



Understanding healthy eating behaviors at casual dining restaurants using the extended theory of planned behavior



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ABSTRACT

This study examined the effects of customers' psychological factors on their 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. 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 also 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. By extending the existing theory, this study makes contribution by remedying the shortcomings of the original theory and providing practical implications to encourage people to select healthy menu items.

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1. Introduction

Given the increase in obesity rates along with the increased frequency of consuming food away from home (Bowman and Vinyard, 2004), the focus on restaurants efforts to promote healthier eating has received much attention (Glanz et al., 2007; Koplan and Brownell, 2010). 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, 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). In contrast, other researchers have emphasized the role of psychological factors in food selection (Jun et al., 2014; 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). However, the TPB has received criticism in two respects: its assumptions and conceptualization of some components. With respect to assumptions, the TPB has been criticized because of the focus on rational decision making although not all behavioral decisions are made based on a rational consideration of the behavior's advantage and disadvantage (Gibbons et al., 1998; Ohtomo and Hirose, 2007). In particular, food selections are not determined only through deliberative reasoning processes but instead, people sometimes choose whatever they want to eat without rational consideration. To investigate this type of reactive decision making process, prototype images and behavioral willingness have been most frequently used (Gibbons et al., 2009). Although behavioral willingness does prove to be a determinant of actual behavior, like behavioral intention in the TPB, 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 (Gibbons 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. Some researchers have alleged that the TPB's components, in particular attitudes and subjective norms, are not adequately conceptualized (Rise et al., 2008; Tăut and Băban,

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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) (e.g., Tăut and Băban, 2012), and the concept of subjective norms through both injunctive norms and descriptive norms (e.g., what most people do) (e.g., Tuu et al., 2008). Despite these criticisms, there are limited studies attempting to remedy such shortcomings of the TPB in the domain of healthy eating behavior. Moreover, to the best of our knowledge, there have been no studies done in restaurant settings that have used this theoretical argument.

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 by deploying an on-line survey to restaurant consumers. 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. Therefore this study contributed to and extended the existing literature by examining the roles of these constructs in people's selection of healthful menu items at casual dining restaurants.

2. Review of literature

2.1. Healthful foods

Healthful food has been defined in various ways (Croll et al., 2001; Martínez-González et al., 2000; Martínez-González et al., 1998). Given that overconsumption of calorically dense foods is one contributor to obesity and obesity is a contributor to a variety of chronic diseases (Swinburn et al., 2004; Swinburn et al., 2009; 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 et al., 2004; Glanz et al., 2007).

2.2. 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 (Han et al., 2010; Stein et al., 2010) including healthy eating behaviors (e.g., consumption of fruits and vegetables) (Fila and Smith, 2006), 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 et al., 1998; Pomeroy et al., 2009). To account for unintentional or reactive decisions, the concept of behavioral willingness has been introduced.

Behavioral willingness may seem similar to behavioral intention, in that both are the predictors of actual behavior, there is a clear distinction between these concepts, as is evident given the definitions of each. While 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, that is, his or her willingness to perform a certain behavior in situations that are conducive to that behavior" (Pomeroy et al., 2009). As indicated in

these definitions, behavioral willingness involves less planning or premeditation than behavioral intention and also requires a certain situation be presented and then people are asked how willing they would be to perform a behavior in the given situation.

The roles of both behavioral intention and behavioral willingness have been investigated in various behavior domains (Hukkelberg and Dykstra, 2009; 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).

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), not health-promoting behaviors. To the best of the authors' knowledge, Ohtomo's study (Ohtomo, 2013) is the only one to have combined the two in investigating eating behaviors. That study 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 unplanned or reactive decision-making. Based on the discussion above, we expect that both behavioral intention and behavioral willingness to choose healthful menu items have positive effects on selecting those menu items at a restaurant.

2.3. Affective vs. cognitive attitudes

Attitudes have traditionally been conceptualized as having both cognitive and affective components (Crites et al., 1994; Norman, 1975; Tăut and Băban, 2012), and this conceptualization has been confirmed through methodological (e.g., Crites et al., 1994) and empirical research (e.g., Lawton et al., 2009). 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 both attitudes on fast food consumption within the framework of the TPB and found that only cognitive attitudes had a significant effect on intention to consume fast food. However, other studies have shown that affective attitude has a stronger effect than cognitive attitude on behavioral intentions (Lawton et al., 2009; Tăut and Băban, 2012). 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. 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. As explained above, it is expected that both affective and cognitive attitudes toward healthful menu item consumption positively affect behavioral intention and willingness to choose those menu items at a restaurant.

2.4. Injunctive vs. descriptive norms

The more social pressure people feel, the more likely they are to intent to consume healthful foods (Kim et al., 2003; Rah et al., 2004). While social norms are traditionally conceptualized as both injunctive and descriptive norms (Rimal and Real, 2005; Ravis and Sheeran, 2003; Sheeran and Orbell, 1999), the concept of social norms in the TPB is represented only by injunctive norms. Ravis and Sheeran's (2003) and Manning's (2009) meta-analytical studies demonstrated that the addition of descriptive norms increased explanatory power of the TPB.

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).

Tuu et al. (2008) found positive impacts of both injunctive and descriptive norms on intention to consume fish. Although 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 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; Kim et al., 2003; Sjoberg et al., 2004).

The positive role of descriptive norms has also been confirmed (Lally et al., 2011; Manning, 2009; Ravis and Sheeran, 2003; Tuu et al., 2008). 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. Therefore, we hypothesize that people who feel more social pressure through these two types of social norms will be more likely to have behavioral intention and willingness to select those menu items at restaurants.

2.5. Perceived behavioral control

Perceived behavioral control (PBC) as a proxy of actual control is defined as "[the] perceived ease or difficulty of performing [a] behavior" (Ajzen, 1991, p. 188). 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; 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. (2004) found that PBC had the weakest effect on women's intention to consume soy products. Only a few studies (e.g., Myklestad and Rise, 2007) investigated the effects of PBC on behavioral willingness in the context of food consumption. For example, regarding alcohol consumption, Zimmerman and Sieverding (2010) reported the significant effects of PBC not only on female young adults' behavioral intention and actual consumption but also on behavioral willingness. According to our discussion above, it is hypothesized that when people have more perceive behavior control over consuming healthful menu items, they are more likely to have behavioral intention and willingness to choose those menu items, and select them at restaurants.

2.6. Prototype images

Prototype image is one of the predictors of behavioral willingness in the prototype/willingness model (Gibbons et al., 2009). 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.

Although the important role of the prototype image has been confirmed in a variety of behavior domains (e.g., unsafe sexual intercourse, binge drinking, smoking) (Gibbons et al., 1998; Etcheverry and Agnew, 2009; Norman et al., 2007), to the best of the authors' knowledge, very little research has been done on the role of the prototype image in healthy eating behavior. For example, Norman et al. (2007) found that the more people perceived themselves to be similar to the prototype images of a typical smoker, the more likely they were to smoke. Regarding the roles of prototype images in the context of healthy eating, the only known study 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, we hypothesize that people with a negative prototype image of unhealthy eaters are more likely to choose healthful menu items at restaurants.

All hypotheses developed based on our review of literature are summarized as follows (see Fig. 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.

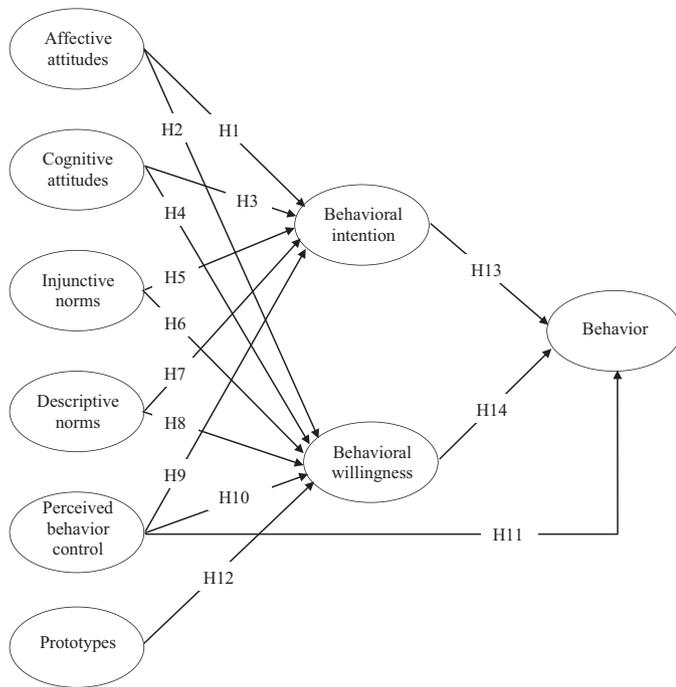


Fig. 1. Proposed conceptual model.

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.

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. We used an online survey tool, Qualtrics to develop our survey and posted it on the Amazon Mechanical Turk website. Amazon Mechanical Turk

was selected as a means of collecting data 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). 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. Each participant was paid 50 cents as incentive. The data collection was conducted for 10 days in the first part of April, 2014; a total of 1009 responses were collected. Based on the distribution of time to complete the survey, surveys completed in less than 5 min were removed, and those with 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 (Ajzen, 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. 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 Hirose's study on recycling behaviors (Ohtomo and Hirose, 2007). The final section requested demographic characteristics (e.g., gender, age) and eating out behaviors (e.g., eating out frequency, experiences consuming low calorie foods, restaurants where participants ate within the last one month). 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. 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. To test the conceptual model, two-step structural equation modeling was used. 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.

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 majority of the sample was White (81.0%). About half of the participants (49.8%) had an annual income less than or equal to \$39999. In terms of education level, 58.2% of 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% indicated that they ate out at a restaurant 2–5 times per month and 83.6% reported that they had tried low calorie menu items.

4.2. Measurement model

Confirmatory factor analysis (CFA) showed that 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 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, a prior study which encountered similar issues suggested that although 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 1](#).

Table 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		
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 revealed 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–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

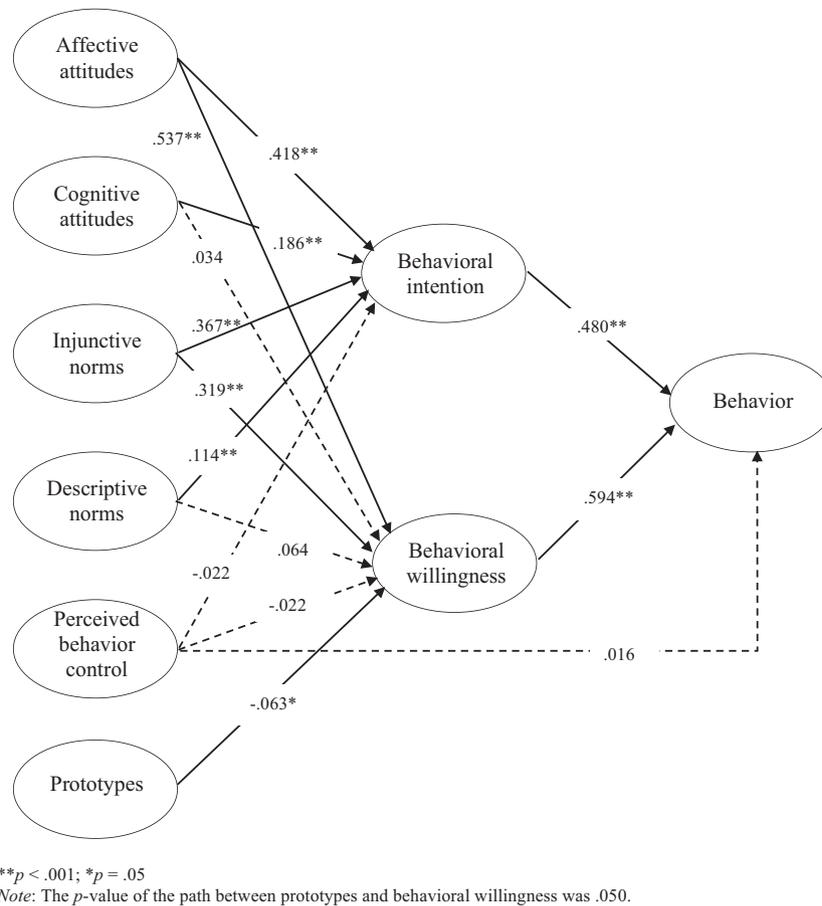


Fig. 2. Analysis results of structural model. ** $p < .001$; * $p = .05$. Note: The p -value of the path between prototypes and behavioral willingness was .050.

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 Fig. 2.

5. Discussion and conclusions

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 our knowledge, no research on healthy eating behaviors has been conducted using this extended model. Our findings highlight the importance of a more balanced approach to explaining healthy eating behaviors at restaurants; an approach which considers premeditated behaviors and 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 (Crites et al., 1994; Tăut and Băban, 2012), there is no known study investigating the roles of each concept in healthy eating behaviors. Thus, this current study extended the existing literature by empirically testing this theoretical argument in the casual dining restaurant setting.

5.2. Practical implications

5.2.1. Behavioral intention and behavioral willingness

By confirming the significant effects of both behavioral intention and willingness on actual low calorie menu item selections in casual dining, the findings indicate that low calorie menu item selection at restaurants results from an intentional decision-making process and also from a 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 were stronger than those of behavioral intentions. Conceptualized, this means that although people may plan to eat healthy when dining out, some end up choosing high calorie menu items because of various situational factors (e.g., tempting unhealthful menu items). These findings are consistent with those by Ohtomo (2013) who reported that unhealthy snacking behavior was predicted more strongly by willingness 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 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).

5.2.2. Negative prototype image

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 “local” celebrities who are respected in the community.

5.2.3. Affective and cognitive attitudes

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; Täut and Bāban, 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 when consuming high-calorie menu items. Therefore, campaigns, messages, and educational efforts could incorporate an affective component. For example, menu 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 about the pleasurable attributes of healthful menu items (e.g., taste, smell, and texture) may be effective.

5.2.4. Social and injunctive norms

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 could incorporate social norm information. For example, interventions and promotions might emphasize that healthy eating is the norm that society expects.

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 sugar-sweetened drinks and unhealthy snacks, they were likely to consume those food items themselves; individuals tended to overestimate others' consumption of these unhealthy foods. 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 may stimulate an individual to reevaluate his/her own consumption and motive conformity 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). Therefore, future researchers could address the shortcomings of using self-reported data by employing different types of research designs or data collection methods. 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. Considering the significant roles of demographics including eating out behaviors (e.g., eating alone or with others), 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) within the foodservice industry. Fourth, this study specified healthful menu items as menu items that are low in calories, however healthful menu items could be defined in various ways. Future researchers could consider using a different definition of healthful menu items, such as menu items with low sodium. By changing the scope of the definition for healthful menu items, the applicability of our extended TPB model could be further confirmed.

Appendix A. Survey instrument

Construct	Items
Affective attitude (7-point bipolar scale)	Unpleasant/Pleasant Unenjoyable/Enjoyable Boring/interesting
Cognitive attitude (7-point bipolar scale)	Bad/Good Harmful/Beneficial Foolish/Wise
Injunctive norm (7-point Likert type scale)	People who are important to me are unlikely/likely to think I should choose restaurant menu items that are low in calories. (1 = Unlikely to think/7 = Likely to think) People who are important to me would disapprove/approve of my choosing restaurant menu items that are low in calories. (1 = Disapprove/7 = Approve) People who are important to me want me to choose restaurant menu items that are low in calories. (1 = Disapprove/7 = Approve)
Descriptive norm (7-point Likert type scale)	A number of people I know think of choosing menu items that are low in calories when they eat out. (1 = Strongly disagree/7 = Strongly agree) A number of people I know try to choose menu items that are low in calories when they eat out. (1 = Strongly disagree/7 = Strongly agree) A number of people I know have chosen menu items that are low in calories when they eat out. (1 = Strongly disagree/7 = Strongly agree)
Perceive behavioral Control (7-point Likert type scale)	I feel in complete control of whether or not I choose healthful menu items with low calories at restaurants. (1 = Strongly disagree/7 = Strongly agree) If I wanted to, I could easily choose healthful menu items with low calories at restaurants. (1 = Strongly disagree/7 = Strongly agree) At restaurants, I have control over choosing healthful menu items with low calories. (1 = No control/7 = Complete control) If I desired, choosing healthful menu items with low calories at restaurants would be . . . (1 = Difficult/7 = Easy)
Prototype (7-point bipolar scale)	Foolish/Wise Irresponsible/Responsible Undisciplined/Disciplined Focused on the present/Focused on the future Dissatisfied/Satisfied Insecure/Self-confident Sloppy/Meticulous Unkept/Well-groomed Chubby/Slim Thinks body is unimportant/Thinks body is important Not sporty/Sporty Lazy/Active
Behavioral intention (7-point Likert type scale)	I plan to eat low calorie menu items at restaurants (1 = Not at all/7 = Frequently) I will not try to eat low calorie menu items at restaurants (1 = Strongly disagree/7 = Strongly agree) I intend to eat low calorie menu items at restaurants (1 = Definitely do not/7 = Definitely do)

Appendix A

Construct	Items
Behavioral willingness (7-point Likert type scale)	Order the healthful menu items with lower calories (1 = Not at all/7 = Very willing) Order the regular menu items with higher calories (1 = Not at all/7 = Very willing) 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. 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. 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? 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? 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?
Self-reported behavior (7-point Likert type scale)	When I eat out, if healthful menu items with low calories are available, I choose menu items that are low in calories (1 = Strongly disagree/7 = Strongly agree) 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 = Never/7 = Always) 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 = Never/7 = Always)

Appendix B. Correlation matrix

	AA	CA	IN	DN	PBC	PT	BI	BW	AB
AA	1								
CA	.634	1							
IN	.332	.363	1						
DN	.242	.142	.415	1					
PBC	.076	.108	-.080	.108	1				
PT	.016	-.129	-.066	-.005	-.049	1			
BI	.608	.537	.527	.362	.018	-.134	1		
BW	.611	.449	.452	.303	.014	.076	.824	1	
AB	.618	.469	.456	.337	.030	-.115	.880	.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.

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