THE ROLE OF SELF-EFFICACY, RESPONSE EFFICACY AND NUTRITION KNOWLEDGE IN CONSUMERS' UTILIZATION OF NUTRITION LABELS

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Careful inspection of nutrition labels on food products has been shown to improve consumers' dietary choices and food consumption decisions. The present study examines the effect of three individual level variables, namely self-efficacy, response efficacy and nutrition knowledge on consumers' intentions to use nutrition labels prior to making food purchase decisions and the effect of these intentions on actual dietary behaviors. These factors have been shown to be important predictors of behavior in multiple health-related domains. Results of a structural equation model suggest that efficacy variables as well as nutrition knowledge have a significant effect on shaping intentions to use the nutrition label and that intentions translate into improved dietary behavior. Results and implications to practitioners and policy makers are discussed.

INTRODUCTION

The rise in obesity rates continues to be a major national health concern. The Center for Disease Control and Prevention (CDC) estimates that 35.7% of American adults are obese (CDC, 2012). Obesity is known to increase the risk factor for multiple diet-related health problems such as heart disease, type 2 diabetes and various types of cancer (Wang, McPherson, Marsh, Gortmaker & Brown, 2011). Given the link between dietary habits and obesity, the Food and Drug Administration (FDA) has attempted to introduce changes to the nutrition labels on food products to make them easier to comprehend by consumers (Burton, Garretson & Velliquette, 1999). Multiple studies have reported that reading nutrient information influences consumers' choice of food products and brands (Hawkes, 2004; Baltas, 2001) and encourages better food consumption (Drichoutis, Lazaridis & Nayga Jr., 2006). Hence, promoting greater utilization of the nutrition label to regulate food and calorie intake represents an important stride towards improving dietary choices.

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Despite FDA regulations that standardized the nutrition label, a number of recent studies indicate that many consumers may still not use the nutrition label prior to purchasing food products (Aboulnasr & Sivaraman, 2010). According to the FDA's 2008 Health and Diet Survey, 24% of those asked about how often they use the nutrition information on a food product prior to purchase replied by rarely (13%) or never (11%). Out of those who said they rarely use the nutrition label information, 49% reported that they do not intend to use it in the six months following the study (FDA, 2008). Given the significance of nutrition labeling in enhancing consumers' food choices, these results emphasize the importance of a better understanding of why and when consumers use nutrition information prior to food purchase and consumption.

The purpose of the present paper is to extend prior research findings on consumers' utilization of nutrition labels in making food consumption decisions. Specifically, the roles of self-efficacy, response efficacy and consumers' nutrition knowledge as precursors to the intention to utilize nutrition labels and to make healthier food choices are explored. While a number of studies have researched the antecedents and consequences of using the nutrition label in the food purchasing process, to the best of our knowledge, none have

specifically investigated the effects of self-efficacy, perceived response efficacy and none have combined these two variables with nutrition knowledge in a single model predicting nutrition label use and dietary behavior.

Self-efficacy, response efficacy and prior knowledge have been shown to be important determinants of consumers' information search and behavior. Self-efficacy refers to an individual's belief in his or her ability to successfully perform a task (Hu, Huhmann & Hyman, 2007) and is one of the most widely studied variables in the field of health promotion research (Song, Peng & Lee, 2011). Response efficacy refers to the degree to which a certain action or response to a given problem is perceived as being effective (Bandura, 1977). Similar to self-efficacy, response efficacy has been a key element in multiple health behavior models (Casey, Timmermann, Allen, Krahn & Turkiewiez, 2009). Akin to the roles of self-efficacy and response efficacy, prior knowledge has been known to influence subsequent information processing (Brucks, 1985) and nutrition knowledge was found to be related to food consumption choices (Johnson & Johnson, 1985). Hence, in the current paper it is hypothesized that the belief in one's skills to comprehend nutrition information; the perception of the effectiveness of the nutrition label and one's nutrition knowledge will shape intentions to use the nutrition label which in turn will shape nutrition behavior.

The balance of this paper is organized as follows. In the next section, a review of the literature on nutrition labeling is presented followed by a presentation of the theoretical foundation and hypotheses development. The research methods used are then described, which include data collection procedures and analysis. This is followed by a discussion of the theoretical and policy implications. The paper concludes by identifying the study's potential limitations.

LITERATURE REVIEW

Nutrition Labeling

Providing nutrition labeling information on packaged food products has emerged as an important dimension of improving dietary practices and regulating food and calorie intake. Prior research indicates that utilizing nutrition labels may influence the way consumers value and perceive food products (Drichoutis et al., 2006). Multiple research studies have investigated the determinants of consumers' use of nutrition labels. These studies can be categorized into ones that researched the effects of individual characteristics and others that examined the likelihood of using nutrition labels in the presence of other information on the food package such as health and promotional claims.

In the category of individual characteristics, a number of traits were examined. While there were mixed findings in the literature regarding the effect of age, income, work status and size of household on label use (Drichoutis et al., 2006), higher levels of education and awareness of the diet-health relationship were found to associate with a greater likelihood to use nutrition labels (Drichoutis, Lazaridis & Nayga Jr., 2005; 2006; Derby & Fein, 1994). Gender was also found to relate to nutrition label use. In general, most prior studies found female consumers to be more likely to use the nutrition label compared to their male counterparts (Guthrie, Fox, Cleveland & Welsh, 1995; for an exception see Aboulnasr, 2010). Similarly, consumers with higher levels of enduring motivation, nutrition knowledge and interest in specific elements of the nutrition label such as cholesterol and fat were all found to increase the chances of nutrition label use (Drichoutis et al., 2005; 2006; Rose, 1994; Guthrie et al., 1995; Moorman, 1990).

Another stream of research examined consumers' likelihood and ability to utilize and elaborate on the nutrition label given the presence of other information on the food package. Ford, Hastak, Mitra & Ringold (1996)

argued for an independent effects model in which the presence of health claims on a food package does not influence consumers' ability to accurately use the nutrition panel. Similarly, Keller et al. (1997) found that consumers are able to utilize the nutrition facts panel to make overall product judgments in the presence of nutrition claims on the package. In support of these findings, Mitra, Hastak, Ford and Ringold (1999) suggested that the existence of health claims on a food package does not impact consumers' ability to comprehend the nutrition label and that this finding was unaffected by consumers' level of education. Despite the agreement of the three prior studies, Roe, Levy & Derby (1999) found that the presence of health claims on food packages curtails the search for nutrition information, hence leading to a greater dependence on those claims compared to the nutrition label. The difference in findings between the Roe et al. study and the prior studies may be attributed to differences in the contexts in which the studies were conducted (Drichoutis et al., 2006).

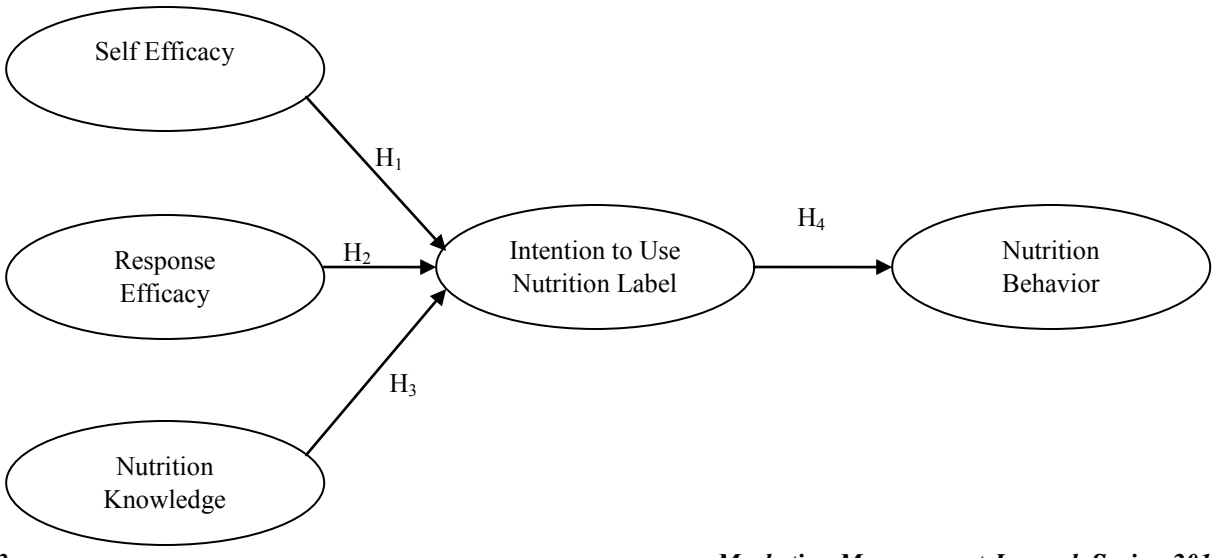
CONCEPTUAL FRAMEWORK AND HYPOTHESES

Self-efficacy

Self-efficacy refers to the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p.3). The concept of self-efficacy finds its roots in social cognitive theory, which suggests that "what people think, believe, and feel affects how they behave" (Bandura, 1986, p.26). According to social cognitive theory, people form beliefs regarding their abilities and skills and use these beliefs to shape their subsequent behavior (Mills, Pajares & Herron, 2007). Individuals who rank high on self-efficacy believe they have the required skills to successfully perform a given task. As a result of their perceived confidence, they tend to show greater motivation and a more positive attitude towards completing a prescribed behavior (Bandura, 1997; 1986).

Self-efficacy has been shown to be an important predictor of changes in health and diet-related behaviors (Schwarzer, 1992; Schwarzer & Renner, 2000). Beck and Lund (1981) found self-efficacy to be a reliable

FIGURE 1:
Hypothesized Model



forecaster of adopting preventative practices in response to health-related communications. Greater perceived self-efficacy was also found to be linked to a greater likelihood to engage in healthier dietary behaviors, a reduction in fat in -take, more weight regulation (Mai & Hoffman, 2012), cancer-prevention behavior including cancer screening (Moriarty, 2009), smoking cessation and adherence to medical programs (Maibach, Flora & Nass, 1991).

In the context of the use of nutrition labels on food products, self-efficacy refers to the belief of the consumer that he/she has the knowledge or resources allowing him/her to successfully utilize the information in the nutrition facts panel. Perceived self-efficacy is expected to generate a positive attitude towards nutrition labels and strengthen the behavioral intentions that relate to the use of these labels. Given the behavioral and processing outcomes of self-efficacy, we predict that consumers who believe in their ability to use and comprehend nutrient information will exhibit a greater intention to utilize the nutrition label when making food purchase decisions. Hence, the following hypothesis is made:

H_1: Consumers' perceived self-efficacy will lead to a greater intention to use the nutrition label when making food consumption decisions.

Response Efficacy

Response efficacy refers to the belief that a certain behavior (response) is effective in yielding a required outcome (Bandura, 1977) or preventing a negative one (Moriarty, 2009). It represents an individual's belief in the extent to which a prescribed behavior works (Moriarty, 2009). In the context of health related behaviors, Bandura (1997) describes response efficacy as a "belief in the effectiveness of the prescribed means to prevent illness or promote health" (p.283). Response efficacy has been presented as a principal component in multiple models such as the Health Belief Model, the AIDS Risk Reduction Model and Bandura's Model (Casey et al., 2009). The assumption in these models is that people are less likely to engage in a certain behavior if they do not believe in its effectiveness in solving a problem or achieving a desired outcome.

A number of studies have provided strong support for the role of response efficacy in the context of health-related behaviors (Moriarty, 2009). In a meta-analysis of 65 studies that examined the role of response efficacy, Floyd, Prentice-Dunn and Rogers (2000) found that it was linked to behavioral outcomes and intentions in multiple fields such as the prevention of AIDS and cancer, reduction of the consumption of alcohol and smoking cessation. Yun, Silk, Bowman, Neuberger and Atkin (2009) found that mothers' belief in the efficacy of maintaining healthy diets, exercising and avoiding chemical exposure in preventing cancer was a good predictor of their intentions to train their daughters on adopting these behaviors.

Based on the prior discussion on the role of response efficacy in shaping behavioral intentions, we expect this relationship to be present in the context of consumers' utilization of nutrition labels. If consumers do not perceive that nutrition labels are useful, they will be less likely to use them. Hence, it is expected that consumers' belief that reading nutrition information on food products prior to purchase is effective in maintaining a healthy diet and/or preventing diet-related disease to strengthen their intentions to utilize the nutrition label. We thus make the following hypothesis:

H_2: Consumers' perceived response efficacy will lead to a greater intention to use the nutrition label when making food consumption decisions.

Nutrition Knowledge

Consumers' prior knowledge has been shown to influence subsequent acquisition and processing of information (Brucks, 1985). A number of studies report that possessing greater levels of knowledge leads to a greater likelihood of information retention and acquisition

(Moorman & Matulich, 1993). More knowledgeable consumers were found to engage in more systematic processing of information compared to consumers who lacked prior knowledge who were shown to engage in greater heuristic processing (Averbeck, Jones & Robertson, 2011). Moorman and Matulich (1993, p.210) suggest that "knowledge may ease the encoding of information, which may make acquisition more likely". The relationship between prior knowledge and subsequent utilization of information is based on the premise that more knowledge structures and networks allow for more efficient use of subsequently encountered information (Andrews, Burton & Netemeyer, 2000). Similarly, the resource matching perspective offers a theoretical explanation to the relationship between knowledge and information processing and utilization. This perspective suggests that ideal processing of information takes place when the resources required to perform a cognitive task are available (Hu, Huhmann & Hyman, 2007). Hence, knowledge availability may facilitate subsequent information processing.

In the context of consumers' dietary choices, prior nutrition knowledge was found to lead to better food selection (Bell, Stewart, Radford & Cairney, 1981), more nutritious food choices (Johnson & Johnson, 1985), improved dietary behaviors (Boechner, Kohn & Rockwell, 1990), more utilization of nutrition information and better performance on tasks related to food label use (Levy & Fein, 1998). Szykman, Bloom and Levy (1997) demonstrated that consumers' diet-disease relationship knowledge had a positive impact on subsequent utilization of nutrition labels. Likewise, Andrews et al. (2000) proposed that consumers' processing of nutrition claims may be affected by the level of nutrition knowledge they possess. Drichoutis et al. (2006) suggested that consumers' prior nutrition knowledge may increase the likelihood of consumers' nutrition label utilization through enhancing the observed benefits and reducing the cost of such use.

In light of the previous discussion featuring the role of knowledge in facilitating the processing and use of subsequently encountered information, it is proposed that consumers who have nutrition knowledge should be more likely to use this knowledge when purchasing packaged food products. We expect consumers with higher levels of nutrition knowledge to perceive themselves as more prepared to utilize such knowledge for the purpose of food product evaluation and hence exhibit a greater likelihood to inspect the nutrition label prior to purchase. Hence, the following hypothesis is made:

H_3: Consumers' prior nutrition knowledge will lead to a greater intention to use the nutrition label when making food consumption decisions.

It is also expected that consumers' intention to utilize the nutrition label will translate into actual behavior that reflects healthier eating habits. Most work that links intentions to behavior finds its origins in the Theory of Reasoned Action. This theory depicts behavioral intentions as a direct predictor of behavior (Park & Levine, 1999). Fishbein and Ajzen (1975) described intention as a decision to act in a certain way. A number of other research studies have linked behavioral intentions to action. Eagley and Chaiken (1993) identified intention as a representation of an individual's effortful motivation to engage in behavior while Sheppard, Hartwick and Warshaw (1988) described it as the prospect that an individual will carry out a behavior. Given evidence from prior studies on the relationship between behavioral intentions and actual behavior, in addition to research that links label use to improved nutrition choices and dietary behavior (Coulson, 2000), it is expected that consumers' intentions to use the nutrition label will represent a greater motivation for consumers to engage in more healthful nutrition behaviors and choices. Hence, we make the following hypothesis:

H_4: Consumers' intention to use the nutrition label when making food consumption decisions will lead to more healthy nutrition behavior.

METHOD

Study Participants

A survey instrument was developed to measure the constructs of interest. Ninety-six undergraduate business students at a southeastern public university participated in the study and completed the survey. The participants ranged in age from 20 to 35 years old. The average age was 23 years old. Forty-four males (46%) and fifty-two females (54%) received the self administered questionnaire that contained the instructions and the measures. As an incentive to participate in the study, participants were given extra course credit. Upon completion, students were debriefed and thanked for their participation.

Measures

The survey instrument used measures and scales that were modified and adapted to the context of this study based on previously developed scales used in prior marketing and nutrition research measuring efficacy, knowledge, intentions and behavior. (Yun et al., 2009; Moriarty, 2009; Burton et al., 1999; Moorman & Matulich, 1993). Mean ratings of multi-item scales were used to measure self-efficacy, response efficacy, nutrition knowledge, intentions and behavior. A higher score indicates a higher level of each of these constructs. All measures were assessed on seven-point Likert-type scales anchored by *strongly disagree* and *strongly agree*.

Study participants rated their self-efficacy (Cronbach's $\alpha = 0.93$) on a four-item scale (e.g. I am confident in my ability to process

TABLE 1:
Exploratory Factor Analysis Results (Varimax Rotation)

	Mean	SD	Self Efficacy	Response Efficacy	Nutrition Knowledge	Intention to use label	Nutrition Behavior
Item 1	5.41	1.56	0.86				
Item 2	5.64	1.30	0.92				
Item 3	5.67	1.40	0.89				
Item 4	5.96	1.33	0.86				
Item 5	5.66	1.30		0.64			
Item 6	5.76	1.34		0.71			
Item 7	5.20	1.86		0.83			
Item 8	5.25	1.46		0.86			
Item 9	5.53	1.40		0.78			
Item 10	5.60	1.41		0.81			
Item 11	5.02	1.35			0.75		
Item 12	5.04	1.40			0.87		
Item 13	5.11	1.61				0.83	
Item 14	4.61	1.74				0.84	
Item 15	4.76	1.78				0.86	
Item 16	4.38	1.41					0.89
Item 17	4.20	1.60					0.86
Item 18	4.11	1.61					0.89
Eigenvalues			3.49	3.86	1.61	2.88	2.53
Variance percent			19.40	21.43	8.92	16.01	14.07
Cronbach's alpha			0.93	0.89	0.75	0.95	0.88
Number of items			4	6	2	3	3

information in the nutrition facts panel on a food product). Response efficacy (Cronbach's α = 0.89) was measured using six items (e.g. Inspecting the nutrition facts panel is important to maintain a healthy diet). The two Items used to measure nutrition knowledge (Chronbach's α = 0.75) were adapted from the scale used by Burton et al. (1999, p.474) e.g. "compared to most people, I am quite knowledgeable about nutrition information". Intention to use the nutrition label (Cronbach's α = 0.95) was measured using three items e.g. "I intend to carefully inspect the nutrition label when buying food products". Nutrition behavior (Cronbach's α = 0.88) was measured using a three-item scale e.g. "Generally, I consume foods that are high in sodium content". All three items used to measure nutrition behavior were reverse coded prior to the analysis.

Measurement Model

A series of tests were conducted to evaluate the characteristics and properties of the measurement scales and to test for the constructs' unidimensionality, reliability and discriminant validity. An exploratory factor analysis (EFA) using the maximum likelihood method with varimax rotation was conducted on all the items used to measure the constructs of interest in the study. As predicted, the analysis generated five factors (self-efficacy, response efficacy, nutrition knowledge, intention to use label and nutrition behavior) using an Eigenvalue of 1.0 as a cut-off value for factors extracted. These results supported the assertion that each one of the multi-item scales shared a single underlying factor. None of the factor loadings were lower than 0.5. Furthermore, none of the correlations of factors was close to 1.0 (factor correlations ranged from 0.23 to 0.53) offering support for discriminant validity. Internal validity for each of the constructs was measured using Cronbach's alpha. All constructs had a Cronbach's alpha greater than the recommended 0.70 level (Nunally, 1978) indicating convergent validity and internal consistency.

To further validate and purify the scales used in the measurement of the latent constructs, a confirmatory factor analysis (CFA) using SPSS AMOS 19 Structural Equation Modeling Program was performed. In support of unidimensionality, all items loaded as theorized (Gerbing & Anderson, 1988). The overall measurement model was significant (χ^2=199; df=125; p=0.0). However, χ^2 is known to be sensitive to sample size and an unreliable measure of structural equation model fit (Srivastava & Owens, 2010). An analysis of a variety of goodness of fit statistics indicates a good model fit to the data (comparative fit index (CFI) = 0.94, incremental fit index (IFI) = 0.94 and the Tucker Lewis index (TLI) = 0.92), all higher than the recommended 0.90 level for model fit (Hair, Black, Babin, Anderson & Tatham, 2006; Srivastava & Owens, 2010). The root mean square error of approximation (RMSEA) = 0.08, which is within the suggested range of adequacy for model fit (Byrne, 2001, p.85).

The model was then examined for construct reliability and convergent and discriminant validity. Given the limitations associated with Cronbach's α such as underestimating the reliability of scales (Garver & Mentzer, 1999), a CFA measurement model was used to test for construct reliability (CR). Construct reliability was calculated using the equation suggested by Fornell & Larcker (1981). In this equation, the numerator represents the sum of the standardized regression weights squared, while the denominator is equal to the sum of the standardized regression weights squared plus the summation of the error variance for each construct calculated as 1 – the squared standard regression weights (Garver & Mentzer, 1999).

$$\text{Construct Reliability} = \frac{(\sum_{i=1}^{n}\lambda_i)^2}{(\sum_{i=1}^{n}\lambda_i)^2 + (\sum_{i=1}^{n}\delta_i)}$$

As presented in Table 2, construct reliability results ranged from 0.80 to 0.95. These values exceed the recommended acceptable level of 0.70 (Garver & Mentzer, 1999) providing

TABLE 2:
Confirmatory Factor Analysis Results (Measurement Properties)

Construct	Scale Items	Factor Loadings (Standardized Regression Weights)	Construct Reliability	Average Variance Extracted
Self-Efficacy	Sfec1	0.879	0.93	0.78
	Sfec2	0.982		
	Sfec3	0.855		
	Sfec4	0.804		
Response Efficacy	Rpec2	0.769	0.90	0.59
	Rpec3	0.745		
	Rpec4	0.805		
	Rpec5	0.736		
	Rpec6	0.8		
	Rpec7	0.748		
Nutrition Knowledge	Nukn1	0.995	0.80	0.68
	Nukn2	0.608		
Intention to Use Nutrition Label	Int1	0.914	0.95	0.86
	Int2	0.927		
	Int3	0.942		
Nutrition Behavior	Bhv1	0.937	0.88	0.71
	Bhv2	0.781		
	Bhv3	0.808		

TABLE 3:
Correlation Matrix of Latent Constructs

	Self Efficacy	Response Efficacy	Nutrition Knowledge	Intention	Behavior
Self-Efficacy	1				
Response Efficacy	0.19	1			
Knowledge	0.48	0.25	1		
Intention	0.45*	0.55*	0.55	1	
Behavior	0.32	0.07	0.26	0.39	1

*Correlation significant at $p<0.001$

support for the reliability and internal consistency of the scales used. As evidence for convergent validity, all items in the model had factor loadings (standardized regression weights) on their respective constructs that were higher than 0.60, exceeding the acceptable value of 0.50 (Gallagher, Ting & Palmer, 2008), were all statistically significant and in the theorized direction (Garver & Mentzer, 1999). Average variance extracted for all the constructs was then calculated. Average variance extracted measures the variance explained by the latent variable in comparison to the measurement error variance (Fornell & Larcker, 1981) and is calculated by dividing the sum of the squared standardized factor loadings

by the number of items for each construct (Gallagher et al., 2008). Average variance extracted values ranged between 0.59 and 0.86, exceeding the recommended 0.5 level for a construct to exhibit convergent validity (Hair et al., 2006). Taken, together the evidence provides support for the convergent validity of all the constructs.

Discriminant validity measures whether a construct is different from other constructs in the model. There is evidence for discriminant validity when the average variance extracted for a construct is greater than the squared correlations between that construct and all the other constructs in the model (Fornell & Larcker, 1981). Each construct in the model had an average variance extracted that was greater than its' squared correlation with all the other constructs indicating divergent validity. Average variance extracted estimates are presented in Table 2. In a second test of discriminant validity, we followed the method recommended by Dunn, Seaker and Waller (1994). An alternative constrained theoretical model was created, in which all the inter-construct correlations were set to 1 and then a chi-square difference test was conducted between the original non-constrained model and the constrained one. A statistically significant chi-squared test denotes discriminant validity of the constructs. The chi-squared difference between the two models was 37.7 with 10 degrees of freedom, which was statistically significant at p<.001. The results of the two tests provide evidence of divergent validity in the model.

Structural Model

A structural equation model using SPSS AMOS 19 was utilized to test our hypotheses. Results of the structural model indicated a good model fit. (χ^2= 203.50; df=128; p=0.00, comparative fit index (CFI) = 0.94, incremental fit index (IFI) = 0.94 and the Tucker Lewis index (NFI) = 0.92). The relationship between the constructs in the model were all found to be statistically significant and in the hypothesized direction. Results for standardized individual path coefficients are presented in Table 4. Hypothesis 1 suggested that self-efficacy should lead to a greater intention to use nutrition labels on food products. Results show that the path from self-efficacy to intention was statistically significant (β=0.21, p<0.05). In support of hypothesis 2, response efficacy was found to positively influence intention to use the nutrition label (β=0.42, p<0.01). The results also support hypothesis 3, which suggested that consumers' nutrition knowledge increases their intention to use the nutrition label (β=0.35, p<0.01). Similarly, hypothesis 4 was supported suggesting a positive relationship between intention to use nutrition label and actual dietary behavior (β=0.39, p<0.01). Overall, the structural equation modeling results supported all of our hypotheses.

TABLE 4:
Hypotheses Testing Results
Structural Equation Model

Relationship	Hypothesis	Standardized Path Coefficient	Significance Level
Self-efficacy ----------> Intention	H_1	0.21	p<0.05
Response efficacy --------> Intention	H_2	0.42	p<0.001
Nutrition Knowledge ----> Intention	H_3	0.35	p<0.001
Intention ---------->Behavior	H_4	0.39	p<0.001

χ^2= 203.50; df=128; p=0.00, CFI = 0.94, IFI = 0.94, NFI = 0.92

Discussion and Implications

In the present research, we empirically tested the effect of three individual level variables on the intention to use nutrition labels, two of which have generally not been studied in past nutritional label literature. In support of social cognitive theory, the theory of reasoned action and the resource matching perspective, the results of this study highlight the importance of self-efficacy, response efficacy and consumers' nutrition knowledge in utilizing the information on food labels. Consistent with our hypotheses, study participants who were more confident in their skills and ability to interpret and process nutrition information (high self-efficacy), those who had a stronger belief in the effectiveness of using nutrition labels in maintaining a healthy diet and preventing disease (high response efficacy) and those who had prior nutrition knowledge (greater nutrition knowledge) displayed a greater intention to utilize the nutrition label. Our results also indicate that intentions to use the nutrition label are related to more healthful eating behavior and choices.

Efficacy perceptions develop as a result of the appraisal of one's abilities and the assessment of the effectiveness of given behaviors (Bandura, 1977). Building on this premise, the results of this study suggest that practitioners and public policy initiatives designed to encourage healthier eating habits need to focus on enhancing and strengthening both self-efficacy and response efficacy dimensions as well as consumers' nutrition knowledge. Given the important role played by the efficacy variables in shaping intentions to use the nutrition label, consumer nutrition education campaigns may find it more effective to focus on communicating and explaining specific nutrient information as opposed to presenting more general information that simply encourage label use. Educating consumers about diet-disease relationships and the specifics of the nutrition composition of food products empowers consumers with the knowledge that may be required to enhance the likelihood of label use. Knowledge and education may also provide consumers with the confidence in their ability to use nutrition labels in the form of self-efficacy. This process is expected to increase behavioral intentions for label utilization.

Similarly, based on our results, the perceived efficacy of using the nutrition label is directly linked to consumers' intentions to use the label. Accordingly, public policy initiatives should be geared towards focusing on the value and effectiveness of nutrition labels in the maintenance of a healthy diet and the prevention of diet-related diseases. The health benefits of nutrition label utilization should be emphasized in campaign messages and educational programs designed to foster greater label usage. Furthermore, given the strong link between nutrition knowledge and label use, these campaigns would also be advised to focus greater resources on targeting consumers with lower levels of nutrition knowledge.

There are some limitations that may affect the generalizability of the findings of this study. Results should be interpreted within the context of these constraints. First, a sample of young adults was used. It is not clear whether the same effects would apply to other age groups given that dietary habits may change with age and experience. Second, study participants were all recruited from a single state; hence a more geographic representation of the population may be desirable in future research. Third, subjective nutrition knowledge rather than objective knowledge was measured. Future research testing the effect of knowledge may want to add an objective measure of nutrition knowledge such as a nutrition quiz to get a more complete picture of respondents' nutrition knowledge.

While more than twenty years have passed since the Nutrition Labeling and Education Act (NLEA) of 1990, requiring packaged food products to display a standardized nutrition facts panel, there continues to be an ongoing

interest among practitioners, researchers and public policy makers in consumers' dietary behavior and selections. This study extended prior research by incorporating into one model, the effects of self-efficacy, response efficacy and nutrition knowledge on consumers' intentions to utilize nutrition labels. It has shed light on efficacy variables that have been widely studied in the literature on health promotion and disease prevention, hoping that it would extend marketers' and policy makers' understanding of when and how consumers use nutrition labels.

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