The Use of the Modified Protection Motivation Theory to Explore Adult Consumers’ Functional Foods Consumption Behavior

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ABSTRACT

Functional foods are the fastest growing sector of the food market because of consumers’ growing interest in health and well-being. There were two objectives of this study. One was to examine the relationships among concepts in the Modified Protection Motivation Theory (MPMT): severity, vulnerability, response-efficacy, self-efficacy, intention, and behavior in regard to functional foods. The other objective was to identify functional food consumer profiles based on the MPMT concepts. A convenience sample of 465 adults from a Southwestern university completed the final online survey questionnaire during April and May, 2010. Results from structural equation modeling revealed that response-efficacy was a significant predictor of intention but not of behavior. Self-efficacy was the only construct that significantly predicted intention as well as behavior. Outcomes of cluster analysis produced two mutually exclusive consumer groups: Health-Oriented and Uninterested group. Results of discriminant analysis confirmed that MPMT constructs correctly classified 97.3% of participants into the two groups identified by the cluster analysis. Outcomes of the study will benefit the food industry (or food service industry) in terms of target marketing, new product development, and successful market performance.

Keywords: behavioral intention, food consumption behavior, foodservice industry, functional foods, health concerns, modified protection motivation theory.

INTRODUCTION

Trends in the food industry mirror the food trends of society. Currently, an important focus of the foodservice industry is on developing new functional food products and providing them to target consumers. Functional foods contain a component that beneficially affects one or more target functions in the body beyond its normal nutritional effects, in a way that is relevant to either an improved stage of health and well-being and/or reduction of risk of disease (Diplock et al., 1999). The trend to develop functional food products capitalizes on consumers’ growing...
health concerns, and such health concerns are a locus factor motivating food choices (Lappalainen, Kearney, & Gibney, 1998).

Accommodating consumer health concerns is not a new strategy in the restaurant industry (Kruse, 1999). Restaurants serve healthful menu options, and many provide nutritional information alongside menu items (Burton & Creyer, 2004). Besides offering healthier choices in restaurants, the foodservice industry targets health-concerned consumers by focusing on health benefits of functional foods. Functional foods present a new kind of health message because they promise specific health effects such as lowering blood cholesterol levels consumed by particular food products.

Consumers’ attention to health concerns facilitates the popularity of functional foods (Sloan, 2000). Consumers already purchase functional foods from grocery stores for home consumption (Williams & Colyer, 2009). It is safe to say that regular home consumption of functional foods may lead to an increase in the popularity of healthy meals/functional meals in the restaurant business. This trend is already occurring in Canada, where over 800 restaurant outlets have provided Health Check menu, which is designed to improve overall health of Canadians by helping consumers easily identify healthy food choices when dining out (The Heart and Stroke Foundation of Canada, 2010).

Serving meals containing functional foods provides an opportunity for differentiation of restaurant business (Rodgers, 2004, 2009). It is a novel idea that needs complex product development to optimize sensory quality and minimize the loss of nutritional functionality (Rodgers, 2009). Such offerings in restaurants will be facilitated if restaurants utilize functional ingredients, maintain product quality, understand consumer knowledge and acceptance, and incorporate appropriate retail prices (Frewer, Scholderer, & Lambert, 2003; Gilbert, 2000; Rodgers, 2009; Stern & Israelsen, 2004; Urala & Lähteenämki, 2007).

Functional foods are main ingredients of functional meals and are usually consumed at home. Understanding consumer’s consumption behavior of functional foods will be necessary prior to the successful marketing of functional meals in the foodservice sector. In addition to understanding consumption behaviors, it is also necessary to investigate consumers’ intention to purchase functional foods. Some studies have sought to explain consumer purchasing behavior related to health concerns such as healthy menu options, nutrition information, health messages, and disease risk perceptions in restaurants (Burton & Creyer, 2004; Horgen & Brownell, 2002; Kozup, Creyer, & Burton, 2003; Saelens, Glanz, Sallis, & Frank, 2007; Yamamoto et al., 2005). However, studies exploring purchase intention and consumption behavior with regard to functional foods using a cognitive behavioral theory are rare. Those studies have relied on the Theory of Planned Behavior (TPB), Extended Rational Expectations (ERE) model, and Theory of Reasoned Actions (TRA) to provide the theoretical background to explain behavioral intention on food choices. For this current study, the Protection Motivation Theory (PMT) was used as theoretical background and it was modified based on the purpose of this study. The specific objectives of this study were: 1) to assess the effectiveness of the Modified PMT (MPMT) model to measure adult consumers’ intention and consumption of functional foods and 2) to identify functional food consumer profiles based on the MPMT constructs.
LITERATURE REVIEW

Theoretical background

The Protection Motivation Theory (PMT) was originally proposed in 1975 and used the Health Belief Model’s emphasis on the cognitive processes mediating attitudinal and behavioral change to provide conceptual clarity to the understanding of fear appeals (Prentice-Dunn & Rogers, 1986; Rogers, 1975). In 1983 the PMT was revised as a complete description of theory, consisting of three cognitive processes: sources of information, cognitive mediating process, and coping modes. Because the PMT has the three cognitive processes with many constructs, most previous research used only part of the constructs (Prentice-Dunn & Rogers 1986). Boer & Seydel (1996) explained the main constructs of the theory: severity, vulnerability, response-efficacy, self-efficacy, protection motivation (intention), and protection behavior.

The PMT has been successfully applied to many health promotion activities and enhancing healthy lifestyles (Cox, Koster, & Russell, 2004; Floyd, Prentice-Dunn, & Rogers, 2000). In addition, even though it was applied to few studies in order to explain intentions to consume foods as health protection means, it is a useful theory to more accurately predict consumer behavior with regard to functional foods (Cox et al., 2004). Chadwick et al. (2003) stressed the importance of functional food study related to perceptions of the health risks associated with cancer and heart disease. This means that the PMT is appropriate to explain consumer food choice (or consumption) behavior concerning health threats.

For this study, the modified PMT (MPMT) model was developed based on Rogers’ (1983) PMT model and was used to assess adult consumers’ consumption behavior with regard to functional foods (Figure 1). The MPMT model uses two cognitive processes: threat appraisal and coping appraisal. Threat appraisal includes severity of health threats (severity) and the perceived probability that health threats will occur (vulnerability). Coping appraisal includes the perceived ability of a coping behavior (e.g., consuming functional foods) to remove the health threat (response-efficacy) and the individual’s perceived ability to carry out the coping behavior (self-efficacy, e.g., actual consumption of functional foods). Examples of health threats were physical and psychological diseases, such as heart disease, digestive problems, mental disorder, cancer, and bone and joint conditions.

In the MPMT model, the outcome of the threat and coping appraisal is the intention to initiate, continue, or inhibit the applicable adaptive responses. Intention was used because intentions accurately predict behavior if: intentions are measured at the same level of specificity and the intentions remain stable (Ajzen & Fishbein 1980; Fishbein & Ajzen, 1975; Prentice-Dunn & Rogers 1986). Behavior was used as a final variable, and it was attenuated from intention.

Severity. The severity of the health threat construct measured how seriously the participant took the health threats. An individual with high perceived severity is more likely to be motivated to adopt the recommended protective behavior (Boer & Seydel, 1996; Henson, Cranfield, & Herath, 2010; Prentice-Dunn & Rogers 1986). For instance, perceived severity of breast cancer was a predictor of the intention to perform breast self examination (Rippetoe & Rogers, 1987). Intrinsic (physical and psychological pleasure) and extrinsic (peer approval)
rewards related to changes in behavior based on the severity of disease (Neuwirth, Dunwood, & Griffin, 2000).

Hypothesis 1a: Severity will have a positive effect on adult consumers’ intention to consume functional foods.
Hypothesis 1b: Severity will have a positive effect on adult consumers’ behavior to consume functional foods.

Vulnerability. The vulnerability of health threat construct measured how susceptible the participant personally felt to the communicated health threats. Wurtele and Maddux (1987) examined the relative effectiveness of persuasive appeals for increasing exercise using the four main components of PMT model. The results revealed that vulnerability to cardiovascular disease was a predictor of intentions to exercise. Further, increase in vulnerability or severity or both lead to greater intentions to behave in a healthful way (Gochman, 1997).

Hypothesis 2a: Vulnerability will have a positive effect on adult consumers’ intention to consume functional foods.
Hypothesis 2b: Vulnerability will have a positive effect on adult consumers’ behavior to consume functional foods.

Response-efficacy and self-efficacy. The response-efficacy measures the efficacy of the proposed protective behavior at averting the threat (Prentice-Dunn & Rogers, 1986). Self-efficacy is the perceived ability of an individual to perform the coping response (Rogers, 1983). Self-efficacy has been considered as an important influencing factor in motivational, cognitive, and affective processes (Bandura, 1992). Particularly, self-efficacy is warranted as a key factor of any health behavior theory (Schwarzer, 1992), and it increases the probability of selecting the adaptive responses (protective responses). Floyd et al. (2000) reviewed 65 protection motivation studies using a meta-analysis, and mentioned that response-efficacy and self-efficacy appear to be consistently maintained and related to engaging in protective behavior. Moreover, Cox et al. (2004) investigated which factors of PMT (severity, vulnerability, response-efficacy, and self-efficacy) motivate consumers to choose functional foods that may improve memory. Their findings indicated that response-efficacy and self-efficacy were the most important predictors of intentions to consume functional foods. Henson et al. (2010) used a structural equation modeling to investigate effectiveness of the PMT factors on intention to purchase functional foods products to offset the risk of cardiovascular diseases. Their findings indicated that response-efficacy and self-efficacy had a positive and significant association with functional food purchase intention (Henson et al., 2010). Through multiple regression analysis, Wurtele and Maddux (1987) used main components of the PMT model to examine the relative effectiveness of persuasive appeals for increasing exercise. Their findings indicated that self-efficacy was the most powerful predictor of intentions to exercise.

Hypothesis 3a: Response-efficacy will have a positive effect on adult consumers’ intention to consume functional foods.
Hypothesis 3b: Response-efficacy will have a positive effect on adult consumers’ behavior to consume functional foods.
Hypothesis 4a: Self-efficacy will have a positive effect on adult consumers’ intention to consume functional foods.
Hypothesis 4b: Self-efficacy will have a positive effect on adult consumers’ behavior to consume functional foods.
**Intention.** Behavioral intention refers to the subject’s agreement with statements expressing clear intent to engage in some behavior (Sapp, 1991). Previous studies in PMT have sought to motivate people to make the decision to accept health educators’ recommendations, and they show that behavioral intentions are an index of the effects of persuasion (Rogers & Prentice-Dunn, 1986).

Hypothesis 5: Intention will have a positive effect on adult consumers’ behavior to consume functional foods.

**Behavior.** Ajzen (2006) defined behavior of interests using Target, Action, Context, and Time (TACT) elements and explained behavior that is a manifest, observable response in a given situation with respect to a given target. In this study, in order to measure the behavior construct, participants were asked about the frequency of consumption of functional foods in the past six months. Specifically, the target (functional foods), the action (consumption), the context (foodservice settings and non-food service settings), and the time frame (frequency of consumption for past six months) were specified. Examples of foodservice settings are restaurants, cafeterias, and grocery stores. Home consumption and other settings (e.g., friends’ houses and party places) were mentioned as examples of non-foodservice settings. The items of behavior were formulated based on the recommendations of Ajzen (2006).

![Figure 1. The Proposed Model of Modified Protection Motivation Theory](image)

**METHOD**

**Instrument development**

**Measurement.** The survey questionnaire consisted of three parts: 1) instruction and definition of terms, 2) main questions, and 3) demographic information. The main questions for this study were developed based on previous food consumption and behavior studies (Ajzen, 2006; Cox et al., 2004; Rivera, 2004; Roman-Shriver & Hoover, 1998; Rogers, 1983). Based on
the purpose of this study, six constructs were adapted from the PMT models to develop MPMT. The constructs in the MPMT are severity, vulnerability, response-efficacy, self-efficacy, intention, and behavior (frequency of functional foods consumption). The constructs in this study were measured by items adapted and revised from existing studies. All the items were anchored by 7-point Likert scales (1 = strongly disagree to 7 = strongly agree).

Pretest and pilot studies. The initial questionnaire was modified after reviewing the results of a pretest (N = 25). Then two pilot studies (N = 179) were conducted. The reliabilities of final measurements were all above .74, indicating internal consistency (Nunnally, 1978).

Sample and data collection
The study sample was a self-selected convenience sample consisting of students, faculty, and staff members at a Southwestern university. Qualtrics software program (Qualtrics, Inc, 2010) was used to administer an online survey. Electronic advertisements with the URL link to the online survey were sent out using the university’s daily email announcement during April and May, 2010. A total number of 536 respondents participated in the online survey, and 483 respondents completed the survey. Among 483 responses, 18 responses were deleted because of partial completion. Thus, 465 responses were used for data analysis.

The respondents of this study were 74.9% female and 25.1% male. The ages were: 43.7% between 18 to 24 years, 24.7% between 25 to 34 years, and 30.7% older than 35 years but less than 64 years. The predominant ethnic group of this study was White (67.4%), followed by Asian/Pacific Islander (13.6%), and Hispanic (12.3%). The majority of the respondents (65.2%) completed at least some college or 4 years of college education, and 29.3% had a master’s degree and beyond. The majority of the respondents (71.1%) reported that they did not have health problems. However, 29% of the respondents reported having health problems, and their health problems were motivating factors for purchasing functional foods (71.4%). Current functional foods consumers comprised 75.9% of the respondents. About 56.4% of the respondents had taken nutrition-related classes.

Data analysis
Collected data were analyzed using SPSS 17.0 (SPSS Inc, 2007) and AMOS 16 (Arbuckle, 2007). To access the effectiveness of the MPMT, two steps of data analysis based on the recommendations by Anderson and Gerbing (1998) were conducted. First, a series of Confirmatory Factor Analyses (CFA) was conducted in order to assess the measurement model. Then Structural Equation Modeling (SEM) was conducted to investigate the overall fit of the MPMT. To identify mutually exclusive groups of participants based on the MPMT constructs, a series of k-means cluster analyses with different solutions were conducted using SPSS 17.0 (SPSS Inc, 2007). Scale scores of each construct were obtained by averaging items scores and then were standardized into z-scores before use in cluster analyses to control for differences in scaling among variables and to maximize cluster solutions (Norusis, 2010). The cluster sizes and a calculation of an ANOVA with a Bonferroni adjustment were examined to decide the best cluster solution (Kirk, 1995). To confirm the cluster solution, a discriminant analysis was conducted (Green & Salkind, 2003).
RESULTS

Measurement model

Cronbach’s alphas of all six constructs ranged from .53 to .94, indicating an acceptable level of internal consistency (Nunnally, 1978, Table 1). The standardized factor loadings ranged from .53 to .99. Item reliabilities, except for the one item of behavior construct (.28), showed an acceptable level of convergent validity (.45 to .99) suggested by Hair, Anderson, Tatham, and Black (1998). The composite reliabilities of constructs ranged from .51 to 91. These values indicated adequate internal consistency of multiple indicators for each construct in the model because composite reliabilities exceed .50 (Fornell & Larcker, 1981). Because all AVE in all six constructs were greater than .50, convergent validity was confirmed (Fornell & Larcker, 1981).

Table 1. Measurement Properties of Latent Constructs of the MPMT

<table>
<thead>
<tr>
<th>Factors</th>
<th>Cronbach’s Alphas</th>
<th>Standardized Factor Loadings</th>
<th>Item Reliabilities</th>
<th>Composite Reliabilities</th>
<th>AVE</th>
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</thead>
<tbody>
<tr>
<td>Severity (S)</td>
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<td></td>
<td>.80</td>
<td>.83</td>
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<tr>
<td>S1</td>
<td>.86</td>
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<td>.74</td>
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<td>S2</td>
<td>.95</td>
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<td>.91</td>
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<td>S3</td>
<td>.67</td>
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<td>Vulnerability (V)</td>
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<td>V1</td>
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<td>V2</td>
<td>.74</td>
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<td>Response-efficacy (RE)</td>
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<td>.81</td>
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<td>RE1</td>
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<td>RE2</td>
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<td>RE3</td>
<td>.85</td>
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<td>Self-efficacy (SE)</td>
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<td>.70</td>
<td>.76</td>
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<td>SE1</td>
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<td>SE2</td>
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<td>Intention (I)</td>
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<td>.91</td>
<td>.92</td>
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<tr>
<td>I1</td>
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<td>Behavior (BH)</td>
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<td>BH1</td>
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<td>BH2</td>
<td>.72</td>
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Note. AVE = average variance extracted; MPMT = Modified Protection Motivation Theory.

Discriminant validity was confirmed by comparing AVE of each construct with the squared variance which it shares with other constructs. All AVE exceeded the squared correlation coefficients between constructs (Fornell & Larcker, 1981). The overall model fit was assessed statistically using several goodness-of-fit indices. The ratio of chi-square statistics to the degree of freedom was 1.42 (χ² = 107.629, df = 76, p < .01), which indicates the measurement model fits the data well. Good fit of the model is indicated when the normed chi-square is less than 3 (Browne & Cudeck, 1993; Bearden et al., 1982; Kline, 2005). In addition, good fit is
obtained when CFI and NNFI are close to .95, NNFI is greater than .95, and RMSEA is less than .06 (Hu & Bentler, 1999). The fit indices (CFI = .99; NNFI = .99; RMSEA = .03) for the measurement model consistently indicated a good fit to the data.

**Structural model**

The normed chi-square was less than 3 ($\chi^2 = 161.84, df = 80, p < .001, \chi^2/df = 2.02$), which indicates the structural model fits the data well (Browne & Cudeck, 1993; Bearden et al., 1982; Kline, 2005). The fit indices also indicated that the structural model obtained a good fit to the data (CFI = .98; NNFI = .97; RMSEA = .05). Figure 2 presents the structural diagram of the MPMT model.

![Figure 2. Structural Relationships among Latent Constructs in the MPMT](image)

*Note. S = Severity; V = Vulnerability; RE = Response-efficacy; SE = Self-efficacy; I = Intention; BH = Behavior; MPMT = Modified Protection Motivation Theory; 
Hypothesis supported; Hypothesis not supported. 
* $p < .05$, *** $p < .001$.

Hypothesis 1a and 1b were not supported ($\beta = .06$, Critical Ratio = 1.45; $\beta = .08$, Critical Ratio = 1.23, respectively). The Hypothesis 2a and 2b were also not supported ($\beta = .03$, Critical Ratio = .63; $\beta = -.11$, Critical Ratio = -1.83, respectively). Hypothesis 3a, relationship between response-efficacy and intention to consume functional foods ($\beta = .23$, Critical Ratio = -3.82, $p < .001$) was supported. However, the standardized path coefficient from response-efficacy to behavior (Hypothesis 3b) was not significant ($\beta = -.17$, Critical Ratio = -1.92), indicating that
response-efficacy is not a significant predictor of behavior. The parameter estimates for the paths from self-efficacy to intention ($\beta = .43$, Critical Ratio = 6.0, $p < .001$) and to behavior ($\beta = .28$, Critical Ratio = 2.54, $p < .05$) were both significant, which supported Hypotheses 4a and 4b. These estimates represented the greatest standardized parameter estimates among all paths in main components of PMT, indicating that self-efficacy is the best predictor with regard to intention as well as the actual consumption of functional foods. The path from intention to behavior ($\beta = .29$, Critical Ratio = 3.23, $p < .001$) was significant. Thus, Hypothesis 5 was supported.

Identifying consumer profiles

Due to missing data, 450 out of the original 465 participants were included in cluster analyses. Based on the results of k-means cluster analysis, two-cluster solution yielded two groups which were significantly different on all constructs (Figure 3). Cluster 1 was named Health-Oriented group ($N = 271$) because people in this group showed higher levels of threat appraisal and coping appraisal as well as intention and actual consumption behavior. On the other hand, cluster 2, Uninterested group ($N = 179$), was characterized by lower levels of threat appraisal and coping appraisal as well as intention and actual consumption behavior. To confirm the two-cluster solution, a discriminant analysis was conducted (Green & Salkind, 2003). The Wilks’s Lamda was significant, $\lambda = .34$, $\chi^2 = 476.01$, $p < .001$. The classification results showed that the MPMT constructs correctly classified 97.3% of participants into the two groups identified by the cluster analysis.

![Figure 3. Standardized Mean Score Values of the Two Clusters on MPMT Concepts](image)

CONCLUSION, DISCUSSION, AND LIMITATIONS

The Protection Motivation Theory (PMT) model provides understanding of why attitudes and behaviors change when people are confronted with threats (Floyd et al., 2000). This study adapted the PMT model as a theoretical foundation and assessed the effectiveness of the Modified PMT model to measure adult consumers’ intention and behavior with regard to
functional foods consumption. The outcomes of this study verified the MPMT as a good model to predict consumers’ intention and actual consumption behavior.

More specifically, severity and vulnerability were not significant predictors of intention and behavior. These outcomes differ from previous studies which found them to be significant predictors (Boer & Seydel, 1996; Henson et al., 2010; Prentice-Dunn & Rogers, 1986; Rippetoe & Rogers, 1987; Wurtele & Maddux, 1987). According to the PMT model, when the participant believed that his/her current undesirable behavior (e.g., smoking or high level of alcohol consumption) will bring serious health threats, the individual has a high tendency to adopt positive behavior (Neuwirth et al., 2000). Nonsignificant results of severity and vulnerability toward intention and behavior in this study might be attributable to the nature of samples used. Severity construct measured how seriously the participant takes the health threats. In this study, over 68% of the participants were between 18 to 34 years old. People in this age group have fewer health problems (Ross & Wu, 1996), which may lead to lower tendency to protect ones health through diet than those in older age groups. Further, younger individuals are not inclined to purchase and prepare foods to meet dietary recommendations, while aging populations are more concerned with preventing diseases through diets (Sibbel, 2007).

The present study found self-efficacy as the most effective predictor of both intention and actual consumption of functional foods. Self-efficacy plays an important role in any health behavior theory, and it has been found to be positively related with the probability of selecting protective actions (Cox et al., 2004; Henson et al., 2010; Schwarzer, 1992). In other words, individuals with a high level of self-efficacy exhibit actual consumption behaviors regarding functional foods directly and indirectly through intention. Response-efficacy was a significant predictor of intention to consume functional foods but not of behavior. Unlike self-efficacy, response-efficacy seems to influence actual consumption of functional food only indirectly through intention. The nature of the two concepts seems to be responsible for the different findings for self-efficacy and response-efficacy. Self-efficacy measures individual’s ability to consume functional foods while response-efficacy assesses the extent to which individuals believe the consumption of functional foods will be beneficial to their health.

Functional foods consumer profiles were identified based on the MPMT model with the expectation that they can be useful for health professionals and for the food service industry. After cluster analyses, two groups were identified: Health-Oriented and Uninterested groups. People in the Health-Oriented group considered diseases as serious health threats (a high level of severity). Even though the vulnerability score in the Health-Oriented group was significantly higher than the Uninterested group, people in this group were likely to believe they do not have high chances of getting/developing diseases, indicating a low level of vulnerability. Again, it may be due to the sample characteristics as mentioned above. They believed that they have the ability to consume functional foods and showed a high level of intention and actual functional foods consumption. In contrast, people in the Uninterested group had a low level of severity, vulnerability, response-efficacy, self-efficacy, intention, and behavior. A discriminant analysis was conducted to confirm the two-cluster solution, and outcomes showed that the MPMT constructs correctly classified 97.3% of participants into the two groups identified by the cluster analysis.
Market researchers use cluster analysis to categorize the general population of consumers into market segmentation as well as to better understand the relationships between different groups of consumers (Punj & Stewart, 1983). The findings of this study showed that two different consumer groups exist related to functional foods consumption. To promote functional food consumption, specific and differentiated strategies should be pursued by the food industry’s managers/ restaurateurs to reach these two target consumer groups with the most appropriate promotional devices. The Health-Oriented group believed that they have a high level of ability to consume functional foods as well as the intention and behavior. Managers might consider more health and nutrition-related marketing plans to involve this group. For people in the Uninterested group, educational intervention will be needed to increase their interests in health in general and also in the benefits of functional foods, which would promote their functional foods consumption. Further, the food service industry can benefit from advertisements focused on increasing self-efficacy and response-efficacy.

Even though this study verified the MPMT model as a good model to predict consumers’ intention and actual consumption behavior of functional foods, several limitations were included. The findings of this study need to be interpreted with caution due to the nature of convenience sampling in a university setting. First, data of this study were collected from only one Southwestern university. Second, more than forty percent (43%) of the sample were between 18 and 24 years old. As mentioned above, this age group has fewer health problems than other age groups, which might lead to weaker relationships among constructs of the model. Third, the influence of gender was not explained in this study due to the fact that almost seventy-five percent (74.9%) of the participants were female. Cox et al. (2004) reported gender difference in intentions to consume functional foods to offset memory loss. Women had more clear preferences for natural functional foods. While men reported the same preferences for natural functional foods, they also were open to nutritional supplement and other products. Moreover, female members of the family are usually responsible for purchasing foods (Childs, & Poryzees, 1997; Gilbert, 1997).

Thus, with respect to future research, a representative sample would be needed to confirm the findings of this study. Second, an examination of the impact of gender and age group differences on intention and behavior in regard to functional food choices to prevent health problems will provide helpful information for food service marketers. Third, it would be useful to add other variables found to be related to functional food consumption to the model. In this study, only the main components of PMT (severity, vulnerability, response-efficacy and self-efficacy) were used to predict consumer’s intention and behavior to consume functional foods. The model can be improved with the inclusion of fear of health threat (Rogers & Deckner, 1975; Rogers & Mewborn, 1976) and economic status which has a strong influence on willingness to purchase (Hilliam, 1996).

REFERENCES


SPSS Inc. (2007). SPSS statistics base 17.0 user’s guide. Chicago, IL: SPSS Inc.


