004; Satia et al., 2004; Schmidt et al., 2005; Schröder, Fito, & Covas, 2007). Using the USDA's CSFII data collected between 1994 and 1996, Bowman and Vinyard (2004) investigated the effects of fast food consumption frequency on diet quality in terms of calorie and macronutrient intake. CSFII food consumption data were collected on two non-consecutive days from U.S. adults aged 20 years and older. Day 1 responses (n=9,872) were divided into two groups, male and female, which again were assigned into two groups based on participants' fast food consumption on day 1. The findings showed that both males and females who reported they had consumed fast food had significantly higher intakes of energy, total fat, saturated fat, and added sugars, and significantly lower intakes of total fluid, milk, and fruits and fruit juices than



participants who had not consumed fast food. Based on the respondents' frequency of consuming fast food during the two survey days, respondents (n=9,323) were divided into three different groups: a group who had not eaten fast food, a group who had eaten fast food on one of the two survey days, and a group who had eaten fast food on both days. Group differences in reported nutrient intake on both days were examined. The results showed that as the frequency of fast food consumption increased, the intake of energy, saturated fat, total carbohydrates, and added sugars increased and the intake of dietary fiber, fruits and vegetables, and micronutrients (e.g., carotene, vitamins A and C, calcium, phosphorus, magnesium) decreased. Also, it was shown that the more frequently participants ate fast foods, the more likely they were to be overweight, with a body mass index (BMI) higher than 25, although the relationship could not be considered causal as the study was a correlation study.

Satia et al. (2004) also investigated the relationship between fast food consumption and diet quality. A total of 658 African-Americans between 18-70 years of age in North Carolina participated in this study. The findings were consistent with Bowman and Vinyard (2004) in that frequency of fast food consumption had significantly positive associations with total fat and saturated fat intake, and participants who usually/often ate fast food were more likely to be obese than those who rarely/never ate fast food. However, the associations between fast food consumption frequency and vegetable and fruit intake was significantly negative.

As discussed, FAFH consumption is a potential contributor to the obesity epidemic. Moreover, obesity has been associated with chronic disease risk. Kenchaiah et al. (2002) conducted a longitudinal study (mean follow-up: 14 years) to examine the relationship between body mass index (BMI) and occurrence of heart failure with a sample of 5881 participants from the Framingham Heart Study. The results revealed that overweight and obese women (identified

based on BMI of 30 or more) had a 50% and 100 % respectively higher risk of heart failure than normal-weight women. For obese men, the risk was 90% higher compared to men of normal weight. Also, regardless of some individual characteristics (e.g., age, gender, alcohol consumption), the effects of BMI on the incidence of heart failure remained constant. Hu et al. (2001) investigated the effects of BMI, diet (e.g., consumption of cereal fiber, polyunsaturated fat, and trans fat), and life style (e.g., exercise, smoking status, alcohol consumption) on the incidence of Type 2 diabetes mellitus using longitudinal data collected from 84,941 female nurses. Data acquired from the follow-up at 16 years indicated that BMI was the most influential risk factor for Type 2 diabetes mellitus, even if other factors such as exercise, smoking status, alcohol consumption, and diet were also significantly related to the incidence of such disease.

Despite the poor quality of FAFH and the potential effects that have been reported, the frequency of FAFH consumption continues to increase (Lin & Guthrie, 2012). According to the U.S. Department of Agriculture Economic Research Service (2014), total U.S. food expenditure on FAFH was \$680 billion in 2012, which accounted for over 50% of Americans' total food expenditure. A dining trends survey conducted by Zagat (2013) reported that U.S. adults consume FAFH (excluding breakfast) 4.4 times a week. Lin and Guthrie (2012) compared FAFH consumption patterns from 2005-2008 with those from 1977-1978. In their study, meals from table service and fast food restaurants, school, and other foodservice operations (e.g., take-out, delivery) were classified as FAFH, unlike Todd et al.'s study (2010) which excluded school meals as FAFH. Lin and Guthrie's results revealed that the proportion caloric intake from FAFH to the average total caloric intake was 17.7% in the first data set (1977-1978), whereas the proportion increased by 31.6% in the second data set (2005-2008). Interestingly, even if the average total daily fat intake decreased from 85.63g to 75.19g per person, the proportion of the

fat intake from FAFH compared to the average total fat intake increased from 18.06% to 34.9% between the two periods. The increase in the proportion of the caloric and fat intake from FAFH was mostly due to meals from table service and fast food restaurants. Drewnowski and Rehm's study (2013), which was funded by the National Restaurant Association, investigated the total caloric intake by food purchase location (e.g., restaurants, school) using NHANES data between 2003 and 2008. According to their findings, the daily caloric intake from food eaten at restaurants, including quick- and full-service restaurants, accounted for 16.9% to 26.3% of the average total daily caloric intake, depending on participants' ages.

In summary, obesity has been considered one of the contributors to a variety of chronic diseases. Given the poor quality and frequent consumption of FAFH, restaurant meals should be considered an important venue for combating the obesity epidemic.

### **Definitions of Healthy Foods**

There is no unanimous definition of healthy food. Researchers have defined healthy in various ways (Croll, Neumark-Sztainer, & Story, 2001; Martine-González, Holgado, Gibney, Kearney, & Martínez, 2000; Martinez-González et al., 1998). Margetts, Martinez, Holm, and Kearney (1997) interviewed 14,331 people aged 15 years and older from 15 European Union countries to investigate their perceptions of healthy eating. Nine categories of healthy eating emerged, including (but not inclusive) more fruit and vegetables; less fat and fatty foods; less red meat; and less sugar. Martinez-González et al. (1998, 2000) also found similar definitions to Margetts et al.'s (1997).

Lee, Jin, Jeon, and Huffman (2011) interviewed foodservice managers in charge of menu planning in South Korea to identify their perceptions of what constituted a healthy menu. Content analysis of interview data revealed two broad concepts for healthy menus: enhanced

nutrition value and reduced unhealthy elements. Combining these two themes, the authors defined a healthy menu as “a menu with increased nutrition value and/or decreased unhealthy factors by changing ingredients or cooking methods”.

While the definitions proposed by Margetts et al. (1997) and Lee et al. (2011) are quite broad, more specific definitions also have been suggested by Cranage, Conklin, and Lambert, (2004) and Glanz et al. (2007). Given that this current study was conducted in the United States, the definitions provided by these studies targeting the U.S. population appeared to be more relevant to this current study than those provided by the above studies done outside of the United States. Glanz et al. (2007) conducted telephone interviews with 41 marketing executives working at chain casual dining or fast food restaurants in the United States. All participants defined healthy foods as foods low in calories and fat, and expressed a belief that customers shared this view. Similar definitions have been suggested by other researchers (Cranage et al., 2004). Conner, Norman, and Bell (2002, p. 194) operationalized healthy eating as “a diet low in fat, high in fiber, and high in fruit and vegetable consumption”. These definitions do not deviate much from the healthy eating suggestions provided by the 2010 Dietary Guidelines for Americans (U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010). The 2010 Dietary Guidelines for Americans recommend that people control total calorie intake; reduce intake of sodium (less than 2300mg per day), saturated fat (less than 10% of calories per day), cholesterol (less than 300mg per day), trans fats (as low as possible), solid fats, and added sugars; and increase intake of fruit, vegetables, whole grains, seafood, fat free or low fat milk and milk products, and consume a variety of protein foods.

## Healthy Menu Trends in the Restaurant Industry

As an attempt to silence criticism for their contribution to the obesity epidemic and meet customers' increasing interests in healthy eating, many restaurants have added healthy menu options to their menus (Glanz et al., 2007; Koplan & Brownell, 2010). According to the 2013 Restaurant Industry Forecast (National Restaurant Association, 2012), healthy menus will continue to be one of the "hot menu trends." Most chain restaurants have incorporated healthful menu options into their menus and several chain restaurants (e.g., Uno Chicago Grill, Starbucks Coffee Company, Au Bon Pain) signed onto the National Salt Reduction Initiative, whose goal is to reduce the salt content of both packaged and restaurant foods by 25% within five years nationally (New York City Department of Health and Mental Hygiene, 2011).

Uno<sup>®</sup> specifically classifies their healthy menu options based on the types of nutrients: "Less than 500 calories," "Less than 750mg sodium," "Greater than 30g protein," "Less than 100mg cholesterol," "Less than 30g carbohydrates," "Less than 5g saturated fat," and "More than 5g dietary fiber" (Uno<sup>®</sup>, 2013). When compared with the Dietary Guidelines for America 2010 (U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010), the amounts of each nutrient for Uno<sup>®</sup> healthful menu options appear to be less than one third of the recommended daily amounts. Other restaurants have adopted another approach. Red Lobster's "LightHouse Selections" cover several nutrients at the same time; that is, all the healthy options include less than 500 calories, 15g of fat, 5g of saturated fat, 750mg of sodium, and 75g of carbohydrate (Red Lobster, 2013). Dunkin' Donuts<sup>®</sup> offers a set of healthy menu options called DD SMART<sup>®</sup>, all of which have calories, fat, saturated fat, sugar or sodium reduced by at least 25% compared to the regular product (Dunkin' Donuts<sup>®</sup>, 2013).

As discussed above, restaurants seem to consider various types of nutrients (e.g., sodium, fats, calories) when developing healthy menus, but the most notable trend in healthy menus is offering calorie-reduced menu items (Brandau, 2011a, b). McDonald's recently started to offer "Favorites Under 400" featuring a variety of burgers, salads, beverages, and snacks with less than 400 calories (McDonald's, 2013). The Cheesecake Factory introduced a "SkinnyLicious® menu" which has around 50 menu items, including sides and appetizers under 490 calories, entrées under 590 calories, and cocktails under 150 calories (The Cheesecake Factory, 2011). Applebee's provides an "Under-550 calorie menu" (Applebee's, 2014). Corner Bakery Café helps customers personalize their healthy options under 600 calories and their website provides a calorie estimator to enable customers to easily manage the total calories of their menu choices (Corner Bakery, 2013). According to data from the research firm Technomic®, the use of the word "low-calorie" on menus has grown 154% since 2010 (Brandau, 2011b).

### **Governmental Response to Healthy Eating Concerns: Menu Labeling Act**

**Background.** In response to public concerns about obesity and poor diet, Congress passed the Nutrition Labeling Act, which mandated nutrition labeling on all packaged food products, in 1990. At that point, the regulation did not apply to restaurant meals; however in 2010, menu-labeling requirements were passed as part of the Patient Protection and Affordable Care Act. The requirements mandate that restaurants with 20 or more locations in the U.S. must provide calories on their menus and drive-through signs. In addition to calorie information, if customers request it, restaurants must provide written information about the amount of fat, saturated fat, cholesterol, sodium, carbohydrates, sugars, dietary fiber, and protein per serving of their foods. Restaurants with fewer than 20 locations can voluntarily become subject to this

regulation through a Federal Register Notice (U.S. Food and Drug Administration, 2013). At the time of this writing, the final rule is still pending.

**Effects.** Numerous studies have been conducted to investigate the role of menu labeling on consumers' healthy eating behaviors (Burton, Creyer, Kees, & Huggins, 2006; Dumanovsky et al., 2011; Elbel, Kersh, Brescoll, & Dixon, 2009; Howlett, Burton, Bates, & Huggins, 2009; Hwang & Cranage, 2011; Hwang & Lorenzen, 2008; Pulos & Leng, 2010; Roberto, Larsen, Agnew, Baik, & Brownell, 2010; Sharma, Wagle, Sucher, & Bugwadia, 2011; Verbeke, 2010). Some of these studies found that the presence of nutrition information on restaurant menus encourages customers to choose healthy menu items (Burton et al., 2006; Hwang & Cranage, 2011; Pulos & Leng, 2010).

Cranage et al. (2004) conducted research to explore the effects of nutrition information on consumer satisfaction with food quality, repurchasing intention, and selection of more healthful options in a university dining facility. Customer survey and sales data were collected in two phases for comparison: 1) during two days when nutrition information was not provided (control) and 2) during another two days when nutrition information was provided (treatment). The findings showed that when nutrition information was provided at the point of purchase, customers were more likely to be satisfied with their foods and indicate great intention to repurchase the foods. Also, sales data revealed that more healthy entrées were sold during the days when nutrition information was presented than during the days when nutrition information was not presented.

Positive effects of nutrition information were also found by Pulos and Leng (2010). They examined the influences of a pilot menu-labeling program called the "SmartMenu Program" on customers' menu item choices in six locally-owned full-service restaurants in Pierce County,

Washington. The local health department estimated the nutrient values of regular menu items at the restaurants participating in the program and helped them provide printed nutrition information on their menu boards. For the six restaurants involved in the study, sales data were collected for 30 days before and after labeling was introduced, and customer survey data were also collected during the post-labeling period. The survey questions concerned customers' ordering decisions and their use of the nutrition information, and were sequentially ordered: noticing nutrition information → reading the nutrition information → understanding the nutrition information → choosing menu item(s). The sales data were used to compare the differences in the amount of calories, fat, sodium, and carbohydrate of entire entrées sold before and after menu labeling was introduced, and the customer survey data were analyzed using descriptive statistics. Sales data revealed that the presence of nutrition information resulted in customers purchasing fewer average calories (15 calories fewer), fat (1.5 grams fewer), and sodium (45 milligrams fewer). Survey data showed that 71% of customers noticed the nutrition information (the first step in the sequence), but that the number of the customers decreased at each step, with 59% of the customers understanding the explanation of the nutrition information and only 20% responding to the information by choosing lower calorie entrées. Based on their findings, they surmised that even if the presence of nutrition information encouraged participants to modify their food choices, it might have more or less significant effects depending on the customers' characteristics (e.g., age).

Burton et al. (2006) also demonstrated the potential impact of nutrition information, indicating that people are often unaware of the actual nutrient contents of restaurant meals. This research consisted of two studies: one for participants' estimation of the nutrition information for given menu items and the other for the effects of actual nutrition information on participants'



attitudes toward the menu items, purchasing intention, and choice behaviors. For the first study, data were collected from 193 research panel and undergraduate students. The participants were given a list of eight menu items divided into three different categories (four “less healthful menu items,” three “more healthful menu items,” and one “very unhealthy menu item”) and asked to estimate the amount of calories, fat, and saturated fat for each menu item. The results showed that, regardless of whether the menu item was actually healthful or unhealthy, participants underestimated the nutrient contents for all of the listed menu items. In particular, participants most underestimated the nutrient contents for menu items belonging to the “less healthful menu items” group (on average, by 642 calories, 44g fat, and 15g saturated fat). In the second study, they examined the effect of the presence of nutrition information on attitudes toward menu items, purchase intentions, perceptions of weight gain and heart disease. Three nutrition information conditions were created: 1) no nutrition information, 2) calorie information only, and 3) calorie and nutrient information. The four menu items were chosen based on the results of the first study: two menu items whose actual nutrient values were inconsistent with (i.e., greatly exceeded) participants’ estimation (deluxe hamburger with fries, chef salad) and two menu items whose actual nutrient values were generally consistent with participants’ estimation (chicken breast with baked potato, turkey sandwich). Findings showed that for the inconsistent menu items, the purchase intention was significantly lower when both calorie-only information and calorie and nutrient information were provided, compared to intentions when no nutrition information was provided. For the menu items that had nutrient values more consistent with participants’ estimation, the effects of the presence or absence of nutrition information were mixed – that is, purchase intention increased for the turkey sandwich but remained constant for the chicken breast. The results of the examination of the influence of nutrition information on the

perceived likelihood of gaining weight and developing heart disease also showed a similar pattern. In particular, when nutrition information was not provided, the perceived likelihood of heart disease was no different among the menu items except for the burger; however, when nutrition information was presented, the perceived likelihood of heart disease increased for the inconsistent menu item, chef salad. When both calorie and nutrient information was provided, purchases of the consistent menu items were mixed depending on the menu item, whereas those of inconsistent menu items significantly decreased (from 37% to 24%). Based on the findings, the authors concluded that the provision of nutrition information would have potential benefits to public health by correcting customers' underestimation of unhealthy nutrients (calories, fats and so on) and thereby modifying their purchase intentions and choices.

Hwang and Lorenzen (2008) identified the most effective amount of nutritional information and investigated the effects of menu labeling on participants' attitudes toward menu items and participants' willingness to pay more for menu items. A total of 120 participants rated five different types of menu labeling according to the amount of nutrition information: 1) no information, 2) calories only, 3) calories and macronutrients, 4) calories, macronutrients, and fat; and 5) calories, macronutrients, fat, and fiber. The fifth option was selected as the most effective menu labeling. Next, using this menu labeling, the researchers evaluated 60 participants' attitudes toward both regular and low-fat menu items with or without menu labeling. The findings revealed that when nutrition information was presented, attitudes toward the regular menu items were more negative and attitudes toward the low-fat menu items were more positive. Finally, participants reported that they were willing to pay more for the low-fat menu items with nutrition information, although this result was not statistically significant. Mayfield, Tang, and Bosselman (2014) also conducted similar research but results were a bit different from Hwang

and Lorenzen's study (2008). Mayfield et al. (2014) asked 113 college students to rate three different types of menu labeling: 1) macronutrient (e.g., fat, protein, and carbohydrates) and total calorie information; 2) specific nutrient information (e.g., saturated fat, trans fat, and fiber); and 3) heart healthy claims. According to their results, only macronutrient and total calorie information had a significantly positive effect on purchase intentions.

Hwang and Cranage (2011) found significant effects of nutrition information on evaluations of fast food items. They defined the favorability of nutrition information based on the level of calories; that is, favorable nutrition information is that which lists fewer calories than unfavorable nutrition information. The findings showed that fast food menu items with favorable nutrition information were evaluated more positively than those with unfavorable nutrition information in terms of attitudes, purchase intention, and perception of nutrient contents. Howlett et al. (2009) also showed the positive role of nutrition information in people's food consumption (e.g., balancing calorie consumption). The effects of nutrition information were more obvious among more motivated people.

However, in addition to the abovementioned positive effects of nutrition information, conflicting results have also been reported (Elbel et al., 2009; Harnack & French, 2008; Harnack et al., 2008; Yamamoto, Yamamoto, Yamamoto, & Yamamoto, 2005). For example, Harnack and French (2008) reviewed and evaluated six previous studies on the effects of calorie information on food choices in restaurants and cafeteria settings. Based on their review, they concluded that the effects of nutrition information were weak or inconsistent.

Elbel et al. (2009) investigated the effects of New York City's menu labeling regulation on people's menu item choices at fast food restaurants. For comparison purposes, Newark was selected because it did not have menu labeling regulation at the time of the study. The

researchers targeted the largest fast food chains in New York City and Newark and focused on low income and minority neighborhoods. Data collection was conducted in two phases: before and after the implementation of menu labeling in New York City. For both phases, the research team visited the targeted restaurants during lunch or dinner for two and a half hours. The research team approached adult customers and asked them to provide their receipts and answer a few questions regarding whether they noticed calorie information, and whether their food decisions were influenced by such information. A total of 1,156 receipts were used to analyze actual nutrient content purchased by the participants by comparing the food items on the receipts and the nutrition information provided by the fast food restaurants. Also, the percentage of customers noticing calorie information and effects on food decision making were compared before and after New York City's menu labeling regulation. Almost 86% of the participants were Black (65.7%) and Latino (19.9%). The authors found that after implementation of New York City's menu labeling regulation, the percentage of people noticing calorie information increased to 54%, whereas, the noticing percentage in Newark did not increase. Also, 27.7% of the participants noticing calorie information reported that they used calorie information when they made food choices, and 88% of the 27.7% reported that they purchased fewer calories, whereas there was no such change for Newark participants. Interestingly, the results of analyzing actual nutrient content based on customer receipts showed no significant difference in the amount of calories (825 before labeling and 846 after in New York City; 823 before labeling and 826 after in Newark), saturated fat, sodium, and sugar purchased by participants in either city, either before or after menu labeling was implemented. In addition, any significant effect of demographics (e.g., sex, age) was not found. Considering their findings, the authors concluded that simply providing nutrition information would not be enough to change people's food choice

behaviors, and multiple interventions might need to be considered. Despite the fact that menu labeling was not found to have a significant influence on participants' food selection behaviors, the authors suggested that the implementation of menu labeling regulation would stimulate chain restaurants to develop and offer more healthful menu items. Finkelstein, Strombotne, Chan, and Krieger (2011) conducted a similar study in King County, Washington. They compared the average calories per transaction during the pre-labeling period with those during the post-labeling period, and found no significant effect of menu labeling regulation.

Harnack et al. (2008) conducted an experimental study to investigate the impact of calorie information on fast food menu item choices and consumption, considering the effects of value pricing. Four different combinations of calorie and value pricing information were used: 1) "Calorie menu" with only calorie information; 2) "Price menu" with only value size pricing information; 3) "Calorie plus price menu" with both calories and value size pricing information; and 4) "Control menu" without any additional information. Each of the 594 participants was assigned to one of these four menu conditions from which they ordered their food. The foods ordered were actually served to the participants, and the nutrient contents of the menu items which they ordered and consumed were calculated. After their meals, participants were interviewed about their nutrition knowledge and beliefs. The results showed no significant difference in the average amount of calories (ranged from 739 to 813) and nutrient contents which the participants selected and consumed across all four menu conditions. About 50% of participants in the "calorie menu" and "calorie plus price menu" groups reported they noticed the calorie information, however no statistically significant differences in calories ordered and calories consumed were observed between participants noticing the calorie information (690 calories) and those not noticing it (671 calories).

Yamamoto et al. (2005) examined whether the presence of nutrition information affected adolescents' restaurant menu item choices. A total of 106 adolescents participated in this study after obtaining parental informed consent for the participants under 18 years of age. Three restaurant chains (McDonald's, Panda Express, Denny's) were selected. Each participant was provided with three menus, one for each of the three restaurants, without nutrition information, and asked to order one item from each menu and indicate how much of the item he/she would consume. Participants were then given the same three menus with nutrition information, and were informed that they could change their orders if they wanted. Results showed that when nutrition information was presented, participants made order changes resulting in significant reduction in calories and fat from McDonald's and Panda Express menus. However, less than 20% of meals were related to such reductions; that is, only 19 of 106 meals at McDonald's and 18 of 106 meals at Panda Express. Taken as a whole, 75 of the 106 participants did not change their orders even when given the menu with nutrition information. The authors concluded that the presence of nutrition information had the potential to enhance adolescents' dietary choices; however, considering the findings of this study, the effects of nutrition information might not be influential for a majority of adolescents.

### **Summary of General Background**

Due to the potential contribution of restaurant foods to the obesity epidemic, both the restaurant industry and the government have attempted to make changes that will improve people's diets when eating out. Restaurants increasingly provide a variety of healthful menu items – in particular, low calorie menu items are some of the healthful menu items most commonly provided by restaurants (Brandau, 2011a, 2011b). Menu-labeling requirements have induced restaurants to provide nutrition information to customers, thus encouraging them to

choose more healthful menu items. However, researchers' findings thus far are mixed in answering the question of whether or not individuals make healthier decisions when nutrition information is available at restaurants; thus, the effects of nutrition information on customers' food choices are still controversial.

These inconsistent findings regarding the impact of nutrition information on consumers' healthy eating behaviors indicate that nutrition information may not be the only factor driving food choices when people eat out; thus, it is important to understand and consider other factors that may help improve customers' diets. Although many other factors affect consumers' healthy eating behaviors (e.g., availability, price, portion size, and atmospherics) (Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008; Wansink, 2004; Wansink & van Ittersum, 2012; Waterlander, Steenhuis, de Vet, Schuit, & Seidell, 2009), according to Senauer (2001), when analyzing consumers' food consumption behaviors it is necessary to account for the role of complicated psychological factors that shape preferences and behaviors. Some researchers have also confirmed the significant effects of psychological factors (e.g., values and attitudes) on healthy eating behaviors (Jun, Kang, & Arendt, 2014; Lawrence et al., 2009). Therefore, using the theory of planned behavior (TPB) extended by incorporating additional constructs from the prototype/willingness model (PWM), this proposed study will examine the full range of psychological factors which may impact consumers' menu choices when they eat at restaurants. More detailed information about the theoretical approach is provided in the following section.

### **Theoretical Background**

The current study applied an extended version of the theory of planned behavior (TPB), containing concepts of both prototype perceptions and behavioral willingness from the prototype/willingness model (PWM), to understand consumers' healthful menu selection at

restaurants. This theoretical background section provides a general background of TPB and PWM, a detailed explanation of components consisting of these theoretical frameworks, and empirical studies investigating the relationship among these constructs within these theoretical frameworks.

### **Theory of Planned Behavior (TPB)**

The theory of planned behavior (TPB) is one of the popular models for predicting human behavior and behavior intentions. TPB assumes behavior is affected by behavioral intentions, which, in turn, are affected by attitudes toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). According to Ajzen (1991, p. 188), each dependent component of TPB is defined as follows: attitudes – “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question,” subjective norms – “the perceived social pressure to perform or not to perform the behavior,” and perceived behavioral control – “perceived ease or difficulty of performing the behavior”. According to TPB, the more favorable the attitude and subjective norms with respect to a behavior, and the greater the perceived behavioral control, the stronger an individual’s intention to perform the behavior under consideration. Also, the stronger the perceived behavioral control and the intention to engage in a behavior, the more likely the person is to engage in the behavior (Ajzen, 1991).

TPB has been successfully applied to a range of behavior domains (Ajzen, 1991), including foodservice administrators’ adoption of sustainable practices (Chen, Gregoire, Arendt, & Shelley, 2011); sustainable food consumption (Vermeir & Verbeke, 2008); green hotel choice (Han, Hsu, & Sheu, 2010); use of social networking websites (Pelling & White, 2009); consumption of food away from home (Bhuyan, 2010); maintenance of physical activity (Armitage, 2005); student dropout (Davis, Ajzen, Saunders, & Williams, 2002); hunting attitudes



and behaviors (Hrubes, Ajzen, & Daigle, 2001); and safe food handling behaviors (Stein, Dirks, & Quinlan, 2010). In particular, TPB has been widely used to predict aspects of consumers' healthy eating behaviors, such as soft drink consumption (Kassem, Lee, Modeste, & Johnson, 2003); reduction of fat intake (Paisley & Sparks, 1998); adherence to a low fat diet (Armitage & Conner, 1999); fast food consumption (Dunn, Mohr, Wilson, & Wittert, 2011); and general healthy eating behaviors (Fila & Smith, 2006).

More specifically, related to people's healthful food selections, Kim, Reicks, and Sjoberg (2003) conducted research on older adults' intention to consume dairy products at home and away from home using TPB and found that attitudes toward dairy product consumption was the most important predictor of the behavioral intention, followed by perceived behavioral control. However, subjective norms were not found to be a statistically significant predictor. According to Sjoberg, Kim, and Reicks' study (2004) on older adults' fruit and vegetable consumption, all TPB constructs, including attitudes, subjective norms, and perceived behavioral control, had a significant influence on intentions to consume fruit and vegetable. The most influential variable was perceived behavioral control, which significantly affected not only behavioral intention but also actual fruit and vegetable consumption.

Rah, Hasler, Painter, and Chapman-Novakofski (2004) also found significant roles of attitudes, subjective norms, and perceived behavioral control in forming women's intentions to eat soy products. Attitudes ( $\beta = .57, p < .01$ ) had the strongest influence on behavioral intention, followed by subjective norms ( $\beta = .37, p < .01$ ) and perceived behavioral control ( $\beta = .33, p < .01$ ). Kassem et al. (2003) investigated female adolescents' soft drink consumption using TPB. All three components of TPB accounted for 64% of variance in the behavioral intention and each of the components had a statistically significant influence on the intention to consume soft

drinks. Kassem and Lee (2004) conducted similar research on male adolescents' soft drink consumption and found similar results to Kassem et al.'s findings (2003).

Utilizing a non-adult sample, Lien, Lytle, and Komoro (2002) investigated adolescents' fruit and vegetable consumption using TPB. The sample consisted of 1406 seventh grade students attending middle schools in the Minneapolis-St. Paul metropolitan area. Students' fruit and vegetable consumption behaviors were assessed by frequency of fruit and vegetable eating (e.g., fruit juice, fruit, green salad, potatoes) during the previous year. The concept of perceived behavioral control, one of the components of TPB, was labeled "barriers" but was operationalized as the same concept as perceived behavioral control. The results showed that attitudes, subjective norms, and barriers significantly affected intention to consume fruits and vegetables ( $\beta = .13, .34, \text{ and } .33, p < .05$ , respectively), and the fruit and vegetable eating frequency was significantly affected by intentions and barriers ( $\beta = .11 \text{ and } .20, p < .05$ , respectively). Gender moderated these relationships. Specifically, for female students, the effect of attitudes on behavioral intention was stronger than for male students, whereas the effects of intention on fruit and vegetable consumption frequency were stronger among male students than female students.

As discussed above, a majority of prior studies have found attitudes, subjective norms, and perceived behavioral control are all significant predictors for healthy eating intentions and these intentions also work as a predictor of healthy eating behavior, even if the relative importance of the components varies across studies (Ajzen, 1991; Conner, Povey, Sparks, James, & Shepherd, 2003; Kassem et al., 2003). Table 2.1 summarizes the findings of selected empirical studies based on TPB that examined healthy eating behaviors.

Table 2.1

*Correlations and regression coefficients of TPB components from prior studies*

Study	Behavior	Sample	Correlations (regression coefficients) with intention				Correlations (regression coefficients) with behavior			
			Attitude	Subjective norm	PBC	R <sup>2</sup>	PBC	Intention	R <sup>2</sup>	
Kassem et al. (2003)	Soft drink consumption	707 female students aged 13-18 in Los Angeles County public high schools	.76**** (.58)****	.42**** (.14)****	.57**** (.24)****	.64	.32**** (.03) ns	.53**** (.51)****	.28	
Kassem & Lee (2004)	Soft drink consumption	564 male students aged 13-18 in Los Angeles County public schools	.72**** (.52)****	.42**** (.19)****	.54**** (.28)****	.61	.22**** (.02) ns	.39**** (.38)****	.15	
Kim et al. (2003)	Diary product consumption	162 adults aged over 33 in Minneapolis-St. Paul area	.60*** (.38)***	.38*** (.11) ns	.55*** (.30)***	.42	.48*** (.22)***	.61*** (.49)***	.39	
Lien et al. (2002)	Fruit and vegetable consumption	1406 7 <sup>th</sup> grade students in Minneapolis-St. Paul metropolitan area	.30* (.13)*	.40* (.34)*	.40* (.33)*	.31	.25* (.20)*	.19* (.11)*	.07	
Rah et al. (2004)	Soy product consumption	205 female adults (103 African American and 102 White)	- (.57)**	- (.37)**	- (.33)**	-	-	- (.59)**	-	

\*  $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ , \*\*\*\* $p < .0001$

Because TPB may not be inclusive of all constructs, researchers have continued to extend TPB by incorporating new variables (Åström & Rise, 2001; Conner et al., 2003; Mahon, Cowan, & McCarthy, 2006; Payne, Jones, & Harris, 2004; Povey, Conner, Sparks, James, & Shepherd, 2000). Armitage and Conner's meta-analysis (2001) examined 185 empirical tests from 161 articles to investigate how much TPB components account for the variance in behavior and intention. According to their findings, TPB explained 39% and 27% of the variance in behavioral intentions and actual behavior, respectively. These results show that TPB is useful in predicting a variety of behaviors, but at the same time there is still some variance that needs explanation. That is why many researchers have attempted to extend TPB by incorporating additional variables, such as habit (Mahon et al., 2006); perceived need (Payne et al., 2004); attitudinal ambivalence (Conner et al., 2003); social influence variables, injunctive norms, descriptive norms, perceived social support (Povey et al., 2000); and role identity, group norms and group identification (Astrom & Rise, 2001). Even Ajzen, who developed TPB, admitted that additional variables might be considered to help increase the explanation power of the TPB: "The theory of planned behavior is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behavior after the theory's current variables have been taken into account. The theory of planned behavior, in fact, expanded the original theory of reasoned action by adding the concept of perceived behavioral control." (Ajzen, 1991, p. 199)

In particular, some researchers have pointed out that TPB's components, including attitudes, subjective norms, and perceived behavioral control, are not adequately conceptualized (Kraft, Rise, Sutton, & Røysamb, 2005; Rise, Kovac, Kraft, & Moan, 2008; Tăut & Băban, 2012; Tuu, Olsen, Thao, & Anh, 2008) and have continued to support their argument through empirical

tests. In these empirical studies, researchers attempted to re-conceptualize each component as follows: attitude was operationalized as two distinct components, affective and cognitive attitudes, while subjective norms were operationalized as injunctive and descriptive norms. However, unlike the concepts of attitudes and subjective norms which have been conceptualized consistently in the same way, there is no clear consensus on the reconceptualization of perceived behavioral control (PBC). Some researchers argue that a unitary concept is more appropriate, saying that while two-dimensional models for attitudes (i.e., affective and cognitive attitudes) and subjective norms (i.e., injunctive and descriptive norms) had a better fit than the single dimensional model, this was not the case for the concept of PBC (Rhodes & Courneya, 2004). Other researchers have attempted to conceptualize PBC using several distinct factors (Ajzen, 2002b; Kraft et al., 2005; Trafimow, Sheeran, Conner, & Finlay, 2002). However, even if researchers agreed with the idea that the concept of PBC consists of several distinct dimensions, there was no consensus on what these distinct dimensions were. For example, Armitage and Conner (2001) considered the concepts of self-efficacy and perception of control over behavior as concepts distinct from PBC but Trafimow et al. (2002) suggested that these two concepts are constituents of PBC. Rhodes and Blanchard (2006) proposed that if PBC does consist of distinct components, the components could be skills/ability, opportunity, and resources.

Therefore, this current study extended TPB by incorporating the subdivided components of attitudes (affective and cognitive attitudes) and social norms (injunctive and descriptive norms), and the concept of PBC was operationalized as a unitary dimension, as Ajzen and Madden's initial study (1986) suggested. The following sections cover some background about prototype/willingness model and give a more detailed explanation for each construct in the following order: 1) prototype/willingness model, 2) affective and cognitive norms, 3) injunctive

and descriptive norms, 4) perceived behavioral control, 5) prototypes, and 6) behavioral intention and willingness.

### **Prototype/Willingness Model (PWM)**

Ajzen (2006, p. 117) stated in his book *Attitudes, Personality, and Behavior* that “the theory of planned behavior is based on [the] assumption that human beings usually behave in a sensible manner; that they take account of available information and implicitly or explicitly consider the implication of their actions.” This rational approach has been criticized by researchers who argue that not all behavioral decisions are made based on the rational consideration of the potential advantages and disadvantages of engaging in a certain behavior (Churchill & Jessop, 2011; Churchill, Jessop, & Sparks, 2008; Gibbons, Gerrard, Blanton, & Russell, 1998; Gibbons, Gerrard, Ouellette, and Burzette, 1998; Ohtomo & Hirose, 2007). These researchers have asserted that the decision to perform a certain behavior is based not only on deliberative reasoning processes but also on social context, emphasizing the utility of PWM, which is considered the model that makes up for TPB’s weaknesses. PWM shares some components with TPB, such as attitudes, subjective norms, and behavioral intentions; on the other hand, it also has unique components, including prototype and behavioral willingness. While attitude in PWM is conceptualized similarly to attitude in TPB, subjective norms are conceptualized as descriptive norms, not injunctive norms, which are used to measure the concept of subjective norm in TPB (Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008; Gibbons & Gerrard, 1995; Gibbons, Gerrard, Blanton et al., 1998). Within PWM, two different decision making processes exist to explain people’s behavior: 1) a social reaction path, in which attitudes, subjective norms, and prototypes are antecedents of behavioral willingness, and 2) a

reasoned path, consisting of attitudes and subjective norms predicting behavioral intention as proposed in TPB.

Originally, PWM was used to predict health-risk behaviors, such as binge drinking (Norman, Armitage, & Quigley, 2007), young adults' alcohol consumption (Spijkerman, van den Eijnden, Overbeek, & Engles, 2007; Zimmermann & Sieverding, 2010); smoking (Kremers, Mudde, de Vries, Brug, & de Vries, 2004; Spijkerman, van den Eijnden, Vitale, & Engels, 2004; van den Eijnden, Spijkerman, & Engels, 2006), hand-held mobile phone use (Rozario, Lewis, & White, 2010), and unsafe sexual intercourse (Gibbons, Gerrard, Blanton, et al., 1998). However, recently this model has attracted academic attention for its potential to aid in understanding pro-social (e.g., recycling) (Ohtomo & Hirose, 2007) or health promoting behavior (e.g., quitting smoking) (Hukkelberg & Dykstra, 2009). More details about PWM's unique constructs, which were added to TPB's model in this current study, and about empirical studies including these constructs are given in the following section.

### **Affective versus Cognitive Attitude**

Traditionally, there has been evidence that the attitude construct can be conceptualized as both a cognitive and affective component (Breckler & Wiggins, 1989; Crites, Fabrigar, & Petty, 1994; Norman, 1975; Tăut & Băban, 2012; Trafimow & Sheeran, 1998). The affective attitude refers to “[the] individual’s general level of positive or negative feelings concerning the issue,” whereas cognitive attitude refers to “[the] individual’s beliefs about the instrumental utility of the action for the attainment or blocking of his or her goals weighted by value placed on such goals” (Norman, 1975).

Trafimow and Sheeran (1998) presented three general methodological approaches based on attitude-related studies to show the distinction between affective and cognitive attitudes. One

approach is to examine the differences in explanation power between models with the single attitude component and those with both affective and cognitive attitude components (that is, to examine whether the affective component explains additional variance in behavioral intentions). French et al.'s study (2005) on people's intentions to increase physical activity showed the superiority of the model that included affective attitudes as an additional component in terms of explanatory power compared to a model that included only cognitive attitudes. Their research revealed that affective attitudes accounted for an additional 11% of the variance in behavioral intention. In addition to that study, a number of researchers have found by using this approach that affective and cognitive attitudes are distinctive concepts (De Wit, Victoir, & Van den Bergh, 1997; Lowe, Eves, & Carroll, 2002; Lawton, Conner, & McEachan, 2009; Lawton, Conner, & Parker, 2007).

The second approach is to use factor analysis. Ajzen and Driver (1992) showed how this statistical technique could be used to find evidence for a distinction between affective and cognitive attitudes. They provided 10 adjective pairs, each of which had an affective (e.g., unpleasant-pleasant) or cognitive (e.g., useless-useful) tone, and asked participants to rate five leisure activities using those pairs. They conducted factor analysis on the responses and found that the affective adjectives loaded together and the cognitive adjectives loaded together, indicating that affective and cognitive attitudes should be considered as two separate concepts. Crites et al. (1994) also utilized factor analysis to show this distinction. In particular, they attempted to find a consistent distinction over four different types of scales (e.g., semantic differential, multi-response checklist) and six different attitude objects (e.g., church, snakes, birth control). The results of factor analysis revealed that a two-factor model that included both



affective and cognitive components was the best solution for all six attitude objects and three out of four measurement scales.

The third approach is to believe people to focus on either affective or cognitive information when forming attitudes during an experimental study; that is, if people are exposed to more affective information, they are more likely to report affective attitudes than those exposed to more cognitive information. Crites et al.'s experimental study (1994) took this approach. They provided participants with either affect- or cognition-based information and investigated their attitude formation. The findings revealed that participants who were shown affect-based information tended to form more affective attitudes while those exposed to cognition-based information were more likely to form cognitive attitudes, indicating that there was in fact a differentiation between affective and cognitive attitudes. Farley and Stasson (2003) used a similar research design to investigate the relative importance of affective and cognitive attitudes in predicting blood donation intention and found that each component had significantly different predictive power.

Along with the conceptual distinction between affective and cognitive attitudes, researchers have empirically tested the role of each attitudinal component in a variety of behavioral domains, such as smoking and driving over the speed limit (Lawton et al., 2007); condom use (De Wit et al., 1997); and exercise (Lowe et al., 2002). Interestingly, recent studies show that affective attitude is a stronger predictor than cognitive attitude (Farley & Stasson, 2003; Kraft et al., 2005; Lawton et al., 2009; Nameghi & Shadi, 2013; Tăut & Băban, 2012; van den Berg, Manstead, van der Pligt, & Wigboldus, 2006).

Lawton et al. (2009) examined the role of cognitive and affective attitudes in predicting behavioral intentions to engage in 14 health-promoting (e.g., brushing teeth, exercise, low-fat

diet consumption) or health-risk behaviors (e.g., binge drinking, illegal drugs, smoking) and actual performance of such behaviors. Data were collected in two phases. In the first phase, participants' affective and cognitive attitudes were assessed and in the second phase, participants' behavioral intention and actual behavior were measured. For all 14 given behaviors, affective attitudes had a significant effect on both behavioral intention and actual behavior. However, cognitive attitudes were a significant predictor for behavioral intentions for 11 of the 14 behaviors and for actual implementation of 7 out of 14 behaviors. Also, except for the intention to take vitamins, affective attitudes had a stronger influence on behavioral intentions than cognitive attitudes; in particular, for 7 of the 14 behaviors, the higher effects were statistically significant.

van den Berg et al. (2006) conducted research on the effects of affective and cognitive attitudes on organ donation behavior. A total of 464 students attending the University of Amsterdam received a questionnaire to evaluate their overall, affective, and cognitive evaluations of organ donation. Six months later, a follow-up survey was conducted to measure the commitment to organ donation; 36 students participated in the follow-up survey. Through confirmatory factor analysis, it was shown that the three evaluations were conceptually distinct. When the concept of commitment as a dependent variable was regressed separately on each of three evaluations, affective evaluation was indicated as the only predictor of commitment to organ donation.

Despite a long-standing distinction between cognitive and affective attitudes in general attitude-related research, it is only recently that researchers have begun to integrate both concepts into the TPB model. Although Ajzen and Driver (1992) introduced the criticism that the attitude component of TPB focused only on cognitive attitude and suggested the potential importance of

affective attitude, it is only recently that researchers have begun to examine the role of affective attitudes along with cognitive attitudes in TPB.

Kiviniemi, Voss-Humke, and Seifert (2007) investigated the role of affective associations in physical activity behaviors and examined the interrelation between affective associations and other psychological constructs of TPB and the health belief model. Specifically, the concepts of attitudes, particularly cognitive attitudes, social norms, and perceived behavioral control were adopted from TPB, and the constructs of perceived severity of and susceptibility to selected health problems (e.g., diabetes, heart disease), and benefits of and barriers to physical activity (e.g., staying in shape) were taken from health belief model. The main dependent variable, physical activity, was measured by calculating the amount of time per day that participants spent on physical activity. The results revealed the significant effects of affective association on physical activity behavior. Affective association not only directly affected physical activity but also played a critical role as a mediator between cognitive attitude and physical activity.

Tăut and Băban (2012) conducted both surveys and an experiment to explore the roles of cognitive and affective attitudes in physical activity behavior. For the survey, 36 undergraduate students age 19-26 received a questionnaire to assess various TPB components including the concept of affective attitude. According to the findings, the only influential factor on physical activity intention was affective attitude (e.g., sad/happy, pleasant/very unpleasant) ( $\beta = .42, p < .01$ ), which alone accounted for 23% of the variance in behavioral intention. For the experimental portion of the study, 90 undergraduate students were assigned to one of three groups: 1) a group provided with a leaflet containing an affective persuasion message promoting physical activity; 2) a group provided with a leaflet containing a cognitive persuasion message promoting physical activity; and 3) a group not provided with any motivational material (control

group). After participants were provided with the leaflet, researchers assessed the TPB components of affective attitude; two weeks later, 62 students took a follow-up questionnaire about actual physical activity. Results acquired from the initial data indicated that the group provided with affective messages had higher affective attitude and behavioral intention to engage in physical activity than the other two groups. However, interestingly, the results from the follow-up survey showed that affective attitude of the participants provided with affective messages decreased more steeply from the initial to the follow-up survey compared to the other two groups. Also, their attitudes and behavioral intentions decreased, whereas those of the other two groups increased, from the first to the second survey. However, cognitive messages did not have a significant effect on attitudes or intentions, either at the first or the second survey, indicating that the effects of affective attitudes might be fading but affective attitudes were more predictive than cognitive attitudes. Rhodes, Blanchard, and Matheson (2006) and Lowe et al. (2002) also examined both attitudinal components within the TPB model to understand undergraduate students' exercise behavior. Consistent with Tăut and Băban's study (2012), they found that while cognitive attitudes did not predict behavioral intentions to exercise, affective attitudes had significantly positive effects on exercise intentions.

Payne et al. (2004) extended TPB by incorporating affective attitudes and perceived need in their examination of exercise and healthy eating behaviors. The study was conducted in two phases. In the first phase, the constructs of TPB, except for actual behavior, and the new construct of perceived need were assessed among 331 employees of a UK computer software/hardware company. One week later, the second phase of the study measured actual exercise and eating behaviors; 286 employees completed the follow-up questionnaire. Except for actual behavior, all constructs were measured on a seven-point Likert-type scale; in particular,

attitudes were measured by two attitudinal subscales: cognitive (e.g., good, beneficial, wise) and affective (pleasant, enjoyable). Multiple linear regression revealed that for exercise, perceived behavior control ( $\beta = .34, p < .001$ ) was the most influential predictor of intention, followed by affective attitude ( $\beta = .17, p < .01$ ), and for healthy eating, affective attitudes toward eating healthy ( $\beta = .29, p < .001$ ) was the most influential factor in forming intentions. For both health-promoting behaviors, intention to perform the activity was the best predictor of actual behavior, while perceived need had a significantly positive effect only on intentions to eat healthy. However, subjective norms and cognitive attitudes did not significantly affect behavioral intentions toward either health-promoting behavior.

Blanchard et al. (2009) examined college students' fruit and vegetable consumption based on TPB. Data were collected from 511 college students in two phases. In the first phase, the components of TPB, including attitudes, subjective norms, perceived behavioral control, and behavioral intention, were assessed. For attitudes, both instrumental and affective attitudes were measured. One week later, the second phase was conducted to measure the respondents' actual consumption of fruit and vegetables each day. Using path analysis (a data analysis technique), the researchers found that affective attitudes and perceived behavioral control were significant predictors of behavioral intention to consume fruit and vegetables, which in turn predicted the respondents' actual consumption of such foods regardless of respondents' gender or ethnicity. Based on their findings, the authors emphasized the importance of separately measuring affective and the instrumental attitudes.

Dunn et al. (2011) investigated the effects of both cognitive and affective attitudes on fast food consumption within TPB. A total of 404 Australians between 18 and 45 years old completed a questionnaire. The results showed that cognitive attitudes were a significant

predictor of intentions to consume fast foods, whereas affective attitudes were not. A summary of the empirical studies that examined both affective and cognitive attitudes within TPB is presented in Table 2.2.

Table 2.2

*Summary of studies investigating both affective and cognitive attitudes in TPB*

Author(s) / Research method	Behavior measured	Sample	Main findings
Kiviniemi et al. (2007) / Survey	Physical activity	358 community participants and 75 college students	<ul style="list-style-type: none"> <li>• Significant effects of affective association to physical activity behaviors</li> <li>• Critical role as a mediator of affective association in the relationship between cognitive attitudes and physical activity behavior</li> </ul>
Tăut & Băban (2012) / Survey (Study 1) and experimental study (Study 2)	Exercise	<ul style="list-style-type: none"> <li>• Study 1: 36 undergraduate students aged between 19 and 26 years</li> <li>• Study 2: 62 undergraduate students (Cognitive intervention, affective intervention, and control)</li> </ul>	<ul style="list-style-type: none"> <li>• Study 1: Affective attitude was the only predictor of behavioral intention (<math>\beta = .42, p &lt; .01</math>)</li> <li>• Study 2: <ul style="list-style-type: none"> <li>– Participants given the affective intervention had the most positive affective attitudes toward physical activity, and a significantly higher intention to engage in physical activity in the affective intervention group than the other two groups</li> <li>– No significant effects of cognitive attitude</li> </ul> </li> </ul>
Payne et al. (2004) / Survey	Exercise and healthy eating behavior	286 employees at a UK company	<ul style="list-style-type: none"> <li>• For both behavioral intentions, no significant effects of cognitive attitudes</li> <li>• For both behavioral intentions, significant effects of affective attitudes (<math>\beta = .17, p &lt; .01</math> for exercise and <math>\beta = .29, p &lt; .001</math>)</li> <li>• For healthy eating behavior, affective attitude was most influential</li> </ul>

Table 2.2 (continued)

Author(s) / Research method	Behavior measured	Sample	Main findings
Blanchard et al. (2009) / Survey	Fruit and vegetable consumption	511 undergraduate students enrolled in fitness and health classes	<ul style="list-style-type: none"> <li>• No significant effects of cognitive attitudes on behavioral intention</li> <li>• Significant effects of affective attitudes on behavioral intention (<math>\beta = .16, p &lt; .05</math>)</li> </ul>
Dunn et al. (2011) / Survey	Fast food consumption	914 Australians aged between 18 and 45	<ul style="list-style-type: none"> <li>• Significant effects of cognitive attitudes on fast food consumption intention (<math>\beta = .14, p &lt; .05</math>)</li> <li>• No significant effects of affective attitudes on the behavioral intention</li> </ul>
Rise et al. (2008) / Survey	Smoking cessation		<ul style="list-style-type: none"> <li>• Significant, positive effects of affective attitudes on intention to quit smoking (<math>\beta = .39, p &lt; .001</math>)</li> <li>• No significant effects of cognitive attitudes</li> </ul>

### **Injunctive versus Descriptive Norm**

Social norms are defined as “socially shared and enforced attitudes specifying what to do and what not to do in a given situation” (Prentice, 2012, p. 23) and consist of both injunctive and descriptive norms (Cialdini, Reno, & Kallgren, 1990; Kallgren, Reno, & Cialdini, 2000; Park & Smith, 2007; Rimal, 2008; Smith-McLallen and Fishbein, 2008; Yun & Silk, 2011). Injunctive norms refer to the perception of “what significant others think the person ought to do,” whereas descriptive norms are defined as the perception of “what significant others themselves do” (Rivis & Sheeran, 2003, p. 219). While injunctive norms motivate people to behave through “the possibility of gaining approval or disapproval from significant others for one’s intentions and actions,” descriptive norms motivate people to behave by showing “what is the typical or normal thing to do” as evidenced by the conduct of significant others (Sheeran & Orbell, 1999, p. 2112). Researchers have shown the distinction between injunctive and descriptive norms using a factor

analytical technique (Sheeran & Orbell, 1999). In TPB, social influence is conceptualized by the concept of subjective norms, which is determined by “the person’s beliefs that specific individuals or groups approve or disapprove of performing the behavior” (Ajzen, 2006, p.124). Considering the definition (and measurement) of subjective norms, this social norm should be considered an injunctive norm (Rivis & Sheeran, 2003).

According to the meta-analysis conducted by Armitage and Conner (2001), subjective norms have a weaker relationship with behavioral intentions than attitudes or perceived behavioral control. Researchers have pointed out that this weak relationship is caused by the inappropriate conceptualization of social norms (Armitage & Conner, 2001; Rimal & Real, 2005; Sheeran & Orbell, 1999). This theoretical conceptualization of social norms has been empirically tested in different behavior domains, such as littering in public places (Cialdini et al., 1990); exercise (Hagger & Chatzisarantis, 2005; Rhodes & Blanchard, 2006; Rivis & Sheeran, 2003); recycling (White, Smith, Terry, Greenslade, & McKimmie, 2009); sports-related violence (Norman, Clark, & Walker, 2005); and smoking (Rise et al., 2008). The magnitude of each norm’s effect has varied across studies. In some studies, injunctive norms (Povey et al., 2000) have more influential effects on behavioral intention, whereas in other studies, descriptive norms are more predictive (Rise et al., 2008). For example, Povey et al. (2000) extended TPB by adding the concept of descriptive norms to examine general healthy eating behaviors with 235 participants recruited through the local newspaper. While they found that subjective norms played a significant role, descriptive norms did not. However, Rise et al. (2008) demonstrated that descriptive norms were the strongest predictors of intention to quit smoking, and injunctive norms did not play a significant role in forming such intentions.



Considering the results from Ravis and Sheeran's meta-analysis (2003), descriptive norms generally appear to be more predictive than subjective (injunctive) norms. Ravis and Sheeran (2003) conducted a meta-analysis on 21 studies to quantify the effects of descriptive norms on behavioral attitudes and to investigate whether descriptive norms could explain the additional variance of behavioral intentions within TPB. They found that the correlation between descriptive norms and behavioral intentions was .46 in the context of the theory of planned behavior, and descriptive norms accounted for an additional 5% of the variance in behavioral intentions. Also, they found that the beta coefficients of descriptive norms ( $\beta=0.24$ ) were higher than those of subjective norms ( $\beta=0.16$ ), indicating that descriptive norms had a greater effect than subjective norms. Manning's meta-analytical paper (2009) found results consistent with Ravis and Sheeran (2003). Some researchers have empirically found that descriptive norms play a significant role in people's food selection behaviors (Lally, Bartle, & Wardle, 2011; Mollen, Rimal, Ruiter, & Kok, 2013; Robinson, Benwell, & Higgs, 2013; Robinson, Fleming, & Higgs, 2014; Stok, de Ridder, de Vet, de Wit, 2012; Tuu et al., 2008; Yun & Silk, 2011).

Ball, Jeffery, Abbot, McNaughton, and Crawford (2010) investigated the effects of descriptive norms on physical activity and healthy eating behaviors, considering the influences of social support of family members and demographic characteristics. Questionnaires were administered to 3610 Australian women aged 18-46 living in socioeconomically deprived areas. Descriptive norms were measured by assessing participants' perception of what people around them were doing in terms of physical activity (e.g., walking, and cycling) and eating behaviors (e.g., fast food/pizza, soft drinks, and fruit/vegetable consumption). Social support was measured by perceived encouragement/discouragement to perform a certain physical activity or healthy eating behavior from family members, friends, and colleagues. Data were analyzed through

ordinal logistic regression, controlling for social support regarding their weight management. The results revealed that descriptive norms were significant, or at least marginally significant, in predicting all three physical activities and all three healthy eating behaviors. Even after controlling for social support, the significant effects of descriptive norms on all physical activity and healthy eating behaviors remained, except for fruit/vegetable intake. Based on their findings, the authors emphasized the role of descriptive norms in developing interventions to improve people's exercise and eating behaviors.

Burger et al. (2010) conducted two studies to investigate the influence of descriptive norms on women's food choices. The first study examined the impact of descriptive norms on 120 female undergraduate students' snack choices. Participants were believed to believe that other participants in a (fictitious) taste sensation experiment study had selected either a healthy (e.g., nutrition bar) or an unhealthy (e.g., Snickers bar) snack, and were then asked to make their own choice among healthy and unhealthy snack options. The results showed that participants tended to choose the same type of snack as they believed other participants had chosen. The second study was conducted to eliminate the variable of self-presentation concerns, which might have been caused by the presence of the researcher or other participants when participants chose their healthy or unhealthy snack. Similar procedures to those used in the first study were used, except that participants made their choice in the absence of any witnesses or observers. This second study found that participants who believed that other participants had chosen a healthy snack were more likely to choose a healthy snack themselves than either those who were told that other participants had chosen an unhealthy snack or those who were told nothing (control group). However, no significant difference was found between the unhealthy and the control group. The findings from both studies support the theory that perceived descriptive norms have a

significant impact on women's food choices. Based on their findings, the authors suggested that it might be possible to enhance people's food choices by developing interventions that use descriptive norm information. That is, it is important to persuade people that healthy eating is the norm. However, incorporating the descriptive norm into such interventions might be complicated, therefore it would be beneficial to investigate people's current perception of healthy eating as the norm and attempt to avoid potential unintended outcomes of descriptive norm-based healthy eating promotions. Prinsen, de Ridder, and de Vet (2013) replicated Burger et al.'s study and produced the same results.

Lally et al. (2011) examined misperceptions and impacts of adolescents' descriptive and social norms in food choices. A total of 264 U.K. students aged 16-17 participated in this study. Descriptive norms were assessed by asking the students to rate the perceived frequency of their peers to eat fruit/vegetables, sugar-sweetened drinks, and unhealthy snacks, while injunctive norms were measured by asking students to evaluate their peers' behaviors to eat such foods (e.g., good/bad health, sensible/foolish choices). Also, participants were asked to evaluate their own attitudes towards eating such foods. The authors found significant misperceptions between actual and perceived frequency (descriptive norm) of eating the foods under consideration, and their own attitudes toward eating such foods and perceived attitudes toward peers' eating such foods (injunctive norm). That is, the students tended to underestimate their peers' fruit/vegetable consumption and overestimate their sugar-sweetened beverage and unhealthy snack consumption. Also, when the authors investigated the effects of attitudes and descriptive and injunctive norms on all three eating behaviors, they found that only descriptive norms were a significant predictor of all three behaviors, whereas injunctive norms did not have a significant impact on any eating behaviors. Interestingly, the attitudes significantly affected only snacking

behaviors. Based on their findings, the authors suggested that it would be beneficial to develop interventions that alter these misconceptions in order to improve adolescents' eating behavior.

Tuu et al. (2008) examined the consumption of fish by Vietnamese consumers using TPB extended by incorporating descriptive norms. Six hundred and twelve consumers participated in this study. Through confirmatory factor analysis, the distinction between subjective norms, which is the original norm construct of TPB, and descriptive norms was found. Also, they found that not only the original constructs of TPB (attitudes, subjective norms, and perceived behavioral control) but also the new norm construct, descriptive norms ( $\beta = .13, p < .05$ ), had a significantly positive impact on fish consumption intention. Specifically, attitudes toward fish consumption ( $\beta = .33, p < .05$ ) were the most significant determinant of fish consumption intention. Also, the significant importance of descriptive norms indicated that fish consumption is influenced by perceptions of significant others' attitudes and behaviors as well as perceived social pressure; these empirical findings supported the theoretical extension of TPB by inclusion of descriptive norms. Table 2.3 summarizes the findings of the studies regarding the roles of injunctive and descriptive norms.

Even if both social norms have independently important effects on certain behaviors (Burger et al., 2010; Dunn et al., 2011; Fila and Smith, 2006; Kassem et al., 2003; Lally et al., 2011; Lien et al., 2002; Neighbors, Larimer, & Lewis, 2004; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008; Sjoberg et al., 2004), researchers have also noted the importance of the combination of these two norms (Göckeritz et al., 2010; Shultz, Nolan, cialdini, Goldstein, & griskevicius, 2007; Smith et al., 2012). In other words, researchers have pointed out that intervention focusing only on one of the two social norms might produce unintended behaviors. For example, Schultz et al. (2007) investigated the effects of social norm-based interventions on

household electricity usage using an experimental design and found that when participants received information about their neighbors' average household electricity usage (descriptive norm-based intervention), participants who had previously used more electricity than their neighbors decreased their electricity consumption, whereas those who had previously used less electricity increased their electricity consumption. However, when the participants who had previously used less electricity than their neighbors received intervention including both descriptive and injunctive norm-related information, an increase in electricity consumption did not occur. While Schultz et al. (2007) pointed out the negative aspect of intervention focusing only on descriptive norms, Stok, de Ridder, de Vet, and de Wit (2014) demonstrated the negative aspect of the intervention focusing only on injunctive norms. Stok and colleagues (2014) examined influences of norm-based information on high school students' fruit consumption using an experimental design and showed that participants receiving injunctive norm-based information had less intention to consume fruit than those in the control group. Their findings are consistent with the argument that injunctive norm-based messages may induce people to think that their personal freedom to enjoy whatever they want is being suppressed, which in turn may result in resistance towards injunctive norm-based messages (Cialdini, Kallagren, & Reno, 1991).

Noting that emphasizing only one of the two social norms may produce unintended outcomes or fail to promote desirable behaviors, researchers have investigated the role of combination of descriptive and injunctive norms in changing behavioral intentions or actual behaviors. In particular, researchers have emphasized the importance of alignment of descriptive and injunctive norms (Cialdini, 2003; Gockeritz et al., 2010; Schultz, Khazian, & Zaleski, 2008; Schultz et al., 2007; Smith et al., 2012). For example, Smith et al. (2012) investigated the roles of conflict between descriptive and injunctive norms in forming intentions to engage in energy

conservation and found negative effects of the conflict between the two norms on the energy conservation intentions. To the best of our knowledge, no research has been done on the effects of alignment or misalignment of these two norms on healthy eating behaviors; however, based on the alignment or misalignment research conducted in other behavior domains, it can be inferred that an individual may be more strongly motivated to eat healthy when he/she believes that most others eat healthy (descriptive norm) and that others also expect him/her to eat healthy (injunctive norm).

In addition to considering whether the alignment of the two social norms maximizes the effects of social norm-based interventions, researchers have also emphasized the importance of identifying the individuals or social groups that are most influential on the target audience or target behavior (Barr, 1994; Kassem et al., 2003; Neumark-Sztainer, Story, Perry, & Casey, 1999; Yanovitzky, Stewart, & Lederman, 2006; Yun & Silk, 2011). For example, Kassem et al. (2003) showed that people who were close in terms of social distance, such as friends and parents, were most influential on the participants' soft drink consumption. While many studies have found that close people are more influential than those belonging to distant social groups (e.g., general populations), a recent study indicated that the influence of social groups might depend on the type of behaviors and/or the type of social norms involved (Yun & Silk, 2011). Yun and Silk (2011) showed that the effects of reference norm groups (close versus distant social groups) on maintaining a healthy diet and exercising differed by type of social norms (descriptive versus injunctive norms). Regarding maintaining a healthy diet, descriptive norms were significantly influential only when the norms were those of close people, whereas injunctive norms had a similar effect size regardless of social distance. Regarding exercise, both injunctive and descriptive norms of close people only had significant effects.

Table 2.3

*Summary of studies investigating the role of injunctive or/and descriptive norms*

Author(s) / Research Design	Behavior	Sample	Main findings
Ball et al. (2010) / Survey	Physical activity and healthy eating behavior	3610 Australian women aged 18-46	<ul style="list-style-type: none"> <li>• Significant or marginally significant effects of descriptive norms on all three physical activity behaviors (leisure time physical activity, walking, cycling for transport) and all three food consumption behaviors (fast food/pizza, soft drinks, fruit/vegetables)</li> </ul>
Burger et al. (2010) / Experiment (2 groups: healthy snack and unhealthy snack)	Snack choices	120 (Study 1) and 75 (Study 2) female undergraduate students	<ul style="list-style-type: none"> <li>• For both studies, the role of descriptive norms was confirmed; that is, participants who believed most people chose a healthy snack were more likely to choose healthy snacks themselves than those who believed most people chose an unhealthy snack</li> </ul>
Lally et al. (2011) / Survey	Consumption of fruit/vegetables, sugar-sweetened drinks, and unhealthy snacks	264 U.K. students aged 16-17	<ul style="list-style-type: none"> <li>• Descriptive norms were the only predictor of all three food consumption behaviors (<math>\beta = .41</math> to <math>.50</math>, <math>p &lt; .01</math>)</li> <li>• No significant effects of injunctive norms on any of the three food consumption behaviors</li> </ul>
Povey et al. (2000) / Survey	General healthy eating behavior	235 participants, no details	<ul style="list-style-type: none"> <li>• Significant effect of injunctive norms on healthy eating intention (<math>\beta = .12</math>, <math>p &lt; .01</math>)</li> <li>• No significant effects of descriptive norms</li> </ul>
Rise et al. (2008) / Survey	Quit smoking	No details	<ul style="list-style-type: none"> <li>• Significant, positive effect of descriptive norms on intention to quit smoking (<math>\beta = .26</math>, <math>p &lt; .01</math>)</li> <li>• No significant effects of injunctive norms</li> </ul>
Tuu et al. (2008) / Survey	Consumption of fish	612 Vietnamese consumers	<ul style="list-style-type: none"> <li>• Significant effects of both injunctive and descriptive norms on intention to consume fish (<math>\beta = .12</math> and <math>.13</math>, <math>p &lt; .05</math>, respectively)</li> </ul>

### **Perceived Behavioral Control (PBC)**

Perceived behavioral control (PBC) predicts both behavioral intention and actual behavior in TPB; that is, PBC directly affects behavioral intention and actual behavior, and also indirectly affects actual behavior through behavioral intentions. PBC was added when the theory of reasoned action (TRA) was extended to TPB (Ajzen, 2006). TRA is the same model as TPB, except for the inclusion of PBC, and within TRA behavioral intention was the only predictor of actual behavior. The reason to extend TRA into TPB was that TRA was limited to predicting volitional behaviors defined as behaviors which “can be easily performed if people are so inclined or refrain from performing them if they decide against it” (Ajzen, 2006, p. 99) – that is, for those behaviors that are under volitional control, behavioral intentions could act as a good predictor. However, for non-volitional behaviors, other control factors (e.g., information, opportunity) could play a significant role in behavior performance (Ajzen & Madden, 1986). Thus, if the behavior is perfectly under an individual’s control, behavioral intentions accurately predict actual behavior and PBC would not explain much additional variance, whereas in the case of behaviors with low volitional control, PBC would explain much more additional variance in behavior performance (Ajzen, 2006). Even if the perceived extent to which people have control over the behavior under consideration should be considered for precise prediction of a certain behavior, it is almost impossible to consider all control factors that may predict behaviors and figure out which individual possesses which facilitators and barriers pertinent to the behavior in question. For this reason, Ajzen and Madden (1986) measured PBC as a proxy of actual control. They empirically tested the roles of PBC through two experimental studies examining how much additional variance in behavioral intentions and actual behaviors could be explained by incorporating PBC into the TRA model. The behavior considered in the first study was class



attendance, which they considered more volitional, and that of the second study was a grade of “A” in a class, which they considered less volitional. For both studies, PBC accounted for additional variances in behavioral intentions; however, in the first study, which predicted the more volitional behavior, PBC did not significantly explain additional variances in actual behavior, whereas in the second study, which predicted the less volitional behavior, PBC significantly increased predictive power, indicating that the role of PBC might be different depending on the type of behavior in question.

Using a meta-analytical technique, researchers found average effects of PBC on behavioral intention and actual behaviors (Armitage & Conner, 2001; Godin & Kok, 1996; Sheeran & Taylor, 1999). Sheeran and Taylor (1999) conducted a meta-analysis to investigate 23 predictors (e.g., perceived severity, perceived vulnerability, attitude, subjective norm, PBC) of intention to use a condom using a variety of theoretical models (e.g., health belief model, TRA, TPB). According to the results, in seven out of 10 studies using TPB, PBC significantly predicted intention, and on average 5% of the additional variances in intention could be explained by adding PBC. Godin and Kok (1996) reviewed 87 individual tests (e.g., alcohol use, health check, eating, exercising) from 56 studies examining health-related behaviors based on TPB. In 76 of the 87 tests where the researchers provided  $R^2$  values, PBC was found to be a significant factor influencing behavioral intention and contributed to explaining on average 13.1% and 11.5% of additional variances in behavioral intention and actual behavior, respectively, over a variety of health-related behavior domains. In particular, for healthy eating, the average variance in intention explained by PBC was 5%. Armitage and Conner’s meta-analysis (2001) also found that on average PBC explained an additional 6% and 2% of the variance in behavioral intention and actual behavior, respectively. Empirical studies on the

effects of PBC within TPB have been provided in the section titled “theory of planned behavior” and detailed results are shown in Table 2.1.

Ajzen (1991) conceptualized PCB as “[the] perceived ease or difficulty of performing [a] behavior” (p. 188). In the first study incorporating PBC by Ajzen and Madden (1986), the concept was measured by three questions: 1) “How much control do you have over whether you do or do not [behavior X]?” (complete control – very little control); 2) “For me, to do [behavior X] is” (easy – difficult); and 3) “If I wanted to, I could do [behavior X]” (extremely likely – extremely unlikely). Confirmatory factor analysis showed that all questions loaded on one underlying factor. However, because PBC was introduced into the mix, a number of researchers have attempted to reconceptualize this concept (Kraft et al., 2005; Rhodes & Blanchard, 2006; Rhodes & Courneya, 2003; Rhodes & Courneya, 2004; Trafimow et al., 2002) even if the distinction is not as clear as the distinctions between the concepts of attitude and social norms.

Armitage and Conner (1999) measured the concept of PBC using self-efficacy, which they defined as “confidence in one’s own ability to carry out a behavior” and perceptions of control over behavior, which they defined as “[the] extent to which people perceive control over more external factors.” Principal component analysis revealed that these two concepts were distinct. More recent research also argues that PBC consists of two distinct dimensions (Ajzen, 2002b; Trafimow et al., 2002). Although there is no consensus on the names of these two dimensions, Ajzen (2002b) identified one as self-efficacy and the other as controllability. He suggested that the concept of self-efficacy is related to “[the] ease or difficulty of performing [a] behavior, with people’s confidence that they can perform it if they want to do so” (p. 676) and controllability is related to “[the] belief that they have control over the behavior, that performance or nonperformance of the behavior is up to them” (p. 676), and concluded that both

concepts should be considered when measuring PBC. Unlike the argument that PBC should be assessed in terms of self-efficacy and controllability, Armitage and Conner (2001) considered PBC another control factor, not including self-efficacy and perceived control, and examined the effects of these three distinct control factors on behavioral intention and actual behavior. Results revealed that the concept of perceived control had weak and unreliable effects on behavioral intention and actual behavior; however, both self-efficacy and PBC had a significantly strong relationship with behavioral intention and actual behavior. In particular, compared with PBC, self-efficacy explained a similar amount of variance in behavioral intention but accounted for more variances in actual behavior, indicating self-efficacy might be the preferred measurement by which to assess actual control within TPB.

Kraft et al. (2005) considered four dimensions of PCB, including perceived difficulty (e.g., “For me, to ... perform behavior X... would be difficult” (disagree completely/agree completely), confidence (e.g., “How confident are you that you could ... perform behavior X” (completely unconfident/completely confident), perceived control (e.g., “I have full control over ... performing behavior X” (disagree completely/agree completely), and locus of control (e.g., “It is completely up to me whether or not I ... perform behavior X...” (disagree completely/agree completely). Through repeated comparison among several models with different combinations of control components, the authors suggested three solutions: PCB could be considered having 1) three separate dimensions: perceived difficulty, confidence, and perceived control, 2) two separate dimensions: self-efficacy (consisting of perceived difficulty and confidence) and controllability (representing perceived control), or 3) two separate dimensions: confidence and perceived control.

As mentioned above, the subordinate components of the concept of PBC are still controversial. There is some argument that the distinction is not well established, indicating that a unidimensional measurement including only the concept of controllability is both theoretically and empirically appropriate (Rhodes & Blanchard, 2006; Rhodes & Courneya, 2003; Rhodes & Courneya, 2004). Rhodes and Courneya (2003) investigated the roles of self-efficacy and controllability in forming intention and found that self-efficacy showed redundancy with the concept of intention, indicating that controllability was the best measurement of PBC reflecting the original theoretical concept of PBC well. However, when the phrase “if I wanted to do so” was added to the items measuring the concept of self-efficacy, the redundancy was decreased and the items accurately measured the concept of PBC; thus, it was suggested that if self-efficacy were to be used to assess PBC, this phrase should be added to the questions to hold motivation constant. Rhodes and Blanchard (2006), and Rhodes and Courneya (2004) also found results consistent with Rhodes and Courneya’s study (2003).

### **Behavioral Intention versus Behavioral Willingness**

Behavioral intention is one of two predictors of actual behavior in TPB. If behaviors were completely under an individual’s control as assumed in TRA, behavioral intention would be the best predictor of actual behavior. However, realizing that many behaviors are not completely under voluntary control, TPB includes both behavioral intention and PBC to predict actual behavior. Behavioral intention is defined as “a person’s motivation in the sense of her of his conscious plan or decision to exert effort to enact the behavior” (Conner & Armitage, 1998, p. 1430). Therefore, if a person has a strong intention to engage in a behavior, he/she is more likely to perform the behavior.

Even if behavioral intention has been widely used to predict a variety of behaviors, researchers have pointed out that behavioral intention is the proximal antecedent for behaviors based on a rational or premeditated behavior decision approach; however, not all behaviors can be explained with such an approach (Gibbons & Gerrard, 1995; Gibbons, Gerrard, Blanton, et al., 1998; Gibbons, Gerrard, Ouellette, et al., 1998). To address this argument, researchers have introduced behavioral willingness as a predictor of behavior considering the unintentional and reactive behavior decision processes. The results of Armitage and Conner's meta-analysis (2001) also support incorporation of another determinant of actual behavior. According to the findings, the correlation between behavioral intention and behavior is 0.47, explaining 22% of the variance in behaviors. Even considering both behavioral intention and PBC, which is the other predictor of behavior, around 70-80% of variance should still be explained. Therefore, given that behavioral intention is unable to explain unintentional behavioral decisions and that there is more room for improvement in terms of explanatory power, behavioral willingness could be considered another good addition to extend TPB.

The concept of behavioral willingness in PMW seems similar to the concept of behavioral intention in the TPB in that both concepts are used in proximal measures of actual behavior. However, there is a clear distinction between them, as is evident given the definition of each concept. Behavioral intention is defined as “[an] indication of how much of an effort they are planning to exert in order to perform the behavior” (Ajzen, 1991, p. 181), whereas behavioral willingness refers to “an individual's openness to opportunity, that is, his or her willingness to perform a certain behavior in situations that are conducive to that behavior” (Pomery, Gibbons, Reis-Bergan, & Gerrard, 2009). That is, compared with behavioral intention, behavioral willingness involves little planning or premeditation. Another distinction between behavioral

intention and behavioral willingness is in the way of measuring each component. As indicated in the definition of behavioral willingness, measurement of behavioral willingness involves specifying a certain situation; that is, this concept is assessed by asking participants how willing they would be to perform a behavior in a given situation. Gibbons, Gerrard, Blanton, et al. (1998) investigated the roles of behavioral willingness and behavioral expectation in predicting adolescent smoking behavior. They chose behavioral expectation instead of behavioral intention because they wanted a more conservative test to distinguish behavioral willingness and behavioral intention; that is, because behavioral expectation is considered more similar to behavioral willingness than behavioral intention is to behavioral willingness, if it is found that behavioral expectation is distinct from behavioral willingness, the distinction between behavioral willingness and behavioral intention would be more pronounced. The findings indicated that even if behavioral willingness was correlated with behavioral expectation, behavioral willingness and behavioral expectation respectively accounted for a significant variance in adolescent smoking behavior. Based on the results, the authors concluded that both behavioral willingness and behavioral expectation could be used as important proximal antecedents of actual behavior.

Numerous empirical studies have examined the roles of both behavioral intention and behavioral willingness as determinants of actual behavior in a wide range of behavior domains (Blanton et al., 2001; Hukkelberg & Dykstra, 2009; Hyde & White, 2010; Myklestad & Rise, 2007; Ohtomo & Hirose, 2007; Zimmermann & Sieverding, 2010). Moreover, a sizeable number of studies have found that behavioral willingness is a better predictor of actual behavior than behavioral intention (Fila & Smith, 2006; Hammer & Vogel, 2013; Hukkelberg & Dykstra, 2009).

## Prototype

The definition of the prototype image is “an individual’s image of the typical person who belongs to a group or engages in a certain behavior“ (Ouellette, Hessling, Gibbons, Reis-Bergan, & Gerrard, 2005, p. 610). PWM posits that if people have positive perceptions of the typical person who engages in a certain behavior, they are more willing to perform the behavior (Gibbons & Gerrard, 1995). Also, perceived prototype images have been considered as a predictor only for behavioral willingness, not behavioral intention (Gibbons, Gerrard, Blanton, et al., 1998; Gibbon, Houlihan, & Gerrard, 2009; Thornton, Gibbons, & Gerrard, 2002)

To investigate the role of the prototype image in influencing behavioral decisions, most studies have looked at the typical person who engages in negative behavior (e.g., smoking, binge drinking) instead of positive behavior (Hukkelberg & Dykstra, 2009; Ohtomo & Hirose, 2007). Blanton et al. (2001, pp. 277-278) gave as their reason the idea of “negative bias,” which means that people tend to give more weight to negative information rather than positive. In other words, because people have a tendency to be more motivated by “a desire to avoid association with unhealthy images” than “a desire to gain association with healthy images,” prototype images of people engaging in negative behaviors would be more predictive than those of people engaging in positive behaviors. Blanton et al. (2001) empirically tested this proposition in the unsafe sexual behavior domain through a questionnaire and an experiment. Prototype images of persons engaging in safe sex by using condoms and persons engaging in unsafe sex by not using condoms were measured or manipulated to predict participants’ willingness to engage in unsafe sex. Consistent with their proposition, the unhealthy prototype image acted as a significant predictor of willingness to engage in unprotected sex, whereas the healthy prototype image did not significantly predict such willingness. A number of empirical studies have used negative

prototype images to predict a variety of behaviors (Gibbons, Gerrard, Blanton, et al., 1998; Gibbons, Gerrard, Ouellette, et al., 1998; Ohtomo & Hirose, 2007), but recently some researchers have started to use healthy prototype images, such as non-smokers (Hukkelberg & Dykstra, 2009) and people who engage in safe sex (Myklestad & Rise, 2007).

### **Empirical studies based on PWM or TPB with PWM components**

Because PWM was originally developed to predict young people's health risk behaviors (e.g., unsafe sexual intercourse, binge drinking) (Gibbons, Gerrard, Blanton, et al., 1998; Norman et al., 2007) and more recently applied to the pro-social or health promoting behavior domains (e.g., recycling, non-smoking) (Hukkelberg & Dykstra, 2009; Ohtomo & Hirose, 2007), few empirical studies have been done on other topics. In particular, to the best of our knowledge, there is no PWM research focusing on healthy food selection behavior. That is why the empirical studies introduced in this section concern young people's health risk behaviors. The empirical studies in this section may not directly relate to the topic of this current study; however they do provide a sense of how PWM has been used to predict people's behaviors and how it could be utilized to answer the research questions of this current study.

Myklestad and Rise (2007) examined ninth grade students' behavioral intention and willingness related to sexual intercourse. Student (n=196) completed a questionnaire which included items about intention to use contraception; willingness to engage in unsafe sexual intercourse; attitudes, subjective norms, and perceived behavioral control related to using contraception; moral norms related to unsafe sexual intercourse; prototype images of a typical person engaging in unsafe sexual intercourse; and prototype images of a typical person using contraception. Prototype images were measured using 15 adjectives and through principle component analysis, three dimensions of prototype images, including "desperate," "reasonable,"



and “conceited,” were produced. Hierarchical regression analysis found that intention to use contraception was predicted by TPB components, which explained 32% and 40% of variances in boys’ and girls’ intention to use contraception, whereas willingness to engage in unsafe sexual intercourse was not predicted by the three components. Specifically, boys’ behavioral intention to use contraception was predicted by subjective and moral norms, and adding three prototype images to the model with attitudes, subjective norms, PBC, and moral norms did not explain the additional variance in behavioral intention. This model without prototype images accounted for 43% of variance in intention. For girls, subjective norm and two prototype images, such as “desperate,” and “reasonable,” predicted behavioral intention, and adding prototype images accounted for 6% of variance in behavioral intention. Boys’ willingness to engage in unsafe sexual intercourse was predicted only by moral norms, while girls’ willingness was predicted by moral norms and one of the prototype images. Again, prototype images did not increase predictive power in boys’ behavioral willingness, but did increase it for girls. Based on the findings, the authors proposed that in order to encourage adolescents to engage in safe sexual intercourse, the intervention should consider the effects of normative factors to correct adolescents’ misunderstandings about their peers’ involvement in unsafe sexual behavior and attempt to modify their perception of a typical person engaging in such behaviors.

Zimmerman and Sieverding (2010) investigated social drinking behavior based on extended TPB by adding six factors: four distinctive prototype images, behavioral willingness, and past behavior. Specifically, four distinctive prototype images were actor evaluation, actor similarity, abstainer evaluation, and abstainer similarity. “Actor” referred to a typical person drinking more than three glasses of alcohol during an evening of socializing, and “abstainer” meant a typical person drinking only non-alcoholic drinks during that same time. “Evaluation”

meant participants' perception and "similarity" refers to the perceived similarity between the participant and the typical person. Attitudes, subjective norms, self-efficacy, and behavioral intention related to drinking more than three glasses of alcohol in one evening were assessed. Behavioral willingness was measured by posing the question, "I continue drinking" (no, in no case/yes, in any case) using two scenarios that promote drinking. After all these constructs were measured in the first stage of data collection, follow-up interviews were conducted to collect information regarding the participants' actual alcohol consumption. A total of 202 young adults (average age 24.7) participated in both stages of data collection. Because gender significantly affected the relationship among the constructs, the conceptual model was analyzed by gender. For women, subjective norms ( $\beta = .24$  and  $.26, p < .05$ ) and self-efficacy ( $\beta = .31$  and  $.26, p < .05$ ) were the only predictors for both behavioral intention ( $R^2 = .28$ ) and willingness ( $R^2 = .40$ ), and prototype images did not have significant effect on them. Actual alcohol consumption ( $R^2 = .41$ ) was affected by behavioral intention ( $\beta = .45, p < .05$ ) and self-efficacy ( $\beta = .20, p < .05$ ). For men, behavioral intention ( $R^2 = .39$ ) was predicted by self-efficacy ( $\beta = .32, p < .05$ ), actor evaluation ( $\beta = .16, p < .05$ ), and actor similarity ( $\beta = .23, p < .05$ ), and behavioral willingness ( $R^2 = .43$ ) by subjective norms ( $\beta = .23, p < .05$ ), self-efficacy ( $\beta = .16, p < .05$ ) and abstainer similarity ( $\beta = -.21, p < .05$ ). Men's alcohol consumption ( $R^2 = .49$ ) was predicted by behavioral intention ( $\beta = .52, p < .05$ ), willingness ( $\beta = .27, p < .05$ ), and abstainer evaluation ( $\beta = -.25, p < .05$ ). To briefly summarize the results: self-efficacy and normative factors (e.g., subjective norms and abstainer similarity) had a significant influence for both men and women. However, for women, subjective norms exerted more important force, and for men, abstainer similarity played a more critical role.

Ohtomo and Hirose (2007) conducted research to predict eco-friendly behaviors based on a modified prototype/willingness model. They distributed 217 questionnaires to Japanese undergraduate students during class, with 206 questionnaires completed (68 males and 138 females). The questionnaire included items to assess recycling behavior, prototype images, descriptive norms, behavioral willingness, environmental concerns, injunctive norms, and behavioral intention. In particular, the prototype images were employed by requiring participants to evaluate a typical person who does not recycle, and behavioral willingness to recycle was assessed via a scenario that discouraged participants from recycling by imagining that they were in a specific situation; thus, higher scores in behavioral willingness indicated that participants were more willing to engage in non-recycling behaviors. As authors expected, behavioral willingness to recycle was predicted by prototype images ( $\beta = .31, p < .01$ ) and descriptive norm ( $\beta = .33, p < .01$ ), while behavioral intention to recycle was determined by injunctive norms ( $\beta = .21, p < .01$ ) and environmental concerns ( $\beta = .67, p < .01$ ). Both behavioral willingness ( $\beta = -.47, p < .01$ ) and intention to recycle ( $\beta = .39, p < .01$ ) played significant roles in predicting recycling behaviors – that is, participants who had a stronger intention to recycle and less willingness to not recycle were more likely to engage in recycling behavior.

Hammer and Vogel (2013) investigated psychological help-seeking behaviors using PWM in a study with 182 undergraduate students experiencing psychological distress. Attitude was assessed with “Attitudes Towards Seeking Professional Psychological Help Scale” and subjective norms with both injunctive and descriptive norms. Prototypes were measured by perception of the typical person seeking psychological help. Behavioral willingness was assessed by asking participants to rate their openness to engaging in help-seeking behavior after they were presented with scenarios which might elicit such behavior, whereas behavioral intention was

measured without such scenarios. Results demonstrated that attitudes ( $\beta = .41$  and  $.40, p < .001$ ) and subjective norms ( $\beta = .51, p < .05$  and  $\beta = .20, p < .01$ ) had significantly positive influences on both intention and willingness to seek psychological help, whereas the prototype image ( $\beta = -.20, p < .01$ ) had a significantly negative effect on behavioral willingness, which contradicts what PWM proposes. To explain this anomaly, the authors speculated that there might be some measurement problems in assessing prototypes. Behavioral willingness ( $\beta = .32, p < .001$ ) acted as a predictor of actual help seeking behavior but behavioral intention did not, indicating that “creating conducive help-seeking circumstances” would be beneficial in encouraging students to seek professional help to reduce their psychological distress.

Hukkelberg and Dykstra (2009) used PWM to examine Norwegian adolescents’ non-smoking behavior. Non-smoking students in eighth and ninth grade ( $n=760$ ) were administered a questionnaire that included questions about smoking behavior; behavioral willingness and intention to not smoke; attitudes; subjective norms; and prototype images. A follow-up survey was conducted to measure their smoking behavior again. Attitudes and subjective norms were measured related to non-smoking behavior. To assess behavioral willingness, scenarios which might encourage students to smoke were provided, and prototype images were measured by asking respondents to rate the image of a typical smoker using 12 adjectives (e.g., cool, sexy, unattractive). First of all, authors evaluated the model with only social reaction paths, which showed the interrelationships among previous behavior, prototype images, behavioral willingness, and actual behavior; they found that this model accounted for 16% of variance in non-smoking behavior. Next, they incorporated into the first model reasoned paths consisting of attitude, subjective norms, and behavioral intention and found that this second model, the traditional PWM, increased the predictive power by 31%.

Table 2.4

*Summary of studies developed based on PWM or TPB with PWM components*

Author(s) / research design	Behavior	Sample	Main findings
Hammer & Vogel (2013) / Survey	Help-seeking behavior	182 undergraduate students experiencing psychological distress in one Midwestern university	<ul style="list-style-type: none"> <li>• Significantly positive effects of attitudes (<math>\beta = .41</math> and <math>.40</math>, <math>p &lt; .001</math>) social norms (<math>\beta = .51</math>, <math>p &lt; .001</math> and <math>\beta = .20</math>, <math>p &lt; .01</math>, respectively) on both behavioral intention and willingness</li> <li>• Significantly negative effects of prototypes on behavioral willingness (<math>\beta = -.20</math>, <math>p &lt; .01</math>)</li> <li>• Behavioral willingness was the only predictor of behavior</li> </ul>
Hukkelberg & Dykstra (2009) / Survey	Non-smoking behavior	760 8 <sup>th</sup> and 9 <sup>th</sup> grade students	<ul style="list-style-type: none"> <li>• No gender differences</li> <li>• Subjective norm (<math>\beta = .41</math>, <math>p &lt; .001</math>) was the only predictor of behavioral intention</li> <li>• Subjective norm (<math>\beta = .14</math>, <math>p &lt; .05</math>) and prototype (<math>\beta = .27</math>, <math>p &lt; .001</math>) significantly affected behavioral willingness</li> <li>• Behavioral willingness (<math>\beta = .20</math>, <math>p &lt; .05</math>) was the only determinant of actual behavior</li> </ul>
Myklestad et al. (2006) / Survey	Safe- and unsafe- sexual behaviors	196 9 <sup>th</sup> grade students in Oslo	<ul style="list-style-type: none"> <li>• Behavioral intention to use contraception <ul style="list-style-type: none"> <li>– Attitude, subjective norm, and PBC explained 32% of variance in intention for boys and 40% for girls</li> <li>– Addition of prototypes did not increase predictive power for boys but did increase it for girls</li> </ul> </li> <li>• Behavioral willingness to engage in unsafe sex <ul style="list-style-type: none"> <li>– Attitudes, subjective norm, and PBC accounted for 5% of variances for boy and 1% for girls in willingness</li> <li>– Addition of prototype did not increase predictive power for boys but increased for girls</li> </ul> </li> </ul>

Table 2.4 (continued)

Author(s) / research design	Behavior	Sample	Main findings
Ohtomo & Hirose (2007) / Survey	Recycling behavior	217 Japanese undergraduate students	<ul style="list-style-type: none"> <li>• Both prototypes (<math>\beta = .31, p &lt; .01</math>) and descriptive norms (<math>\beta = .33, p &lt; .01</math>) significantly influenced behavioral willingness</li> <li>• Both injunctive norms (<math>\beta = .21, p &lt; .01</math>) and environmental concern (<math>\beta = .67, p &lt; .001</math>) had a significant, positive influence on behavioral willingness</li> <li>• Both behavioral intention (<math>\beta = -.47, p &lt; .01</math>) and willingness (<math>\beta = .39, p &lt; .01</math>) predicted actual behavior</li> </ul>
Zimmermann & Sieverding (2010) / Survey	Social drinking behavior	202 young adults (average age 24.7 years)	<ul style="list-style-type: none"> <li>• Gender differences were found</li> <li>• For women: <ul style="list-style-type: none"> <li>– Subjective norms (<math>\beta = .24</math> and <math>.26, p &lt; .05</math>) and self-efficacy (<math>\beta = .31</math> and <math>.26, p &lt; .05</math>) predicted both behavioral intention (<math>R^2 = .28</math>) and willingness (<math>R^2 = .40</math>)</li> <li>– Self-efficacy and behavioral willingness predicted actual behavior (<math>R^2 = .41</math>)</li> <li>– No effects of behavioral intention on actual behavior</li> </ul> </li> <li>• For men: <ul style="list-style-type: none"> <li>– Self-efficacy (<math>\beta = .32, p &lt; .05</math>), actor evaluation (<math>\beta = .16, p &lt; .05</math>), and actor similarity (<math>\beta = .23, p &lt; .05</math>) all had a significant effect on behavioral intention (<math>R^2 = .39</math>)</li> <li>– Subjective norms (<math>\beta = .23, p &lt; .05</math>), self-efficacy (<math>\beta = .16, p &lt; .05</math>), and abstainer similarity (<math>\beta = -.21, p &lt; .05</math>) significantly affected behavioral willingness (<math>R^2 = .43</math>)</li> <li>– Both behavioral intention (<math>\beta = .52, p &lt; .05</math>) and willingness (<math>\beta = .43, p &lt; .05</math>) predicted actual behavior (<math>R^2 = .49</math>)</li> </ul> </li> </ul>

Within this PWM, subjective norms ( $\beta = .15, p < .05$  and  $\beta = .41$  and  $p < .001$ ) were positively related to both behavioral willingness and intention, whereas attitude ( $\beta = .08, p < .05$ ) was positively associated with behavioral willingness only and prototype images ( $\beta = .27, p < .001$ ) were negatively associated with behavioral willingness, indicating if students have negative perceptions of smokers, they are less likely to engage in smoking. Finally, non-smoking behavior ( $\beta = .20, p < .001$ ) was predicted only by behavioral willingness, not intention to smoke. Table 2.4 provides a summary of studies that investigated a variety of behaviors within PWM or TPB with PWM components.

### **Summary of Theoretical Background**

As described, researchers have attempted to extend TPB by re-conceptualizing its components and incorporating additional variables from other theoretical frameworks. Specifically, the concept of attitudes consists of both affective and cognitive attitudes and the concept of social norm is composed of both injunctive and subjective norms. However, the theoretical conceptualization of PBC is still controversial. To remedy the shortcomings of TPB, address the lack of explanatory power with respect to unintentional behavioral decisions and understand the irrational and unintentional behavioral decision process, two components of PWM, prototype images and behavioral willingness, have been added to TPB. To date only a few studies have investigated the effects of these additional variables on healthy eating behavior intention and consumption. Moreover, to the best of the authors' knowledge, there has been no research on this theoretical argument in the restaurant context. Therefore, this proposed study will contribute to and extend the existing literature by examining the roles of these constructs in people's healthy menu item choices at casual dining restaurants. Based on the above discussion, the conceptual model of this study is shown in Figure 2.1.

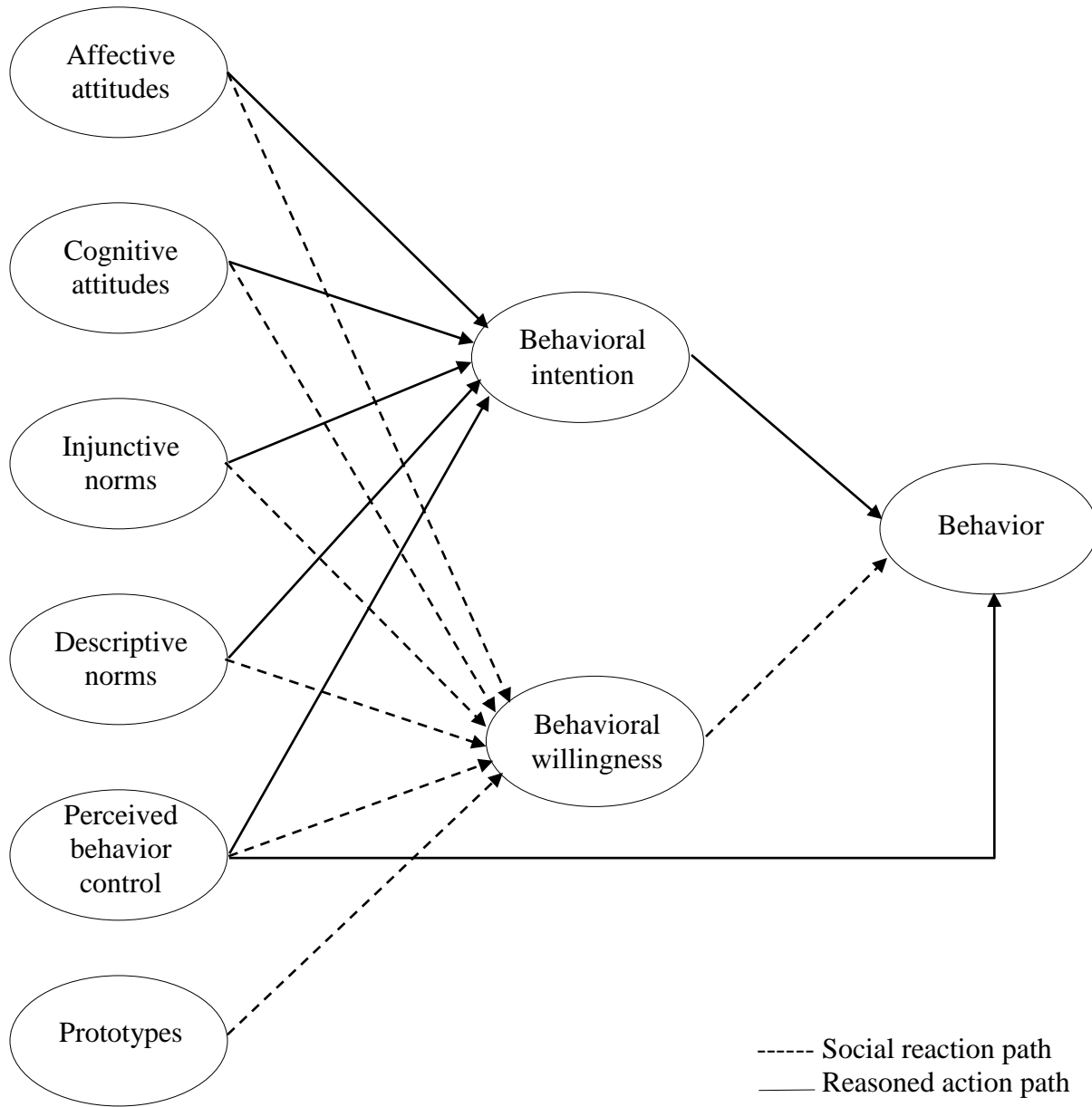


Figure 2.1. Proposed Conceptual Model

### Measurement Tools

#### Affective and Cognitive Attitudes

Researchers have measured affective and cognitive attitudes using a seven-point bipolar adjective scales. When measuring affective attitude, three adjective pairs (e.g. enjoyable/unenjoyable; pleasant/unpleasant; and interesting/boring) were used. When measuring



cognitive attitude, three adjective pairs (e.g. useful/useless; wise/foolish; and beneficial/harmful) were used. Using the same adjective pairs, Armitage and Conner (1999) investigated people's low fat diet behavior with TPB. Even though they did not split attitude into affective and cognitive attitude, Cronbach's alpha value for the composite attitude was .75, confirming acceptable reliability of the items. McConnon et al. (2012) examined the effects of both affective and cognitive attitudes toward preventing weight gain on intentions to prevent weigh gain. They collected data at three time points, and Cronbach's alpha values for cognitive attitude over all three time points were higher than the cutoff point of .70. Even though McCannon et al. (2012) found Cronbach's alpha values for affective attitude to be unsatisfactory, Rhodes, Courneya, and Jones (2004) and Hyde, Doerksen, Ribeiro, and Conroy (2010) found acceptable internal consistency for the same affective attitude items.

### **Injunctive and Descriptive Norms**

Ajzen (2002a) provided general guidelines to measure the injunctive norm and suggested three item stems as follows: 1) Most people who are important to me think that I should ...; 2) It is expected of me that I ...; and 3) The people in my life whose opinions I value would approve.... Although Ajzen provided the three items, he also suggested that researchers could formulate similar items based on his proposed measurement items. Researchers have formulated as many as four items similar to Ajzen's items, Cronbach's alpha values demonstrated acceptable reliability of the measurement items regardless of the number of the items (Armitage & Conner, 1999; Blanchard et al., 2009; Mahon et al., 2006; Rhode et al., 2004). To measure descriptive norms, Rise et al. (2008) developed three items (e.g., a number of my friends/fellow students think of quitting smoking). Using a principal component analysis, it was confirmed that these three items belonged to one construct, showing acceptable internal consistency.

### **Perceived Behavioral Control**

Perceived behavioral control refers to “people’s perception of the ease or difficulty of performing the behavior of interest” (Ajzen, 1991, p.183). Based on this definition, researchers have formulated the measurement items to assess the perceived behavioral control (Conner and McMillan, 1999; Netemeyer, Burton, & Johnston, 1991; Ravis & Sheeran, 2003). For example, Ravis and Sheeran (2003) measured perceived behavioral control using four items (e.g., If I wanted to, I could easily exercise at least 6 times in the next two week) and confirmed acceptable internal consistency of the measurement items (Cronbach’s alpha more than the cutoff of .70).

### **Prototypes**

Prototype has been evaluated using adjectives which describe a typical person who engages in a certain behavior (Blanton et al., 2001; Gibbons, Gerrard, Balnton et al., 1998). For example, Hukkelberg and Dykstra (2009) used 12 adjectives to discover the prototype image of a smoker (e.g., cool, smart, self-conscious, sympathetic, and independent). However, the best of our knowledge, there is only one study providing the adjectives to assess the prototype image of an unhealthy eater (Gerrits, de Ridder, de Wit, & Kuijer, 2009). They determined the 12 pairs of adjectives to describe an unhealthy eater using both qualitative and quantitative methods. The adjective pairs demonstrated acceptable internal consistency with Cronbach’s alpha value of .81.

### **Behavioral Intention**

Ajzen’s suggestions (2002a) suggested three item stems to measure the behavioral intention. The three item stems are as follows: 1) I intend to ...; 2) I will try to ...; and 3) I plan to .... Rise et al. (2008) used the same items to investigate smoking quitting behaviors and confirmed the internal consistency of those items. Chen et al. (2011) also confirmed the acceptable internal consistency of those items.

**Behavioral Willingness**

Behavioral willingness has been measured using scenario-based questions. According to Gibbons, Gerrard, and McCoy (1995), Gibbons, Gerrard, and Blanton et al. (1998), and Ohtomo and Hirose (2007), behavioral willingness is assessed by first presenting a scenario that describes situations inducing health-risky behaviors and then asking participants how likely they would be to engage in the target behaviors in such a situation. Two or three items were recommended. Following these suggestions, researchers have assessed the behavior willingness and confirmed internal consistency of the measurement items (Blanton et al., 2001; Gibbons et al., 1995; Gibbons, Gerrard, & Blanton et al., 1998; Ohtomo & Hirose, 2007; Pomery et al., 2009).

**Self-reported Behavior**

Researchers measured actual behavior by asking participants to report their usual behaviors (Ohtomo & Hirose, 2007; Honkanen, Olsen, Verplanken, & Tuu, 2012). Ohtomo and Hirose (2007) developed three items that asked about participants' usual recycling behaviors to assess actual recycling behavior. They did not provide Cronbach's alpha values for the measurement items, however they showed an acceptable level of composite reliability, indicating internal consistency of the measurement items. In addition to Ohtomo and Hirose, Honkanen et al. (2012) investigated actual snacking behaviors by asking participants to indicate their usual snacking behaviors, however they used one item instead of using multiple items.

As noted, these constructs have been studied by other researchers in various behavior domains and verified as valid measurement items. Therefore, this current study used these validated measurement items to investigate the proposed research objectives. More details related to measurements specific to this study can be found in Chapter 3.

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## **CHAPTER 3. METHODS**

The purpose of this study was to understand consumers' healthful menu itema` (i.e. low calorie menu item) selections at restaurants within a model that draws on an expanded TPB by incorporating two constructs from the prototype/willingness model: prototypes and behavioral willingness. This chapter discusses use of human subjects, study sample, data collection, instrument development, and data analysis.

### **Use of Human Subjects**

Approval from Iowa State University Human Subjects Institutional Review Board was obtained before data collection began (Appendix A). Participants were clearly informed of the purpose of the study and assured confidentiality of their responses through the cover letter (Appendix B) accompanying the questionnaire (Appendix C). All researchers involved in this study completed the Human Subjects Research Assurance Training authorized by Iowa State University.

### **Participants and Data Collection**

The sample consisted of casual dining restaurant goers who lived in the United States. A survey link was posted on Amazon Mechanical Turk and then individuals (over 18 years of age) who were registered on the website filled out the questionnaire voluntarily. Amazon Mechanical Turk is considered an efficient means of collecting data because of its large subject pool with diverse backgrounds (Mason & Suri, 2011). Researchers have attempted to determine whether Amazon Mechanical Turk is a valid means of collecting data and confirmed that there are not significant differences between the results obtained from Amazon Mechanical Turk and from other online samples (Buhrmester, Kwang, & Gosling, 2011).

Before the survey link was posted on Amazon Mechanical Turk, \$554.95 was deposited in the primary researcher's Amazon Mechanical Turk account. The deposit included incentives for participants (50 cents each) and service fees for Amazon Mechanical Turk (10% of incentives). Once participants completed the survey and the primary researcher approved it, Amazon Mechanical Turk automatically deducted incentives from researcher's prepaid balance and deposited the incentives to the Amazon accounts of the participants who completed the survey. The participants could then transfer the incentives to their personal bank accounts if they wanted. For this study, all participants who completed a survey received the 50 cents incentive.

### **Survey Development Tool**

An online survey tool, Qualtrics, was used to develop our survey. The survey began with an informed consent form and asked participants to verify that they have read the information and agreed to participate in the survey. If the participants chose "I agree" to this statement, they were offered an opportunity to respond to the remaining survey questions; if they chose "no", the survey was terminated. After that, a screening question, "Are you living in the United States?" was provided. If the participants chose "no", they could not continue to participate in the survey. Except for one question asking about the names of restaurants which participants visited within the previous month, participants were allowed to choose only one answer to each of the questions throughout the survey. For participants' convenience, participants were allowed to go back to the previous section, and the progress bar was presented to let them know how far along they were in the survey. Also, participants were restricted from participating in the survey more than once because the "Prevent Ballot Box Stuffing" feature was activated in Qualtrics.

## **Survey Instrument**

To assess the nine constructs of this proposed model – cognitive and affective attitudes, injunctive and descriptive norms, perceived behavioral control, prototype, behavioral intention, behavioral willingness, and behavior, survey items were generated based on published scales used in previous research or developed by authors based on prior studies (Ajzen, 2002; Blanton et al., 2001; Gerrits, de Ridder, de Wit, & Kuijer, 2009; Gibbons, Gerrard, & McCoy, 1995; McConnon et al., 2012; Ohtomo & Hirose, 2007; Rise, Kovac, Kraft, & Moan, 2008; Ravis & Sheeran, 2003).

### **Cognitive and Affective Attitudes**

The first section of the survey asked respondents to rate their attitudes toward choosing menu items that are low in calories at casual dining restaurants using a seven-point semantic differential scale. The measurement (McConnon et al., 2012) contained six adjective pairs, each preceded with the statement, “For me, eating menu items that are low in calories at restaurant would be \_\_\_\_.” Three of these six adjective pairs (bad/good, harmful/beneficial, foolish/wise) assessed the cognitive aspect and three (unpleasant/pleasant, unenjoyable/enjoyable, boring/interesting) assessed the affective aspect of attitudes.

### **Injunctive and Descriptive Norms**

The second section of the survey was designed to gather perceived social norms related to choosing menu items that are low in calories at restaurants. Injunctive and descriptive norms were assessed separately with three items each using a seven-point Likert type scale. The questions to measure injunctive norms (e.g., “People who are important to me are unlikely/likely to think I should choose restaurant menu items that are low in calories”) were adapted from Ajzen’s study (2002). Those for descriptive norms (e.g., “A number of people I know think of

choosing menu items that are low in calories when they eat out”) were employed from Rise et al. (2008). Because the behavior studied in Rise et al.’s study (2008) was quitting smoking, the questions were slightly modified to fit our study context.

### **Perceived Behavioral Control**

In the third section, participants’ perceptions about the extent to which they control the target behavior were assessed by four items (e.g., “I feel in complete control of whether or not I choose healthful menu items with low calorie at restaurants”). These items were adapted from Ravis and Sheeran (2003). Because the behavior studied by Ravis and Sheeran was exercise, the wording was modified to fit this study. All items were assessed using a seven-point Likert type scale.

### **Prototypes**

Based on Blanton et al.’s suggestions (2001), the fourth section required participants to indicate their ideas about the typical person who engages in socially undesirable behavior (in this case, consumption of foods that are high in calories). The 12 bipolar items (e.g., foolish/wise, insecure/self-confident, lazy/active) were adopted from a study conducted by Gerrits et al. (2009) and offered as assessment descriptors for the typical person. A higher score reflected a more favorable evaluation of the typical person who engages in unhealthy food choices at restaurants.

### **Behavioral Intention**

In the fifth section, intentions to choose restaurant menu items that are low in calories (e.g., “I plan to eat healthy at restaurants”) were measured via three item stems suggested by Ajzen (2002). Higher scores indicated a stronger intention to perform the target behavior.



### **Behavioral Willingness**

The sixth section assessed behavioral willingness to choose restaurant menu items that are low in calories. Based on suggestions of Gibbons et al. (1995) and Ohtomo and Hirose (2007), situations that might elicit socially undesirable behavior (in this case, choosing unhealthy restaurant menu items that are high in calories) were developed and provided to respondents to assess their behavioral willingness to perform the target behavior. A total of five situations were provided. Each scenario was followed by two items to measure behavioral willingness in a given situation. One item was negatively phrased and scored in reverse, so that a higher score reflected a stronger willingness to choose the menu items that are low in calories at restaurants.

### **Self-reported Behavior**

Reported healthy eating behaviors at restaurants were measured in the seventh section by assessing participants' usual healthy food selection behaviors at restaurants. Three items were adopted from Ohtomo and Hirose (2007). Because the behavior studied by Ohtomo and Hirose was recycling, the items were revised to meet the purpose of the current study. An example of these items was "When I eat out, if healthful menu items are available I choose menu items that are low in calories." One of the three items was negatively phrased and was scored in reverse. Alternating positively and negatively phrased questions helps identify whether participants answered questions without carefully reading each questions (Kaplan & Saccuzzo, 2009). The higher the mean score of these items, the stronger the willingness to choose healthful menu items at restaurants.

## **Demographics**

The last section was designed to gather information regarding participants' demographic characteristics (e.g., age, gender, and ethnicity) and eating out behaviors (e.g., eating out frequency). A total of 13 questions were asked.

## **Pilot Test**

The survey instrument (Appendix D) were pilot tested with a total of 18 graduate students, faculty and staff in the hospitality management program in a selected Midwestern university. Reliability and content validity of the instruments were examined. Based on results from the pilot test (Appendix E), the questionnaire was modified slightly. For example, the introductory statement of the original questionnaire, "please indicate your responses using the following scales" was changed to "please select the response that best conveys your views using the following scales".

## **Data Analysis**

Statistical analysis was performed using the Statistical Program for Social Sciences (SPSS) 18.0 and AMOS 18.0. Frequencies were computed to describe participants' demographic characteristics. To assess internal consistency of each construct, Cronbach's alpha was used. The cutoff value of Cronbach's alpha was .70, which indicates that the individual items of the scale all measure the same construct and thus are highly intercorrelated (Hair, Black, Babin, & Anderson, 2009; Nunnally, 1978).

Research objectives one through five were investigated using the two-step structural equation modeling (SEM) approach suggested by Anderson and Gerbing (1988). The first step involved using confirmatory factor analysis (CFA) to evaluate the overall measurement quality of the proposed model. Measurement model validity was confirmed through the Goodness of Fit

indices, including chi-square statistics ( $\chi^2$ ), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). The recommended value of each fit index is shown in Table 3.1. In the second stage, the structural model was examined to confirm the structural model validity and test the structural hypotheses of the proposed model. To assess the validity of the structural model, the general guidelines used for measurement model validity were utilized (Table 3.1) (Hair et al., 2009). The maximum likelihood procedure was utilized to estimate both the measurement model and structural model in Amos 18.0. Research objective six was examined using the hierarchical regression analysis. First, the composite mean scores for descriptive norm, injunctive norm, and behavioral intention were computed. To determine whether there was misalignment of descriptive and injunctive norms, divergence scores between them were calculated based on Lawton et al.'s method (2009). Misalignment scores between descriptive and injunctive norms were calculated by taking the absolute value of differences between the composite mean scores for descriptive and injunctive norms. Once the existence of misalignment of the two social norms was confirmed, hierarchical regression was conducted using SPSS 18.0.

Table 3.1

*Recommended Values of Fit Indices by Hair et al. (2009)*

Fit index	Ideal value
$\chi^2$ statistics	Significant $p$ -values expected
CFI	$\geq .9$
TLI	$\geq .9$
RMSEA	$\leq .07$

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**CHAPTER 4. UNDERSTANDING HEALTHY EATING BEHAVIORS AT CASUAL  
DINING RESTAURANTS USING THE EXTENDED THEORY OF PLANNED  
BEHAVIOR**

A paper to be submitted to *International Journal of Hospitality Management*

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**Abstract**

This study examined customers' healthy eating behaviors (e.g., selecting low-calorie menu items) at restaurants within an extended version of the theory of planned behavior (TPB), which consists of attitudes, subjective norms, perceived behavioral control, and behavioral intentions. This extension was implemented by incorporating two new constructs (prototype and willingness) and subdividing the original TPB constructs of attitudes (affective and cognitive attitudes) and social norms (injunctive and descriptive norms). Data were collected using on-line surveys (n = 744). Structural equation modeling revealed that healthful menu item selection was better predicted by the willingness-based reactive decision making process than by the intention-based rational process. Results indicated that affective attitude and injunctive norms had stronger and more consistent effects on behavioral intentions and willingness to choose healthful menu items than did cognitive attitude and descriptive norms. Prototype image had a positive effect on behavioral willingness. Theoretical and practical implications of the findings are discussed.

**Keywords:** Theory of planned behavior, prototype, behavioral willingness, healthful food, restaurants

**1. Introduction**

Nutrition information is sometimes provided and/or required on restaurant menus to help people make healthy choices when they eat out (U.S. Food and Drug Administration [FDA],

2013); however, researchers have reported inconsistent effects of nutrition information on customers selecting healthful menu items at restaurants (Elbel et al., 2009; Harnack and French, 2008; Yamamoto et al., 2005). Other researchers have emphasized the role of psychological factors in food selection (Jun et al., 2014; Lawrence et al., 2009; Senauer, 2001). The theory of planned behavior is one of the most popular theoretical frameworks for investigating how the psychological factors of attitude, subjective norms, perceived behavioral control, and behavior intention affect people's eating behaviors (e.g., Dunn et al., 2011; Kassem et al., 2003; Vermeir and Verbeke, 2008). Application of this theory suggests that when people have a positive attitude toward, feel more social pressure regarding, and have more control over eating healthy, they likely intend to eat healthy. Also, the stronger their perceived behavioral control and intention to eat healthy, the more likely people are to actually eat healthy.

However, the TPB has received criticism in two respects: its assumptions and conceptualization of some components. With respect to assumptions, Ajzen (2006, p. 117) explained that the TPB was developed "based on [the] assumption that human beings usually behave in a sensible manner; that they take into account of available information and implicitly or explicitly consider the implication of their actions." This rational approach has been criticized by researchers who argue that not all behavioral decisions are made based on a rational consideration of the behavior's advantages and disadvantages (Gibbons, Gerrard, Blanton et al., 1998; Gibbons, Gerrard, Ouellette et al., 1998; Ohtomo and Hirose, 2007). These researchers have asserted that the decision to perform a certain behavior (like eating healthy) is based not only on deliberative reasoning but also on irrational reactions within a social context. Prototype image and behavioral willingness are the constructs most frequently used to investigate this type of reactive decision making process (Gibbons, Gerrard, Blanton et al., 1998; Gibbon et al., 2009;

Thornton et al., 2002). Although behavioral willingness does prove to be a determinant of actual behavior, like behavioral intention in the TPB, the behavioral willingness tends to be shaped by a reactive response to a social context. Prototype image refers to the perceptions a person has about the typical person who engages in a given behavior, and it is one of the determinants of behavioral willingness (Gibbon et al., 2009). For example, Spijkerman et al. (2004) reported that when people had positive perceptions of smokers, they were likely to be willing to smoke themselves; this relationship could be explained by the reactive decision making approach. With respect to conceptualization, some researchers have alleged that the TPB's components, in particular attitudes and subjective norms, are not adequately conceptualized (Kraft et al., 2005; Rise et al., 2008; Tăut and Băban, 2012; Tuu et al., 2008). Critics have charged that the TPB focuses only on cognitive aspects of attitude (i.e., cognitive attitudes) and on social norms related to others' approval/disapproval regarding a certain behavior (i.e., injunctive norms) thereby suggesting that the concept of attitudes should be examined through both cognitive attitudes and affective attitudes (e.g., feelings/emotions), and the concept of subjective norms through both injunctive norms and descriptive norms (e.g., what most people do).

To address these criticisms, this study investigated the applicability of an extended theory of planned behavior in the domain of customers' healthful menu item selection. This study had two objectives. The first was to investigate both rational and reactive (or unintentional) behavioral decision processes in selection of healthful menu items at restaurants by adding both prototype image and behavioral willingness to the TPB. The second objective was to test the extended TPB by subdividing the components of attitudes into affective and cognitive attitudes and the component of social norms into injunctive and descriptive norms.



Because overconsumption of calorically dense foods is one of the contributors to obesity and obesity is a contributor to a variety of chronic diseases (Hu et al., 2001; Kenchaiah et al., 2002; Swinburn et al., 2004; U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010), healthful menu items in this study were defined as menu items that were low calorie. Others have also defined healthful foods as low calorie foods (Cranage, Conklin, and Lambert, 2004; Glanz et al., 2007).

## **2. Review of literature**

### ***2.1. Behavioral intentions vs. behavioral willingness***

Behavioral intention is one of the determinants of actual behavior in the TPB. If a person has a strong intention to engage in a behavior, he or she is more likely to perform the behavior. Although behavioral intention has been widely used in various behavior domains (e.g., maintenance of physical activity, green hotel choice, safe food handling behaviors) (Armitage, 2005; Han et al., 2010; Stein et al., 2010) including healthy eating behaviors (e.g., adherence to a low fat diet, consumption of fruits and vegetables) (Armitage and Conner, 1999; Fila and Smith, 2006; Lien et al., 2002), scholars have pointed out that behavioral intention is particularly useful in predicting rational or premeditated behavior decisions. However, not all behaviors are a result of rational decision making (Gibbons and Gerrard, 1995; Gibbons, Gerrard, Blanton et al., 1998; Gibbons, Gerrard, Ouellette et al., 1998). To account for the importance of unintentional or reactive decisions, the concept of behavioral willingness has been introduced.

Behavioral intention refers to “how much of an effort [an individual is] planning to exert in order to perform the behavior” (Ajzen, 1991, p. 181), while behavioral willingness refers to “an individual’s openness to opportunity”. These definitions show a clear distinction between the two concepts: behavioral willingness involves less planning or premeditation than behavioral

intention. Also, according to Armitage and Conner's meta-analysis (2001), behavioral intention explains 22% of the variance in behaviors; this indicates that more than 70% of variance still needs to be explained, and other determinant(s) of actual behavior may need to be added to improve the TPB's explanatory power. To remedy the shortcomings of behavioral intention, behavior willingness could be considered a good means of extending the TPB.

Researchers have empirically investigated the roles of both behavioral intention and behavioral willingness in various behavior domains (Hukkelberg and Dykstra, 2009; Hyde and White, 2010; Myklestad and Rise, 2007; Ohtomo and Hirose, 2007; Zimmermann and Sieverding, 2010), and some studies have found that behavioral willingness had a stronger effect on actual behavior than behavioral intention (Hammer and Vogel, 2013; Hukkelberg and Dykstra, 2009). For example, Ohtomo and Hirose (2007) found behavioral willingness had a more significant role in people's recycling behavior than behavioral intention.

Despite this suggestive evidence, there is only one known healthy eating study using both concepts together (Ohtomo, 2013). One possible reason for this is that the concept of behavioral willingness comes from the prototype/willingness model, which has been used to predict health-risk behaviors (e.g., smoking, binge drinking), not health-promoting behaviors. To the best of the authors' knowledge, Ohtomo's study (2013) is the only one to have combined the two in investigating eating behaviors. That study examined the roles of behavioral intention and willingness in unhealthy snacking behavior and found that behavioral willingness had a stronger impact on unhealthy snacking behaviors, emphasizing the importance of the unintentional or reactive decision making process in food selections. Similarly, other studies have also indicated the importance of this decision making process using the concept of impulsivity (Churchill et al., 2008; Churchill and Jessop, 2011). According to these studies, impulsive people tend to eat high-

calorie snacks more frequently than less impulsive people do, which shows that unhealthy eating behavior is closely related to the unplanned or reactive decision making process.

## ***2.2. Affective vs. cognitive attitudes***

Attitudes are defined as “the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question” (Ajzen, 1991, p. 188). Researchers have found that attitudes play a positive role in encouraging a variety of behaviors including eating healthy (Fila and Smith, 2006; Kim et al., 2003; Lien et al., 2002). Attitudes have traditionally been conceptualized as having both cognitive and affective components (Breckler and Wiggins, 1989; Crites et al., 1994; Norman, 1975; Tăut and Băban, 2012; Trafimow and Sheeran, 1998), and this conceptualization has been confirmed through methodological (e.g., Trafimow and Sheeran, 1998) and empirical research (e.g., Lawton et al., 2009; Lowe et al., 2002). Affective attitude is defined as “[the] individual’s general level of positive or negative feelings concerning the issue,” whereas cognitive attitude is “[the] individual’s beliefs about the instrumental utility of the action for the attainment or blocking of his or her goals weighted by value placed on such goals” (Norman, 1975). The magnitude of the effect of each type of attitude varies from one study to another (e.g., Dunn et al., 2011; Payne et al., 2004). For example, Dunn et al. (2011) investigated the effects of cognitive and affective attitudes on fast food consumption within the framework of the TPB and found that while cognitive attitudes were a significant predictor of intention to consume fast foods, affective attitudes were not. However, other studies have shown that affective attitude has a stronger effect than cognitive attitude on behavioral intentions (Farley and Stasson, 2003; Kraft et al., 2005; Lawton et al., 2009; Nameghi and Shadi, 2013; Tăut and Băban, 2012; van den Berg et al., 2006). Lawton et al. (2009) examined the effects of cognitive and affective attitudes on intentions to engage in 14 health-promoting (e.g., brushing

teeth, exercise, low-fat diet consumption) or health-risk (e.g., binge drinking, illegal drugs, smoking) behaviors and on actual performance of such behaviors. While affective attitude significantly affected behavioral intention to engage in all 14 given behaviors as well as the actual performance of those behaviors, cognitive attitude had a significant effect on behavioral intentions for 11 out of the 14 behaviors and on actual performance for 7 out of 14. Several researchers have reported the significant role of affective attitude on exercise behavior (Lowe et al., 2002; Rhodes et al., 2006; Tăut and Băban, 2012). Related to healthy eating behaviors, Payne et al. (2004) found that affective attitude toward eating healthy was the most influential factor in forming intentions. Blanchard et al. (2009) also found a significantly positive effect of affective attitude on the intention to consume fruits and vegetables and on actual consumption, regardless of respondents' gender or ethnicity.

### ***2.3. Injunctive vs. descriptive norms***

In the TPB, the concept of social norms is represented by subjective norms, defined as “the person’s beliefs that specific individuals or groups approve or disapprove of performing the behavior “ (Ajzen, 2006, p.124). Researchers have found that the more social pressure people feel, the more likely they are to intent to consume healthful foods (Kim et al., 2003; Lien et al., 2002; Rah et al., 2004). However, researchers have suggested that social norms should be reconceptualized as both injunctive and descriptive norms (Armitage and Conner, 2001; Rimal and Real, 2005; Ravis and Sheeran, 2003; Sheeran and Orbell, 1999). Injunctive norms refer to a person’s perception of “what significant others think the person ought to do,” whereas descriptive norms refer to a person’s perception of “what significant others themselves do” (Ravis and Sheeran, 2003, p. 219); that is, injunctive norms motivate people to behave in a certain way based on “the possibility of gaining approval or disapproval from significant others

for one's intentions and actions" while descriptive norms motivate people to behave by showing "what is the typical or normal thing to do" as evidenced by the conduct of significant others (Sheeran and Orbell, 1999, p. 2112). Considering these definitions, the subjective norm as defined in the TPB represents only the concept of injunctive norms (Rivis and Sheeran, 2003). Moreover, descriptive norms are not addressed in the TPB.

This theoretical conceptualization of social norms has been empirically tested in various behavior domains (e.g., exercise, smoking) (Hagger and Chatzisarantis, 2005; Rhodes and Blanchard, 2006; Rivis and Sheeran, 2003; Rise et al., 2008). Related to people's healthy eating behaviors, Tuu et al. (2008) found positive impacts of both injunctive and descriptive norms on intention to consume fish. Dunn et al. (2011) created a composite social norm variable by combining both types of social norm and found that this composite variable played a significantly positive role in people's fast food consumption intentions. Even if both types of social norm have not been widely investigated together in one study, many studies have examined each concept separately. Injunctive norms have been widely investigated in the form of subjective norms within the TPB and have proven to be a significantly positive predictor of intentions to eat healthful foods (e.g., dairy products, fruits and vegetables) or avoid unhealthy foods (e.g., soft drinks) (Fila and Smith, 2006; Kassem et al., 2003; Kassem and Lee, 2004; Kim et al., 2003; Lien et al., 2002; Sjoberg et al., 2004).

The positive role of descriptive norms has also been confirmed (Burger et al., 2010; Lally et al., 2011; Manning, 2009; Rivis and Sheeran, 2003; Tuu et al., 2008; Yun and Silk, 2011). Rivis and Sheeran's (2003) and Manning's (2009) meta-analytical studies demonstrated that the addition of descriptive norms increased explanatory power of the TPB. Ball et al. (2010) reported that people who believe that many people around them often eat fast food or drink soft drinks are

more likely to eat and drink those items. Lally et al. (2011) had similar findings emphasizing the potential role of descriptive norms in developing effective interventions to promote healthy eating.

#### **2.4. Perceived behavioral control**

Perceived behavioral control (PBC) is defined as “[the] perceived ease or difficulty of performing [a] behavior” (Ajzen, 1991, p. 188). Ajzen and Madden (1986) measured PBC as a proxy of actual control. In the TPB, PBC is the antecedent of both behavioral intention and actual behavior; that is, PBC has a direct effect on behavioral intention and actual behavior, and an indirect effect on actual behavior via behavioral intentions. While behaviors that are under an individual’s control can be accurately predicted by behavioral intentions, behaviors which an individual cannot easily control cannot be predicted. PBC could help explain this variance in implementation of given behaviors (Ajzen, 2006).

Prior research has found that PBC has a significantly positive effect on healthy eating intention and behavior (e.g., fruit and vegetable consumption, dairy product intake, soy product consumption), though the relative importance varies across studies (Ajzen, 1991; Conner et al., 2003; Kassem et al., 2003; Kim et al., 2003; Rah et al., 2004; Sjoberg et al., 2004). Sjoberg et al. (2004) tested the effects of the TPB components on older adults’ fruit and vegetable consumption and found that PBC significantly affected both behavioral intention and actual fruit and vegetable consumption and was the most influential variable in predicting behavioral intention. On the other hand, Rah et al.’s study (2004) found that PBC had the weakest effect on women’s intention to consume soy products.

### ***2.5. Prototype images***

Prototype image is one of the predictors of behavioral willingness in the prototype/willingness model (Gibbons, Gerrard, Blanton et al., 1998; Gibbon et al., 2009; Thornton et al., 2002). Ouellette et al. (2005, p. 610) defined prototype image as “an individual’s image of the typical person who belongs to a group or engages in a certain behavior”. If people hold positive viewpoints about the person who engages in a certain behavior, they are more willing to engage in such behavior themselves (Gibbons and Gerrard, 1995).

Because people tend to be more motivated by “a desire to avoid association with unhealthy images” than “a desire to gain association with healthy images” (known as “negative bias”), most studies have investigated the role of prototype image in terms of the typical person who engages in negative behaviors rather than positive behaviors (Blanton et al., 2001). A number of studies have empirically confirmed the important role of the prototype image in a variety of behavior domains (e.g., unsafe sexual intercourse, binge drinking, smoking) (Gibbons, Gerrard, Blanton et al., 1998; Gibbons, Gerrard, Ouellette et al., 1998; Etcheverry and Agnew, 2009; Norman et al., 2007). However, to the best of the authors’ knowledge, very little research has been done on the role of the prototype image in healthy eating behavior. The only known study in this domain was conducted by Gerrits et al. (2009), who identified 12 adjective pairs to describe the typical unhealthy eater (e.g., foolish/wise, lazy/active) and found that participants with positive perceptions of unhealthy eaters were more likely to consume unhealthy foods, fatty foods, and soft drinks than participants with negative perceptions. Based on the foregoing discussion, the following hypotheses were proposed (see Figure 4.1):

- H1: Affective attitude toward eating healthful (low calorie) menu items at restaurants has a positive effect on intention to eat healthy at restaurants.
- H2: Affective attitude toward eating healthful (low calorie) menu items at restaurants has a positive effect on willingness to eat healthy at restaurants.
- H3: Cognitive attitude toward eating healthful (low calorie) menu items at restaurants has a positive effect on intention to eat healthy at restaurants.
- H4: Cognitive attitude toward eating healthful (low calorie) menu items at restaurants has a positive effect on willingness to eat healthy at restaurants.
- H5: Injunctive norms regarding eating healthful (low calorie) menu items at restaurants have a positive effect on intention to eat healthy at restaurants.
- H6: Injunctive norms regarding eating healthful (low calorie) menu items at restaurants have a positive effect on willingness to eat healthy at restaurants.
- H7: Descriptive norms regarding eating healthful (low calorie) menu items at restaurants have a positive effect on intention to eat healthy at restaurants.
- H8: Descriptive norms regarding eating healthful (low calorie) menu items at restaurants have a positive effect on willingness to eat healthy at restaurants.
- H9: Perceived behavioral control over eating healthful (low calorie) menu items at restaurants has a positive effect on intention to eat healthy at restaurants.
- H10: Perceived behavioral control toward eating healthful (low calorie) menu items at restaurants has a positive effect on willingness to eat healthy at restaurants.
- H11: Perceived behavioral control over eating healthful (low calorie) menu items at restaurants has a positive effect on eating healthy at restaurants.

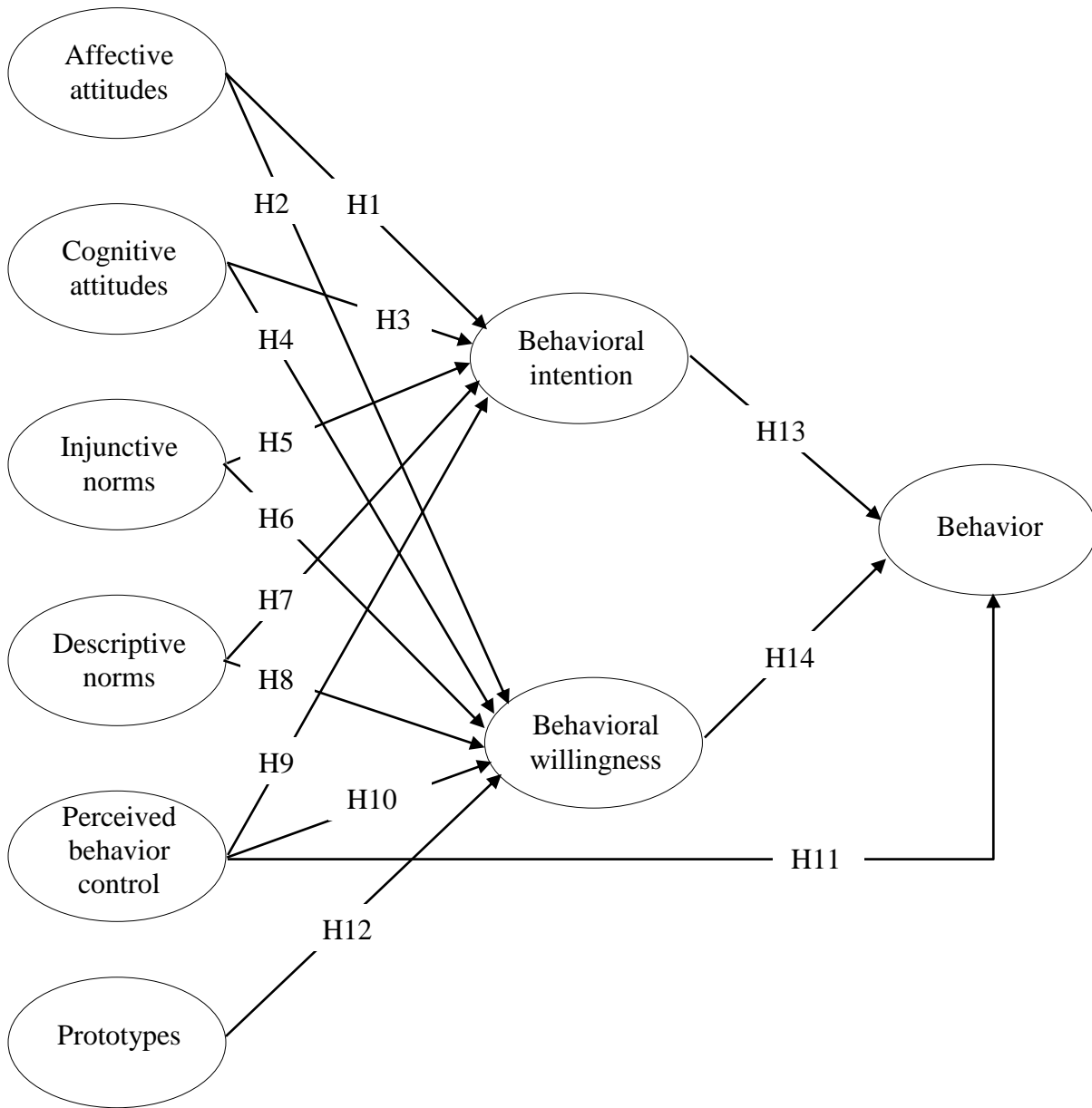


H12: Prototype image of the typical person who eats unhealthy foods has a negative effect on willingness to eat healthy at restaurants.

H13: Behavioral intention has a positive effect on eating healthy at restaurants.

H14: Behavioral willingness has a positive effect on eating healthy at restaurants.

Figure 4.1  
Proposed conceptual model



### **3. Methods**

#### ***3.1. Respondents and data collection***

Participants were individuals who lived in the United States and who were registered with Amazon Mechanical Turk. Amazon Mechanical Turk was selected as a means of collecting data for this study because it provides a large subject pool with diverse backgrounds in terms of age, gender, and ethnicity; this may increase generalizability of the findings compared to studies using a limited study population, such as college students (Mason and Suri, 2011). Because Amazon Mechanical Turk required researchers to provide an incentive for participating, the primary researcher deposited 554.95 USD, which included incentives for participants and service fees in the Amazon Mechanical Turk account. After posting the survey on the website, any individual over 18 years of age registered on the website was invited to fill out the questionnaire. Once participants completed the survey and the primary researcher approved their work, their incentives were automatically provided from the primary researcher's Amazon Mechanical Turk account. Each participant was paid 50 cents as an incentive. A total of 1,009 responses were collected. Based on the distribution of the time taken to complete the survey, surveys which were completed in less than 5 minutes were first removed and incomplete responses were also eliminated. A total of 265 responses were deleted, resulting in 744 usable responses.

#### ***3.2. Instrument development***

Survey items were generated to measure the nine constructs under examination (cognitive and affective attitudes, injunctive and descriptive norms, perceived behavioral control, prototype image, behavioral intentions, behavioral willingness, and actual behavior). Items were used from scales in previous studies or developed by authors based on previous studies.

The survey consisted of eight parts. The first part assessed respondents' affective and cognitive attitudes toward choosing low-calorie menu items at casual dining restaurants using six bipolar items with a seven-point semantic differential scale. Six adjective pairs were adopted from McConnon et al., (2012). Of these six pairs, three (bad/good, harmful/beneficial, foolish/wise) measured cognitive attitudes and three (unpleasant/pleasant, unenjoyable/enjoyable, boring/interesting) measured affective attitudes. The second part asked participants to rate their perceived social norms (both injunctive and descriptive) with regard to low-calorie menu item selection using a seven-point Likert-type scale. Injunctive norms were measured by items adapted from Ajzen's study (2002) (e.g., people who are important to me want me to choose restaurant menu items that are low in calories), and descriptive norms were measured by items adopted from Rise et al. (2008) (e.g., a number of people I know have chosen menu items that are low in calories when they eat out). The third part assessed perceived behavioral control using four items adopted from Ravis and Sheeran (2003) (e.g., if I wanted to, I could easily choose healthful menu items with low calories at restaurants), each rated on a seven-point Likert-type scale. In the fourth part, participants were asked to evaluate prototype images by describing the typical person who engages in unhealthy food choices at restaurants using 12 paired adjectives (e.g., foolish/wise, lazy/active). The paired adjectives were adopted from Gerrits et al. (2009) and assessed with a seven-point semantic differential scale. A higher score indicated a more favorable evaluation of the typical unhealthy eater at restaurants. The fifth part asked about participants' intentions to choose low-calorie menu items, using three items adapted from Ajzen (2002) (e.g., I plan to eat low calorie menu items at restaurants). Part six examined participants' willingness to choose low-calorie menu items using scenario-based questions. A total of five scenarios developed based on suggestions of Gibbons et al. (1995) and Ohtomo and Hirose

(2007) were provided and each scenario was followed by two items to assess behavioral willingness in the given situation (e.g., order the healthful menu items with lower calories). Part seven asked participants to describe their usual low-calorie menu item selection behaviors as a proxy of actual behavior. These three items were based on Ohtomo and Hiorose's study on recycling behaviors (2007). The final section requested participants' demographic characteristics (e.g., gender, age), and eating out behaviors. All survey items were pilot tested to ensure reliability and content validity. The pilot test was administered to 18 graduate students, faculty and staff in the hospitality management program in a Midwestern university. Based on comments, the questionnaire was refined by rewording questions to make them more understandable and adjusting the format to improve readability.

### ***3.3. Data analysis***

Frequencies were computed regarding participants' demographic and behavioral characteristics. Cronbach's alpha was used to ensure the reliability and internal consistency of each construct (See Table 4.1). Finally, two-step structural equation modeling was used to test the conceptual model. First, confirmatory factor analysis was conducted to validate the measurement quality of the conceptual model; second, structural equation modeling was utilized to evaluate the validity of the structural model and test the hypotheses. Statistical software packages SPSS 18.0 and AMOS 18.0 were used to perform the analysis.

## **4. Results**

### ***4.1. Sample profile***

The percentages of male and female participants were 57.8% and 42.2%, respectively. Regarding age, 82.9% of participants were between 18 and 44 years old, and the vast majority of the study sample was White (81.0%). Around half of the participants (49.8%) had an income less

than or equal to \$39,999. In terms of education level, 58.2% of the participants had at least an associate's degree. Of the participants who indicated their home state ( $n = 733$ ) based on regions from the U.S. Census Bureau (2014), 34.7% of participants lived in the southern U.S., while those who lived in the West, Midwest, and Northeast accounted for 23.0%, 21.5%, and 20.7%, respectively. In regards to eating out behaviors, 61.5% of participants indicated that they ate out at a restaurant 2-5 times per month and 83.6% of study sample reported that they had tried low calorie menu items.

#### ***4.2. Measurement model***

Confirmatory factor analysis (CFA) was conducted to estimate the accuracy of the measurement model. Standardized regression weighted values (i.e. standardized factor loading) ranged from .359 to .956 indicating that some items did not appropriately represent the corresponding construct; therefore, five items with factor loadings  $< .700$  were excluded (Hair et al., 2009) leaving 33 items. The deleted five items included one from the injunctive norm items ("people who are important to me would disapprove/approve of my choosing restaurant menu items that are low in calories"), one from the behavioral willingness items ("suppose you are eat at a casual dining restaurant with your family. It is the evening. You had a calorie-filled noon meal. How willing are you to do the following?") and three from the prototype items ("focused on the present/focused on the future," "dissatisfied/satisfied," and "insecure/self-confident"). The fit of the finalized model was acceptable ( $\chi^2 = 1717.135$  [ $df = 459$ ,  $p < .001$ ], NFI = .915, TLI = .926, CFI = .936, RMSEA = .061). Internal consistency of each construct was verified by Cronbach's alpha values greater than the cutoff value of .70 (ranging from .801 to .925) (Hair et al., 2009). All of the composite reliabilities of the constructs were also acceptable with values above .70 (Hair et al., 2009). Convergent validity was satisfactory in that the factor loading of

each item on its corresponding construct was significant at the .001 level (Hair et al., 2009). Average variance extracted (AVE) of each construct also exceeded the recommended threshold of .50 (Hair et al., 2009). A comparison of AVE and squared correlations showed that the squared correlation of behavioral willingness and actual behavior was somewhat higher than the AVE of each construct, indicating that these two constructs may not be fully discriminated from each other lacking discriminant validity. However, prior studies which encountered similar issues suggested that even if the squared correlations of certain constructs were higher than their AVEs, the constructs could be used for further analysis if they had been successfully operationalized in previous studies as an independent construct (Campbell et al., 2014). Therefore, for this study, behavioral willingness and actual behaviors were retained for further analysis. The results of measurement model assessments are summarized in Table 4.1.

Table 4.1

*Measurement properties of scales*

Constructs	Cronbach's alpha	Standardized factor loadings	Composite reliabilities	AVE
Affective attitude (AA)	.920		.927	.811
AA1		.952		
AA2		.954		
AA3		.784		
Cognitive attitude (CA)	.861		.865	.682
CA1		.790		
CA2		.804		
CA3		.880		
Injunctive norm (IN)	.801		.808	.679
IN1		.768		
IN2		.851		
Descriptive norm (DN)	.925		.988	.808
DN1		.868		
DN2		.953		
DN3		.873		

Table 4.1 (continued)

Constructs	Cronbach's alpha	Standardized factor loadings	Composite reliabilities	AVE
Perceived behavioral control (PBC)	.860		.860	.673
PBC1		.804		
PBC2		.845		
PBC3		.811		
Prototype (PT)	.924		.925	.578
PT1		.774		
PT2		.777		
PT3		.786		
PT4		.737		
PT5		.707		
PT6		.769		
PT7		.740		
PT8		.762		
PT9		.787		
Behavioral Intention (BI)	.908		.915	.784
BI1		.941		
BI2		.943		
BI3		.719		
Behavioral willingness (BW)	.913		.912	.722
BW1		.891		
BW2		.764		
BW3		.853		
BW4		.839		
Actual behavior (AB)	.900		.905	.763
AB1		.913		
AB2		.888		
AB3		.725		

### 4.3. Structural model

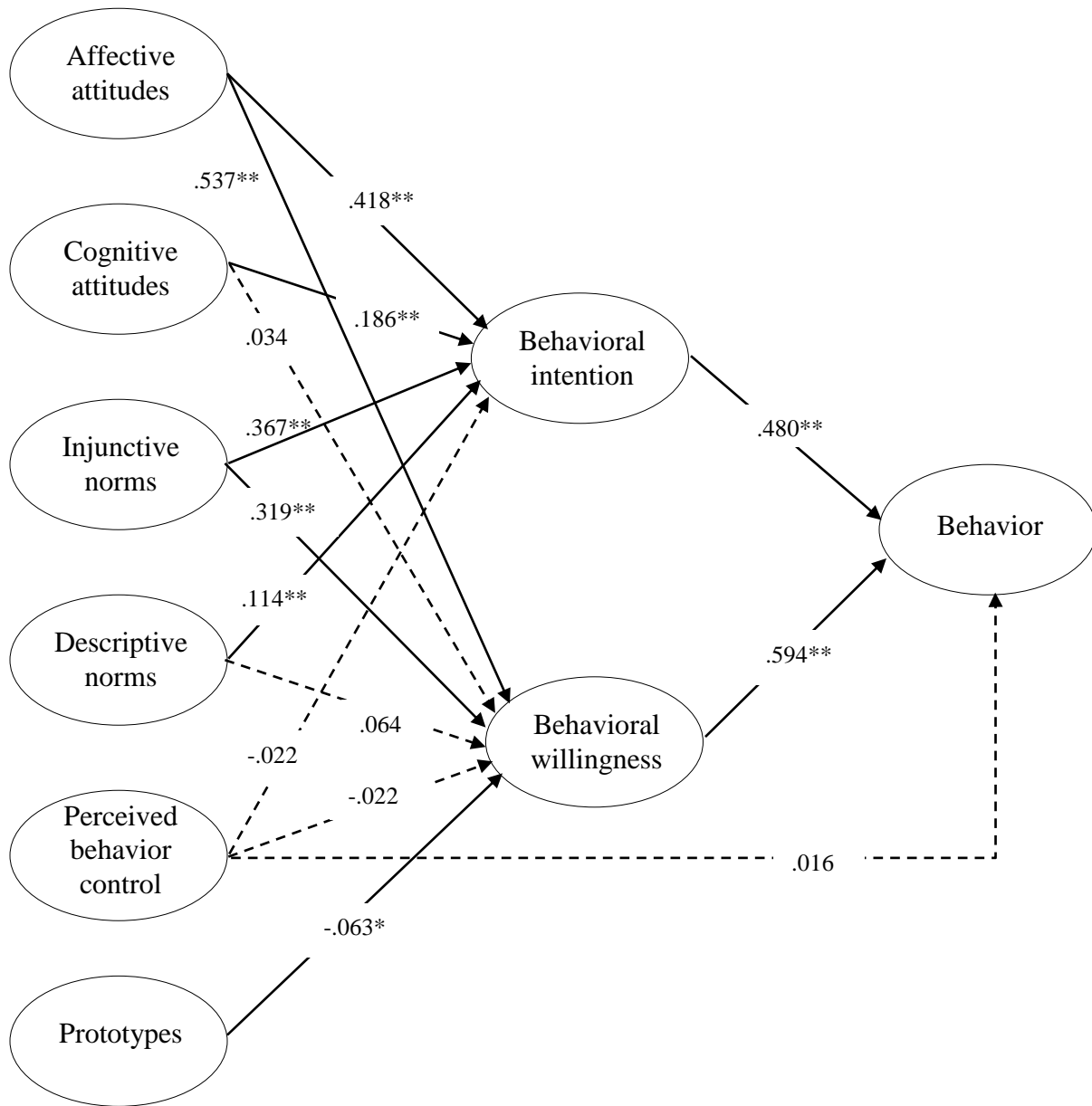
Structural equation modeling (SEM) was conducted to validate the proposed model and test the relationships among the constructs. SEM results showed that the proposed model had a satisfactory model fit ( $\chi^2 = 2195.661$  [ $df = 479$ ,  $p < .001$ ], TLI = .903, IFI = .913, CFI = .912, RMSEA = .069). The hypothesis tests of the SEM model showed that affective attitude had

positive effects on both intention ( $\beta = .418, p < .001$ ) and willingness ( $\beta = .537, p < .001$ ) to select low-calorie menu items (H1 and H2 were supported), whereas cognitive attitude had a significantly positive effect only on behavioral intention ( $\beta = .186, p < .001$ ) (H3 was supported) and not on behavioral willingness (H4 was not supported).

Related to the effects of social norms on low-calorie menu item selection, while injunctive norms significantly positively affected both behavioral intention ( $\beta = .367, p < .001$ ) and willingness ( $\beta = .319, p < .001$ ) (H5 and H6 were supported), descriptive norms had a significantly positive effect only on behavioral intention ( $\beta = .114, p < .001$ ) (H7 is supported but not H8). Perceived behavioral control did not have a significant effect on behavioral intention, willingness, or actual behavior (H9, H10, and H11 were not supported). Considering that previous studies consistently found that perceived behavioral control had a significant effect on behavioral intention and actual behavior, these results are a bit surprising. These results might be due to sampling differences or use of the extended TPB instead of the traditional TPB. H12, which hypothesized a negative relationship between perceived prototype images of unhealthy eaters and willingness to select low-calorie menu items, was supported ( $\beta = -.063, p = .050$ ). As hypothesized in H13 and H14, both behavioral intention ( $\beta = .480, p < .001$ ) and willingness ( $\beta = .594, p < .001$ ) to select low-calorie menu items had significantly positive effects on actual selection behaviors. The results are summarized in Figure 4.2.



Figure 4.2  
Analysis results of structural model



\*\* $p < .001$ ; \* $p = .05$

Note: The  $p$ -value of the path between prototypes and behavioral willingness was .050.

## **5. Discussion and implications**

### *5.1. Theoretical implications*

This study is significant in that it extended the TPB in two respects. First, the TPB was expanded by the addition of prototype images and behavioral willingness. This extension enabled us to examine both rational and unintentional (reactive) decision making processes in low-calorie restaurant menu item selection. Some studies on health-promoting behaviors (e.g., non-smoking behaviors) (Hukkelberg and Dykstra, 2009), have used this type of extended model but to the best of the authors' knowledge, no research model of healthy eating behaviors has been developed based on this extended model. The findings of this study highlight the importance of a more balanced approach to explaining healthy eating behaviors at restaurants, one which considers not only premeditated behaviors but also those arising from unintentional or reactive decision making processes. This study also expanded the TPB in that the original concepts of attitude and social norms were re-operationalized: the first was split into affective and cognitive attitudes and the second into injunctive and descriptive norms. Although these two concepts have been traditionally conceptualized in this manner (Breckler and Wiggins, 1989; Crites et al., 1994; Norman, 1975; Tăut and Băban, 2012; Trafimow and Sheeran, 1998), there is no known study investigating the roles of each concept in healthy eating behaviors within the extended TPB. Thus, this current study extended the existing literature by empirically testing this theoretical argument in the casual dining restaurant setting.

### *5.2. Practical implications*

In addition to these theoretical contributions, this study provides practical implications for the foodservice industry, educators, and policy makers. By confirming the significant effects of both behavioral intention and willingness on actual low calorie menu item selections in the

casual dining segment, the findings indicate that low calorie menu item selection at restaurants results not only from intentional decision making process but also from reactive decision making. In other words, people are likely to choose low calorie restaurant menu items not only by conscious intent but also through reactive responses to situational factors (e.g., servers' recommendations) (Gibbons et al., 2004). In particular, the effects of behavioral willingness on low calorie menu selection at casual dining restaurants were stronger than those of behavioral intentions. Even if people planned to eat healthy at restaurants, some ended up choosing high calorie menu items because of various situational factors (e.g., tempting unhealthy menu items). These findings are consistent with those by Ohtomo (2013) who reported that unhealthy snacking behavior was predicted more strongly by willingness to engage in such a behavior than by behavioral intention.

Further support for the role of behavioral willingness comes from research on impulsivity, defined as "the generalized tendency to act without deliberation" (Hofmann et al., 2008, p.113) in that both behavioral willingness and impulsivity are reactive responses to situational factors. In their study on fruit and vegetable consumption, Churchill and Jessop (2011) found that impulsivity plays a critical role in the reactive response and emphasized the importance of additional concepts that capture non-reflective decision making processes. These findings acknowledged importance of the situation when customers order menu items, suggesting that restaurants should create situations that promote healthful menu item selection. For example, because servers have the closest contact with customers, they could encourage customers to select healthful menu items by introducing those items in an enticing manner. The significant role of servers has been confirmed in prior research (Patterson et al., 2002; Schwartz et al., 2012). Another effective strategy might be to place delicious-looking pictures of healthful menu items

on the menus or restaurant walls, because people are likely to respond to visual stimuli more rapidly than textual stimuli (Eguido and Patterson, 1988).

Our results suggest that customers with a negative prototype image of the unhealthy eater are more likely to be willing to consume healthful (low calorie) restaurant menu items, further supporting the importance of including unintentional or reactive decision making approaches in any explanation of customers' healthy eating behaviors. As anticipated, this result aligns with prior research findings that more positive perceptions of the typical person engaging in a certain behavior predicts greater willingness to implement the behavior as found by Gerrard et al. (2002), Spijkerman et al. (2007), and van den Eijnden et al. (2006) in their work about alcohol consumption and smoking. Conversely, people's desire to distance themselves from the unhealthy eater lessens their willingness to consume unhealthy foods. Gerrits et al. (2009) also found that people with more favorable viewpoints about unhealthy eaters were more likely to eat unhealthy. This indicates that healthy eating might be encouraged by providing negative images of unhealthy eaters, for example through various types of media. The effectiveness of a healthy eating campaign, promotion, or intervention might be increased by disseminating images of typical unhealthy eaters which would reduce the favorable perceptions of unhealthy eaters. However, this strategy should be used with caution because inducing negative images of unhealthy eaters may result in stigmatization of, or resistance from, the very people that need to be encouraged to make healthier choices (van den Eijnden et al., 2006). Providing positive images of healthy eaters might be an alternate way to develop prototype-image-related healthy eating educational materials, campaigns, or promotions. For example, restaurants could develop commercials using celebrities who are admired and respected. Famous athletes are possible candidates to promote people's healthy eating in a restaurant television commercial; according to

the 2009 Gallup Poll, more than half of Americans identified themselves as sports fans (Schultz, 2014). The healthy image of athletes in a television commercial may stimulate people's desire to resemble healthy athletes by eating healthful menu items at the restaurant being promoted in the commercial.

Our findings also show that although both affective and cognitive attitudes were significant predictors of behavioral intentions, affective attitudes had a greater effect than cognitive attitudes. Similar results were also found in Blanchard et al.'s study (2009) on college students' fruit and vegetable consumption and Povey et al.'s study (2000) on general healthy eating. Research on exercise and other health-promoting behaviors further support our findings (Kiviniemi et al., 2007; Rise et al., 2008; Tăut and Băban, 2012). Moreover, while affective attitudes had a significantly positive effect on both intentions and willingness to choose low-calorie menu items, cognitive attitudes were a significant predictor only of behavioral intentions. Given that both behavioral intention and cognitive attitude are formed based on rational evaluations of a given behavior, this result is reasonable. Considering the more consistent and stronger effects of affective attitudes and more powerful effects of behavioral willingness on actual low-calorie food selection, people's feelings or emotions toward those menu items appear to be more critical in the decision to select them at restaurants. Therefore, messages or advertising appealing to customers' emotions may be more effective than those focusing on the factual benefits of consuming healthful menu items. In particular, such a cost-benefit approach may not be effective with people who have had positive emotional experiences with consuming high-calorie menu items. Therefore, campaigns, messages, and educational efforts should incorporate an affective component. Affective attitudes are related to pleasurable attributes of healthful menu items; thus, emphasizing the pleasurable attributes of those menu items could be

one of the strategies to promote healthful menu items. For example, menu labels and descriptions may help highlight the pleasurable attributes of healthful menu items because people's evaluations of a certain food item could be changed by the information provided about the food item (Deliza and MacFie, 1996; Keystone Center, 2006; Wansink et al., 2001). Therefore, including words reminiscent of the pleasurable attributes of healthful menu items (e.g., taste, smell, and texture) would be an effective way to induce people's positive feelings about or emotions towards those menu items.

This study indicates that perceived social norms are also critical in customers' selection of low calorie menu items at restaurants. This finding is in line with prior research (Povey et al., 2000; Lally et al., 2011; Tuu et al., 2008). In particular, injunctive norms were found to be a more powerful predictor because they significantly positively affected both behavioral intentions and willingness, whereas descriptive norms had a significant effect only on behavioral intentions. The effect of injunctive norms was also greater than that of descriptive norms. Similar findings were reported by Povey et al. (2000). These findings demonstrated that people are likely to act based on social expectation and concerns about the social consequences of their behaviors. Therefore, healthy-eating interventions and promotions should incorporate social norm information. For example, those interventions and promotions might persuade people that healthy eating is the norm that society expects them to follow by providing a clear message emphasizing the importance of healthy eating. In terms of injunctive norms, prior studies have reported that friends and parents have the most influence on food selection (Barr, 1994; Kassem et al., 2003; Neumark-Sztainer et al., 1999); thus their roles should be emphasized to encourage healthy eating. In terms of descriptive norms, Lally et al. (2011) found that when people believed others normally consumed fruits and vegetable, sugar-sweetened drinks, and unhealthy snacks,

they were likely to consume those food items themselves. Lally et al. also found that an individual tended to overestimate others' consumption of sugar-sweetened drinks and unhealthy snacks. Based on these findings, correcting such misconceptions through campaigns or education would be another way to encourage healthy eating because knowledge of the desirable descriptive norm would stimulate an individual to reevaluate his/her own food consumption and motivate them to conform to the desirable eating norm.

## **6. Limitations and future research**

Like all studies, this study has limitations. The first is that the measurement of low-calorie food selection was done by self-report. Respondents may have over- or underreported their healthy eating behaviors because of inaccurate memory or social desirability (e.g., they may say they eat healthy because they know they should). Second, there were high correlations among three constructs: behavioral intention, willingness, and actual behavior. Although it makes sense that these constructs would be highly correlated, this may also indicate problems in discriminant validity. Third, although prior research noted that demographics had a significant effect on healthy eating behaviors (e.g., Baker et al., 2006; Kiefer et al., 2005; Lone et al., 2009; Vriendt et al., 2009; Wong, 2006), this study did not investigate such effects. Future researchers could test the moderating effects of demographics (e.g., gender, education level, income, age and weight status) in our proposed theoretical framework to provide more detailed information for brand positioning and marketing segmentation (e.g., males vs. females) to foodservice industry.

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**CHAPTER 5. THE IMPACT OF SOCIAL NORMS ON CUSTOMERS' HEALTHY EATING INTENTIONS AT CASUAL DINING RESTAURANTS: CONSIDERING SOCIAL NORMS MISALIGNMENT**

A paper to be submitted to *International Journal of Contemporary Hospitality Management*

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**Abstract**

**Purpose** – The purpose of this study was (1) to investigate the effects of perceived descriptive norms, defined as “what most others do,” and injunctive norms, defined as “what others approve/disapprove of,” on people’s intentions to choose healthful menu items at casual dining restaurants, and (2) to explore the role of misalignment of these two social norms in forming intentions to choose healthful menu items at restaurants.

**Design/methodology/approach** –A web-based survey was undertaken, yielding a total of 744 respondents. Hierarchical regression analysis was used to address the two purposes of this study.

**Findings** – Hierarchical regression revealed that when people perceived that most others eat healthy and that most others approve of healthy eating, they were more likely to have intentions to choose healthful menu items at restaurants. However, the conflict between perceived descriptive and injunctive norms led to weaker intentions to choose those menu items.

**Research limitations/implications** – By understanding the independent effects of the two social norms and the effects of their misalignment on intentions to choose healthful menu items at restaurants, practitioners, educators, and marketers can develop promotional tools or messages that are effective and avoid potential unintended outcomes. One of the limitations of this study was the use of self-reported data.

**Originality/value** – This study expanded the existing literature on the role of social norms in changing behavioral intentions by investigating the roles of not only these two social norms but also conflict between the two norms related to consuming healthful menu items.

**Keywords** Social norms, Descriptive norms, Injunctive norms, Misalignment, Restaurants, Healthy eating, Low calorie, Behavioral intentions

**Article classification** Research paper

## **Introduction**

Overconsumption of calorically dense food is one of the leading factors in the obesity epidemic, along with a decrease in physical activity (Swinburn et al., 2004; U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010). In particular, food prepared away from home (FAFH) has been shown to contribute to this overconsumption (Todd et al., 2010). Todd et al. (2010) assessed the effects of FAFH consumption on dietary quality using two non-consecutive days of dietary intake data and found that consumption of one FAFH meal per day added 134 calories to daily calorie intake and decreased overall diet quality.

Although the obesity rate in the United States seems to be leveling off, more than one-third of adults are still classified as obese (Ogden et al., 2014). Obesity has negative effects and has been identified as a contributor to diseases such as diabetes, and heart disease (Hu et al., 2001; Kenchaiah et al., 2002).

Prior research has shown that providing nutrition knowledge and nutrition information does not always translate into healthy food selections (Axelson et al., 1985; Elbel et al., 2009; Harnack and French, 2008; Harnack et al., 2008; Yamamoto et al., 2005), suggesting there are factors other than knowledge or information affecting people's healthy eating behaviors.

Researchers have continued to report that how people behave is influenced by two defined social

norms: descriptive norms and injunctive norms. Descriptive norm refers to an individual's perception of what most other people do and injunctive norms refer to an individual's perception of others' approval or disapproval (Cialdini et al., 1990). Prior studies have found that these social norms play a critical role in forming people's healthy eating intentions and implementation of a healthy diet (Smith-McLallen and Fishbein, 2008; Tuu et al., 2008; Yun and Silk, 2011). Burger et al. (2010) found that participants who believed most others chose a healthy snack were more likely to choose the same snack, confirming the important role of descriptive norms. In the Povey et al.'s study about the role of injunctive norms (2000), it was found that when participants were more concerned about others' approval of healthy eating, they were more likely to have intentions to eat healthy.

However, other studies have argued that focusing only on one of the two norms when attempting to promote a given behavior might produce undesirable outcomes (Göckeritz et al., 2010; Schultz et al., 2007; Smith et al., 2012). For example, Shultz et al. (2007) showed that undesirable outcomes occurred when only descriptive norm was emphasized. In their study, when participants were provided with information about their neighbors' average electricity consumption, the participants who had previously consumed less than the average electricity consumption showed a tendency to consume more (in other words, move toward the average). Based on these and similar unintended outcomes, researchers have argued that the two norms should be used together and the information from both should be aligned for more effective social norm-based intervention or promotion (Cialdini, 2003; Schultz et al., 2008). Although both descriptive and injunctive norms have significant roles in the decision making process, few researchers have examined both norms in a single study about healthy eating behaviors. In particular, no known study has been conducted using a casual dining restaurant setting.



Moreover, to the best of our knowledge, no research has investigated whether alignment or misalignment of descriptive and injunctive norms plays a role in people's food selections at restaurants. To fill this research gap, we examined the effects of both descriptive and injunctive norms on intentions to choose healthful menu items at casual dining restaurants, determined perceived alignment or misalignment between the two social norms, and explored the influences of the determined alignment or misalignment in forming these intentions. Specifically, healthful menu items in this study were defined as low-calorie menu items. Controlling caloric intake is one critical way to prevent obesity (Swinburn et al., 2004; U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010) and obesity contributes to a variety of chronic diseases such as diabetes and heart disease (CDC, 2010; Hu et al., 2001; Kenchaiah et al., 2002).

## **Review of literature**

### ***Theoretical background: Focus theory of normative conduct***

Social norms refer to “socially shared and enforced attitudes specifying what to do and what not to do in a given situation” (Prentice, 2012, p. 23). The focus of normative conduct developed by Cialdini et al. (1990) posits that the concept of social norms includes both descriptive and injunctive norms, which have separate motivation sources and are likely to affect behaviors separately. Descriptive norms refer to what most people do whereas injunctive norms refer to what ought to be done – that is, descriptive norms motivate people to engage or not engage in a certain behavior by providing “evidence as to what will likely be effective and adaptive action,” while injunctive norms motivate people to act because of social rewards and punishments associated with engaging or not engaging in the behavior (Cialdini et al., 1990, p. 1015). Using various research techniques, researchers have confirmed that descriptive and

injunctive norms are distinct concepts and have independently significant effects on performing a given behavior (Cialdini et al., 1990; Kallgren et al., 2000; Manning, 2009; Ravis and Sheeran, 2003; Rhodes and Courneya, 2003). The independent effects of each norm have also been investigated in a variety of behavior domains (e.g., littering, exercising, recycling, and smoking) (Cialdini et al., 1990; Hagger and Chatzisarantis, 2005; Rhodes and Blanchard, 2006; Rise et al., 2008; Ravis and Sheeran, 2003; White et al., 2009).

### *Descriptive norms*

Descriptive norms indicate “what is commonly done” (Cialdini et al., 2006, p. 4). Perceiving that behaviors happen over and over again is likely to motivate people to imitate the behavior by making them think, “If everyone is doing, it must be a sensible thing to do” (Cialdini et al., 1990, p. 1015). Descriptive norms thus provide a means of making efficient decisions without too much consideration (Jacobson et al., 2011). Perceived descriptive norms have been found to be positively associated with healthful and unhealthful food consumption (Burger et al., 2010; Lally et al., 2011; Robinson et al., 2013; Smith-McLallen and Fishbein, 2008; Yun and Silk, 2011).

Burger et al.’s laboratory experimental study (2010) showed that participants who believed that other participants had chosen a healthful snack were more likely to choose the healthful snack (nutrition bar) than either those who believed that other participants had chosen an unhealthful snack (chocolate bar) or those in a control group. Prinsen et al. (2013) replicated that study and got the same results. To remedy the shortcomings of laboratory experimental study in terms of external validity, Mollen et al. (2013) conducted a field study on the impacts of three types of social norm messages (healthy descriptive, unhealthy descriptive, and injunctive) on healthful food selections in an on-campus food court, and found that the promotional

messages that included positive descriptive norms (e.g., “Every day more than 150 [name of university] students have a tossed salad for lunch here!”) encouraged more students to choose a healthful menu item. Consistent findings about the positive role of descriptive norms have also been reported in a study on promoting consumption of fruits and vegetables and decreasing consumption of high calorie snacks (Robinson et al., 2014). Interestingly, Lally et al. (2011) found significant inaccuracies in adolescents’ perceived descriptive norm regarding their peers’ food consumption; that is, participants tended to: 1) underestimate their peers’ fruit and vegetable consumption, 2) overestimate their consumption of sugar-sweetened beverages and 3) overestimate unhealthy snack consumption. Moreover, these mistaken perceived descriptive norms showed a significant influence on all three eating behaviors, emphasizing the importance of correcting these misperceptions in order to improve people’s eating behavior. In the line with this discussion, we proposed the following hypothesis:

H1: Descriptive norms have a positive effect on intention to choose low-calorie menu items at restaurants.

### ***Injunctive norms***

Injunctive norms refer to “what is commonly approved or disapproved of” (Cialdini et al., 2006, p. 4). While descriptive norms inform an individual what others typically do, injunctive norms impose social pressure by stimulating an individual’s desire to be accepted by a social group to which he/she belongs (Cialdini et al., 1990). Compared to descriptive norms, injunctive norms have been less frequently investigated, at least under that name. Based on the definition, injunctive norms, appear to be interchangeable with the concept of subjective norms – “the person’s beliefs that specific individuals or groups approve or disapprove of performing the behavior” (Ajzen, 2006, p.124) – in the theory of planned behavior (TPB). Injunctive norms

have been frequently investigated under subjective norms and have been shown to have significant effects on people's food selections (e.g., low-fat foods, fruits and vegetables, dairy products, and soft drinks) (Armitage and Conner, 1999; Dunn et al., 2011; Fila and Smith, 2006; Kassem et al., 2003; Lien et al., 2002; Paisley and Sparks, 1998; Sjoberg et al., 2004). For example, Lien et al. (2002) used TPB and investigated the role of subjective norms in adolescents' fruit and vegetable consumption and found subjective norms were one of the most influential variables in forming adolescents' intentions to consume fruits and vegetables. Rah et al. (2004) found that subjective norms were the second most influential variable in forming women's intentions to consume soy products. Other research has emphasized the importance of different types of social groups providing approval or disapproval of a given behavior (Neighbors et al., 2008; Yun and Silk, 2011). Neighbors et al. (2008) split injunctive norms into two types based on the amount of social distance (proximal and distal) and investigated the role of each type on the amount of alcohol consumed. Their findings indicated that only perceptions of the proximal social group, friends and parents, had a significant effect. Similar findings were also shown by Barr (1994), Kassem et al. (2003), and Neumark-Sztainer et al. (1999), suggesting the critical role of that group in promoting healthy eating behaviors. Based on a review of the injunctive norm literature, we derived a second hypothesis:

H2: Injunctive norms have a positive effect on intentions to choose low-calorie menu items at restaurants.

### ***Alignment or misalignment of descriptive and injunctive norms***

Researchers have reported that both descriptive and injunctive norms independently play a critical role in engagement in certain behaviors, such as drinking alcohol, food selection, and energy conservation, and have proved the effectiveness of social norms-based interventions in

behavior changes (Burger et al., 2010; Dunn et al., 2011; Fila and Smith, 2006; Kassem et al., 2003; Lally et al., 2011; Lien et al., 2002; Neighbors et al., 2004; Nolan et al., 2008; Sjoberg et al., 2004). However, there is also evidence of mixed effects, indicating the importance of the combination of descriptive and injunctive norms. For example, some researchers have pointed out that interventions focusing only on descriptive norms might increase undesirable behaviors (Göckeritz et al., 2010; Shultz et al., 2007; Smith et al., 2012) and argued that such negative effects could be reduced by including injunctive normative information. According to Schultz et al. (2007), when information about neighbors' average electricity consumption was provided as a descriptive norm-based intervention with the aim of encouraging people to save electricity, people who previously consumed less electricity than their neighbors were likely to increase their electricity consumption. Interestingly, when the injunctive norm-based message was combined with a descriptive normative message, no increase in electricity consumption occurred, emphasizing the importance of combining both descriptive and injunctive norms to produce desirable outcomes.

On the other hand, it has been argued that normative messages emphasizing only the injunctive (telling people to do or not to do something) may generate reluctance; people may be reluctant to implement the behavior because they may believe that their freedom of choice has been taken away or limited (e.g., Cialdini et al., 1991). In the case of our study, it could be inferred that if an individual is surrounded by people who tell him/her to eat healthy but these people do not do so themselves, the individual is likely not to eat healthy either. Stok et al. (2014) investigated how types of social norm-based messaging affected high school students' fruit consumption. The researchers found that when high school students received an injunctive norm-

based message to promote fruit consumption, their intentions to eat fruit was lower than the group who did not receive any promotional message.

As we can see, then, emphasizing only one of the two norms may fail to promote healthy eating behavior. To address this, researchers have explored the importance of combined norm-based messages that include both descriptive and injunctive norms (Cialdini et al., 2006; Schultz et al., 2008). In terms of the interplay between descriptive and injunctive norms, studies have confirmed the significant role of misalignment between the two norms in changing behavioral intentions or actual behaviors (Cialdini, 2003; Göckeritz et al., 2010; Schultz et al., 2008; Schultz et al., 2007; Smith et al., 2012). Specifically, misalignment of the descriptive and the injunctive norms will reduce the perceived social pressure to conform, which in turn may discourage people from engaging in a desirable behavior. Based on the discussion above, we propose the following hypothesis:

H3: Misalignment of descriptive and injunctive norms exists and the misalignment of the two has a negative effect on intentions to choose low-calorie menu items at restaurants.

## **Methods**

### ***Respondents and data collection***

Respondents were adults registered with Amazon Mechanical Turk, a website where member researchers can post questionnaires. In 2009, the site had over 200,000 registered members (Ross et al., 2009). Since Amazon Mechanical Turk was launched in 2005, it has attracted researchers' attention as an efficient means of collecting data (e.g., Eriksson and Simpson, 2010; Mason and Watts, 2009). Prior to data collection, the approval from Institutional Review Board was obtained. The questionnaire link for this study was posted on Amazon Mechanical Turk, and members over 18 years of age were invited to complete the questionnaire

in exchange for a 50-cent incentive. Out of the 1,009 questionnaires submitted, 265 were eliminated. The elimination was based on the distribution of the time taken to finish the questionnaire. Specifically, questionnaires finished in less than 5 minutes were eliminated. After that, questionnaires with missing values on any for the three main constructs (descriptive norms, injunctive norms, and behavioral intentions) were excluded. The remaining 744 questionnaires were used for further data analysis.

### ***Instrument development***

To measure the constructs in the proposed model, validated measurement items were adapted from previous studies; some were slightly modified. Descriptive norms were measured using three items employed by Rise et al. (2008) (e.g., “A number of people I know try to choose menu items that are low in calories when they eat out”). Because the behavior studied in Rise et al.’s study was smoking cessation, the measurement items were modified to fit healthful menu item selection behaviors. Three items adapted from Ajzen (2002) assessed injunctive norms (e.g., “People who are important to me would either disapprove or approve of my choosing restaurant menu items that are low in calories”). Behavioral intentions were measured using three items adapted from Ajzen (2002) (e.g., “I plan to eat low calorie menu items at restaurants”). All items were assessed using a seven-point Likert type scale. Finally, information about participants’ demographic characteristics and dining-out behaviors were gathered. The survey was pilot tested with 18 graduate students, faculty, and staff at one Midwestern university. Based on feedback from the pilot test, the questionnaire was slightly modified and a final questionnaire was developed. For example, the introductory statements for some sections on the pilot questionnaire were modified to provide clearer directions. The introductory statement of the pilot

questionnaire, “please indicate your responses using the following scales” was modified to “please select the response that best conveys your views using the following scales”.

### ***Data analysis***

Frequencies were calculated to describe participants’ demographic characteristics and dining-out behaviors, and descriptive statistics, such as means and standard deviation, were calculated for each construct. To confirm the reliability and internal consistency of the measurements, Cronbach’s alpha was computed. For further analysis, the composite scores for each construct (descriptive norm, injunctive norm, and behavioral intention) were calculated by averaging the item scores for each construct. Divergence scores between descriptive and injunctive norms were computed by taking the absolute value of differences between the composite scores for descriptive and injunctive norms based on the method used by Lawton et al. (2009). The calculated divergence scores confirmed that misalignment between descriptive and injunctive norms existed. Finally, hierarchical regression was employed to test our hypothesis. SPSS 18.0 was used to perform the statistical analyses.

## **Results**

### ***Participant profile***

The participants were 57.8% men and 42.2 % women. A majority of participants were White (81.0%). In terms of age, 41.7% were 25-34 years old, followed by 18-24 (27.4%) and 35-44 (13.8%). Around half of the participants (48.4%) had at least a bachelor’s degree. With respect to income, 31.4% of participants earned \$40,000-\$79,999, followed by those who earned \$20,000-\$39,999 (30.8%). Participants came from all regions of the U.S.; 34.7% of the participants resided in the South and the rest evenly distributed (23.0% in West, 21.5% in Midwest, and 20.7% in Northeast). This division was based on regions from the U.S. Census



Bureau (2014). With regard to frequency of dining out, 61.0% of the participants reported that they did so 2-5 times a month and 15.2% did so at least 6 times a month, whereas 23.1% of study sample reported that they dined out never or once a month. When compared to the participants of the dining out survey conducted by Rasmussen Reports (2013), the participants who rarely or never dined out were under-represented in our study (23.1% vs. 39%). Over 80% of the participants reported they had consumed low-calorie menu items at restaurants (See Table 5.1).

Table 5.1

*Demographic information (n = 739-744)*

Characteristics		Frequency	Percentage
Gender	Male	430	57.8
	Female	314	42.2
Age	18-24 years	204	27.4
	25-34 years	310	41.7
	35-44 years	103	13.8
	45-54 years	62	8.3
	55-64 years	52	7.0
	Older than 64 years	13	1.7
	Ethnicity	African American	47
American Indian or Alaskan Native		6	0.8
Asia		67	9.0
Native Hawaiian or other Pacific Islander		1	0.1
White		603	81.0
Other		20	2.7
Annual household income		Less than \$20,000	141
	\$20,000 to \$39,999	228	30.8
	\$40,000 to \$79,999	223	31.4
	\$80,000 to \$119,000	91	12.3
	\$120,000 to \$149,000	27	3.6
	Over \$150,000	21	2.8

Table 5.1 (continued)

Characteristics		Frequency	Percentage
Education	Less than high school diploma	4	0.5
	High school diploma	73	9.8
	Some college, but no degree	232	31.2
	Associate degree	73	9.8
	Bachelor's degree	298	40.1
	Graduate degree	62	8.3
	Other	2	0.3
U.S. region	Northeast	154	20.7
	Midwest	160	21.5
	South	258	34.7
	West	171	23.0
Average eating out frequency per month	Never	10	1.3
	Once	162	21.9
	2-5 times	456	61.5
	6-10 times	92	12.4
	More than 10 times	21	2.8
Experience eating low calorie menu items	Yes	618	83.6
	No	121	16.4

### *Regression analysis*

Cronbach's alpha values for each construct exceeded the cutoff value of .7, verifying the internal consistency of each construct (Hair et al., 2009, Nunnally, 1978). Specifically, Cronbach's alpha values for descriptive norm, injunctive norm, and behavioral intention were .925, .801, and .908, respectively. These Cronbach's alpha values were similar to those found in previous studies (Armitage and Conner, 1999; Rise et al., 2008). The overall mean scores of each construct used for this study are presented in Table 5.2.

Table 5.2

*Descriptive statistics for independent and dependent variables*

Variables	Mean	SD	Cronbach's alpha
Descriptive norm	4.38	1.42	.925
A number of people I know think of choosing menu items that are low in calories when they eat out <sup>a</sup>	4.26	1.66	
A number of people I know try to choose menu items that are low in calories when they eat out <sup>a</sup>	4.23	1.69	
A number of people I know have chosen menu items that are low in calories when they eat out <sup>a</sup>	4.42	1.73	
Injunctive norm	4.30	1.58	.713
People who are important to me are unlikely/likely to think I should choose restaurant menu items that are low in calories <sup>b</sup>	3.99	1.91	
People who are important to me would disapprove/approve of my choosing restaurant menu items that are low in calories <sup>c</sup>	5.02	1.69	
People who are important to me want me to choose restaurant menu items that are low in calories <sup>a</sup>	4.14	1.73	
Behavioral Intention	4.28	1.66	.908
I plan to eat low calories menu items at restaurants <sup>d</sup>	4.05	1.78	
I will not try to eat low calorie menu items at restaurants <sup>a</sup> (R)	4.58	1.87	
I intend to eat low calorie menu items at restaurants <sup>e</sup>	4.22	1.77	

*Note:* Scale of statements: <sup>a</sup> 1=Strongly disagree to 7=Strongly agree; <sup>b</sup> 1=Unlikely to think to 7=Likely to think; <sup>c</sup> 1=Disapprove to 7=Approve; <sup>d</sup> 1=Not at all to 7=Frequently; <sup>e</sup> Definitely do not to 7=Definitely do (R) the statement was reversely coded

Hierarchical regression was performed to examine the proposed hypotheses and test the additive effect of differences between descriptive and injunctive norms. First of all, we controlled for gender because prior research has shown that males and females have different levels of conformity to social norms (Eagly et al., 1981; Helfert and Warschburger, 2013; Wang and Worsley, 2014). We also controlled for education level because there is evidence that education level has a significant effect on perceived social norms (Verbeke and Vackier, 2005; Wang and Worsley, 2014). To control for these two variables, gender and education level were

entered in the first model. In the second model, descriptive and injunctive norms were entered. The total variance explained by the second model explained an additional 20.6% variance in behavioral intentions, after controlling for the two demographic variables ( $R^2$  change = .206,  $F$  change (2, 739) = 99.702,  $p < .001$ ). Finally, the misalignment of descriptive and injunctive norm difference variable was entered in the third model. This also increased the explained variance of behavioral intentions and was statistically significant ( $R^2$  change = .004,  $F$  change = 4.279 (1,738),  $p < .05$ ); all three independent variables were statistically significant. As expected, both descriptive ( $\beta = .182$ ,  $p < .001$ ) and injunctive ( $\beta = .352$ ,  $p < .001$ ) norms had a significantly positive influence on intentions to choose low-calorie restaurant menu items, supporting H1 and H2. The third hypothesis was also supported, showing that misalignment of the two social norms ( $\beta = -.067$ ,  $p < .05$ ) had a significantly negative effect on behavioral intentions. Summary of results are shown in Table 5.3.

Table 5.3

## Hierarchical regression analysis

	$R^2$	$R^2$ Change	$F$ change ( $df$ )	$\beta$	$t$
<i>Model 1</i>					
Gender	.032	.032	12.097 (2, 741)**	.172	4.759**
Education level				.048	1.338
<i>Model 2</i>					
Gender	.237	.206	99.702 (2, 739)**	.115	3.567**
Education level				.025	.759
Descriptive norm (DN)				.190	5.492**
Injunctive norm (IN)				.356	10.323**
<i>Model 3</i>					
Gender	.242	.004	4.279 (1, 738)*	.119	3.677**
Education level				.024	.743
Descriptive norm (DN)				.182	5.237**
Injunctive norm (IN)				.352	10.245**
Difference between DN and IN				-.067	-2.069*

\*  $p < .05$ , \*\*  $p < .001$

## **Discussion and implications**

This study examined the importance of both descriptive and injunctive norms in the prediction of intentions to choose healthful menu items at restaurants and explored the effects of misalignment between the two types of social norms on behavioral intentions. Overall, this study shows that what others approve or disapprove of and how others behave does matter in forming intentions to consume healthful menu items at restaurants.

Hierarchical regression analysis, controlled for gender and education level, revealed that both descriptive and injunctive norms have a significantly positive effect on intentions to choose low-calorie menu items; that is, when an individual thought that most others would choose those menu items and that others expected him/her to choose low-calorie menu items, the individual was more likely to intend to choose those items. These findings are consistent with prior studies (Ball et al., 2010; Burger et al., 2010; Cialdini, 2003; Kim et al., 2003; Lien et al., 2002; Mollen et al., 2013; Moore et al., 2009; Tuu et al., 2008). Some of these studies did not relate to food selection behaviors, however showed how important perceived social pressure is in forming intentions to engage in a given behavior. Tuu et al. (2008) found that intentions to consume fish were affected by the perceptions of not only others' frequency of consuming fish but also others' approval of fish consumption. In terms of descriptive norms, Burger et al.'s experiment (2010) demonstrated that when participants were informed of others' snack choices, they showed a tendency to imitate the choices of others. Following Burger et al.'s research procedures, Mollen et al. (2013) replicated the study and get the same results. Similar findings were reported by Stok et al. (2012) in terms of fruit consumption. While many studies have examined the role of descriptive norms independently, relatively few studies have been conducted on the role of injunctive norms as a sole variable. Instead, injunctive norms have usually been explored in

conjunction with other psychological variables (e.g., attitudes, perceived behavioral control).

Lien et al. (2002) investigated the effects of injunctive norms with other psychological variables on intentions to eat fruits and vegetables and found that the injunctive norm was the most influential variable for the intentions.

Even if both social norms have a significant effect on people's behaviors independently, research indicates that when descriptive and injunctive norms are combined, conditions are optimal for promoting a desirable behavior (Göckeritz et al., 2010; Lee et al., 2007; Schultz et al., 2008). Another finding of our study further supports this idea. Our findings revealed that while each norm is significant, independently, the interplay between these two norms is critical in promoting people's healthy eating behaviors.

Specifically, our study explored what happens when there is a gap between what others do and what others expect with regard to low calorie restaurant menu item selection; we found that the greater the gap, the less likely people are to intend to select those menu items. Consistent with prior research, the results of this study show that it is critical to align descriptive and injunctive norms (Cialdini, 2003; Cialdini et al., 2006; Göckeritz et al., 2010; Schultz et al., 2007, Schultz et al., 2008; Smith et al., 2012). Schultz et al. (2008) examined the effects of social norms on reuse of towels by hotel guests. Their findings revealed that the guests exposed to the aligned injunctive-descriptive norm condition was significantly more likely to reuse their towels compared to the guests exposed to either the injunctive or descriptive norm condition or the control group.

Applying this logic to healthy eating behaviors, it could be inferred that when an individual believe that others want or expect him/her to eat healthy and that most others also eat healthy, the individual will feel more social pressure to conform to those eating norms and thus

be more motivated to eat healthy than if either of the two norms alone was emphasized. For example, if an individual perceives that others expect him/her to consume healthful foods but do not *actually* consume those foods, the individual might be reluctant to follow the healthy eating norms (e.g., Stok et al., 2014). On the other hand, even if an individual believes that most others consume healthful foods, the individual might not feel pressure to do so if the individual does not believe that others want or expect him/her to do so, and such misalignment may have adverse effects (Schultz et al., 2007; Smith et al., 2012). For example, Smith et al. (2012) found that when there was a conflict between the descriptive and the injunctive norms, intentions to implement energy conservation were reduced.

Based on our findings, then, in order to encourage people to choose healthful menu items at restaurants it is necessary to persuade them that healthy eating is the norm by providing the appropriate norm-based messages. Developing such messages may be complicated because social norm-based promotions may produce unintended negative outcomes, so it would be beneficial to investigate and dispel recipients' misperceptions about what most other people do. Prior research suggests that people have a tendency to overestimate the prevalence of undesirable but enjoyable behaviors, such as smoking and binge drinking, and underestimate that of desirable but less enjoyable behaviors, such as healthy eating (Lally et al., 2011; World Health Organization, 2010). Thus, educators, practitioners and marketers need to analyze the perceptions people hold on healthy eating as a norm, and rectify any misperceptions by providing realistic information about actual norms. Also, because people are more likely to engage in healthy eating when they believe that healthy eating is commonly done by others and is approved of by others, any promotional interventions or messages developed need to incorporate both descriptive and injunctive norms and ensure the alignment of the two norms.

It may also be beneficial to identify what individuals or social groups would be most influential on the target audience. Although more studies report that those who are closer in social distance (e.g., friends and family) have a greater influence on behavior changes than those who are not close (e.g., strangers, general population), this influence may vary across behaviors and/or between the type of social norm. For example, Yanovitzky et al. (2006) compared the effects of perceived descriptive norms on alcohol consumption by close versus distant social groups on students' alcohol consumption and found that people closest (e.g., best friends) exerted a stronger influence. On the other hand, Yun and Silk's study (2011) on healthy eating behaviors demonstrated that the influences of reference norm groups differed by type of social norms; that is, while descriptive norms were significantly influential only when the norms were those of close people, injunctive norms had a similar effect size regardless of social distance. Therefore, in order to maximize the effects of social norm-based promotions, more studies need to be conducted on individuals and social groups that effectively induce people to conform to social norms, in particular eating healthy. These influential social groups could be incorporated into the promotional interventions or messages, which might increase the possibility of producing positive outcomes.

If people's awareness of healthy eating becomes prevalent and healthy eating is perceived as a social norm in a society, it might have societal impacts, leading to the creation of new policies favorable to healthy eating and/or the reconstruction of existing policies. For example, Story et al. (2008) argued that the U.S. agricultural policies contribute to lowering the cost of some unhealthful products, such as sugars and fats by supporting the overproduction of the crops used as the main sources (e.g., corn and soybeans), whereas fruits and vegetables have not received enough government support. Based on their arguments, they concluded that the



agricultural policies should be reformed to make food environments healthier. Prior research has indicated that individual-level healthy eating promotions (e.g., nutrition knowledge acquisition) do not produce significantly positive outcomes, suggesting a need for more comprehensive approaches involving large groups or an entire society. In 2010, the Act was passed and mandated restaurants with 20 or more locations in the United States to provide nutrition information, however, the final rule is still pending at the time of this writing. The formation of social norms supportive of healthy eating may change not only individual eating behaviors but also the societal system, creating an environment more favorable to healthy eating.

Although the role of social norms in encouraging people to eat healthy has been explored, few studies have examined the two types of norms together in a single study. Moreover, while most social norm/healthy eating studies have focused on specific types of food items, such as chocolate bars or energy dense foods, this study extends the literature by investigating the relationship between social norms and healthy eating behaviors in a dining out setting.

Finally, this study advanced research about the misalignment between descriptive and injunctive norms and how this misalignment can affect people's healthy eating behaviors at restaurants. This research area has received little attention from researchers yet is of major significance given eating out behaviors and potential impact on obesity rates. Our study thus contributes an important new perspective to the literature by confirming the critical role not only of the effects of each norm individually, but also of the interplay between them.

### **Limitations and future research**

Like other studies, this study has limitations. Previous research found that the effects of social norms on behavioral changes tend to vary based on characteristics of the individual. For example, Robinson et al. (2014) suggested that when the descriptive norm message about others'

average fruit consumption was provided, the consumers who had consumed fruit below the average significantly consumed more fruit, whereas the consumers who above the average did not. Our study did not take into account the characteristics of the sample in examining the role of social norms in promoting healthy eating at restaurants. Future research could incorporate individual characteristics (e.g., interest in healthy eating) having potential influences into our conceptual model to provide more detailed implications in customizing intervention programs or promotional messages to a more targeted audience (e.g. customized promotional messages for health-conscious people). To collect data, this study used a self-report survey. Self-reported survey data have shortcomings (e.g., social desirability bias), and the influence of various confounding variables cannot be fully excluded. People may underreport consumption of junk foods because they know that junk food should be avoided. Future studies could employ an experimental research design to control for those confounding variables.

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## CHAPTER 6. GENERAL CONCLUSION

This study explored the effects of psychological factors on healthful menu item selection, specifically low calorie menu item selection, at casual dining restaurants. First, this study examined healthful restaurant menu item selection within the extended theory of planned behavior (TPB). The original TPB is composed of attitudes, subjective norms, perceived behavioral control, behavioral intention, and actual behavior; our study extends the theory by incorporating prototype and behavioral willingness and subdividing the original TPB constructs of attitudes and social norms. Second, the social norms construct – consisting of descriptive and injunctive norms – was investigated by exploring the effect of misalignment of the two types of norms on intentions to choose low calorie menu items. More specifically, the effects of descriptive and injunctive norms and misalignment of these two norms on intention to choose healthful menu items at restaurants were investigated. This chapter provides a summary of results, implications of the findings, potential limitations, and recommendations for future study.

### Summary of Results

The data were collected from American adults who were registered with Amazon Mechanical Turk. The sample (n=744) used for analysis was 57.8% male and 42.2 % female. A majority of participants were White (81.0%). In terms of age, 69.1% of participants were between 18 and 34 years old, and about half of the sample (48.4%) had at least a bachelor's degree. In terms of income, the largest groups indicated that their annual household income was either \$40,000-\$79,999 (31.4%) or \$20,000-\$39,999 (30.8%), respectively. Participants who lived in the southern U.S. accounted for 34.7% of study sample, while those who lived in the West, Midwest, and Northeast accounted for 23.0%, 21.5%, and 20.7% respectively. Regarding the frequency of dining out, the largest group (61.0%) reported that they dined out 2-5 times a

month, followed by those who reported that they dined out at least 6 times a month (15.2%). A majority of the participants (83.6%) had tried low-calorie menu items at restaurants.

The six research objectives of this study were to: 1) explore effects of customers' attitudes (cognitive and affective) toward consuming healthful menu items on behavioral intention and willingness to select those menu items; 2) examine influences of customers' social norms (injunctive and descriptive) related to consuming healthful menu items on behavioral intention and willingness to select those menu items; 3) investigate impacts of customers' perceived behavioral control over consuming healthful menu items on behavioral intention and willingness to select such menu items and on self-reported selection behavior; 4) explore the effects of customers' perceived prototype images on behavioral intention and willingness to select those menu items; 5) determine the relationship between behavioral intention and willingness to select healthful menu items and self-reported selection behavior; and 6) determine whether there is a misalignment of descriptive and injunctive norms, and if existence of misalignment of the two norms occurs, explore effects of this misalignment of injunctive and descriptive norms related to consuming healthful menu items on behavioral intention to select such menu items.

To fulfill objectives one through five, the two-step approach recommended by Anderson and Gerbing (1988) was employed. In the first step, confirmatory factor analysis (CFA) was conducted to assess the conceptual model. In the second step, structural equation modeling was performed to evaluate the validity of the proposed conceptual model and test the proposed hypotheses.

Based on the CFA results, the five items with factor loadings less than .70 were removed and 33 items retained. The fit of the final model was satisfactory at  $\chi^2 = 1717.135$  ( $df = 459$ ,  $p$

< .001), NFI = .915, TLI = .926, CFI = .936, RMSEA = .061 (Hair, Black, Babin, & Anderson, 2009). Cronbach's alpha values for each construct were greater than the cutoff value of .70, verifying reliability and internal consistency of the construct. The composite reliabilities for all constructs ranged from .808 to .988 and thus were greater than the cutoff value of .70, confirming acceptable internal consistency of the items for each construct. Convergent validity was acceptable because all factor loadings were significant at .01, and the AVE values for all the constructs were above the cutoff value of .50 (Fornell & Larcker, 1981; Hair et al., 2009). Discriminant validity between constructs was evaluated by comparing AVE values and the squared correlation between constructs. Except for the constructs of behavioral willingness and actual behavior, all AVE values were greater than the squared correlations between pairs of constructs, indicating satisfactory discriminant validity. The squared correlations between behavioral willingness and actual behaviors were a bit higher than the AVE values for each of them, suggesting that these two constructs may not be perfectly discriminated from one another; however, these constructs have been successfully operationalized in prior studies, therefore these two constructs were retained for further statistical analysis (see Campbell, DiPietro, & Remar, 2014). The correlation matrix between each construct is provided in Appendix F.

In the second step, structural equation modeling (SEM) was conducted and confirmed the validity of the proposed conceptual model with  $\chi^2 = 2195.661$  ( $df = 479, p < .001$ ), TLI = .903, IFI = .913, CFI = .912, RMSEA = .069 (Hair et al., 2009). In addition to the structural model proposed by this current study, this study examined the fully recursive model, and the results of the fully recursive model are provided in Appendix G. SEM results showed that 10 out of 14 hypotheses related to research objectives one through five were supported. Specifically, affective attitude and injunctive norms had significantly positive effects on both behavioral intention ( $\beta$



= .418,  $p < .001$ ,  $\beta = .367$ ,  $p < .001$ , respectively) and behavioral willingness ( $\beta = .537$ ,  $p < .001$ ,  $\beta = .319$ ,  $p < .001$ ) to choose low-calorie menu items. However, cognitive attitude and descriptive norms had a significantly positive effect only on behavioral intention ( $\beta = .186$ ,  $p < .001$ ,  $\beta = .114$ ,  $p < .001$ ) (objective 1). In other words, people's feelings or emotions toward low calorie menu items are more critical than their evaluations on the factual benefits of those menu items (e.g., nutrition information) in forming both intention and willingness to choose those menu items. In terms of social norms, both injunctive descriptive norms significantly, positively affected behavioral intention ( $\beta = .367$ ,  $p < .001$ ,  $\beta = .114$ ,  $p < .01$ , respectively), whereas only injunctive norm had a significantly positive effect on behavioral willingness ( $\beta = .319$ ,  $p < .001$ ) (objective 2). These results indicate that both social norms are critical in forming intentions and/or willingness to choose healthful menu options, however people's perceived social pressure from others' expectations have more significant effects on both intentions and willingness. Contrary to our expectation, perceived behavioral control did not have a significant effect on any of the three dependent variables (behavioral intention, willingness, and actual behavior) (objective 3). Prototype images of unhealthy eaters negatively affected willingness to select low-calorie menu items at restaurants ( $\beta = -.063$ ,  $p = .050$ ) (objective 4); that is, when people hold negative viewpoints about the person who eats unhealthy, they are more likely to have intentions to choose healthful menu items at restaurants. Finally, both behavioral intention ( $\beta = .480$ ,  $p < .001$ ) and willingness ( $\beta = .594$ ,  $p < .001$ ) to select low-calorie menu items positively affected self-reported choices of those menu items (objective 5). These results show that people's healthful menu selections are affected by not only the rational (behavioral intention), but also the reactive (behavioral willingness) decision making processes.

The misalignment of descriptive and injunctive norms (objective 6) was investigated using hierarchical regression analysis. Before conducting hierarchical regression, the difference scores of the two social norms were calculated. Based on the difference scores, it was confirmed that there was misalignment between the two social norms. After confirming the existence of misalignment of the two, hierarchical regression analysis was performed. In the first model, gender and education level were entered to exclude the effects of these two demographic variables. In the second model, descriptive and injunctive norms were entered. After controlling for the demographic variables, an additional 20.6% variance in behavioral intention was explained by the descriptive and injunctive norms ( $R^2$  change = .206,  $F$  change (2, 739) = 99.702,  $p < .001$ ). The final model included the variable of misalignment of descriptive and injunctive norms. Addition of this variable yielded a significant increase in the explained variance of behavioral intention ( $R^2$  change = .004,  $F$  change (1, 738) = 4.279,  $p < .05$ ). The results of the third model demonstrated that all three independent variables were significant predictors of intention to select low-calorie restaurant menu items. Specifically, while descriptive ( $\beta = .182$ ,  $p < .001$ ) and injunctive ( $\beta = .352$ ,  $p < .001$ ) norms positively affected intentions to choose low-calorie restaurant menu items, misalignment of the two social norms ( $\beta = -.067$ ,  $p < .05$ ) negatively affected behavioral intention. These results indicate that while the two social norms have independently positive effects on intentions to choose healthful food items, when people perceive conflict between the two, people are less likely to have intentions to choose those menu items.

## **Implications of the Findings**

### **Practical Implications**

This study found that various psychological factors significantly affected people's healthful menu item selections (in particular, low calorie menu item selection) at casual dining restaurants. Given that obesity increases the risk for a variety of chronic diseases, and obesity is caused by excessive caloric intake, determining what factors affect people's low calorie menu item selections is beneficial. In particular, people have freedom of choice when making food selections and although healthful restaurant menu items are available and regulations promoting people's healthful menu item selections are enacted (i.e. Affordable Care Act), it is still critical to understand individual-level factors related to food selections. By understanding the roles of individual-level factors, such as psychological factors in encouraging people to choose healthful menu items, restaurant marketers, educators, and policy makers may develop effective healthy eating promotions, campaigns, and marketing materials.

This study confirmed that self-reported healthy eating behaviors at restaurants were influenced by both intentional and reactive decision making processes, which means that even if people plan to choose low-calorie menu items at restaurants, they may actually select regular menu items with higher calorie content as a result of various situational factors. These findings highlight the important role of various situational factors inducing reactive responses (e.g., server's recommendation at the point of order) in promoting healthful menu item selection at restaurants. Restaurant marketers could encourage customers to choose healthful menu items by creating circumstances that promote healthful menu item selection, such as using delicious-looking pictures of healthful menu items (Egido & Patterson, 1988), thereby potentially increasing the sales of healthful menu items.

Recognizing that the primary goal of casual dining operators is profitability, some may question what incentives casual dining restaurants have to promote healthy eating through offering and marketing healthy menu options. One argument may be the restaurants have a corporate social responsibility to offer and encourage customers to choose healthful menu items. This may be a more active approach to mitigate the public health concerns about obesity than just providing healthful menu items without promotion. Such an active promotion may induce customers' positive evaluations on the restaurant, which in turn help attract more customers. In addition, because customers have intentions to pay more for the healthful menu items (Hwang & Lorenzen, 2008), restaurants may be able to increase their profit margin by promoting healthful menu items.

Our results also suggest that when people have a negative viewpoint (prototype image) about the unhealthy eater, they are more willing to choose low calorie menu items at restaurants due to a desire not to belong to the negatively perceived group. This significant role of prototype images indicates that incorporating images of unhealthy eaters into promotions, campaigns, or advertisements might encourage people to eat healthy at restaurants by creating an unfavorable perception of the typical unhealthy eater. However, this strategy might induce resistance from people, therefore providing positive images of healthy eaters might be an alternative (van den Eijnden, Spijkerman, & Engels, 2006). One example of healthy eating promotion strategies using prototype images may be commercials with celebrities whom people want to resemble; this in turn may stimulate people's desire to have a positive image of the celebrities consuming healthful foods at restaurants.

Based on our findings, addressing affective attitude appears to be more important than cognitive attitude in encouraging people to choose healthful menu items. This means that

people's feelings or emotions about eating healthy at restaurants are a critical consideration for effective promotional messages or advertising. Because affective attitudes are based on the pleasurable attributes of healthful menu items (e.g., taste, smell, and texture), emphasizing these attributes would be one strategy to promote healthful menu items. For example, use of the words reminiscent of pleasurable taste or smell of healthful menu items in the menu descriptions may be one of the ways to induce positive feelings or emotions and in turn encourage people to choose healthful menu items (Keystone, 2006).

Finally, our study highlights the important role of social norms in understanding people's healthy eating behaviors. Both descriptive and injunctive norms were revealed as significant predictors of intentions to choose low calorie menu items at restaurants. In other words, an individual is more likely to have intentions to eat healthy at restaurants when he/she believes that most others do so, and when he/she believes that others expect or want him/her to do so. However, our study also indicates that the misalignment of perceived descriptive and injunctive norms significantly weakened people's intentions to choose the healthful menu items. This suggests that people can be encouraged to eat healthy at restaurants by persuading them that healthy eating is the norm through promotional messages, intervention, and campaigns with closely-aligned social norm messages. To maximize the effectiveness of such social norm-based promotions, developers of promotions, interventions, or marketing materials should identify and correct any misperceptions people may hold about healthy eating as a norm. For example, adolescents are likely to underestimate others' fruit and vegetable consumption, whereas overestimate others' unhealthy snack consumption (Lally, Bartle, & Wardle, 2011). Also, it might be beneficial to determine the most influential social groups on people's healthy eating

behavior and incorporate them into the promotions for the optimal effects of social norm-based promotions.

### **Theoretical Implications**

Our work has theoretical value. First, our study extended TPB by adding new constructs and subdividing two of the original constructs. While TPB focuses only on the intentional decision making process, through the addition of two new constructs (prototype images and behavioral willingness), this study opens a line of investigation into both intentional and reactive decision making processes in the domain of healthy eating behaviors at restaurants. By subdividing the original TPB constructs of attitudes and social norms, this study also more rigorously conceptualizes these two constructs. This extended model allows researchers to better understand the complicated psychological factors related to healthful menu item selections and investigate the roles of other potential factors affecting those menu item selections by using this theoretical framework as a starting point. To the best of our knowledge, this is the first study to apply an extended TPB model to the understanding of low calorie menu item selections at restaurants. Moreover, this study investigated not only the independent effects of descriptive and injunctive norms but also the interplay between them, confirming the important influence of misalignment between the two. Related to healthful menu item selections at restaurants, the conflict between descriptive and injunctive norms has not previously been examined and therefore our study expands the existing social norm-related literature.

### **Limitations and Recommendations**

As with any research, this study has limitations. First, this study used self-reported responses to assess low calorie menu item selection decisions. Self-reported responses have potential shortcomings, most notably that participants may overestimate or underestimate the

behavior being investigated (e.g., eating behavior). However, it should be also noted that researchers have argued that self-reported food consumption (e.g., diet history) yields similar results to actual consumption (Sjöberg et al., 2003). Second, the constructs of behavioral willingness and actual behavior did not seem to be distinctly discrete as evidenced by the high correlation between them. Third, this study did not examine the effects of potential moderators. Finally, the study sample did not exactly reflect the U.S. population aged 18 and older. Compared with the U.S. population, males and young adults in our study were overrepresented (49% vs. 58% and 47.4% vs. 82.9%, respectively) (U.S. Census Bureau, 2014). Future researchers could test the moderating effects of participants' various characteristics (e.g., interest in healthy eating) (Pieniak, Vebeke, Scholderer, Brunsø, & Olsen, 2008) within our theoretical framework. Also, by employing experimental design, future researchers could remedy some of the shortcomings of using self-reported data (e.g., social desirability bias). Finally, to make findings more generalizable, future researchers could strive for a more representative study sample.

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## APEENDIX A. HUMAN SUBJECT INSTITUTIONAL REVIEW BOARD APPROVAL

**IOWA STATE UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

Institutional Review Board  
Office for Responsible Research  
Vice President for Research  
1138 Pearson Hall  
Ames, Iowa 50011-2207  
515 294-4566  
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**Date:** 1/27/2014

**To:** Jinhyun Jun  
7E MacKay Hall

**CC:** Dr. Susan Wohlsdorf Arendt  
9E MacKay Hall

**From:** Office for Responsible Research

**Title:** Understanding customers' healthful menu item selection behaviors at casual dining restaurants

**IRB ID:** 14-030

**Study Review Date:** 1/24/2014

The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

- (2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey or interview procedures with adults or observation of public behavior where
  - Information obtained is recorded in such a manner that human subjects cannot be identified directly or through identifiers linked to the subjects; or
  - Any disclosure of the human subjects' responses outside the research could not reasonably place the subject at risk of criminal or civil liability or be damaging to their financial standing, employability, or reputation.

The determination of exemption means that:

- **You do not need to submit an application for annual continuing review.**
- **You must carry out the research as described in the IRB application.** Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. Changes to key personnel must also be approved. The purpose of review is to determine if the project still meets the federal criteria for exemption.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

**Detailed information about requirements for submission of modifications can be found on the Exempt Study Modification Form.** A Personnel Change Form may be submitted when the only modification involves changes in study staff. If it is determined that exemption is no longer warranted, then an Application for Approval of Research Involving Humans Form will need to be submitted and approved before proceeding with data collection.

Please note that you must submit all research involving human participants for review. **Only the IRB or designees may make the determination of exemption**, even if you conduct a study in the future that is exactly like this study.

Please be aware that **approval from other entities may also be needed**. For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.**

## APPENDIX B. COVER LETTER

Dear Participants:

This survey is for a study that will investigate how people make healthful food choices in casual dining restaurants. Specifically, the purpose of this study is to learn about your attitudes and perceptions related to choosing healthful menu items in a casual dining setting.

**To participate in this survey, you should be at least 18 years of age and currently reside in the United States.** This survey will take about 15-20 minutes to complete. If you agree to participate, you will be asked to complete a survey about your attitudes, perceptions, future plans, and behavior related to healthful food choices in casual dining restaurants.

Once you complete a valid survey, you will receive 50 cents as an incentive. There are not any foreseeable risks to you for participating in this survey. It is hoped that the information you provide will help us better understand how customers make food choices at restaurants and may result in suggestions restaurants can use to develop better promotion and intervention strategies to improve customers' diets at restaurants.

Your participation is completely voluntary and anonymous. You may choose not to participate in the study or stop participating at any time, for any reason, without penalty or negative consequences. You may skip any question if you are uncomfortable answering.

Your responses will be used for research purposes only and kept anonymous and confidential. This means that you cannot be directly identified by your responses, and all responses will be securely stored and accessed only by the principal investigator and her major professor.

If you have any questions regarding this survey, please contact Jinhyun Jun (primary researcher) at [jjun@iastate.edu](mailto:jjun@iastate.edu), or Susan Arendt (major professor) at [sarendt@iastate.edu](mailto:sarendt@iastate.edu). For questions regarding the rights of research subjects, or for complaints or comments regarding the manner in which the study is being conducted, contact the Iowa State University Office for Responsible Research at 515-294-4566.

Thank you for your time and consideration. Your participation is greatly appreciated.

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By clicking on the "I AGREE" button below you verify that you have read the above information and agree to participate in this survey. You also acknowledge that you are at least 18 years of age.

- I agree  
 I do not agree

APPENDIX C. QUESTIONNAIRE

Are you living in the United States?

- Yes
- No

Have you ever eaten at a casual dining restaurant\*?

(\* Defined as a restaurant where the server takes customer’s order at the table and food is then served to the customer)

- Yes
- No

Before participating in this survey, please recall your recent dining experiences at casual dining restaurants (e.g., Outback Steakhouse, Red Lobster, Cheesecake Factory)

Which casual dining restaurant(s)\* have you eaten at within the last one month?

(\* Defined as a restaurant where the server takes customer’s order at the table and food is then served to the customer)

- Applebee’s
- Red Lobster
- The Cheesecake Factory
- Outback Steakhouse
- TGIF
- Bennigan’s
- Chili’s
- Mimi’s Café
- Ruby Tuesday
- Sizzler
- Tony Roma’s
- Uno Chicago Grill
- IHOP
- Perkins
- Village Inn
- Olive Garden
- P.F. Chang’s
- Denny’s
- Others, please specify. \_\_\_\_\_

**Section 1.** We are interested in how you view low calorie food options at casual dining restaurants.

For me, eating healthful menu items with low calories at restaurants would be...								
	Extremely		Neither			Extremely		
Unpleasant	1	2	3	4	5	6	7	Pleasant
Unenjoyable	1	2	3	4	5	6	7	Enjoyable
Boring	1	2	3	4	5	6	7	Interesting
Bad	1	2	3	4	5	6	7	Good
Harmful	1	2	3	4	5	6	7	Beneficial
Foolish	1	2	3	4	5	6	7	Wise

**Section 2.** Please select the response that best conveys your views using the following scales.

	←Unlikely to Think				Likely to Think→		
People who are important to me are unlikely/likely to think I should choose restaurant menu items that are low in calories.	1	2	3	4	5	6	7
	←Disapprove				Approve→		
People who are important to me would disapprove/approve of my choosing restaurant menu items that are low in calories.	1	2	3	4	5	6	7

	←Strongly Disagree				Strongly Agree→		
People who are important to me want me to choose restaurant menu items that are low in calories.	1	2	3	4	5	6	7
A number of people I know think of choosing menu items that are low in calories when they eat out.	1	2	3	4	5	6	7
A number of people I know try to choose menu items that are low in calories when they eat out.	1	2	3	4	5	6	7
A number of people I know have chosen menu items that are low in calories when they eat out.	1	2	3	4	5	6	7

**Section 3.** Please select the response that best conveys your views using the following scales.

	←Strongly Disagree				Strongly Agree →		
I feel in complete control of whether or not I choose healthful menu items with low calories at restaurants.	1	2	3	4	5	6	7
If I wanted to, I could easily choose healthful menu items with low calories at restaurants.	1	2	3	4	5	6	7
	←No Control				Complete Control →		
At restaurants, I have _____ control over choosing healthful menu items with low calories.	1	2	3	4	5	6	7
	←Difficult				Easy →		
If I desired, choosing healthful menu items with low calories at restaurants would be...	1	2	3	4	5	6	7

**Section 4.** Think about a typical person who is the same age and gender as you and who is an unhealthy eater consuming high calorie foods. Use the descriptors below to characterize this person.

	Extremely			Neither			Extremely	
Foolish	1	2	3	4	5	6	7	Wise
Irresponsible	1	2	3	4	5	6	7	Responsible
Undisciplined	1	2	3	4	5	6	7	Disciplined
Focused on the present	1	2	3	4	5	6	7	Focused on the future
Dissatisfied	1	2	3	4	5	6	7	Satisfied
Insecure	1	2	3	4	5	6	7	Self-confident
Sloppy	1	2	3	4	5	6	7	Meticulous
Unkept	1	2	3	4	5	6	7	Well-groomed
Chubby	1	2	3	4	5	6	7	Slim
Thinks body is unimportant	1	2	3	4	5	6	7	Thinks body is important
Not Sporty	1	2	3	4	5	6	7	Sporty
Lazy	1	2	3	4	5	6	7	Active

**Section 5.** We are interested in your *future plans* to choose low calorie menu items at casual dining restaurants. Please indicate your responses to each statement using the following scale.

	←Not at All						Frequently→	
I plan to eat low calorie menu items at restaurants.	1	2	3	4	5	6	7	
	←Strongly Disagree						Strongly Agree→	
I will <u>not</u> try to eat low calorie menu items at restaurants.	1	2	3	4	5	6	7	
	←Definitely Do Not						Definitely Do→	
I intend to eat low calorie menu items at restaurants.	1	2	3	4	5	6	7	

**Section 6.** We are interested in your future behaviors in choosing low calorie menu items at casual dining restaurants. Please, read the following scenario and answer the questions.

**Scenario #1**

Suppose you are at a casual dining restaurant with your family. The restaurant is full of delicious, mouthwatering smells from a variety of foods. It is time for you to order your food. Your family recommends menu items that are high in calories. Under these circumstances, please indicate your agreement with each statement.

	←Strongly Disagree				Strongly Agree→			
Order the healthful menu items with lower calories	1	2	3	4	5	6	7	
Order the regular menu items with higher calories	1	2	3	4	5	6	7	

**Scenario #2**

Imagine the following situation: After spending a long day at work, you go to a restaurant. You are feeling down, tired, and stressed and want to eat comfort foods. please indicate your agreement with each statement.

	←Strongly Disagree				Strongly Agree→			
Order the healthful menu items with lower calories	1	2	3	4	5	6	7	
Order the regular menu items with higher calories	1	2	3	4	5	6	7	

**Scenario #3**

You are at a restaurant where most of the menu items are high calorie; all of these items look very appetizing. Your friends accompanying you choose the high calorie menu items and recommend you do the same. Under these circumstances, how willing are you to do the following?

	←Not at All				Very Willing →			
Order the healthful menu items with lower calories	1	2	3	4	5	6	7	
Order the regular menu items with higher calories	1	2	3	4	5	6	7	

**Scenario #4**

Suppose you are at a casual dining restaurant with your family. It is in the evening. You had a calorie-filled noon meal. How willing are you to do the following?

	←Not at All				Very Willing →		
Order the healthful menu items with lower calories	1	2	3	4	5	6	7
Order the regular menu items with higher calories	1	2	3	4	5	6	7

**Scenario #5**

Delicious, mouthwatering smells greet you when you enter the restaurant. The server recommends the daily special menu items which look very appetizing but do not sound that healthful. How likely would you be to do the following?

	←Not at All				Very Willing →		
Order the healthful menu items with lower calories	1	2	3	4	5	6	7
Order the regular menu items with higher calories	1	2	3	4	5	6	7

**Section 7.** We are interested in your food choice behaviors at casual dining restaurants. Please respond to each statement using the following scale.

	←Strongly Disagree				Strongly Agree→		
When I eat out, if healthful menu items with low calories are available, I choose menu items that are low in calories.	1	2	3	4	5	6	7
	←Never				Always→		
When I eat out, if healthful menu items with low calories are available, I often times choose menu items that are low in calories.	1	2	3	4	5	6	7
When I eat out, even if healthful menu items with low calories are available, I often times choose regular menu items with high calorie.	1	2	3	4	5	6	7

**Section 8.** Demographic Information

1. What is your gender?

Male

Female

2. What is your age range?

18 – 24 years

25 – 34 years

35 – 44 years

45 – 54 years

55 – 64 years

Older than 64 years

3. What is your annual household income before taxes?

- Less than \$20,000
- \$20,000 to \$39,999
- \$40,000 to \$79,999
- \$80,000 to \$119,999
- \$120,000 to \$149,999
- over \$150,000

4. What is the highest level of education you have completed?

- Less than high school diploma
- High school diploma
- Some college, but no degree
- Associate degree
- Bachelor's degree
- Graduate degree (Master, Ph.D, J.D., MD)
- Others, please specify \_\_\_\_\_

5. What is your race?

- White
- Black or African American
- American Indian or Alaskan Native
- Asian Indian
- Japanese
- Native Hawaiian
- Chinese
- Korean
- Guamanian or Chamorro
- Filipino
- Vietnamese
- Samoan
- Other Asian: (please indicate) \_\_\_\_\_
- Other Pacific Islander: (please indicate) \_\_\_\_\_
- Some other race: (please indicate) \_\_\_\_\_

6. Are you of Hispanic, Latino, or Spanish origin?

- No, not of Hispanic, Latino, or Spanish origin
- Yes, Mexican, Mexican American, Chicano
- Yes, Puerto Rican
- Yes, Cuban
- Yes, another Hispanic, Latino, or Spanish origin: (please indicate) \_\_\_\_\_



7. What is your occupation? \_\_\_\_\_
8. Where in the United States do you live??
- Northeast (CT, ME, MA, NH, RI, VT, NJ, NY, PA)
  - Midwest (IN, IL, MI, OH, WI, IA, KS, MN, MO, NE, ND, SD)
  - South (DE, DC, FL, GA, MD, NC, SC, VA, WV, AL, KY, MS, TN, AR, LA, OK, TX)
  - West (AZ, CO, ID, NM, MT, UT, NV, WY, AK, CA, HI, OR, WA)
9. On average, how many times per month do you eat out at restaurants?
- Never
  - Once
  - 2 – 5 times
  - 6 – 10 times
  - More than 10 times
10. In the past 1 month, how often have you eaten at casual dining restaurants?
- Never
  - Once
  - 2 – 5 times
  - 6 – 10 times
  - More than 10 times
11. Have you ever chosen low calorie foods at a restaurant?
- Yes    No
12. In the past 1 month, how often have you chosen a low calorie food at a casual dining restaurant\*?  
(\* Defined as a restaurant where the server takes customer's order at the table and food is then served to the customer)
- Never
  - Once
  - 2 – 5 times
  - 6 – 10 times
  - More than 10 times
13. What is your health status?
- Extremely unhealthy
  - Unhealthy
  - Neutral
  - Healthy
  - Extremely healthy

**Thank you very much for your participation!**

## APEENDIX D. COVER LETTER AND QUESTIONNAIRE FOR PILOT TEST

Dear Participants:

This survey is for a study in regards to how people make healthful food choices in casual dining restaurants. Specifically, the purpose of this study is to learn about your attitudes and perceptions related to choosing healthful menu items in a casual dining setting.

**To participate in this survey, you should be at least 18 years of age and currently reside in the United States.** This survey will take about 15-20 minutes to complete. If you agree to participate, you will be asked to complete a survey about your attitudes, perceptions, future plans, and behavior related to healthful food choices in casual dining restaurants.

Once you complete a valid survey, you will receive 50 cents as an incentive. There are not any foreseeable risks to you for participating in this survey. It is hoped that the information you provide will help us better understand how customers make food choices at restaurants and may result in suggestions restaurants can use to develop better promotion and intervention strategies to improve customers' diets at restaurants.

Your participation is completely voluntary and anonymous. You may choose not to participate in the study or stop participating at any time, for any reason, without penalty or negative consequences. You may skip any question if you are uncomfortable answering.

Your responses will be used for research purposes only and kept anonymous and confidential. This means that you cannot be directly identified by your responses, and all responses will be securely stored and accessed only by the principal investigator and her major professor.

If you have any questions regarding this survey, please contact Jinhyun Jun (primary researcher) at [jjun@iastate.edu](mailto:jjun@iastate.edu), or Susan Arendt (major professor) at [sarendt@iastate.edu](mailto:sarendt@iastate.edu). For questions regarding the rights of research subjects, or for complaints or comments regarding the manner in which the study is being conducted, contact the Iowa State University Office for Responsible Research at 515-294-4566.

By clicking on the "I AGREE" button below you verify that you have read the above information and agree to participate in this survey. You also acknowledge that you are at least 18 years of age.

- I agree  
 I do not agree to participate

Thank you for your time and consideration. Your participation is greatly appreciated.

Jinhyun Jun, PhD. Candidate  
 Hospitality Management  
 Iowa State University  
 515-294-8600  
[jjun@iastate.edu](mailto:jjun@iastate.edu)

Susan Arendt, PhD, RD  
 Hospitality Management  
 Iowa State University  
 515-294-7575  
[sarendt@iastate.edu](mailto:sarendt@iastate.edu)

Are you living in the United States?  
 Yes  No

Have you ever eaten at a casual dining restaurant\*?  
 (\* Defined as a restaurant where the server takes customer's order at the table and food is then served to the customer)  
 Yes  No

Before participating in this survey, please recall your recent dining experiences at casual dining restaurants (e.g., Outback Steakhouse, Red Lobster, Cheesecake Factory)

Which casual dining restaurant(s)\* have you eaten at within the last one month?

(\* Defined as a restaurant where the server takes customer’s order at the table and food is then served to the customer)

- |                                    |                                   |   |  |
|------------------------------------|-----------------------------------|---|--|
| <input type="radio"/> Applebee’s   | <input type="radio"/> Red Lobster | <input type="radio"/> The Cheesecake Factory        | <input type="radio"/> Outback Steakhouse |
| <input type="radio"/> TGIF         | <input type="radio"/> Bennigan’s  | <input type="radio"/> Chili’s                       | <input type="radio"/> Mimi’s Café        |
| <input type="radio"/> Ruby Tuesday | <input type="radio"/> Sizzler     | <input type="radio"/> Tony Roma’s                   | <input type="radio"/> Uno Chicago Grill  |
| <input type="radio"/> IHOP         | <input type="radio"/> Perkins     | <input type="radio"/> Village Inn                   | <input type="radio"/> Olive Garden       |
| <input type="radio"/> P.F. Chang’s | <input type="radio"/> Denny’s     | <input type="radio"/> Others, please specify. _____ |  |

**Section 1.** We are interested in how you view low calorie food options at casual dining restaurants.

For me, eating healthful menu items with low calories at restaurants would be...									
	Extremely			Neither			Extremely		
Unpleasant	1	2	3	4	5	6	7	Pleasant	
Unenjoyable	1	2	3	4	5	6	7	Enjoyable	
Boring	1	2	3	4	5	6	7	Interesting	

For me, eating healthful menu items with low calories at restaurants would be...									
	Extremely			Neither			Extremely		
Bad	1	2	3	4	5	6	7	Good	
Harmful	1	2	3	4	5	6	7	Beneficial	
Foolish	1	2	3	4	5	6	7	Wise	

**Section 2.** Please indicate your responses using the following scales.

	←Unlikely to Think				Likely to Think→		
People who are important to me are unlikely/likely to think I should choose restaurant menu items that are low in calories.	1	2	3	4	5	6	7
	←Disapprove				Approve→		
People who are important to me would disapprove/approve of my choosing restaurant menu items that are low in calories.	1	2	3	4	5	6	7
	←Strongly Disagree				Strongly Agree→		
People who are important to me want me to choose restaurant menu items that are low in calories.	1	2	3	4	5	6	7

	←Strongly Disagree				Strongly Agree→		
A number of people I know think of choosing menu items that are low in calories when they eat out.	1	2	3	4	5	6	7
A number of people I know try to choose menu items that are low in calories when they eat out.	1	2	3	4	5	6	7
A number of people I know have chosen menu items that are low in calories when they eat out.	1	2	3	4	5	6	7

**Section 3.** Please indicate your responses to each statement using the following scale.

	←Strongly Disagree				Strongly Agree →		
I feel in complete control of whether or not I choose healthful menu items with low calories at restaurants.	1	2	3	4	5	6	7
If I wanted to, I could easily choose healthful menu items with low calories at restaurants.	1	2	3	4	5	6	7
	←No Control				Complete Control →		
At restaurants, I have _____ control over choosing healthful menu items with low calories.	1	2	3	4	5	6	7
	←Difficult				Easy →		
If I desired, choosing healthful menu items with low calories at restaurants would be...	1	2	3	4	5	6	7

**Section 4.** Think about a person who is the same age and gender as you and who is an unhealthy eater consuming high calorie foods. Use the descriptors below to characterize this person.

	Extremely			Neither			Extremely	
Foolish	1	2	3	4	5	6	7	Wise
Irresponsible	1	2	3	4	5	6	7	Responsible
Undisciplined	1	2	3	4	5	6	7	Disciplined
Focused on the present	1	2	3	4	5	6	7	Focused on the future
Dissatisfied	1	2	3	4	5	6	7	Satisfied
Insecure	1	2	3	4	5	6	7	Self-confident
Sloppy	1	2	3	4	5	6	7	Meticulous
Unkept	1	2	3	4	5	6	7	Well-groomed
Chubby	1	2	3	4	5	6	7	Slim
Thinks body is unimportant	1	2	3	4	5	6	7	Thinks body is important
Not Sporty	1	2	3	4	5	6	7	Sporty
Lazy	1	2	3	4	5	6	7	Active

**Section 5.** We are interested in your *future plans* to choose low calorie menu items at casual dining restaurants. Please indicate your responses to each statement using the following scale.

	<b>←Not at All</b>				<b>Frequently→</b>		
I plan to eat low calorie menu items at restaurants.	1	2	3	4	5	6	7
	<b>←Strongly Disagree</b>				<b>Strongly Agree→</b>		
I will <u>not</u> try to eat low calorie menu items at restaurants.	1	2	3	4	5	6	7
	<b>←Definitely Do Not</b>				<b>Definitely Do→</b>		
I intend to eat low calorie menu items at restaurants.	1	2	3	4	5	6	7

**Section 6.** We are interested in your future behaviors in choosing low calorie menu items at casual dining restaurants. Please, read the following scenario and answer the questions.

**#1 Scenario:**

Suppose you are at a casual dining restaurant with your family. The restaurant is full of delicious, mouthwatering smells from a variety of foods. It is time for you to order your food. Your family recommends menu items that are high in calories. Under these circumstances, please indicate your agreement with each statement.

	<b>←Strongly Disagree</b>				<b>Strongly Agree→</b>		
Order the healthful menu items with lower calories	1	2	3	4	5	6	7
Order the regular menu items with higher calories	1	2	3	4	5	6	7

**#2 Scenario:**

Imagine the following situation: After spending a long day at work, you go to a restaurant. You are feeling down, tired, and stressed and want to eat comfort foods. Please indicate your agreement with each statement.

	<b>←Strongly Disagree</b>				<b>Strongly Agree→</b>		
Order the healthful menu items with lower calories	1	2	3	4	5	6	7
Order the regular menu items with higher calories	1	2	3	4	5	6	7

**#3 Scenario:**

You are at a restaurant where most of the menu items are high calorie; all of these items look very appetizing. Your friends accompanying you choose the high calorie menu items and recommend you do the same. Under these circumstances, how willing are you to do the following?

	<b>←Not at All</b>				<b>Very Willing→</b>		
Order the healthful menu items with lower calories	1	2	3	4	5	6	7
Order the regular menu items with higher calories	1	2	3	4	5	6	7

**#4 Scenario:**

Suppose you are at a casual dining restaurant with your family. It is in the evening. You had a calorie-filled noon meal. How willing are you to do the following?

	←Not at All				Very Willing →		
Order the healthful menu items with lower calories	1	2	3	4	5	6	7
Order the regular menu items with higher calories	1	2	3	4	5	6	7

**#5 Scenario:**

Delicious, mouthwatering smells greet you when you enter the restaurant. The server recommends the daily special menu items which look very appetizing but do not sound that healthful. How likely would you be to do the following?

	←Not at All				Very Willing →		
Order the healthful menu items with lower calories	1	2	3	4	5	6	7
Order the regular menu items with higher calories	1	2	3	4	5	6	7

**Section 7.** We are interested in your food choice behaviors at casual dining restaurants. Please respond to each statement using the following scale.

	←Strongly Disagree				Strongly Agree→		
When I eat out, if healthful menu items with low calories are available, I choose menu items that are low in calories.	1	2	3	4	5	6	7
	←Never				Always→		
When I eat out, if healthful menu items with low calories are available, I often times choose menu items that are low in calories.	1	2	3	4	5	6	7
When I eat out, even if healthful menu items with low calories are available, I often times choose regular menu items with high calorie.	1	2	3	4	5	6	7

**Section 8.** Demographic Information

1. What is your gender?

- Male  
 Female

2. What is your age range?

- 18 – 24 years  
 25 – 34 years  
 35 – 44 years  
 45 – 54 years  
 55 – 64 years  
 Older than 64 years

3. What is your annual household income before taxes?

- Less than \$20,000
- \$20,000 to \$39,999
- \$40,000 to \$79,999
- \$80,000 to \$119,999
- \$120,000 to \$149,999
- over \$150,000

4. What is the highest level of education you have completed?

- Less than high school diploma
- High school diploma
- Some college, but no degree
- Associate degree
- Bachelor's degree
- Graduate degree (Master, Ph.D, J.D., MD)
- Others, please specify \_\_\_\_\_

5. What is your race?

- White
- Black, African American, or Negro
- American Indian or Alaskan Native
- Asian Indian
- Japanese
- Native Hawaiian
- Chinese
- Korean
- Guamanian or Chamorro
- Filipino
- Vietnamese
- Samoan
- Other Asian: (please indicate) \_\_\_\_\_
- Other Pacific Islander: (please indicate) \_\_\_\_\_
- Some other race: (please indicate) \_\_\_\_\_

6. Are you of Hispanic, Latino, or Spanish origin?

- No, not of Hispanic, Latino, or Spanish origin
- Yes, Mexican, Mexican American, Chicano
- Yes, Puerto Rican
- Yes, Cuban
- Yes, another Hispanic, Latino, or Spanish origin: (please indicate) \_\_\_\_\_

7. What is your occupation? \_\_\_\_\_
8. Where in the United States do you live??
- Northeast (CT, ME, MA, NH, RI, VT, NJ, NY, PA)
  - Midwest (IN, IL, MI, OH, WI, IA, KS, MN, MO, NE, ND, SD)
  - South (DE, DC, FL, GA, MD, NC, SC, VA, WV, AL, KY, MS, TN, AR, LA, OK, TX)
  - West (AZ, CO, ID, NM, MT, UT, NV, WY, AK, CA, HI, OR, WA)
9. On average, how many times per month do you eat out at restaurants?
- Never
  - Once
  - 2 – 5 times
  - 6 – 10 times
  - More than 10 times
10. In the past 1 month, how often have you eaten at casual dining restaurants?
- Never
  - Once
  - 2 – 5 times
  - 6 – 10 times
  - More than 10 times
11. Have you ever chosen low calorie foods at a restaurant?
- Yes    No
12. In the past 1 month, how often have you chosen a low calorie food at a casual dining restaurant\*?  
(\* Defined as a restaurant where the server takes customer's order at the table and food is then served to the customer)
- Never
  - Once
  - 2 – 5 times
  - 6 – 10 times
  - More than 10 times
13. What is your health status?
- Extremely unhealthy
  - Unhealthy
  - Neutral
  - Healthy
  - Extremely healthy

**Thank you very much for your participation!**



Thank you very much for completing the questionnaire. This pilot test is intended to test reliability and wording of instruments. Please respond to the following questions:

1. Were the questions understandable? \_\_\_\_\_

If not, please indicate which question number and what is difficult to understand

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2. Were the scales understandable?

If not, please indicate what you feel could be done to make the scale easier to understand

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3. Overall, what suggestions do you have to improve the questionnaire?

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**Thank you for all your help with this pilot test!**

## APPENDIX E. CRONBACH'S ALPHA VALUES FOR PILOT TEST INSTRUMENTS

Constructs	Cronbach's alpha
Affective attitude (3 items)	0.894
Cognitive attitude (3 items)	0.869
Injunctive norm (3 items)	0.700
Descriptive norm (3 items)	0.866
Perceived behavioral control (4 items)	0.716
Prototype (12 items)	0.972
Behavioral intention (3 items)	0.640
Behavioral willingness (5 items)	0.901
Self-reported behavior (3 items)	0.800

## APPENDIX F. CORRELATION MATRIX

	AA	CA	IN	DN	PBC	PT	BI	BW	AB
AA	1								
CA	0.634	1							
IN	0.332	0.363	1						
DN	0.242	0.142	0.415	1					
PBC	0.076	0.108	-0.080	0.108	1				
PT	0.016	-0.129	-0.066	-0.005	-0.049	1			
BI	0.608	0.537	0.527	0.362	0.018	-0.134	1		
BW	0.611	0.449	0.452	0.303	0.014	0.076	0.824	1	
AB	0.618	0.469	0.456	0.337	0.030	-0.115	0.880	0.908	1

*Note.* AA = affective attitude; CA = cognitive attitude; IN = injunctive norm; DN = descriptive norm; PBC = perceived behavioral control; PT: prototype; BI = behavioral intention; BW = behavioral willingness; AB = actual behavior

## APPENDIX G. RESULTS FOR FULLY RECURSIVE MODEL

## Standardized Regression Weights

Exogenous Variable	Endogenous Variable	Coefficients
Affective attitude	Behavioral intention	.434**
	Behavioral willingness	.534**
	Actual behavior	.028
Cognitive attitude	Behavioral intention	.166**
	Behavioral willingness	.035
	Actual behavior	-.045
Injunctive norm	Behavioral intention	.369**
	Behavioral willingness	.330**
	Actual behavior	-.059
Descriptive norm	Behavioral intention	.113*
	Behavioral willingness	.059
	Actual behavior	.019
Perceived behavioral control	Behavioral intention	-.026
	Behavioral willingness	-.022
	Actual behavior	.012
Prototype	Behavioral intention	-.117**
	Behavioral willingness	-.071*
	Actual behavior	-.017
Behavioral intention	Actual behavior	.503**
Behavioral willingness	Actual behavior	.595**

Note. \*\* $p < .001$ ; \* $p < .05$

## Model Fit Summary

Fit Index	
$\chi^2$ statistics	$\chi^2 = 2172.957, df = 473, p < .001$
NFI	.892
RFI	.879
IFI	.914
TLI	.903
CFI	.913