

# A Pilot Investigation to Healthy Menu Selection Attitudes and Behaviors among Restaurant Consumers

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## Abstract

This study was to assess the perception of healthy food and to explore the behavioral intention to consume healthy food at restaurants using the theory of planned behavior. A survey was used for data collection. An information table was set up at the entrance to the café. Interested customers voluntarily visited the table to receive a brief introduction to the study and paper surveys. One group participants received menus with nutrition information, while the other group received the café's regular menu, which includes no nutrition information. The first part of the survey instrument consisted of items assessing participants' knowledge about healthy food (Know), the perception of the importance of respondents' knowledge (ImKnow), attitude (ATT), subjective norm (SN), perceived behavioral control (PBC), and intention (INT) toward healthy food consumption. The second section included measurement items designed to assess salient beliefs and referents regarding healthy food consumption. The last section consisted of questions related to participants' social demographic information. Descriptive analysis, exploratory factor analysis, confirmatory factor analysis, and multi-group structural equation modeling were used in the study. Most participants' ATT ( $\beta=0.442$ ;  $p<0.001$ ), PBC ( $\beta=0.386$ ;  $p<0.001$ ), and SN ( $\beta=0.267$ ;  $p<0.001$ ) were significantly related to behavioral intention, while PBC ( $\beta=0.225$ ;  $p=0.019$ ) was not significantly related to INT for participants in the regular menu group. The results highlight that providing nutrition information and more healthy food options are essential in order to improve restaurant consumers' diets in the U.S.

**Keywords:** Healthy foods; Restaurants; Nutrition menus; Theory of planned behavior; Perceptions

## Introduction

According to the National Health and Nutrition Examination Survey (NHANES) 2013-2014 data, nearly 38% of adults were obese in the United States during that period [1]. Within this group, 34.3% of adults ages 20-39 and nearly 8% of all adults are extremely obese, with a body mass index (BMI) greater than or equal to 40.0. Approximately one in four young adults aged 17 to 24 are too overweight to join the US military. Being overweight or obese is the leading medical reason that young adults cannot enlist. The military spends more than \$1.5 billion on healthcare and on recruiting replacements for those who are too unfit to serve. Americans in the state of Missouri are not immune to this trend. According to the report *The State of Obesity: Better Policies for a Healthier America*, released September 2016, Missouri has the 10th highest adult obesity rate in the nation; Missouri's adult obesity rate was 32.4% as of 2016, up from 21.4% in 2000 and from 11.3% in 1990 [1].

The obesity epidemic is a serious health concern because it increases the risk of many chronic diseases and health conditions such as hypertension, diabetes, and certain types of cancer [2]. Consuming appropriate amounts of healthy food provides necessary nutrients, helps to prevent diseases, gives people more energy, and improves health status [3]. Eating healthy is a challenge at restaurants, however. One study has indicated that the increased frequency of dining out at restaurants is one contributor to the increase in obesity rates [4]. To overcome this challenge, menu-labeling legislation was passed in 2010 as part of a healthcare bill in the United States [5]. The assumption behind this legislation appears to be that providing people with calorie information will lead them to reduce their caloric intake, therefore reducing their body weight. The legislation requires all chain restaurants with 420 or more outlets to provide information about calories next to each item on the menu. A previous study has shown that nutrition knowledge may play a small but pivotal role in the adoption of healthier food habits [6].

In addition, several studies have examined the effects of calorie information on customers' consumption behaviors. The findings from these studies may be inconsistent, however, because of fast-paced changes across the population (such as changes in consumers' eating habits) or because of lack of theoretical foundation applications [7,8]. The current study has thus applied the theory of planned behavior (TPB) to better understand consumers' healthy food consumption intentions. More specifically, the purpose of this study is to assess the perception of healthy food and to explore the behavioral intention to consume healthy food at restaurants using TPB.

## Literature Review

Ajzen and Fishbein formulated the theory of reasoned action (TRA) in 1980. Based on TRA, if people have positive attitudes toward a suggested behavior, and if they think important others such as family members, friends, or colleagues want them to act on the behavior (i.e., the subjective norm [SN]), they will be more highly motivated to perform or intend to perform the behaviour [9]. But because TRA cannot fully explain behavioral intentions when a suggested behavior is not under volitional control, researchers have added an additional factor of perceived behavioral control (PBC) to TRA. Since behavior can be deliberated and planned, Ajzen have revised TRA into the theory of planned behavior (TPB), which predicts deliberate behaviour [10].

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Received July 17, 2018; Accepted July 25, 2018; Published August 01, 2018

Citation: Pei L (2018) A Pilot Investigation to Healthy Menu Selection Attitudes and Behaviors among Restaurant Consumers. *J Hotel Bus Manage* 7: 184. doi: [10.4172/2169-0286.1000184](https://doi.org/10.4172/2169-0286.1000184)

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## Attitudes

Attitude toward a behavior refers to the degree to which a person has a favorable or unfavorable evaluation of the behavior in question [10]. Attitude is one of the determinants of healthy eating in community-dwelling older people, as Payette and Shatenstein concluded in their study [11]. Adults' attitudes toward the consumption of dairy products significantly influence their intentions [12]. Armitage and Conner's meta-analysis concluded that the TPB explained 27% variance in behavior and 39% of variance in intention among 185 independent studies published by the end of 1997, and they found the average correlation between attitude and behavioral intention to be strongly significant [13]. Another meta-analysis conducted by Sheppard et al. indicated the strong correlation between attitude toward behavior and behavioral intentions [14].

## Subjective norms

A subjective norm (SN) refers to "a person's perception that most people who are important to him/her think he/she should or should not perform the behavior in question" [9]. Namely, SN represents one's perceptions of significant others' preferences about whether one should engage in a behavior. After reviewing 185 independent published studies, Armitage and Conner found that SN was significantly related to behavioral intention [13]. Fila and Smith concluded that referents such as family members, friends, television, and after-school programs significantly influenced healthy eating behavior among urban Native American youth [15]. Warburton and Terry also found that SN significantly influenced volunteering decisions among the elderly in their study [16].

## Perceived behavioral control

In previous research, perceived behavioral control (PBC) was described as if behavior were not under complete volitional control; individuals need to have the necessary resources and opportunities to perform a behavior. The more resources and opportunities that people think they possess, the greater their PBC should be over the behavior [17]. In Armitage and Conner's meta-analysis, they found that PBC was significantly related to behavioral intention, and overall behavioral intention was explained 6% more by adding PBC as a factor [13]. Godin and Kok addressed PBC as a predictor of dietary behavioral intention [18]. The intention to consume dairy products among older adults can also be predicted by PBC [12]. Thus, residents in assisted-living facilities who have full control over inhibiting factors or situational variables are more likely to consume healthy food items than those who do not have such full control [19].

## Methodology

Prior to conducting primary data collection, approval to use human subjects in research was obtained from the university's Institutional Review Board (IRB).

## Instrument development

Researchers have applied TPB to many kinds of behaviors. Based on the assumption that choosing healthy food is under the volitional control of the individual, Ajzen's TPB was adopted for the present study to predict and explain the psychological process that informs a customer's healthy food consumption intention [10]. A survey questionnaire was developed based on TPB, a literature review, and an elicitation study. In this study, both direct and indirect measures were included in a questionnaire. The questionnaire included direct measures of respondents' knowledge about healthy food (called Know), the

perception of the importance of respondents' knowledge (ImKnow), attitudes about consuming healthy food (ATT), perceived influences of other people near the customer regarding consuming healthy food (SN), situations and conditions that either allow or interfere with someone's intention to consume healthy food (PBC), and a person's intention to consume healthy food in the future (INT), all in regards to healthy food at restaurants.

A definition of "healthy food" was provided in the questionnaire as a reference for participants. The questionnaire also included indirect measures based on a literature review and an elicitation study. Ajzen and Fishbein indicated that new sets of beliefs and salient referents should be elicited for each new context and population [9]. Hence, as an elicitation method, a panel of food-service experts developed and reviewed the items in terms of beliefs and salient referents that specifically fit the context of the current study. More specifically, knowledge about healthy food was measured using eight items regarding healthy food definitions on a seven-point Likert-type scale (1=strongly disagree, 7= strongly agree), such as "Health food items mean the food is low in calories per serving."

The perception of the importance of respondents' knowledge was measured using eight statements on a seven-point Likert-type scale (1=extremely unimportant, 7=extremely important). For example, "In your opinion, how important is it for you to consume low calories per serving daily"? Participants' behavioral belief (BB) regarding the outcomes of consuming healthy food was measured by five items scored on a seven-point Likert-type scale (1=strongly disagree, 7=strongly agree). A sample item was "Eating healthy food items in restaurants is beneficial for health." Five items were also used to measure the evaluation of these outcomes (OE) via a seven-point Likert-type scale (1=extremely unimportant, 7=extremely important). A sample item was "To me, choosing food that is beneficial for health is..." The salient referents' normative beliefs (NB) were measured by four items with a seven-point Likert-type scale (1= definitely should not, 7=definitely should); a sample item was "Family members (such as daughters, sons, spouse, and relatives) think I... eat healthy food in restaurants." The corresponding motivation to comply (MC) with those referents was also measured by four items with a seven-point Likert-type scale (1=very unlikely, 7=very likely); a sample item was "How likely is it for you to take the advice of your family members (such as daughters, sons, spouse, and relatives)?"

In addition, control beliefs (CB) regarding participants' perception of the presence of resources to perform a certain behavior were measured by five items on a seven-point Likert-type scale (1=strongly agree, 7=strongly disagree); a sample was "An adequate number of healthy food choices is available at restaurants." The relevant perceived power of each control belief (PP) was measured by five items on a seven-point Likert scale (1=less likely, 7=very likely); an example was "If I am more informed about healthy food choices in restaurants, I am... to choose healthy food items in restaurants." Based on Ajzen's suggestion [10], the summated level of each belief construct was computed by the square root of multiplication of their evaluative components using the "expectancy-value" (E-V) method:  $(\sum^2 \sqrt{BB,OE}, \sum^2 \sqrt{NB,MC}, \sum^2 \sqrt{CB,PP})$ .

Demographic characteristics were also included in the instrument. The initial questionnaire was reviewed by a panel of food-service experts for content validity and clarity of directions. The questionnaire was then revised and pilot tested with 20 restaurant customers. All inter-item reliability levels were examined using Cronbach's  $\alpha$  ( $\alpha \geq 0.80$ ). The questionnaire was then revised again as appropriate. The final questionnaire was presented to customers when they were visiting the restaurant.

## Study participants and data collection

A convenience sampling method was used in the study. Customers dining in the café on campus were the target population. The researcher and research assistants set up an information table at the entrance to the café. Interested customers voluntarily visited the table, where they were presented with a brief introduction to the study and given paper surveys. Participants were randomly assigned into two groups. One group received menus with nutrition information, while the other group received the café's regular menu, which includes no nutrition information. They were asked to order meals and complete the questionnaire during their meal and to return the questionnaire at the information table as they left the café. To increase participation, a \$5 restaurant coupon was given to those who completed the survey.

## Data analysis

The data were analyzed in three steps. In the first step, SPSS Statistics 23.0 for Windows (IBM Corporation, Armonk, NY) was used to conduct a descriptive analysis, screen the data, and conduct a reliability test and exploratory factor analysis (EFA). In the second step, confirmatory factor analysis (CFA) was conducted using SPSS for Windows Version 24.0 (2016, SPSS Inc., Chicago, IL) to provide evidence of the construct validity. Finally, multi-group structural equation modeling (SEM) was used to identify the relationship among constructs and to examine the model invariance across participants with different menus.

## Results

### Respondents' demographic and dining profiles

Among the 125 valid respondents, males accounted for 51.2% of respondents (n=64). The average age of the respondents was 32 years old, more than half of whom were Caucasians (66.4%; n=83). A total of 64.3% participants (n=79) had a bachelor's degree or above. Almost half the participants were full-time students (n=60; 48%), followed by university staff (n=20; 16.0%) and faculty (n=17; 13.6%). Participants were most likely to visit a full-service restaurant once a week (n=79; 63.2%). About 50% participants (n=62) had an annual household income of less than \$40,000. Nearly half the respondents (n=38; 46.3%) ordered meals with calories between 551 to 800, and another 25% of respondents (n=21) chose foods with more than 800 calories Table 1.

### Descriptive analysis and measurement model

First, missing data analysis was conducted to identify any missing data patterns in the current dataset; the results indicated that the dataset had a missing at random (MAR) pattern. A full information maximum likelihood estimation was thus conducted to handle missing data, following the instructions of Enders and Bandalos [20]. The construct validity of the measurement model was then examined by CFA (Table 2). The CFA results demonstrated a reasonable model fit ( $\chi^2=68.136$ ;  $df=22$ ;  $p<0.01$ ; CFI=0.97; TLI=0.908; RMSEA=0.081; [21]).

The mean score of direct attitude measure was 5.46, with individual ratings ranging from 5.19-5.87 on the 7.0 scale (Table 2). Respondents rated "Eating healthy food items in restaurants is beneficial" the highest (5.87 ± 1.30). The mean score of two direct measures of SN was 5.26, indicating that respondents thought most people whose opinions they valued would approve of them eating healthy food items in restaurants. The mean of PBC measures was 5.86, with a range of 5.45-6.25. Respondents rated "If I want, I could easily eat healthy food items in restaurants" the lowest (5.45 ± 1.26), which indicated that respondents perceived somewhat limited availability for them to consume healthy

Items	Frequency	Percentage
<b>Gender</b>		
Male	64	51.2
Female	59	47.2
Missing	2	1.6
<b>Age</b>		
19-29	77	61.6
30-39	11	8.8
40-49	9	7.2
50-59	13	10.4
60-69	9	7.2
70 and older	2	1.6
Missing	4	3.2
<b>Ethnicity</b>		
Caucasian	83	79.4
African American	8	6.1
Native American	0	0
Hispanic/Latino	2	1.6
Asian/Pacific Islander	21	16.8
Other	7	5.6
<b>Education</b>		
Less than high school	1	0.8
High school/GED	5	4
Some college	33	26.4
Associate degree	5	4
Bachelor's degree	35	28
Graduate degree	44	35.2
<b>Annual income</b>		
Less than \$40,000	62	49.6
\$40,000-59,999	10	8
\$60,000-79,999	9	7.2
\$80,000-99,999	14	11.2
\$100,000 and above	21	16.8
<b>Dining-out frequency (Full-service restaurants only)</b>		
Once a day	5	4
Several times a week	36	28.8
Once a week	38	30.4
2-3 times a month	25	20
Once a month	18	14.4
<b>Current job</b>		
Faculty	17	13.6
Staff	20	16
Full-time student	60	48
Part-time student	2	1.6
Visitor	6	4.8
<b>Others</b>	17	13.6
<b>Total calories</b>		
<550	23	28
551-800	38	46.3
801-1000	15	18.3
>1001	6	7.3

Table 1: Demographic profile of respondents (N=125).

food items in restaurants. The mean score of behavioral intentions was 5.35, indicating that respondents planned to consume healthy food items in restaurants in the future.

When asked about the three most important things that needed to

be improved in the café, 68.9% of the participants included “Providing healthier food” in answering this open-ended question. More specifically, 33.6% (n=42) of the participants hoped to have more food choices from the café, and 16.8% (n=21) of the participants believed that the café should provide more healthy food choices in the future. In addition, 11.2% (n=14) of the participants indicated that they would like to see nutrient information on the menu.

### Structural equation modeling analysis

An SEM analysis was then conducted to examine the relationship between each construct. The global model fit indices indicated sufficient construct validity for the proposed model  $\chi^2=483.631$ ;  $df=271$ ;  $p<0.01$ ; CFI=0.916; TLI=0.899; RMSEA=0.079; [21]. Standardized path coefficients with  $p$ -values indicated the direction and magnitude of the significant impact of each path in the estimated model. The results (Table 3 and Figure 1) indicated that participants’ knowledge of healthy foods (Know) was significantly associated with their

perceptions of the importance of healthy foods (ImKnow) ( $\beta = 0.664$ ;  $p<0.001$ ). Participants’ perceptions of the importance of healthy foods (ImKnow) had a significant impact on participants’ behavioral belief related to healthy food consumption ( $BB_i OE_i$ ) ( $\beta=0.651$ ;  $p<0.001$ ), the salient referents’ normative belief ( $NB_j MC_j$ ) ( $\beta=0.379$ ;  $p<0.001$ ), and participants’ control belief ( $CB_k PP_k$ ) ( $\beta=0.692$ ;  $p<0.001$ ).

The SEM results also showed that participants’ behavioral belief related to healthy food consumption ( $BB_i OE_i$ ) was significantly related to their attitude ( $\beta=0.895$ ;  $p<0.001$ ), and the salient referents’ normative belief ( $NB_j MC_j$ ) was significantly related to participants’ subjective norm (SN) ( $\beta=0.564$ ;  $p<0.001$ ). The relationship between participants’ control belief ( $CB_k PP_k$ ) and their perceived behavioral control (PBC) regarding healthy food consumption was also significant and positive ( $\beta=0.493$ ;  $p<0.001$ ). In terms of antecedents of intention to consume healthy food, ATT ( $\beta=0.442$ ;  $p<0.001$ ), PBC ( $\beta=0.386$ ;  $p<0.001$ ), and SN ( $\beta=0.267$ ;  $p<0.001$ ) were significantly related to behavioral intention ( $R^2=0.604$ ).

### Comparison between regular menu and nutrition menu groups

Because the antecedents of healthy food consumption may have varied between participants with nutrition information and those who had no access to nutrition information, participants were divided into regular menu and nutrition menu groups. Based on this grouping method, 61 participants were clustered into the regular menu group, and 64 participants were clustered into the nutrition menu group. The results for the structural models of regular menu and nutrition menu groups are shown in Table 4 and Figure 2. In the regular menu group, participants’ ATT ( $\beta=0.497$ ;  $p<0.001$ ) and SN ( $\beta=0.317$ ;  $p<0.001$ ) were significantly related to INT, while PBC ( $\beta=0.225$ ;  $p=0.019$ ) was not significantly related to INT ( $R^2=0.490$ ). For participants in the nutrition menu group, ATT ( $\beta=0.391$ ;  $p<0.001$ ), SN ( $\beta=0.457$ ;  $p<0.001$ ), and PBC ( $\beta=0.262$ ;  $p<0.01$ ) were significantly related to INT ( $R^2=0.580$ ) (Table 5).

### Discussion and Implications

The purpose of this study was to assess the perception of healthy food and to explore the behavioral intention to consume healthy food at restaurants using TPB. The first key finding was that participants’ knowledge of healthy foods (Know) appeared to be significantly and positively associated with their perceptions of the importance of healthy foods (ImKnow). This result was consistent with the findings of multiple previous studies on perceptions of healthy food consumption [22,23]. Paquette, who reviewed and summarized the literature on the perceptions of healthy food consumption, then identified the need to understand the relationship between healthy food knowledge and the perceptions of healthy eating [22].

Measurement items	Mean <sup>a</sup> ± SD <sup>b</sup>
<b>Attitude (ATT): Eating "healthy food items" in restaurants is</b>	
Beneficial	5.87 ± 1.30
Good	5.68 ± 1.46
Valuable	5.58 ± 1.46
Useful	5.42 ± 1.44
Pleasant	5.13 ± 1.65
Interesting	5.19 ± 1.45
<b>Subjective Norm (SN)</b>	
Most people who are important to me think I should eat healthy food items.	5.57 ± 1.39
When it comes to eating healthy food items in restaurants, I would follow the advice of others who are important to me.	4.96 ± 1.43
<b>Perceived Behavioral Control (PBC)</b>	
The choice to eat healthy food items in restaurants is completely up to me.	6.25 ± 1.22
Whether or not I eat healthy food items in restaurants is entirely up to me.	6.22 ± 1.22
I am confident that I can eat healthy food items in restaurants.	5.51 ± 1.24
If I want, I could easily eat healthy food items in restaurants.	5.45 ± 1.26
<b>Intention (INT)</b>	
I plan to eat healthy food items in restaurants in the future	5.39 ± 1.37
I intend to eat healthy food items in restaurants in the future	5.32 ± 1.30
<sup>a</sup> Scale range from 1(strongly disagree) to 7(strongly agree) or 1 (extremely unimportant) to 7(extremely important)	
<sup>b</sup> Standard Deviation	

Table 2: Summary of Direct Measurement Scales (N=125).

	Mean (SD)	1	2	3	4	5	6	7	8	9
1. Knowledge	5.48 (0.81)	1								
2. Importance of Knowledge	5.21 (0.93)	0.58**	1							
3. Attitude	5.48 (1.23)	0.30**	0.54**	1						
4. PBC	5.51 (1.13)	0.12	0.20**	0.26**	1					
5. SN	5.33 (1.22)	0.25**	0.37**	0.63**	0.24**	1				
6. $BB_i OE_i$	5.72 (1.00)	0.33**	0.61**	0.73**	0.43**	0.65**	1			
7. $NB_j MC_j$	4.98 (1.22)	0.33**	0.53**	0.53**	0.10**	0.56**	0.59**	1		
8. $CB_k PP_k$	4.86 (1.08)	0.22**	0.33**	0.42**	0.47**	0.34**	0.39**	0.38**	1	
9. INT	5.38 (1.30)	0.29**	0.50**	0.71**	0.43**	0.68**	0.76**	0.49**	0.39**	1

Note: \* $p<0.01$ ; \*\* $p<0.001$ .

Table 3: Descriptive analysis and correlation matrix of variables.

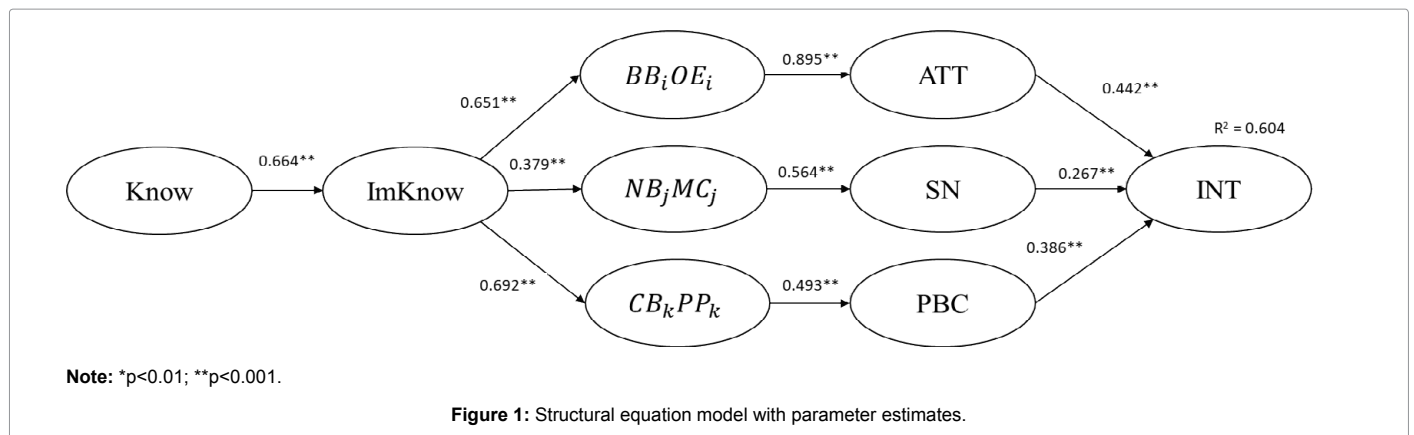


Figure 1: Structural equation model with parameter estimates.

Hypothesized paths	Coefficient	t-value	p-value
Know → ImKnow	0.661	7.844	<0.000
ImKnow → $BB_iOE_i$	0.651	8.501	<0.000
ImKnow → $NB_jMC_j$	0.379	3.857	<0.000
ImKnow → $CB_kPP_k$	0.692	6.968	<0.000
$BB_iOE_i$ → ATT	0.895	11.784	<0.000
$NB_jMC_j$ → SN	0.564	7.602	<0.000
$CB_kPP_k$ → PBC	0.493	5.979	<0.000
ATT → INT	0.442	7.682	<0.000
SN → INT	0.267	4.272	<0.000
PBC → INT	0.386	6.623	<0.000

**Note:**  $\chi^2=483.631$ ;  $df=271$ ,  $p < 0.01$ ,  $CFI=0.916$ ,  $TLI=0.899$ ,  $RMSEA=0.079$ ,  $SRMR=0.07$ ;  $R^2=0.604$ .

Table 4: Structural equation modeling results (N=125).

Hypothesized paths	Regular Menu (N=61)	p-value	Nutrition Menu (N=64)	p-value
	Coefficient		Coefficient	
Know → ImKnow	0.66	<0.000	0.653	<0.000
ImKnow → $BB_iOE_i$	0.646	<0.000	0.693	<0.000
ImKnow → $NB_jMC_j$	0.684	<0.000	0.687	<0.000
ImKnow → $CB_kPP_k$	0.387	0.005	0.373	0.009
$BB_iOE_i$ → ATT	0.97	<0.000	0.848	<0.000
$NB_jMC_j$ → SN	0.508	<0.000	0.632	<0.000
$CB_kPP_k$ → PBC	0.582	<0.000	0.429	<0.000
ATT → INT	0.497	<0.000	0.391	<0.000
SN → INT	0.317	<0.000	0.457	<0.000
PBC → INT	0.225	0.019	0.262	0.001

Table 5: Results of multi-group SEM analysis.

Participants' perceptions of the importance of healthy foods (ImKnow) had a significant impact on participants' behavioral belief related to healthy food consumption ( $BB_iOE_i$ ), the salient referents' normative belief ( $NB_jMC_j$ ), and participants' control belief ( $CB_kPP_k$ ). This result was not surprising and has been confirmed by previous consumer studies [21-24]. For example, Saba and Messina studied consumers' attitudes toward organic foods and confirmed a causal relationship between perceived benefits and risks and attitude [25]. Thus, restaurant operators may provide additional information on healthy foods in restaurants to improve consumers' perception of and attitude toward healthy eating.

In addition, TPB was used to examine how restaurant customers' ATT, SN, and PBC influenced their behavioral intention to

consume healthy food choices in restaurants. The results indicated that respondents had positive ATT toward eating healthy foods in restaurants: (1) they thought that most people whose opinions they valued would approve of them eating healthy food items in restaurants, (2) they perceived that they had control over choosing healthy food choices in restaurants, and (3) they planned to consume healthy food items in restaurants in the future. The present study's results are consistent with those of several previous studies, including research conducted by Fila and Smith and Lautenschlager and Smith, both of which aimed to understand healthy eating behaviors among young participants [15,26].

The results of the multi-group SEM showed significant differences between the regular menu group and the nutrition menu group in terms of PBC and INT relationship. PBC was the only insignificant predictor of participants' healthy food consuming intention for the regular menu group. The results showed that participants' perceived control ability about choosing healthy food choices in restaurants was not associated with their healthy food consumption intention. Two possible reasons could explain this lack of a relationship between the two factors. First, when the researchers asked if the participants were adequately informed about healthy food choices and whether adequate numbers of healthy food choices were available in restaurants, the respondents perceived a somewhat limited availability for them to consume healthy food items. In an open-ended question asking about things that needed to be improved in the restaurant, a total of 68.9% of the participants indicated "Providing healthier food." More specifically, 33.6% (n=42) of the participants hoped to have more food choices from the café, and 16.8% (n=21) of the participants believed that the café should provide more healthy food choices.

The second potential reason for the non-significant relationship between PBC and INT for the regular menu group may have been due to biases stemming from the data collection method. The study was conducted using the convenience sample method. Since the café is located in one building on campus, many participants were regular customers. They knew the regular menu very well even before receiving it from the server. Therefore, their true feelings about PBC may not have been correctly reflected by their answers.

This study has contributed to the literature on restaurant consumers' healthy eating behaviors by comparing regular menus with those with nutrition information and by providing empirical evidence for Kozup et al. proposition [26]. Due to the positive attitude and consumption intention toward healthy food the study found among restaurant consumers, this study implies that providing more healthy

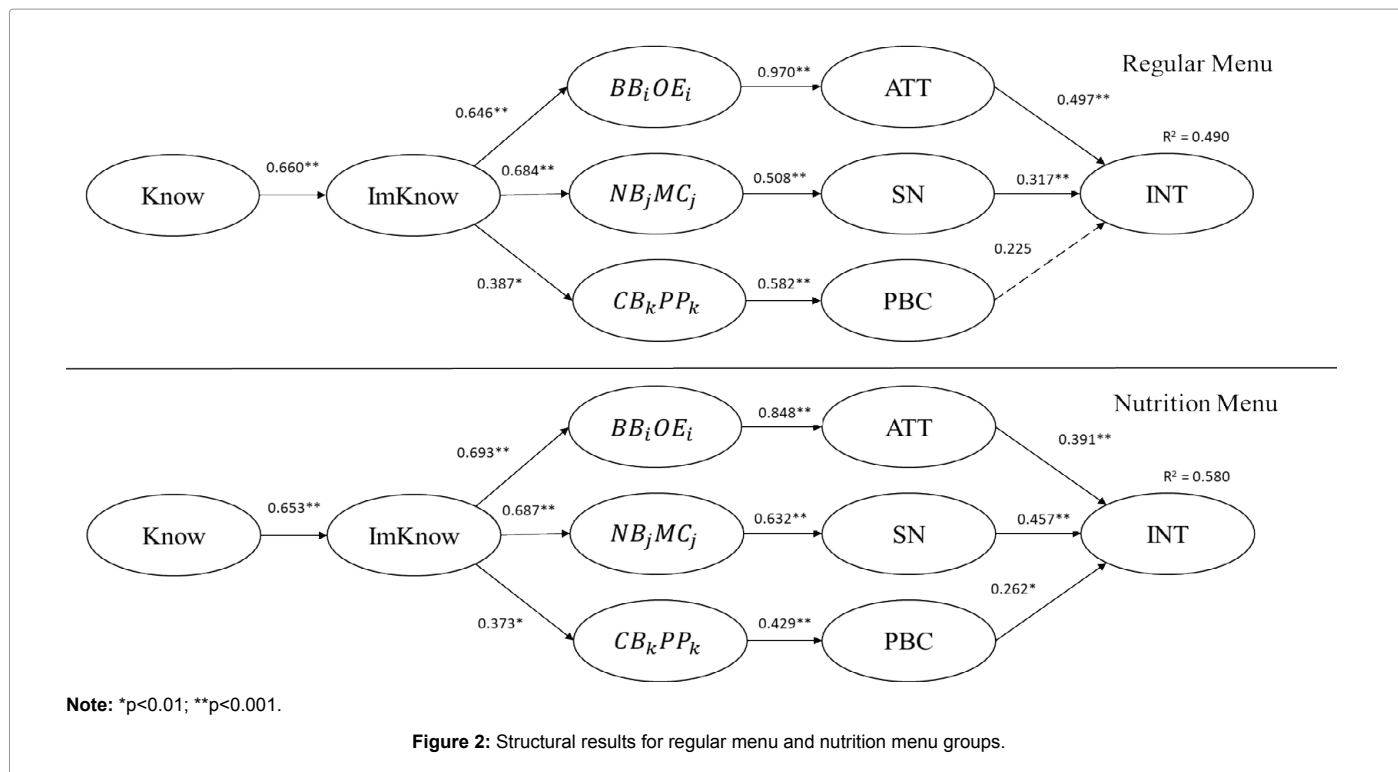


Figure 2: Structural results for regular menu and nutrition menu groups.

food information and choices in restaurants will be an effective strategy to improve people’s diet. Another strength of this study is its use of the TPB framework as a conceptual foundation and methodology. The TPB model provides a comprehensive framework that explains how personal and environmental factors influence an individual’s decision-making process. In addition, the study’s multiple meta-analyses showed that the TPB model provides robust predictive utility in predicting human behaviors [27-29]. Therefore, by developing a survey instrument and conceptual model based on the TPB framework, the current study provides results with higher reliability and validity compared to other exploratory studies on healthy food consumption in restaurants.

### Limitations and Suggestions for Future Research

This study was limited to one full-service restaurant that is located at a university in the United States. The study also did not explore the relationship between behavioral intention and behavior. Although behavioral intention cannot explain 100% of actual behavior, studies have shown that a strong relationship exists between behavioral intention and actual behavior [30]. Therefore, the behavioral intentions identified in this study may not have directly reflected the participants’ actual behaviors. To increase the generalizability of the findings of this research, future studies should explore the actual revisitation action among customers by evaluating the association between behavioral intention and actual behavior. Finally, because this study used self-reported data and did not control for respondents’ affects, emotions, or evaluative perceptions, mono-source bias and social desirability bias may have inflated or distorted the parameters of interest [31,32]. Alternative data sources should thus be sought out for use in future studies.

### Conclusion

The results of this study indicate that most of the participants in the

study held positive attitudes and high levels of intention to consuming healthy food in restaurants. Almost 70% of the participants expressed the opinion that restaurants should provide more healthy food options, and more than 10% of the participants indicated that they would like to see nutrient information on the menu in the future. In general, participants’ ATT, SN, and PBC were positively related with behavioral intention for consuming healthy food choices in restaurants, although their PBC toward healthy food consumption was not found to be related to consuming intention for the regular menu group. The results highlight that providing nutrition information and more healthy food options are essential in order to improve restaurant consumers’ diets in the U.S.

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