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Regulatory focus, nutrition involvement, and nutrition knowledge

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REGULATORY FOCUS, NUTRITION INVOLVEMENT, AND NUTRITION  
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## Abstract

Few studies have examined the antecedents of nutrition involvement. Similarly, conflicting results have been recorded on the relationship between nutrition involvement and knowledge, knowledge and dietary behaviors, and nutrition involvement and dietary behaviors. This paper addresses these research gaps by exploring the role of regulatory focus as an antecedent of nutrition involvement. It also examines the effect of nutrition involvement on nutrition knowledge and the effects of both involvement and knowledge on diet adjustment. A large-scale study with 1125 Taiwanese consumers demonstrates a positive effect of promotion focus and no significant effect of prevention focus, on nutrition involvement. Sex and income moderate the effect of promotion focus on nutrition involvement, which in turn has positive effects on nutrition knowledge and diet adjustment. Nutrition knowledge also has a positive effect on diet adjustment. The study clarifies these relationships and provides suggestions to policy making.

Keywords: regulatory focus; nutrition involvement; nutrition knowledge; promotion; prevention.

## REGULATORY FOCUS, NUTRITION INVOLVEMENT, AND NUTRITION KNOWLEDGE

**1. Introduction**

Consumer decisions regarding eating behaviors and nutrition lead to consequences such as illness and obesity that have direct public policy implications (Andrews, Netemeyer & Burton, 2009; Chandon & Wansink, 2007). An important construct that can inform the stream of research on food selection/nutrition is the involvement construct (Zaichkowsky, 1985, 1986); more specifically, consumer involvement in nutrition (nutrition involvement). This is so because obesity is preventable and enhancing consumer involvement in nutrition enables achieving this goal. This study examines the effect of nutrition involvement on nutrition knowledge and dietary behaviour as well as the effect of regulatory focus on nutrition involvement.

Whereas a few studies have examined the consequences and moderating effects of nutrition involvement (e.g., Mulders, Corneille, & Klein, 2018), little research has examined its antecedents. This study addresses this gap by examining the effects of regulatory focus on nutrition involvement based on the fundamental motivational differences between promotion and prevention focus (Higgins, 1997). Regulatory focus theory has been employed to examine food intake and nutrition issues (e.g. Sengupta & Zhou, 2007). The theory proposes two types of foci – promotion (pursuit of positive outcomes) and prevention (avoidance of negative outcomes). The present study finds differential effects of promotion and prevention focus on nutrition involvement.

The study also examines the effect of (a) nutrition involvement and (b) nutrition knowledge on diet adjustment following advice. The relationship between nutrition

involvement and food selection and intake is unclear (Chandon & Wansink, 2007; Moorman, 1990). Similarly, research has recorded a weak association between nutrition knowledge and dietary intake (Sapp & Jensen, 1997). A possible reason for this inconsistent association is that the assessment of nutrition knowledge was not reliable (Parmenter & Wardle, 1999). The current study employs a reliable and valid scale of nutrition knowledge and demonstrates a positive relationship between knowledge and diet adjustment following advice. By documenting the effect of nutrition involvement and nutrition knowledge on diet adjustment following advice, the study makes useful contributions to the realm of nutrition and health policy making.

In sum, this study makes the following contributions to the literature. First, the literature is scarce on the antecedents of consumer's nutrition involvement. Second, it extends the current understanding of the effects of regulatory focus on health and nutritional issues. Third, the study provides empirical clarification on the relationship between (a) nutrition involvement and consumer's knowledge of nutrition, and (b) nutrition involvement and nutrition related behavior, where ambiguous findings have been reported. Finally, by demonstrating the effect of nutrition knowledge on dietary behavior (diet adjustment following advice), the study seeks to clarify the inconsistencies regarding this effect reported earlier and showcases the benefits of enhancing consumer's nutrition involvement and knowledge.

## **2. Literature review**

### *2.1. Involvement*

Involvement is a person's perception of the relevance of the object based on needs, values, and interests (Zaichkowsky, 1985). For the present study, the behavioral form of

involvement was adopted, following the definition by Stone (1984): “Involvement shall be defined as time and/or intensity of effort expended in the undertaking of behaviours” (p. 210). Zaichkowsky (1986) proposed personal factors (e.g., interest and values), object or stimulus factors (e.g., source/ content of communication) and situational factors (e.g., occasion) as antecedents of involvement. Further to the early studies, little research has examined the antecedents of involvement. Also, given the domain specificity of involvement (a person’s involvement with domain X may not be correlated with her involvement with domain Y), it is important to understand the specific factors that lead to nutrition involvement which will inform actionable strategies.

Regarding the consequences of nutrition involvement, Moorman (1990) found that involvement, measured as enduring motivation, enhanced self-assessed ability to process nutritional information, but not comprehension of information. Chandon and Wansink (2007) noted that consumer involvement leads to better calorie estimations.

## *2.2. Regulatory focus*

Regulatory focus theory suggests that two types of foci - promotion and prevention - guide people’s behaviors (Higgins, 1987, 1997). Individuals with a promotion focus are concerned about the presence or absence of positive outcomes that lead to desired end states, whereas those with a prevention focus are concerned about the absence or presence of negative outcomes. Promotion focus is concerned with people’s wishes and aspirations, whereas prevention focus is concerned with their duties and responsibilities. The theory also suggests that the two foci are not always a stable, individual difference variable (Higgins, 1998). Rather, the foci can be situationally induced.

The theory has been employed by scholars studying health and nutrition (Keller, 2006; Sengupta & Zhou, 2007; Karnal et al. 2016). For example, Sengupta and Zhou (2007) showed that impulsive eaters develop a promotion focus when they see food items that are tempting, which in turn drive their choice behavior to consume the hedonically tempting food.

### *2.3. Consumer knowledge of nutrition*

Consumer knowledge refers to information, both conceptual and relational, regarding the domain stored in consumer's memory. Studies have examined consumer knowledge of nutrition. For example, Moorman et al. (2004) found that subjective knowledge of nutrition affects where consumers search and this in turn leads to better quality choices. While some researchers found that nutrition knowledge does not have an effect on food label use (Nayga 2000), Miller and Cassady (2015), in their review, report a positive effect.

Studies have found that nutrition knowledge is correlated with greater weight loss among low-income mothers who are either obese or overweight (Klohe-Lehman et al., 2006). Men have been found to have poorer knowledge of nutrition compared to women, and nutrition knowledge decreases among people with lower education level and those who belong to lower socio-economic classes (Parmenter, Waller & Wardle, 2000). A salient finding from this stream of research is the weak and inconsistent association between nutrition knowledge and (a) dietary intake (Sapp & Jansen, 1997; Perlstein et al. 2017) and (b) nutrition related behaviors in general (Sapp, 1991). A possible reason for this is the unreliable assessment of nutrition knowledge (Parmenter & Wardle, 1999).

### **3. Hypotheses**

### *3.1. Effect of regulatory focus on nutrition involvement*

Promotion and prevention focus serve the purpose of goal pursuit, though the specific strategies employed by individuals with different foci will differ (Lanaj et al., 2012). Both serve the purpose of health pursuit, albeit through approach (e.g. engaging in healthy behaviors) and avoidance (e.g. avoiding unhealthy behaviors) routes (Crowe & Higgins, 1997). Therefore, both foci can be related to nutritional involvement.

Prior research has noted that promotion focused individuals engage in relational processing of information while prevention focused individuals engage in item level processing (Zhu, 2003). Relational elaboration involves “generating a wide range of associations that pertain to the similarities, connections, or relationships among a provided set of items, or to a given item” (Zhu, 2003; p. 4). But item specific elaboration focuses on the specific details of each piece of information (Meyers-Levy, 1991). Consequently, only limited and rather immediate associations are generated (Zhu, 2003).

People often encounter information related to diseases and health conditions resulting from poor dietary habits. Promotion focused individuals, through relational processing, are able to generate a variety of associations using this information, and thereby connect it to the nutrition domain, which enhances saliency of this domain. It also enhances the utilitarian value of nutritional practices, as such practices can prevent diseases. In addition, relational processing enhances the risk probability of poor nutritional choices by highlighting the connection between poor choices and diseases. Following research findings, increased saliency of the domain, greater utilitarian value, and greater risk probability enhances people’s nutrition involvement (Kapferer & Laurent, 1993). Hence, promotion focused people are likely to exhibit greater levels of



nutrition involvement. Prevention focused people engage in item level processing, focus on the particularities of the given data and therefore generate only limited associations (Zhu, 2003). When they encounter information related to diseases as well as health conditions, they are unlikely to relate the information to nutrition. Consequently, for prevention focused individuals, nutrition domain is not salient, utilitarian value of nutrition is not brought to the fore, and perceived risk probability of poor nutritional choices is not highlighted. Given the possible association of prevention focus with nutrition involvement discussed earlier (since both serve the purpose of health pursuit), we expect a weak positive effect between prevention focus and nutrition involvement.

H1a: Promotion focus will have a positive relationship with consumers' nutrition involvement.

H1b: Prevention focus will have a positive relationship with consumers' nutrition involvement; the effect will be significantly weaker than the effect of promotion focus on nutrition involvement.

### *3.2. Moderating effects of sex, age, and income*

In this section, we propose the moderating effects of sex, income, and age on the effect of promotion focus on nutrition involvement. No hypotheses are offered regarding the effect of prevention focus on involvement since our expectation, as shown above, is at best a weak positive effect.

*3.2.1. Sex:* Prior research has recorded that females have greater knowledge of nutrition and healthier habits compared to males (Yahia et al. 2016). von Bothmer and Fridlund (2005), in a study among Swedish university students, found that female (vs. male) students had healthier nutritional habits. Similar results were obtained in a study among

older adults in the United Kingdom (Baker & Wardle, 2003) and athletes in a U. S. university (Dunn, Turner, & Denny, 2007). Studies have also found that females (vs. males) eat more fruits and vegetables (Wardle, Parmenter & Waller, 2000). Therefore, the overwhelming evidence suggests that females have higher levels of nutritional involvement. Hence, the effect of promotional focus on nutritional involvement will be weaker among females compared to males. In other words, females are likely to have nutritional involvement irrespective of promotion focus. But males have lower nutritional involvement and consequently, their involvement levels will be more responsive to their regulatory promotion focus. Hence we propose the following hypothesis:

H2: Sex moderates the effect of promotional focus on nutrition involvement such that the effect is stronger among males, compared to females.

3.2.2. *Income*: Research has recorded a positive association between income and health (Ecob & Smith, 1999). Low income people experience greater pressure to make ends meet. Hence, they are less able to devote time to issues such as nutrition. It has also been noted that low income consumers use fewer information cues and try to avoid “the cost of thinking” (Shugan, 1980). They are also likely to avoid the cost of searching information (Walsh, Evanschitzky, & Wunderlich, 2008). In addition, they will also not be able to spend extra money on nutritious food. Consequently, even when they are more promotion focused, the effect on nutritional involvement will be weak. Note that low-income consumers experience constraints (time, money) that limit the resources they can devote for nutritional issues; hence we argue this effect. But higher income people have more time and money for issues concerning health. Research has noted that income and education are correlated (Arnould, Plastina, & Ball, 2009) and hence higher income

consumers process information better and are able to reason better, especially when motivated to do so. Therefore, when their promotion focus increases, their nutritional involvement is likely to show greater increase. Hence,

H3: Income positively moderates the effect of promotion focus on nutritional involvement such that the effect is greater among high (vs. low) income consumers.

3.2.3. *Age*: Older consumers are more likely to have health problems and are more concerned about health. Hence, they will be more concerned about nutrition related issues, leading to greater levels of nutritional involvement. This is especially so as older consumers have more free time (East et al., 2000), which enables them to devote attention to nutrition and health issues. This effect will operate irrespective of promotion focus. But younger consumers are less likely to be concerned about nutritional issues, leading to lower levels of nutritional involvement. Promotion focus will likely enhance nutritional involvement among younger consumers. In other words, the effect of promotion focus is likely to manifest more strongly among younger compared to older consumers. Therefore,

H4: Age negatively moderates the relationship between promotion focus and nutritional involvement such that the effect is stronger among younger (vs. older) consumers.

### 3.3. *Effect of nutrition involvement on knowledge of nutrition*

As noted earlier, the relationship between nutrition involvement and nutrition knowledge is unclear. Wansink (2005) suggested that consumers high in nutritional involvement are likely to be more knowledgeable about nutritional issues than their low-involvement counterparts are. Moorman (1990) found that nutrition involvement, measured as enduring motivation, does not increase comprehension of nutrition information.

Involvement is associated with (a) more time and effort that are spent on searching the domain (Stone, 1984) and (b) cognitive elaboration and greater processing of relevant information (Celsi & Olson, 1988). Highly involved, compared to uninvolved, consumers are more motivated to form accurate judgements. Therefore, they engage in more intensive search of relevant information (Pillai & Hofacker, 2007). These effects will operate with nutrition involvement thereby resulting in the acquisition of greater amounts of nutritional information by involved consumers. Therefore,

H5: Nutrition involvement is positively related to the level of nutrition knowledge.

#### *3.4. Effect of nutrition knowledge on diet adjustment following advice*

The effect of knowledge on the intention to perform the behavior and subsequent behavior has been highlighted by the theory of planned behavior (Ajzen, 1985; Ajzen & Fishbein, 1977). Research has documented the positive effects of diet adjustment and diet modification. For example, it has been shown that diet modification, which implies a move towards greater consumption of natural products, can help prevent cancer (Abdulla & Gruber, 2000) and is critical in managing diabetes (vanWormer & Boucher, 2004). Popular press and mass media constantly highlight the importance of diet modification for better health. Nutrition knowledge enables better understanding and processing of the messages which enables subsequent action. Consumers are also likely to receive several pieces of advice regarding nutrition from multiple sources in their day-to-day lives. Greater levels of nutrition knowledge enhance the processing of such messages, and enables consumers to understand the implications of following such advice. Therefore, greater levels of knowledge will lead to diet adjustment following advice.

H6: Greater the level of nutritional knowledge, greater the incidence of diet adjustment following advice.

### 3.5. *Effect of nutrition involvement on diet adjustment following advice*

As noted earlier, the effect of nutrition involvement on nutrition related behaviors is unclear (Moorman, 1990; Chandon & Wansink 2007). A direct effect of involvement on behavior is true by the definition of involvement. Nutrition involvement enhances the risk importance and risk probability of nutritional domain (Kapferer & Laurent, 1993), which will lead to individuals paying greater attention to advice regarding diet, and being more likely to heed such advice. Hence we propose a direct effect of nutrition involvement on diet adjustment following advice.

H7: Greater the level of nutrition involvement, greater the incidence of diet adjustment following advice.

Hypotheses 5, 6, and 7 propose that nutrition involvement leads to both nutrition knowledge and diet adjustment following advice, while nutrition knowledge leads to diet adjustment. Taken together, the hypotheses propose a partial mediation effect of nutrition knowledge on the relationship between nutrition involvement and diet adjustment. Hence, H8: Nutrition knowledge partially mediates the relationship between nutrition involvement and diet adjustment following advice.

Figure 1 shows the hypothesized model.

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## 4. Method

The hypotheses were tested in a national level study conducted in Taiwan. We chose Taiwan as a representative country for the region. The high per capita GDP is comparable

to Hong Kong, Japan and South Korea, while the ethnic similarity with Chinese lead to meaningful extrapolation of the findings to urban China. Dietary habits have been changing in Taiwan. Increases in metabolic syndrome and diabetes were observed from the 1990s to mid 2000s. Positive dietary behaviors were catching up during this period (avoidance of animal fat, more intake of fruits, fish etc.) (Pan et al., 2011). All these trends make Taiwan a useful context for this study by providing insights about nutrition-related consumer attitudes and behaviors in East Asia.

Data were collected through stratified sampling from all the major geographical regions in Taiwan – North, Middle, South and East in early 2009. Care was taken to ensure that the geographical distribution of the sample corresponded with the census data. The proportion of consumers aged 20-64 from each region in the national population matched with the proportion of consumers from each region in the sample, within a margin of 2%. Trained research assistants undertook the data collection. These research assistants contacted adults from the general population and sought participation in the study. 1176 questionnaires were completed. After rejecting incomplete ones, 1125 usable questionnaires were obtained.

#### 4.1. *Measures*

Nutrition knowledge was measured using a 21 item scale developed by the current authors. Prior research has employed diverse methods to measure nutrition and health knowledge. For example, Moorman (1990) employed a ten item scale to measure consumers' health knowledge. Nayga (2000) used an 8 item knowledge scale. In the nutrition science domain too, various scales have been employed and concern has been raised that some of these scales do not meet standards of reliability or construct validity

(Parmenter & Wardle, 1999; Sapp & Jensen, 1997). Attempts have been made to remedy the problem through the development of scales through accepted scale development procedures (Dickson-Spillmann, Siegrist, & Keller, 2011). However, food being culturally rooted, these scales are often based on the more popular food consumed in the countries in which they were developed. Therefore, we sought to develop our own scale suited to the context of study (Taiwan) to measure consumer's nutrition knowledge.

The scale development followed standard psychometric procedure such as (a) initial review of the literature and consultations with dieticians in Taiwan to develop an initial pool of 179 items (b) paring down the number of items to 73 following interviews with dieticians and masters students in food and nutrition regarding accuracy and clarity of construction of the items, and (c) pretest among 60 Taiwanese students in the U.K to understand the difficulty and discrimination of the items. Items with poor discrimination scores were dropped and 21 items were selected.

Nutrition involvement was measured using the five-item scale proposed by Chandon and Wansink (2007) (I pay close attention to nutrition information; Calorie levels influence what I eat; It is important to me that nutrition information is available; I ignore nutrition information (reverse coded); I actively seek out nutrition information). Responses were obtained on a 7 item scale. Promotion and prevention focus were measured using the Regulatory Focus Questionnaire (RFQ) (Higgins et al., 2001). Promotion focus scale comprises six items, while the prevention focus scale comprises five items. Responses were obtained on a 1 to 5 agree-disagree scale.

Diet adjustment following advice was measured by a four item scale, adapted from the cues about the importance of eating a quality diet scale employed by Sapp and

Weng (2007). The items included (1) I have once been affected by mass media presentations to adjust my diet type (2) I have once listened to my doctor's recommendations to adjust my diet type (3) I have once accepted my family member's advice to adjust my diet type and (4) I have once accepted my friend's recommendation to adjust my diet type. Responses were obtained on a yes-no format.

The scales in English were translated to traditional Chinese by three PhD level English-traditional Chinese bilingual researchers in Taiwanese academia who were employed in the health or health psychology fields. Six Masters students studying Chinese literature, with English as their mother tongue, back-translated the questionnaires to English. The versions were compared and required modifications were made, after consultations with the researchers and the Masters students. The translated questionnaire was pretested with 42 consumers from different socio-economic backgrounds to ensure that it works well.

The moderating variables can have direct effects on the three dependent variables. Literature provides unequivocal support only for the direct effect of sex on nutrition involvement, nutrition knowledge and dietary behaviour. In order to account for any potential direct effects and provide a more rigorous test of the proposed hypotheses, we controlled for the effects of sex, income and age on nutrition involvement, nutrition knowledge and diet adjustment following advice.

#### 4.2. *Scale reliability and validity*

Nutrition involvement scale had reliability (coefficient alpha) of .83. The scale was also found to be unidimensional as 60.2% of the variance was extracted by the first principal



component. The coefficient alpha value of the six item promotion scale was .86, while that of the five item prevention scale was .85.

The nutrition knowledge scale is a formative scale. Following the recommendations of Diamantopoulos and Winklhofer (2001), we examined indicator collinearity which could potentially lead to item redundancy. This was done through a dummy variable regression analysis, with knowledge as the dependent variable and the individual items as the independent variables. Maximum VIF obtained (1.39) was less than the recommended cut-off value of 10 (Neter, Kutner, Nachtsheim, & Wasserman, 1996). Therefore, no significant redundancy was observed.

Reliability estimates of the knowledge scale and the diet adjustment scale were also obtained using the Proportional Reduction of Loss method (Rust & Cooil, 1994). This method can be used to compute the reliability of formative scales. The measure is evaluated similar to the coefficient alpha, with .7 being the acceptable threshold of reliability. The PRL method gave estimates of .93 for the nutrition knowledge scale and .79 for the diet adjustment scale. These estimates can be considered as very conservative as they are obtained from the table with a maximum number of 20 judges (Rust & Cooil, 1994, p. 7), whereas the sample size for the study is 1125. Note that reliability increases with the number of judges for a given proportion of inter-rater agreement. Overall, both the scales are deemed very reliable.

Confirmatory Factor Analysis (CFA) using maximum likelihood estimation was employed to test the convergent and discriminant validities of the three multi-item constructs. The fit indices indicated that the model had a good fit ( $\chi^2 (101) = 427, p < .001$ ; TLI = .95; CFI = .95; RMSEA = .05). We also computed construct reliabilities

using standardized loadings. Construct reliabilities of nutrition involvement, promotion, and prevention were .83, .86, and .85, all higher than the threshold value of .75 (Bagozzi & Yi, 1988). Average variance extracted and factor loadings were examined to assess convergent validity. AVE values of Nutrition Involvement, Promotion, and Prevention were .50, .51, and .52, all of them being higher than the recommended cut-off value of .5. Factor loadings of all the constructs were statistically significant at .05 level. In addition, indicators load substantively on their respective constructs, as the standardized coefficients are greater than .5. Together, these results indicate convergent validity. We examined discriminant validity by comparing the AVE values with the square of the correlation between the construct and each of the other constructs. Discriminant validity is obtained if the square of the intercorrelation is less than the AVE values of the corresponding constructs (Fornell & Larker, 1981). This was the case for all pairs of constructs, establishing discriminant validity.

Common method variance is discounted for the study as the responses for the variables were obtained through different operational procedures (Likert scale items for regulatory focus and involvement, multiple choice items for knowledge, yes-no response choices for diet adjustment scale; response items for different income, age, sex groups). This conforms to the recommendation by Podsakoff et al. (2003, p. 888) that the predictor and criterion variables should be measured using different response formats. A Harman's one factor test, run using the three multi-item scales (promotion, prevention, nutrition involvement) yielded 28.2% of variance for the single factor, which is acceptable. A common factor analysis was also run. The regression estimate between the

common factor and each item was .00, denoting an extremely low common variance.

Overall, it can be concluded that common method variance is not an issue.

#### 4.3. *Descriptive statistics*

The sample exhibited a high level of nutrition involvement with a mean of  $5.29 \pm 1.76$ . Promotion (Mean =  $3.34 \pm .86$ ) and prevention (Mean =  $3.28 \pm .93$ ) were just above average. Nutrition knowledge was moderate with a mean of  $11 \pm 2.91$ . Diet adjustment following advice too was above average (Mean =  $2.47 \pm 1.48$ ). Table 1 provides the descriptive statistics. We compared the distribution of age with the data for Taiwan obtained from U. S. census bureau for 2008 and found that there is a broad correspondence with the national figures on age distribution.

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Insert tables 1 and 2 here  
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#### 4.4. *Test of hypotheses*

The hypotheses were tested using a structural model. The model obtained an acceptable fit ( $\chi^2(215) = 612, p < .001$ ; IFI = .95; CFI = .95; RMSEA = .041). The supplementary table shows the parameter estimates. It can be seen that promotion focus is positively related to nutrition involvement but prevention has no relationship with involvement; these results provide support for H1a but not H1b. Sex tended to have a directional negative moderating effect on the effect of promotion on nutrition involvement ( $p = .052$ ); since males were coded as 1 and females as 2, the directional negative moderating effect indicates that the effect is likely to be stronger among males; thus there is some evidence of directional support to H2. The moderating effect of income on the promotion- nutrition involvement relationship is supported; the effect of promotion is

greater among high income people, thus supporting H3. The moderating effect of age is not significant; thus H4 is not supported. Nutrition involvement is found to have a positive effect on nutrition knowledge, supporting H5. As hypothesized by H6, nutrition knowledge has a positive effect on diet adjustment following advice. According to H7, nutrition involvement has a positive effect on diet adjustment following advice. It can be seen that this hypothesis is also supported.

The significance of paths in hypotheses 5, 6, and 7 together seem to indicate a partial mediation effect. In order to provide a more rigorous test for the effect, we conducted the Sobel test (Sobel, 1982). Note that Sobel test is powerful when the sample size is large, as is the case with this study. The test was significant (Test statistic = 3.567; S.E. = .008;  $p = .00$ ). Therefore, H8 is supported.

It is possible to argue that nutrition knowledge leads to nutrition involvement. To rule out this possibility, we ran another model with nutrition knowledge leading to nutrition involvement and the other constructs remaining the same. It was found that the chi-square value for the second model went up from 612.4 to 651.6. The AIC for the first model was 782.4, whereas the same for the second model was 821.6. This indicates that the specified model is superior to the alternative model.

## **5. Discussion**

Regulatory focus theory, proposes the existence of fundamental motivational differences among people (Higgins, 1997, 1998). The very existence of such differences, and their influence on consumer behaviors, make them very relevant to the study of issues that affects public policy. Not many studies have examined the effects of regulatory focus on

such issues (e.g., Dholakia et al., 2006). The results of this study point to the applicability of regulatory focus theory to the study of diet and nutrition.

The study found that promotion focus leads to consumer's nutrition involvement. Prevention focus had no effect on nutrition involvement. The former result is in line with theoretical expectations. It is important to note that promotion focused people are ideal focused (pursuing their own goals) whereas prevention focused people are ought focused (pursuing responsibilities). Expectedly, it is the former who are likely to devote attention to their nutrition needs. The higher aspirational levels of promotion focused consumers will lead to greater involvement with nutrition to enhance their well-being. More interesting are the moderating effects of sex and income. Sex tended to have a moderating effect such that the effect is likely to be greater among males (vs. females). The study found that the effect of promotion focus on nutritional involvement is greater among high (vs. low) income consumers.

Both regulatory foci serve the purpose of goal pursuit, albeit through different strategies (Lanaj et al., 2012). Thus, while both promotion and prevention focused individuals will be motivated to maintain good health, the former are more likely to employ approach strategies such as nutritional involvement, while the latter will employ avoidance strategies (e.g., avoiding risky behaviors). The findings of the study indicate that involvement is essentially an approach behavior.

The study found that nutrition involvement leads to nutrition knowledge. While the theory of involvement leads to such an expectation, prior findings have been rather equivocal (e.g., Moorman, 1990). The current study provides useful empirical

clarification regarding this effect. The finding was obtained using a rigorously developed scale, following recommended psychometric procedures, to assess nutrition knowledge.

The study also contributes to the literature by demonstrating a pertinent behavioral consequence of nutrition knowledge. In this context too, the study provides empirical clarification regarding an important effect where conflicting findings have been recorded (Nayga, 2000; Sapp, 1991; Sapp & Jensen, 1997). However, as noted by previous researchers, knowledge was often measured poorly, using scales comprising only a few items. This study reexamines the effect using a reliable 21 item scale and confirms the effect. In so doing, it provides valuable guidance to public policy efforts in enhancing consumer's nutrition involvement and knowledge.

Finally, the study showed the effect of nutrition involvement on diet adjustment. The relationship between nutrition involvement and food selection is unclear in the literature (Moorman, 1990; Chandon & Wansink 2007). The finding of this study supports the conclusion that nutrition involvement has a positive effect on diet selection. The direct effect of nutrition involvement on diet adjustment is stronger than the indirect effect through nutrition knowledge. This underscores the importance of investing efforts to promote nutrition involvement.

The study employed data collected through a rigorous procedure, which broadly corresponded to the national distribution regarding relevant demographic variables. This is a key strength of the study and adds to the external validity of the findings.

### *5.1. Theoretical implications and future research*

As mentioned earlier, few studies have examined the determinants of nutrition involvement. This is a major contribution of the study and furthers the research agenda in

this direction. Given the problems of obesity and illnesses directly linked to unhealthy eating habits and the direct effect of nutrition involvement on dietary behaviors demonstrated in this study, the construct of nutrition involvement merits greater scholarly attention. Future research can examine the role of other antecedents on nutrition involvement as well as the boundary conditions of these relationships. Future research can also examine the boundary conditions of the relationships between (a) nutrition involvement and nutrition knowledge (b) nutrition knowledge and dietary behavior and (c) nutrition involvement and dietary behavior that will help develop a more fine-grained understanding of these effects.

In trying to understand the effect of regulatory focus on nutrition involvement and thereby dietary behaviour, the study complements research in areas such as neuroeconomics that seeks to decipher the mechanism behind nutrition choices (Bruce, Krespi & Lusk 2015; Muller & Prevoost 2016). Future research can investigate the neurological bases and neural responses of regulatory foci and the paths through which they influence dietary behavior.

### 5.2. *Managerial implications*

Prior research has recorded that regulatory focus can be induced (Roney et al., 1995). Situational factors that can prime a person's aspirations (duties) can induce promotion (prevention) focus. Therefore, in addition to being an individual difference variable, regulatory focus can also be considered as a motivational state (Zhu, 2003). The implication is that public agencies can induce promotional focus through appropriate communication, which should enhance their nutritional involvement. The direct effect of promotion focus on nutritional involvement would call for such a course of action. But,

as the results of this study indicate, the efficacy of this intervention will vary between high and low income groups and is likely to vary between males and females. The demonstrated positive effects of nutrition involvement on nutrition knowledge and dietary adjustment would call for such an intervention.

### 5.3. *Limitations*

The study has some limitations. The hypotheses have been tested using correlational design. Field experiments can further examine the hypothesized relationships. Further research can also replicate the study in western contexts.

To conclude, the study makes useful contributions to the streams of research on regulatory focus, nutrition involvement, and nutrition knowledge. It is hoped that the reported findings will (a) fuel further research and (b) inform public policy formulation.



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Figure 1

## Hypothesized model

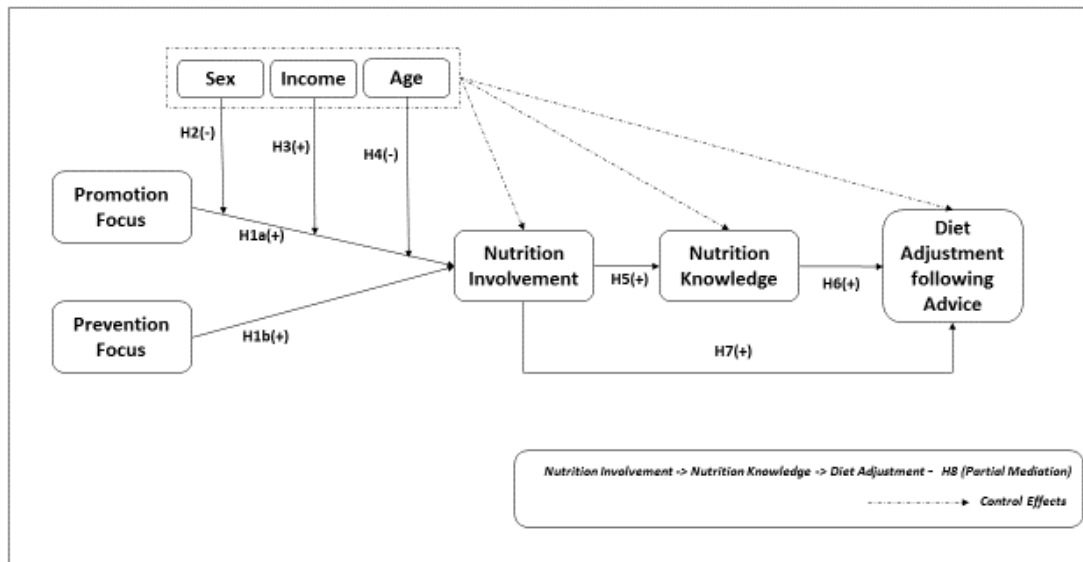




Table 1  
Descriptive Statistics

	Mean $\pm$ SD
Nutrition involvement	5.29 $\pm$ 1.76
Promotion	3.34 $\pm$ .86
Prevention	3.28 $\pm$ .93
Nutrition knowledge	11 $\pm$ 2.91
Diet adjustment following advice	2.47 $\pm$ 1.48
	Percentage
Sex (Males)	42.1
Sex (Females)	57.9
Age (20-30)	32.5
Age (31-40)	27.9
Age (41-50)	21.1
Age (51-60)	14
Age (above 60)	4.5
Income (No income)	10.5
Income (Less than NT\$ 17280)	13.2
Income (NT\$ 17281-25000)	21.2
Income (NT\$ 25001-35000)	22.2
Income (NT\$ 35001-45000)	16.9
Income (NT\$ 45001-55000)	11.7
Income (NT\$ 55001-65000)	3.7
Income (Above NT\$ 65000)	.5

Table 2  
Correlation Matrix

	N.I.	Promo.	Preven.	N.K.	D.A.
N.I.	1.00				
Promotion	.161** (.00)	1.00			
Prevention	.019 (.52)	.309** (.00)	1.00		
N.K.	.233** (.00)	.065* (.03)	.009 (.75)	1.00	
D.A.	.215** (.00)	.096** (.00)	.068* (.02)	.171** (.00)	1.00

\*\* significant at < .01 level.

\* significant at < .05 level.

( ) indicates p values.

N.I - nutrition involvement; N.K. - nutrition knowledge; D.A. - diet adjustment following advice