WILL IMPROVEMENTS TO THE NUTRITION FACTS PANEL INCREASE LABEL INVOLVEMENT?

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Abstract: The nutrition fact label has been on foods in the United States since the 1990 Nutrition Labeling and Education Act. While little has changed with the label in the U.S., many countries in Europe have started utilizing front of package labels to inform consumers more quickly, and highlight the nutritional benefits and hazards of food items. Some companies in the U.S. have begun to release their own front of package labeling systems. However, these labels are generally created as a tool for marketing. Therefore, the purpose of our pilot study was to determine what components of food labels most benefit American consumers, what type of label would be most effective in encouraging nutritional choices. Focus groups with a total of nineteen participants were first recruited to obtain preliminary data. The participants were first asked questions to determine how the individuals use nutrition fact labels. The groups were then exposed to a variety of nutrition labels from around the world. They were asked to write down what they thought about the label, and for some, what they liked and didn't like about the labels. Data collected was used to re-focus our study. Results revealed having labels on the front of packages was not as crucial as improving the information on the current nutrition facts panel. Therefore, a survey with a control and two stimuli groups was presented to study participants. 951 individuals participated in the survey. One of the stimulus groups had a caloric breakdown panel accompanying the nutrition facts panel. The other had a panel explaining the percent breakdown of the daily diet. The purpose of these additional panels was to learn if adding them could improve the ability of consumers to use the nutrition facts panel, and learn if they could encourage individuals to make more nutritious choices. We hoped to learn if a summary table supplement to the current nutrition facts label would increase label involvement. We found presenting nutrition label information to individuals who prefer to evaluate potential outcomes, have a greater need for cognition and a higher health consciousness in the form of a percent daily value recommendation chart may be effective. Also, evidence suggested the behavioral makeup, degree of health consciousness and need for cognition of an individual could impact their perception of labels.

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CHAPTER I

INTRODUCTION

The Nutrition Facts Panel

The U.S. Nutrition Labeling and Education Act of 1990 standardized the nutrition information found on manufactured food items (U.S. Food and Drug Administration, 1990). The nutrition facts label is monitored and regulated by the Food and Drug Administration. Food labels are intended to educate individuals about the nutritional components of different foods (Levy & Fein, 1998). It was also expected that the Act would allow consumers to make more informed food choices (Levy & Fein, 1996). Levy and Fein (1998) suggested that nutrition labels can be used to compare similar foods products, evaluate claims present elsewhere on the product, decide if a product is too high or low in something for an individual diet, or track what a particular food contributes to daily intake. Calories, calories from fat, total fat, saturated fat, cholesterol, sodium, carbohydrate, dietary fiber, sugars, protein, vitamin A and C, calcium, and iron have to be present on the Nutrition facts label (Drewnowski et al., 2010). Despite a plethora of nutrition information and tools such as the nutrition facts panel being readily available in the United States, obesity and chronic diseases still continue to rise (Berning et al., 2010).

Following a more healthful diet can decrease the risk for many diseases, including heart disease, high blood pressure, osteoporosis, diabetes, and some cancers (Soederberg Miller & Cassady, 2012). When used correctly, consumers can determine the amount of total fat, calories, sodium, carbohydrates, sugars and protein in a product by reading the nutrition facts label (Post et al., 2010).

The study conducted by Post et al. (2010) revealed that when an individual with a chronic disease is directed by a health professional to read the label, there is a 50% chance that the patient will do so. Post et al. (2010) also found those who read food labels consumed less energy, saturated fat, carbohydrates, and sugar. They also consumed more fiber (Post et al., 2010). Another study conducted by Balasubramanian and Cole in 2002 found that individuals who are highly motivated and less knowledgeable benefit more from the Nutrition Labeling and Education Act than other groups (Balasubramanian & Cole, 2002). They also found that participants paid closer attention to "negative" items on the panel such as fat and sodium than "healthier" nutrients (ex: calcium and vitamins).

CHAPTER II

REVIEW OF THE LITERATURE

Why do Consumers Need to Understand the Nutrition Facts Panel?

With a great deal of emphasis on disease prevention and nutrition in the United States today, it is important that consumers make the necessary steps to lead healthy lives. This increase in health awareness has lead to an increase in a marketing emphasis on nutrition. It is important for consumers to know how to read the Nutrition Facts Panel so that they are able to muddle through marketing slogans and tactics to understand for themselves if a product is healthful or not.

A study by Colby et al. (2010) revealed that 49% of products contain some sort of nutrition marketing. Of this amount, 48% of the products were actually high in saturated fat, sodium and/or sugar (Colby et al., 2010). A study conducted in the UK found that while participants were aware of product claims, when a sugar reduction claim was not accompanied by a reduction in calories the participants felt deceived (Patterson, Sadler, & Cooper, 2012). This type of marketing can also lead to the halo effect, or a situation in which a consumer consumes more of a food because he or she believes it is healthy because of the claims (Zank & Kemp, 2012). A study conducted by Roe et al. (1999) on the impact of health claims found that consumers focused on health information

placed on the front of a product, and gave greater weight to the health claim than to the Nutrition Facts Panel (Roe et al., 1999). Therefore, consumers need to be aware of how to use the Nutrition Facts Panel, and not accept a product as nutritionally sound because of the product's nutrition marketing.

Understanding and knowing how to use the Nutrition Facts Panel can lead to a healthier life. A study over trans fat information on food labels by Jasti & Kovacks (2010) found that trans fat and low fat diet importance awareness were positively correlated with a higher amount of label use, as well as observance of trans fat information. Those who did not use the label or look at trans fat information consumed higher amounts of fried foods (Jasti & Kovacs, 2010).

Negative Aspects of the Current Nutrition Facts Panel

Although many consumers feel that nutrition labeling is important, many do not use the labels when making food purchases. In a fast paced world, many feel they simply don't have time to read and analyze the information provided on the current nutrition facts panel (Berning et al., 2010). People with more time available to spend at a grocery store are more likely to use nutrition labels, but many do not have this luxury (Drichoutis et al., 2006). Many shoppers are also more interested in product price unless they attach importance to nutrition (Drichoutis et al., 2006).

According to Graham et al. (2012), some aspects of the current nutrition label may prevent consumers from effectively understanding the information presented. When the literature review on studies conducted using eye tracking on nutrition labels was

completed, Graham et al. (2012) concluded individuals use labels more often when they are put in the middle of a product, health components are listed in order by relevance, there is not too much going on visually around the label, the contrast and orientation of the label is increased, the size of the label is increased, and supplemental tools to enhance the label are included (Graham et al., 2012). Another study found that when short health claims are located on the front of a package and all nutrition information is listed on the back, consumers are able to process the information more effectively and are more likely to believe the information (Wansink, 2003).

A large number of consumers don't completely understand how to interpret the information provided to them. Many consumers may not always understand what amounts of nutrients are considered unhealthy. Individuals in 56 countries have reported a misunderstanding, and even a mistrust of food labels (Soederberg Miller & Cassady, 2012). A study conducted to create a labeling system in university dining found that focus group participants had a lack of nutrition knowledge, and only associated healthfulness with salads and sandwiches (Pohlmeier et al., 2012). A simplified way for consumers to compare healthy and unhealthy options on the label could increase nutrition knowledge.

Success Using the Current Nutrition Facts Panel

While it seems a good deal of Americans don't understand or have time to use labels, previous research has shown between 45 and 80% of adults have reported using nutrition facts (Ollberding et al., 2010). Another study conducted with university

students found 44% of students used nutrition information often or always when buying an item for the first time (Driskell et al., 2008). Label use has also been shown to correlate with better dietary patterns (Ollberding et al., 2010). The final results of the study revealed 61.6% of study participants used the Nutrition Facts panel, 51.6% read the ingredients list and 47.2% observed serving size (Ollberding et al., 2010).

A study conducted by Cook et al. (2011) set out to discover if those with morbidities are more likely to use the Nutrition Facts Panel than those without a morbidity, or individuals with only one morbidity. The two morbidities taken into consideration were high blood pressure and high cholesterol, both of which are high risk factors for heart disease. Participants with both conditions were more likely to use the Nutrition Facts Panel than those with normal cholesterol and blood pressure levels, as well as participants with only one condition. They also found that those with only one condition were more likely to use the label than individuals with normal levels (Cook et al., 2011). Another study conducted by Lewis et al. (2009) also found that individuals with chronic diseases (hypertension, hypercholesterolemia, at risk for or having diabetes, being overweight and heart disease) had greater knowledge of nutrition and were more likely to use the Nutrition Facts Panel to observe specific nutrients (Lewis et al., 2009). A study conducted on older Americans by Macon et al. (2004) also found that men 71-80 with a heart related problem were more likely to use food labels than men or women of other ages with a similar diagnoses (Macon et al., 2004). While these studies reveal that the Nutrition Facts Panel is being used to help with symptoms of chronic disease, it is important that the panel be used as a prevention tool as well.

Users of nutrition facts labels often have diets lower in fat and cholesterol, eat more fruits and vegetables, and have a higher level of nutrition understanding (Misra, 2007). Therefore, a gap needs to be bridged between those who understand the information and those individuals who do not. Providing nutrition information in a simplified, comprehensive manner could increase the chance of consumers using nutrition facts as a tool, and therefore increase health and overall nutrition understanding.

Front of Package Labeling

Front of package labeling has taken off quickly in Europe. In the United Kingdom, the Food Standards Agency has developed a front of package label resembling a traffic light to indicate the presence of certain nutrients (Switt, 2007). In the U.S., health claims, nutrient content claims, and structure/function claims are regulated. Some health claim topics permitted include fluoride and the risk for dental carries, saturated fat, cholesterol, trans fat and the risk for heart disease, and whole grain foods and the risk for heart disease and certain caners (U.S. Food and Drug Administration). Nutrient content claims must meet certain standards to be able to use terms such as “high potency” and “antioxidant” (U.S. Food and Drug Administration). Nutrient content claims also include terms such as “low fat”, “low sodium”, and “contains 100 calories”.

Although the FDA regulates the Nutrition Facts Panel and health claims in the United States, some front of package labels companies have decided to put on the front of their products are not regulated. Most producers choose to include only information they feel makes their product more marketable, such as high fiber levels, low sodium levels, the amount of protein, the low amount of sugar, etc. A study conducted by Levin and

Gaeth in 1988 found that when meat packaging was labeled as “75% lean” or as “25% fat” consumers favored the packages labeled as “75% lean” (Levin & Gaeth, 1988). These findings clearly represent why companies want to present their products favorably. Front of package labels are also not being put on all products a company produces. Front of Package labels are often found on “diet” or “light” options. Labels are left off of products that have little nutritional significance such as chips or cookies.

Summarizing certain nutrition information in the form of front of package nutrition labels could help consumers make better nutrition choices (Vyth et al., 2009). Pointing out the negative aspects of a product may be the best way to translate the healthfulness of a product. Some front of package labeling systems currently being used include percentage guideline daily amounts, traffic lights, percentage guideline daily amount schemes that include nutrients per portion, and the “Facts Up Front” Label. There are also summary systems used that provide a nutritional score. Some of these systems include the NuVal system in the United States, the keyhole symbol used in Sweden, Denmark and Norway, and the guiding stars shelf tag system used in the U.S. (Hersey et al., 2013). The guiding stars system is a similar concept to what the Institute of Medicine’s Committee on Examination of Front-of-package Nutrition Rating Systems and Symbols is considering (Hersey, et al., 2013). The committee is recommending a summary icon that shows calories and ranks products on a three point system. Nutrients taken into consideration would include saturated and trans fats, sodium, and added sugars. This icon would be standardized and required on all products.

The traffic light system is gaining popularity in the United Kingdom, and the United States is taking notice. One study conducted in the United Kingdom found

consumers wanted the amount of nutrients associated with a red light to be reduced. This study also allowed the investigators to learn that consumers are most concerned with sodium and saturated fats (Balcombe et al., 2010). This study revealed once consumers could understand the nutrients, they wanted the foods available to them to be healthful. Something similar to this might benefit the U.S., a country with high obesity rates, and a generally confusing nutrition fact label. The nutrition facts on foods need to be transformed into a more efficient tool for consumers.

Significance of Front of Package label research

It has been determined in previous research that sex, income and education level are general indicators of nutrition label use (Campos et al., 2011). Many studies, including one conducted by Grahm and Laska (2012) show that labels are more likely to be used by individuals that already value healthy choices. Label use has been linked to healthy dietary intake. Factors about the label itself may also increase the likelihood of its use. Label size, color scheme and location can also increase or decrease the chance of a nutrition label being used (Bialkova & van Trijp, 2010). While price is also generally considered a major factor in the purchase of groceries, one study conducted in the UK found price did not have a negative effect on label use (Petrovici et al., 2010).

As stated before, obesity is a major problem in the United States, and many consumers believe the nutrition information provided on foods needs to be simplified. Many companies are currently using their own forms of simplified front of package labeling, but these labels are generally used as a marketing ploy and only highlight what

the producer wants them to. Companies do not want to only focus on the negative aspects of the product as a standardized labeling system might, but highlight positives they think will trigger customers to purchase the product. They are also not being included on all products produced by the companies. These labels need some regulation so that the wellbeing of the consumer is being emphasized as the number one priority.

The significance of this research is that there is still a very small amount of research available concerning front of package labeling in the United States. While marketing research is a very important tool in studying front of package nutrition labels, more nutrition researchers should take an interest in these labels. Front of package labels could be an important tool in nutrition education and prevention of obesity and chronic disease among consumers. This is why research should be conducted on these labels. Front of package labels should be transformed into something helpful, instead of being used by big companies to gain a profit. The health of Americans could greatly improve from modification of front of package labels.

Before a standardized labeling system can be created, it must be determined what labels consumers will be responsive to. Another question would be: what information are consumers most concerned about? What nutrients need to be included on a front of package label? A great deal of research still must be conducted to determine what consumers will actually look at and respond to.

CHAPTER III

METHODOLOGY

The methods and study design began with a preliminary study. The preliminary study consisted of qualitative research methods utilizing focus groups. The Institutional Review Board approved the study. It was exploratory in nature, and allowed the researchers to learn if there was a need to explore changes in nutrition information on foods.

Preliminary Testing and Focus Groups

To obtain preliminary data and to see if initial ideas could be transformed into a study, focus groups were organized to learn how, and if front of package labels influence the choices of consumers. The pretest consisted of four steps, and a laddering approach was used. The laddering design consisted of each step or "rung" of the ladder being more detailed, with the first "rung" being extremely general, and the final "rung" providing the answer to our main study questions.

Participants

Nineteen individuals who attended a large university in the south were recruited

to participate in the focus groups. A week of time was set aside and interested individuals were asked to provide availability so that actual meeting times could be set. Four sessions were scheduled. Group members were college-aged Design, Housing and Merchandizing students who were rewarded with extra credit for their participation. This sample was fairly homogenous, as it was composed mostly of eighteen to twenty nine year old female college students making their own food purchasing decisions. This sample was a convenience sample, as the study sessions took place on the campus the individuals were recruited from.

Focus Group Sessions

The focus group sessions were each about forty-five minutes long, with each of the four stages lasting from five to fifteen minutes. Each focus group had four to five participants. One individual was not able to attend after scheduled to do so because of personal reasons. Participants spoke often and openly. Individuals who seemed a little shyer were asked if they had anything to add, so they could stay active in conversations. In these instances, participants agreed with or repeated something another group member said, or provided new ideas and opinions.

Stage One

The group sessions began with the first stage, which consisted of preliminary questions on nutrition, nutritional concerns, nutrition fact labeling, and nutrition label use. The following are the questions asked:

- When grocery shopping, what influences the choices you make?
- What are your nutritional concerns when shopping?
- In your opinion, what makes a product healthy?
- How do you use nutrition labels?
- What aspects of nutrition labels are helpful to you? Is there anything you feel could be altered?

Stage Two

After the discussion portion was completed, participants were shown sixteen pictures of currently used front of package and supplementary nutrition fact information from all over the globe on PowerPoint slides. This slide section began with an instruction slide, which stated: " For the following slides, please write the first three words that come to mind when viewing this picture". They were given worksheets with the pictures on them and verbally asked to write the first three words that came to mind about each label on a provided worksheet. The students were given about thirty seconds of time to view each slide and write down three words. The principle investigator kept track of the time with a stopwatch. After the sixteenth slide viewing was complete, worksheets were collected.

Stage Three

Once they had completed the sixteen slides, participants were asked to look at another set of twenty pictures. These pictures were obtained from the local grocery store

and were taken of foods in the organic/natural foods section. The purpose of this was to provide a sample of some "real world" items. Pictures were mostly of cereals, muffins, and other frozen breakfast items. Some of the pictures were of the entire front of the box, some of highlighted nutrition information, and some of front of package nutrition labels. Participants were provided with the following instruction: "For the following slides, write two words about what you like most about the label, and write two words about what you like least about the label". The participants were then verbally prompted to write two things they liked about each picture, and two things they did not on a provided worksheet. About forty seconds were provided for each slide. Worksheets were collected at the end of the slide show, and the group session proceeded to stage four.

Stage Four

Stage four consisted of two steps. Participants were provided with a picture of an exploded box that depicted the top, bottom, front, back, left and right of a general packaged food box (See exploded box picture in the appendices). In the first step, the participants were asked to mark on the box where they would put a nutrition label, what size it would be, and were asked to put as many as they felt would be helpful and appropriate on the picture. They were given about sixty seconds to complete their label placement before the pictures were collected. Next, in the second step, participants were provided with another box picture and asked to draw where a nutrition label should be placed, and the size of the label. They were asked to only put one nutrition label on the box in this step. The participants were given sixty seconds to complete their label

drawing before the pictures were collected. This was the final activity completed in the focus groups. Therefore, upon completion participants were dismissed.

Preliminary Study Analysis

The results from the slideshows were assessed using Excel and SPSS to find trends. The transcribed focus groups were also assessed for repetition and similarities. What we find from these results will be used to compose a larger scale study that individuals completed on the Internet. The four components of our preliminary study provided some interesting results that require future study, and have therefore provided the preliminary design for our thesis-based study.

Stage One

Questions used in stage one were designed to obtain information about what the participants find important nutritionally (what would be most important to them on a front of package label), and what their opinions are of the current nutrition labels.

The focus group conversations were recorded and transcribed to text. They were then analyzed and organized in Excel to identify repetition and patterns of words. A preliminary coding scheme was used. Once the coding scheme was reviewed, a final codebook was made. Codes were collected and then coded by themes by the principal investigator. The themes were then mapped into a model and analyzed.

Once organized in Excel and mapped, the findings from stage one were examined. There were some areas of nutrition information that groups seemed to focus on a great deal. Calories were discussed often, and many said they looked at them on the nutrition facts panel. Carbohydrate grams were also brought up frequently. Study participants also said they used nutrition information to plan out grocery shopping trips ahead of time to meet their health goals. Also, participants expressed a desire to see improvements in the current nutrition facts panel. The following are comments from focus group participants:

S5: "You have to have an eighth grade reading level here, so they should write nutrition labels at that level"

S2: "If they were brighter colors I think people would notice them more. More visually appealing and I would pay more attention to them."

S5: "I think that how they have really small print what ingredients are in there like red dye 40 and stuff like that. I think that needs to be bigger. So that way people will know what's in their food."

Four main nutritional components discussed by participants were identified. They were fat, sugar, protein, and sodium. Preservatives and additives were also brought up

several times. The following are some quotes from participants related to nutritional components:

S3: "The energy you will have and I also look at the carbohydrates and fat content as well. I really don't look at the calorie content, in the end; it's what nutrition you are getting out of it. But if the carbs are really high I will try to stay away from that. But if it's a good kind of fat I will choose that food."

S1: "I focus on sugars as part of healthier choices and want low amounts of sugar. I try to look for things, like if I want something sweet I look for a piece of fruit and not a big chocolate bar with tons if sugar in it."

Group participants also discussed serving sizes often. Calculating portion information was the main aspect discussed. Participants mentioned that simplifying the way that serving sizes and portions are expressed would make nutrition labels easier to use. The following are direct quotes from participants concerning serving sizes:

S2: "I look at serving sizes. I mean, I think society as a whole doesn't know serving sizes, and I am really bad at it too, but I am trying to look at them more."

S5: "Sun Chips are my weakness. I was sitting there eating them and then I looked at the back and I realized I ate over half the servings."

S4: "I like to look at the serving size and see just how many servings are in the package. Like my boyfriend will cook the entire package and I tell him this is meant to feed six people and you need like half of that."

In each of the focus groups, there was one participant who said they did not particularly care about nutrition facts and did not use the information on packages. The following are quotes from some of the individuals who don't usually look at nutrition information:

S1: "Honestly, I never look at them."

S3: "I look at them if I am buying something new, but if I buy it often, I never look at it every time."

S4: "I don't pay much attention to the ingredients. I just buy what I like."

From the data collected a model was created (see appendices) of developing themes. The main theme of stage one was "Perceptions of Nutrition and Nutrition Labels". From the main theme seven categories were deciphered including: reference group, nutrition information, packaging, choices, usefulness, health matters, and ingredient focus.

Key words participants mentioned that classified for the category "reference groups" dealt with the influence of others. Some key influences included: mother's influence, family health matters, friends, and gender differences. Nutrition Information was broken down into three words. They were: calories, carbohydrates, planning. The packaging category had five qualifying key words/phrases. In this category they were: Label design, front of package, technology, what do the numbers mean, color matters. Label design was further broken down to the idea that label designs are "too complicated". Front of package was also further broken down with the phrase "positioning."

The category "Ingredient Focus" contained specific nutrients and ingredients of importance or concern to the focus groups. They included: fat, preservatives, sugar, protein, sodium, additives, artificial, and potassium.

"Health Matters" included the key words/phrases: Junk food, natural, allergies, compulsive eating, dieting weight, guilt, and fried. These words represented general health concerns the groups had when it came to food and nutrition.

"Usefulness" was only broken down into the key phrase "ease of use". However, this phrase was further broken down into the words: guideline, serving size, easy to read, easy to understand, and daily amounts.

The last category was "Choices". Key components of this category included: freshness, never read nutrition labels, knowledge, brand matters, price matters, quality, processed food fears, and local. These words factor into the choices the individuals in the focus groups made when it came to choices made in relation to food purchases.

Stage Two

The second component of the preliminary study consisted of the focus group members looking at slides of current front of package labels from around the world. The participants wrote down the first three words that came to mind for each label.

A model was created from the results centering on the theme "Nutrition Label Associations." Four categories emerged from the focus group responses. They included: Label Design, Nutrition Information, Ingredient Focus, and Healthy Matters. Key words/phrases that stood out to participants that classified for the "Label Design" category included: bright colors, easy to understand, low to high, simplicity, symbols, informative, and large font.

"Nutrition Information" components important to the participants were: calories, low to high, serving size, and standards. Key nutrients included in "Ingredient Focus" were: fat, sodium, sugar, fiber, whole grain, and protein. Phrases included in "Healthy

Matters" were: marketing to children, choose healthy, heart health, and lifestyle. The "calorie" theme in the "nutrition Information" category centered on the way participants use caloric information to make decisions on what foods they consume daily. Participants understood that consuming over their individual calorie requirements could lead to negative results such as health complications and obesity.

Stage Three

The third component consisted of the focus group participants observing pictures of different front of package labels taken in the natural/organic section of a local grocery store. The participants wrote two words/phrases that they liked about the label, and two they disliked about the label. The results are represented in the model titled "FOP Label Associations". The model was first broken down into the categories "Likes" and "Dislikes" because the participants were asked to reflect on what they liked and disliked about each label. Participants were more reflective on what they didn't like about the labels compared to what they did like.

The "Likes" category was broken down into five categories. They included: Ingredients, Bright Colors, Easy to Read, Low to High Indicators, and Health Matters Terms. "Ingredients" was further broken down into: Whole Grain, Gluten Free, Protein, Fiber and Vitamins. "Low to High Indicators" was also broken down into key phrases including: Low Fat, Low Sugar and Low Sodium. "Health Matters 'Terms'" had four key phrases including: Healthy, Natural, Organic, and Non GMO.

Stage Four

The fourth component of the preliminary focus groups was the exploded box picture. This stage was meant to observe the participants' nutrition labeling preferences based on the many examples given in stages two and three, as well as the discussions of stage one. Participants were given two identical pictures. On the first picture, participants were asked to draw the number of labels they thought should be present on food products. Participants could make them any size as well.

After compiling the results, it was observed that when one or more labels were present; participants liked the idea of labels being present on the front of the package, and located in the lower right corner of the packaging. However, this front of package interest was not as strong as the desire for a single, large back of package label. What these findings revealed to us was participants feel front of package labels are a nice addition to packaging and are convenient, but the back of the package is a more appropriate place for labels.

On the second box picture they were asked to identify where and how a label should appear if only one was allowed on a product. When the results from the focus groups were compared, it was observed that participants seemed to prefer a label on the back of a package that would take up half, or all of the space. The lower right corner of the package was the favorite for the majority as far as label placement. When only one label was allowed, participants did not show a great deal of favor toward labels on the front of the package. The fact that the participants desire for a label to take up half or all of the back of a package suggests a need for an increase in font size, or the information provided should increase. There is a great deal of research that still needs to be done to fully understand what consumers prefer in relation to label placement and size.

Upon compiling all of the focus group data results, it was found that four major areas seemed to influence consumer perceptions of nutrition information labeling. We mapped out these influential areas in a model. They include: attitudes and emotions about food, the health impact of the food, seeking out particular nutrition information, and the perceived usefulness of a label. It was also apparent that words such as "natural" and "organic", as well as words such as "low" or "high" were influential to the participants when determining healthfulness. Color, used in the front of package labels, as well as ease of use also influenced the participants.

Where our Preliminary Study Lead

What these findings revealed to us is that while participants feel a front of package label would be a nice addition if more than one label is present on an item, the back of the package is still ideal if only one label is present. These findings support the previously discussed study by Wansink (2003) in which he found having a short health claim present on the front of the package along with the full nutrition information on the back allowed consumers to process the information more effectively (Wansink, 2003). It is obvious, however, most would like to see the back of package label to be more prominent than the current nutrition facts label.

All of the findings from the preliminary focus group study were used to create the next component of the study and determine its focal point. After reviewing the word repetition data and the box picture data, it was felt individuals are not particularly concerned with front of package labeling. The main focus of the individuals in the focus

groups turned out to be actual nutritional composition of food sources, the ease of label use, and how the nutrition information was relayed to the consumer. Having a label on the front did not come up often in the written, or spoken portions of the focus groups. Therefore, for the second portion of the study, it was chosen to focus on the simplification and improvement of traditional back of package nutrition facts labels. By doing so, it was hoped that consumers would use the information more often, and that the information provided would influence consumers to make more healthful choices.

Part Two: Improving the Nutrition Facts Panel

The Elaboration Likelihood model (ELM) is the theory chosen to explore the main study. Richard Petty and John Cacioppo created this model (Wilson, 2007). According to Barbara J. Wilson, "The ELM posits that variations in persuasive effect are a function of how people process information and the degree to which they engage in elaboration or issue-relevant thinking" (Wilson, 2007, S14). This model has two groups into which individuals are categorized for their need for cognition. The first is the "central" route of thinking. This route requires a higher level of thinking and involvement, or high elaboration. Individuals are more likely to fall into this category when the topic being presented is relevant to them (Wilson, 2007). The second group includes those who think in a "peripheral", or low elaboration manner. These individuals tend to want things to be simple, or use some type of "cognitive shortcut" to assess the information (Wilson, 2007). What the ELM tends to reveal is that when central processing occurs, individuals are more likely to maintain what they have learned over

time, but if peripheral processing occurs the habits or opinions of individuals are more likely to change in the future. Therefore, individuals in the field of nutrition should attempt to make an impact on central thinking to maintain habit or attitude change (Wilson, 2007). The Elaboration Likelihood model was chosen to create the hypotheses of the study. For the completed thesis project, the focus was on the following hypotheses:

H1: Need for cognition will demonstrate a direct positive relationship to evaluation of potential outcomes.

H2: Health consciousness will demonstrate a direct positive relationship to evaluation of potential outcomes.

H3a: Health consciousness will demonstrate a direct positive relationship to the "evaluate" and "positive outcome" factors of the evaluation of potential outcomes scale.

H3b: Health consciousness will demonstrate an inverse relationship to the "negative outcome" focus factor.

H4a: Need for cognition will demonstrate a direct positive relationship to the "evaluate" and "positive outcome" factors.

H4b: Need for cognition will demonstrate an inverse relationship to the negative outcome focus factor.

H5a: The interaction of treatment type (control, calories, percentage) and need for cognition will demonstrate a direct positive relationship to evaluation of potential outcomes.

H5b: The interaction of treatment type (control, calories, percentage) and health consciousness will demonstrate a direct positive relationship to “evaluate” and “positive outcome” factors.

H5c: The interaction of treatment type (control, calories, percentage) and need for cognition will demonstrate an inverse relationship to the “negative outcome” focus factor.

H6a: The interaction of treatment type (control, calories, percentage) and health consciousness will demonstrate a direct positive relationship to evaluation of potential outcomes.

H6b: The interaction of treatment type (control, calories, percentage) and health consciousness will demonstrate a direct positive relationship to “evaluate” and “positive outcome” factors.

H6c: The interaction of treatment type (control, calories, percentage) and health consciousness will demonstrate an inverse relationship to “negative outcome” focus factor.

Research Hypothesis: Between subject samples (control, calories, percentage) there are differences in at least one pair of means in need for cognition and health consciousness score across the three classes on elaboration of potential outcomes.

Null Hypothesis (H0): In the population from which the samples were drawn, there are no differences in mean elaboration of potential outcomes across the three subject samples (control, calories, percentage).

A manipulation check for our study was chosen to ensure credibility and reliability. Dimensions of source credibility include expertise, bias and attractiveness. These components can influence how a reader or study participant receives a message (Slater & Rouner, 1996). We took questions created by Slater and Rounder and re-worded them to apply to our study.

Part Two: Methodologies

The analysis of the focus groups revealed participants were concerned with calories, fat, sugars and protein. The researchers considered what products would be best to present on a survey. The researchers felt it would be helpful to choose items without a large amount of servings. Crackers were first considered, but finding convenience portions that represented a wide range of healthfulness was difficult. Therefore, bottled beverages were an excellent choice, as smaller portions are easy to find, and a wide range of healthfulness was available. Choosing products that are familiar to the consumer was the next step. After some consideration two types of milk, two types of juice, and two types of bottled smoothie style drinks were chosen.

The survey data was collected using Qualtrics. Qualtrics is software that allows for online data collection and analysis. The survey was posted online through Amazon Turk and 951 participants were permitted to complete the survey online. 937 individuals

fully completed the survey. The survey consisted of pre-exposure questions, exposure to a product and label, and a posttest. Participants of the online only survey group were compensated with a $1.00 payment for each completed survey.

Participants were exposed to one of three conditions. Each condition was chosen at random. The first condition was a control. This condition consisted of each of the six beverages with the current nutrition facts, and a post-test. The second condition consisted of the beverages with the nutrition facts label and a supplemental nutrition information panel with the caloric breakdown of the beverage, and the posttest. The second condition related to the ELM was believed to appeal to individuals of low elaboration, as it simplifies how one thinks about caloric breakdown of the drinks. The third condition contained the products with the nutrition facts label and a summary of macronutrient recommendations that shows what percent of each should be consumed on a daily basis followed by the posttest. The third condition relates to the ELM because the researchers believed it would likely appeal to individuals of high elaboration. This is because one generally must take more time to process and understand percentages. Completing mental math to calculate the percentage of something consumed can take a considerable amount of time. Recommended macronutrient amounts were obtained from the Dietary Guidelines for Americans (U.S. Department of Agriculture & U.S. Department of Health and Human Services, 2010). The nutrition facts labels were created using the free nutrition label generator at http://www.onlinelabels.com/label-generator-tools/Nutrition-label-generator.aspx, and the supplemental summary information was created with Microsoft Publisher.

Existing scales were used to assess nutrition/health awareness and literacy. The first scale used was the Elaboration of Potential Outcomes Scale (the EPO scale), created by Nenkov, Inman and Hulland (Bearden et al., 2011). This scale is a:

> "Generalized predisposition toward thinking about consequences, specifically, it captures the degree to which individuals: 1) generate potential consequences of their behaviors; 2) evaluate the likelihood and importance of these consequences; 3) encode anticipated end states, with a positive focus; 4) encode anticipated end states with a negative focus" (Bearden et al., 2011, 222).

The EPO scale is separated into three parts. The first six questions are considered the "Generation/Evaluation Dimension". The second part is the "Positive Outcome Focus Dimension" and it consists of three questions. The last section is the "Negative Outcome Focus Dimension" and it contains four questions.

Nenkov, Inman, and Hulland (2011) created the Elaboration of Potential Outcomes scale in 2008 (Bearden et al., 2011). These questions were considered helpful to the project because nutrition choices are often made based on how an individual considers the possible outcomes of consuming a particular food item. An individual may consider what happens if they choose foods high in fat or sugar (obesity, diabetes, heart disease), or they may consider what occurs when healthful choices are made (weight loss/maintenance, strong bones, low cholesterol, decreased cancer risk, etc.). The researchers were also interested to learn if positive thinkers (determined by the "Positive Outcome Focus Dimension") responded differently to our intervention than negative thinkers (determined by the "Negative Outcome Focus Dimension").

To validate the Elaboration of Potential Outcomes scale, Nenkov, Inman and Hulland (2011) used seven samples. The number of participants in each group was 260, 367, 383, 97, 160 and 302. Across the samples, "coefficient alpha estimates of internal consistency ranged from 0.61 to 0.89 across the three dimensions (of the scale)" (Bearden et al., 2011, 222). There was correlation between the three dimensions of the scale from "0.01 to 0.64 in absolute value across samples and showed evidence of discriminant validity from one another" (Bearden et al., 2011, 222).

The second scale chosen was the Health Consciousness Scale (HCS) created by Gould in 1988 (Bearden et al., 2011). This scale allows the researcher to understand a participant's involvement in his or her own health. This scale consisted of nine questions. This scale was relevant to the study because those who take health into consideration likely focus on nutrition, as most health related problems are nutrition related.

A third scale used was the Need for Cognition Scale. Cacioppo and Petty created this scale in 1982 (Cacioppo & Petty, 1982). The purpose of this scale is to assess if a person has a tendency to enjoy the process of thinking and be engaged in it (Cacioppo & Petty, 1982). The Need For Cognition scale is an eighteen-item scale (Cacioppo et al., 1984). This scale was chosen because it can play a role in determining high and low elaboration. An individual who is a high elaboration thinker likes to think things through. Therefore, this scale allowed the potential to determine if a participant was a high or low elaboration thinker.

To determine if an individual was of high or low elaboration, we used a scale graded using numbers one through four (strongly agree to strongly disagree). A choice of

one or two classified an individual as low elaboration. A choice of three or four classified the participant as high elaboration. The questions that determined high or low elaboration were the questions used from the previously mentioned Elaboration of Potential Outcomes Scale and the Health Consciousness Scale.

Survey questions were also drawn from the 2012 Food and Health Survey from the International Food Information Council Foundation. Mathew Greenwald and Associates conducted this survey (Greenwald and Associates, 2012). They used Research Now's consumer panel. Finally, questions from the 2013 Behavioral Risk Factor Surveillance System Questionnaire (BRFSS) (Centers for Disease Control and Prevention, 2013) were used. All of the survey questions obtained from each source will be answered by participants using a scale of strongly agree, agree, neutral/no opinion, disagree, and strongly disagree.

To test the hypothesized model, a one-way ANOVA and multiple comparisons test was utilized. Amazon Turk assigned the three groups randomly and participants were exposed to one of the three nutrition label conditions (calorie summary, control, percentages). Each participant reviewed 5 nutrition labels for beverages before completing the post-test survey. The survey was used to measure the theoretical constructs of elaboration likelihood though the use of the elaboration of potential outcomes scale, the health consciousness scale, and the need for cognition scale. A one-way analysis of variance (ANOVA) was conducted on the mean elaboration of potential outcome scores for the entire scale, and on each of the scale's three components. The three components are evaluate, positive outcome, and negative outcome.

The subject's estimates of the elaboration likelihood for nutrition information stimuli were tested with a factorial ANOVA of three multi label groups (control, percentage, calories) by five (very low to very high) need for cognition ratings by five Health Consciousness (very low to very high) scales that measure the impact of theorized dimensions on the elaboration of potential outcomes as a whole. The three nutrition label group estimates were then compared to each of the three components of the elaboration of potential outcomes (evaluate, positive outcome, negative outcome) using a factorial ANOVA.

Table 5 depicts scale means, standard deviations, and Cronbach's Alpha Reliabilities. Cronbach's Alpha is used to analyze the reliability of scales. It is a measurement of internal consistency and can be expressed as a function of the number of total test items, and the average inter-correlation between them. An alpha coefficient is then produced, ranging from zero to one. The closer to one, the more accurate the scale is. Values and items greater than .70 are considered reliable measures. As Table 5 depicts, all items and scales used were greater than .70.

CHAPTER IV

FINDINGS

A total of 937 participants completed the survey on Amazon Turk. 52.4% of the participants were male and 46.2% were women (Table 1). Participants varied in age. The majority fell into the 20 to 24, 25 to 34 and 35 to 44 ranges. 30.3% had attended some college, 37.1% had obtained a 4-year college degree and 10.2% had completed a masters program. For income, 29.2% of participants made below $20,000 per year, 15.5% made between $20,000 and $29,000 and 15.5% made between $30,000 and $39,000.

The first group of participants (control) reviewed standard FDA nutrition labels M=25.38, SD=4.70, for the evaluate scale. The second group viewed the standard FDA label along with a simplified calorie chart that broke down where all of the calories came from in the beverages. M=26.20, SD=4.03 for the evaluate scale. The third group was exposed to the standard FDA label with a supplementary chart that summarized daily recommendations of macronutrients for different age groups M=25.29, SD=4.79. This analysis produced a significant ANOVA, $F(3.95,2)=19.16$, $p<0.05$, indicating that there were differences in these means. Eta squared was .33, indicating a moderate effect size. Multiple comparisons with Tukey's HSD test revealed that differences exist among pairwise comparisons of means with

mean for the calorie group being the highest, the mean for the control group in the middle, and the mean for the percentage group being the lowest. Thus, the null hypothesis is rejected. This study produced support for the idea that the best method of conveying nutrition label information is the percentage method for individuals who prefer to evaluate potential outcomes, have a greater need for cognition and a higher health consciousness.

Table 4 shows the condition means, standard deviations and sample sizes for the different treatment groups, for the Elaboration of Potential Outcomes scale and the component factors of the scale: evaluate, positive outcome, and negative outcome scales. The combined evaluation of potential outcomes scale mean scores for health consciousness varied from M=44.69, SD=6.51 (percentage) to M=45.82, SD=7.31(calorie) in the very low category to M=52.99, SD=7.68 (percentage) to M=53.16, SD=7.69 (control) in the very high category. Similar means were demonstrated for the combined evaluation of potential outcomes scale means for need for cognition with mean scores ranging from M=45.3, SD=6.47 (percentage) to M=49.68, SD=5.41 (calorie) in the very low category to M=48.94, SD=53.59 (control) to M=53.59, SD=7.41 (percentage) in the very high category. The component factor evaluate demonstrated similar results in the very low to very high categories of health consciousness, M=21.54, SD=4.83 (very low) to M=30.51, SD=3.15 (very high). The positive outcome focus means varied from M=10.36, SD=2.86 (calorie) to M=12.14, SD=2.10 (calorie) health consciousness and M=10.43, SD=2.46 (low percentage) to M=11.89, SD=2.81 (very high percentage need for cognition. The means for the negative outcome focus demonstrated an inverse relationship with health consciousness ranging from M=13.06, SD=2.89 (very

low control) to M=11.11, SD=2.81(very high percentage) and need for cognition M=12.98, SD=3.13 (very low calorie) to M=11.00, SD=4.23 (very high control).

Table 2 presents the factorial ANOVA source table. The analysis was designed to assess the effects of treatment type, need for cognition, and health consciousness on the participants' degree of elaboration likelihood using the EPO scale, and on the separate components of elaboration likelihood (evaluation, positive outcome focus, and negative outcome focus). The ANOVA revealed a significant interaction between treatment type and need for cognition $F(8,883)=2.38$, $p<0.05$ and for treatment type and health consciousness $F(8,883)=2.41$, $p<0.05$ on evaluation of potential outcomes. When examining the different components of the EPO scale, the evaluate portion demonstrated no significant interaction effects between treatment and health consciousness or need for cognition. No significant relationships were found between treatment and need for cognition and health consciousness on negative outcomes. However, there was a significant relationship between treatment and need for cognition $F(8,884)=2.12$, $p<0.05$ and treatment and health consciousness $F(8,884)=3.71$, $p<0.05$ for the positive outcome factor.

As predicted a main effect of need for cognition was observed for the combined evaluation of potential outcomes scale and for the evaluate and negative outcome focus scales during a one-way ANOVA. The relationship between need for cognition and positive outcome focus was not significant. The main effect of need for cognition on evaluation of potential outcomes yielded an F ratio of $F(4,943)=3.82$, $P<0.01$. The main effect of need for cognition on evaluate yielded an F ratio of $F(4,943)=11.91$, $p<0.001$. The main effect of need for cognition on negative outcome focus was not significant.

A similar main effect was observed for subjects reported health consciousness on evaluation of potential outcomes, the elaborate factor and the positive outcome factor. The main effect of health consciousness on evaluation of potential outcomes was not significant. The main effect of health consciousness on the evaluate factor yielded an F ratio of $F(4,944)=4.78$, $p<0.001$. The main effect of health consciousness on positive outcome focus was $F(4,944)=3.71$, $p<0.01$. The relationship between health consciousness and negative outcome focus was not significant.

Most central to the purpose of this study was the observation of a statistically significant interaction between the calories and percentage label modifications by need for cognition on evaluation of potential outcomes. Similarly, statistical significance was observed between calories and percentage label modifications and health consciousness on evaluation of potential outcomes. The component factor scale for subjects positive outcome focus produced similar statistically significant interactions between calories and percentage label modifications and need for cognition on positive outcome focus. Similar statistically significant interactions were observed in the relationship between calorie and percentage modifications and reported health consciousness on positive outcome focus.

Tukey post hoc tests were used to determine differences among groups using the hypothesized dimensions. For the evaluation of potential outcomes entire scale, statistically significant differences were observed between the calorie and percentage label modifications. When the entire scale was considered, calories were preferred to the percentage label. Similar differences were observed between the calorie and control conditions (Mean Difference -0.799 $p<0.05$) and percentage and calorie conditions (Mean

Difference -0.908, $p<0.01$) for the evaluate factor. Tukey post hoc tests for the positive and negative outcome factors were not statistically significant.

CHAPTER V

CONCLUSION

On February 27, 2014, the Food and Drug Administration presented possible updates to the Nutrition Facts label on packaged food items. These future labels will reflect serving sizes more accurately to the amount of food consumers tend to consume, and will focus on key areas including the serving sizes and calories. Calorie information would be in a larger font (Eisenman, 2014). These new revisions proposed by the Food and Drug administration reflect some of the feedback we received from participants in our pilot qualitative study.

Recalling some of the recorded quotes from participants, they focused greatly on calories. Therefore, the recommendation to increase the font size of calories on the FDA label was supported by our findings. Participants also said that print should be larger. The FDA plans to increase the font size of key components. Lastly, many participants were not happy with the way serving sizes are presented on the current Nutrition Facts label. They often ate more than the serving size listed, or did not really understand how to translate the form (ounce, cup, 2.5 servings) into what they were actually consuming.

The new recommendations by the FDA propose that both “per serving” and “per package” be presented on food items that contain multiple servings, and change serving sizes to more accurately reflect current consumption trends. Overall, the fact that findings support the recommendations proposed by the FDA supports the fact that these changes are needed, and could possibly have a positive impact on the nutritional status of Americans.

Upon completion of the second study, it appears behavioral makeup (negative thinker, positive thinker, evaluator), degree of health consciousness and need for cognition of an individual could impact their perception of labels. However, further research is needed to confirm this. Upon the completion of our analysis, we also observed that presenting nutrition label information by providing the percentage chart to individuals who prefer to evaluate potential outcomes, have a greater need for cognition and a higher health consciousness may be effective. More research is required to support this observation.

A study conducted by Barone et al. (1996) concluded that the percent daily values would be of greater use to individuals who tend to evaluate a product in relation to their everyday diet (Barone et al., 1996). This finding is in line with this as those with a higher health consciousness, a greater need for cognition and an increased tendency to evaluate potential outcomes were more perceptive to the percentage chart created to compliment the %DVs on the Nutrition Facts panel. These findings also support the findings of Viswanathan & Hastak (2002), who found that while %DVs might be helpful to consumers alone; the information could be enhanced if summary information was also provided (Viswanathan & Hastak, 2002).

A study in which nutrition information was presented to participants in different formats (additional information panels, multiple columns, or verbal descriptors) revealed that participants did not perceive the additional information effectively because it was not similar to what the standard FDA label looked like. It also was like information the standard label provides (Levy et al., 2006). Perhaps those with a higher need for cognition, high health consciousness, and those who evaluate potential outcomes responded well to the percentage chart because it elaborated on the %DV information already present on the Nutrition Facts panel. It is also likely certain participants preferred the percentage chart because it followed the same format (font, font size, layout) as the standard FDA label. In 1999, Guthrie, Derby and Levy found that %DV on the Nutrition Facts panel positively affected dietary management for consumers. It seems that the addition of a percentage breakdown chart would benefit dietary management even further for some of the American population.

As mentioned in chapter four, individuals seemed to prefer the calorie chart when we first assessed the entire Elaboration of Potential Outcomes, and in the evaluate portion of the scale. However, it seems there may have been a dilution effect when the entire scale was combined. Therefore, further research is needed to understand if a dilution effect occurred, or if a calorie chart is preferred.

Limitations

Several limitations were encountered throughout the course of this study. First, the sample used for our preliminary qualitative study, as well as our larger quantitative study were not representative of the entire U.S. population. The preliminary study group

was recruited from a college campus. Participants were entirely female and were between the ages of eighteen and twenty-nine.

In the quantitative study, the participant population was split fairly evenly between male and female. However, many of the participants were between twenty-five and thirty four (42.1%), with the second greatest amount of participants being between twenty and twenty-four (21.7%). In both studies, the middle aged/older U.S. population was not well represented. In the quantitative study the majority of participants had completed some college or obtained a four-year degree. This means those who have obtained a high school diploma/GED, have completed less than high school, or have obtained a Masters Degree or higher were not well represented. Most participants in the quantitative study made below $39,999 per year and below $20,000 per year. Therefore, individuals in the U.S. population who make $40,000 and over were not represented well. Lastly, as the online survey was a paid survey, it is possible that response bias, or the act of participants responding to questions in a manner they believe will please the questioner, could have occurred.

Future Research Implications

The findings from this study leave a great deal of room for the completion of future research. First, while it was found that the percentage chart appealed to high health conscious individuals who prefer to evaluate potential outcomes and have a greater need for cognition, further study is needed to learn what type of label would appeal to a wider range of people. Secondly, a large-scale study that more fully represents the entire U.S. population would allow us to see if the results relate to other groups of people. Another

area that could be further explored is how the percentage chart is perceived when shown alongside the new FDA proposed label.

Lastly, Studies that mirror our methods are needed. It is imperative to learn if the calorie chart (or a similar stimulus) would benefit consumers. It would also be beneficial to learn if the percentage chart (or a similar stimulus) is ultimately effective for individuals who are high evaluators, highly health conscious, and have a high need for cognition.

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TABLES

Table 1
Socio-demographic characteristics of the participants

	n=937 (%)
Gender	
Male	52.4
Female	46.2
Age	
18 to 19	2.1
20 to 24	21.7
25 to 34	42.1
35 to 44	16.0
45 to 54	9.1
55 to 64	6.5
65 or over	1.2
Education	
Less than High School	.5
High School/GED	8.5
Some College	30.3
2- year College Degree	9.4
4-year College Degree	37.1
Masters Degree	10.2
Doctoral Degree	1.2
Professional Degree (JD, MD)	1.5
Income	
Below $20,000	29.2
$20,000 - $29,999	15.5
$30,000 - $39,999	15.5
$40,000 - $49,999	10.7
$50,000 - $59,999	9.7
$60,000 - $69,999	6.7
$70,000 - $79,999	4.5
$80,000 -$89,999	2.4
$90,000 or more	4.4

Table 2

ANOVA's of treatment

	EPO Scale			Evaluate			Negative Outcome			Positive outcome		
(a)	*F*	*P*	Partial Eta Squared	*F*	*P*	Partial Eta Squared	*F*	*P*	Partial Eta Squared	*F*	*P*	Partial Eta Squared
Treatment	2.094	.124	.005	4.618	.01*	9.235	.058	.944	.000	.071	.931	.142
Need For Cognition (NC)	3.823	.004**	.017	11.91	.000***	47.639	1.842	.119	.008	1.495	.202	5.978
Health Consciousness (HC)	1.089	.361	.005	4.784	.001**	19.135	.689	.600	.003	3.707	.005**	14.829
Treatment x NC	2.412	.014*	.021	1.601	.120	12.811	1.263	.260	.011	2.121	.032*	16.968
Treatment x HC	2.378	.015*	.021	1.872	.061	14.978	.913	.505	.008	2.065	.037*	16.522
NC x HC	.894	.577	.016	1.104	.346	17.669	.673	.822	.012	.933	.531	14.921
Treatment x NC x HC	.739	.780	.016	.580	.922	11.022	.412	.988	.009	.705	.816	13.401

Note: *p< .05 ** p< .01 *** p<. 001

Table 3. Post Hoc Comparisons of the effects of health conciousness and need for cognition scale means on dependent variables.

Variable	Scale	Evaluation of Potential Outcomes (EPO)	Evaluate Factor	Positive Outcome Focus Factor	Negative Outcome Focus Factor
Health Consciousness	Very Low	45.41*	22.38*	n.s.	n.s.
	Low	n.s.	23.89*	n.s.	n.s.
	Moderate	n.s.	26.17*	n.s.	n.s.
	High	n.s.	27.53*	n.s.	n.s.
	Very High	53.38*	30.17*	11.67*	n.s.
Need for Cognition	Very Low	42.50*	23.38*	n.s.	n.s.
	Low	n.s.	n.s.	n.s.	n.s.
	Moderate	n.s.	n.s.	n.s.	n.s.
	High	n.s.	n.s.	n.s.	n.s.
	Very High	52.78*	28.19*	n.s.	n.s.

*p<.05

Table 4. Means, standard deviations and sample sizes for experimental groups: control, calorie, and percentage label variations

Elaboration of Possible Outcomes Scale

Treatment		Control n=316			Calorie n=308			Percentage n=322		
Health Consciousness		MEAN	SD	N	MEAN	SD	N	MEAN	SD	N
	Very Low	45.67	6.89	39	45.82	7.31	55	44.69	6.51	45
	Low	45.73	5.95	91	48.66	5.86	100	46.92	6.56	87
	Moderate	49.21	6.26	102	49.68	5.49	83	49.02	6.14	86
	High	49.91	6.26	47	51.07	6.75	57	49.99	6.82	51
	Very High	53.16	7.69	37	54.29	7.54	28	52.99	7.68	41
Need for Cognition										
	Very Low	48.53	5.67	36	49.68	5.41	20	45.3	6.47	108
	Low	47.45	6.61	82	48.68	6.84	96	47.64	6.1	85
	Moderate	49.31	5.27	78	49.21	6.73	84	51.23	5.27	41
	High	47.88	6.92	77	49.93	7.24	86	50.95	6.92	30
	Very High	48.94	7.41	43	49.63	5.44	324	53.59	7.41	44

Evaluate (Factor)

Treatment		Control n=316			Calorie n=308			Percentage n=322		
Health Consciousness		MEAN	SD	N	MEAN	SD	N	MEAN	SD	N
	Very Low	21.54	4.83	39	23.24	4.59	55	22.07	4.33	45
	Low	23.36	3.77	91	25.24	3.49	100	22.90	4.29	87
	Moderate	25.98	4.09	102	26.56	3.15	83	26.11	3.36	86
	High	27.12	3.75	47	28.35	2.96	57	26.98	4.41	51
	Very High	30.51	3.15	37	29.89	3.62	28	30.05	4.07	41
Need for Cognition										
	Very Low	25.47	4.48	36	25.65	3.28	20	22.27	4.35	108
	Low	24.24	4.8	82	4.02	84	96	25.25	3.66	85
	Moderate	25.76	4.44	78	26.05	4.02	84	26.65	3.28	41
	High	25.17	4.88	77	27.05	3.9	86	26.65	4.55	30
	Very High	27.14	4.37	43	26.18	4.02	324	30.43	3.79	44

Table 4 Continued

Positive Outcome Focus (Factor)

Treatment		Control n=316			Calorie n=308			Percentage n=322		
Health Consciousness		MEAN	SD	N	MEAN	SD	N	MEAN	SD	N
	Very Low	11.08	2.23	39	10.36	2.86	55	10.51	2.49	45
	Low	10.74	2.53	91	10.94	1.91	100	11.05	2.28	87
	Moderate	10.88	2.22	102	11.08	2.36	83	10.7	2.31	86
	High	11.14	2.45	47	10.93	2.84	57	10.82	2.78	51
	Very High	10.9	3.06	37	12.14	2.1	28	11.83	2.82	41
Need for Cognition										
	Very Low	11.00	2.42	36	11.05	1.71	20	10.55	2.39	108
	Low	10.82	2.38	82	10.84	2.44	96	10.43	2.46	85
	Moderate	10.92	2.56	78	10.89	2.51	84	11.61	2.15	41
	High	10.95	2.34	77	11.09	2.6	86	11.47	2.46	30
	Very High	10.8	2.72	43	10.98	2.23	324	11.89	2.81	44

Negative Outcome Focus (Factor)

Treatment		Control n=316			Calorie n=308			Percentage n=322		
Health Consciousness		MEAN	SD	N	MEAN	SD	N	MEAN	SD	N
	Very Low	13.06	2.89	39	12.22	4.29	55	12.11	3.48	45
	Low	11.63	3.77	91	12.48	3.19	100	12.98	3.81	87
	Moderate	12.35	3.41	102	12.04	3.32	83	12.21	3.29	86
	High	11.91	3.68	47	11.79	4.04	57	12.19	3.94	51
	Very High	11.51	4.29	37	12.25	3.85	28	11.11	4.14	41
Need for Cognition										
	Very Low	12.06	3.77	36	12.98	3.13	20	12.48	3.77	108
	Low	12.38	3.42	82	12.45	3.62	96	11.95	3.44	85
	Moderate	12.63	3.49	78	12.27	3.53	84	12.98	3.38	41
	High	11.77	3.46	77	11.79	3.89	86	12.83	4.09	30
	Very High	11.00	4.23	43	11.64	3.49	38	11.27	4.07	44

Table 5. Scale Means, Standard Deviations, and Cronbach's Alpha Reliabilities

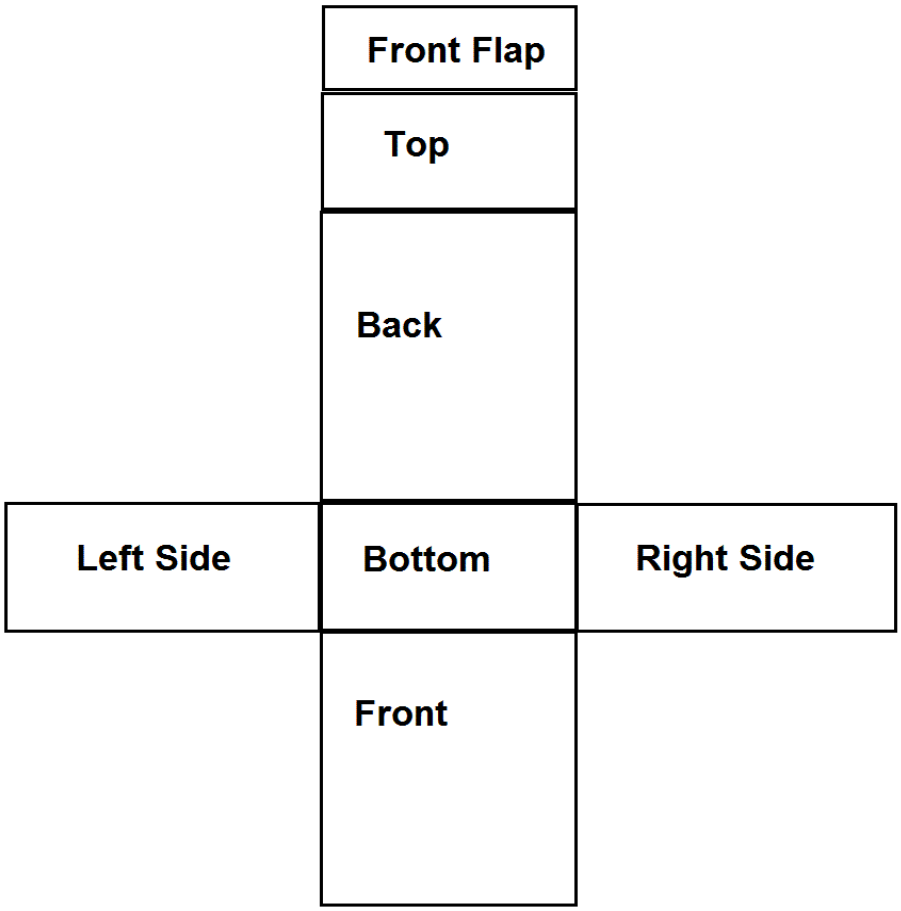
	Item	Mean	SD	Item (Alpha)	Scale (Alpha)
Evaluate	EVAL1	3.63	1.08	0.83	0.80
	EVAL2	3.53	1.06	0.82	
	EVAL3	3.51	1.01	0.79	
	EVAL4	3.94	0.735	0.81	
	EVAL5	3.79	0.82	0.8	
	EVAL6	3.65	0.897	0.79	
	EVAL7	3.58	1.06	0.77	
Negative Outcome Focus	NEGOUT1	2.78	1.05	0.88	0.86
	NEGOUT2	3.03	1.15	0.87	
	NEGOUT3	3.44	1.08	0.84	
	NEGOUT4	2.92	1.11	0.85	
Positive Outcome Focus	POSOUT1	3.6	1.011	0.79	0.81
	POSOUT2	3.68	0.951	0.82	
	POSOUT3	3.66	0.916	0.83	
Health Consciousness	HC1	3.62	1.01	0.9	0.89
	HC2	3.45	1.1	0.93	
	HC3	3.74	0.864	0.88	
	HC4	3.3	1.11	0.86	
	HC5	3.99	0.705	0.88	
	HC6	4.05	0.678	0.88	
	HC7	3.75	0.829	0.92	
	HC8	4.11	0.683	0.89	
	HC9	3.62	0.976	0.89	

Table 5 Continued

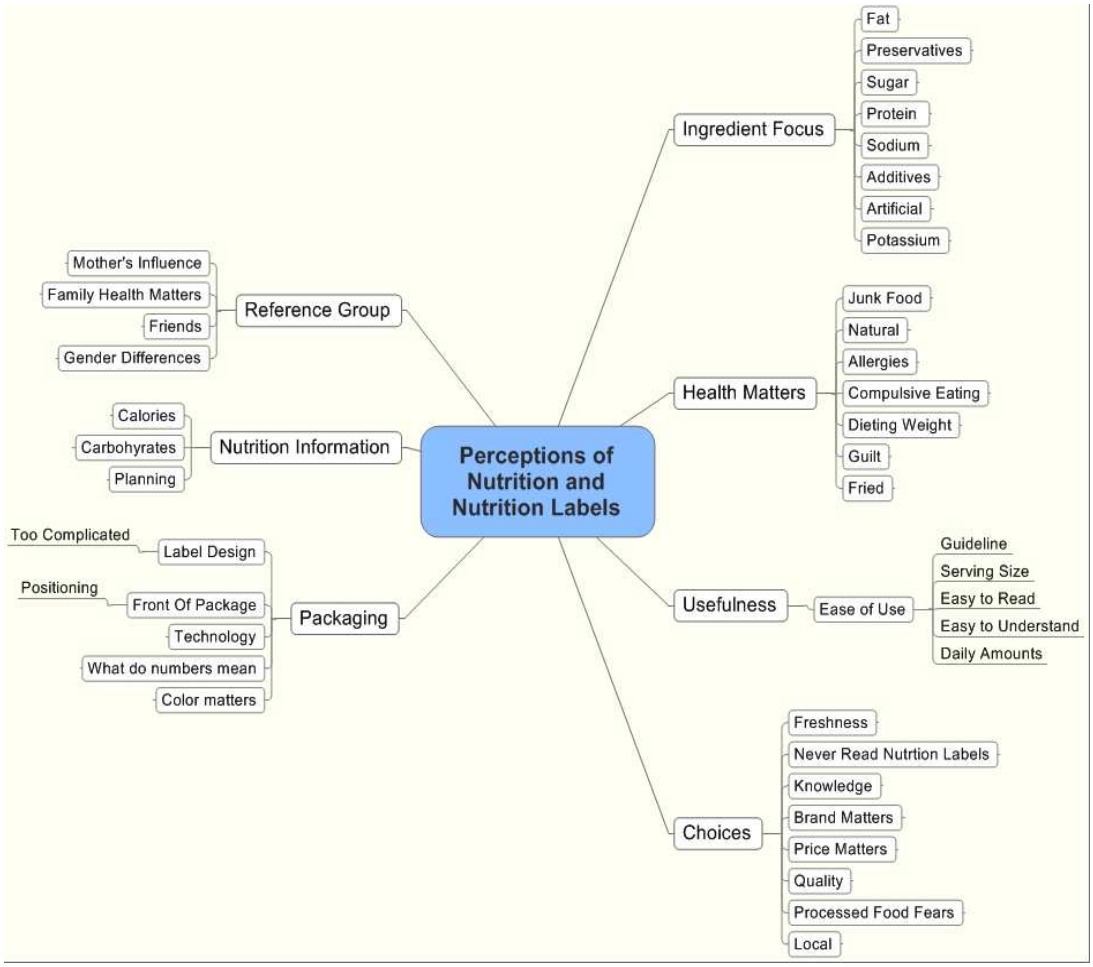
Item		Mean	SD	Item (Alpha)	Scale (Alpha)
Need for Cognition	NC1	3.02	4.54	0.89	0.91
	NC2	3.09	3.55	0.93	
	NC3	1.9	1.46	0.92	
	NC4	2.04	0.958	0.9	
	NC5	1.82	0.885	0.9	
	NC6	2.89	4.68	0.88	
	NC7	2.11	0.942	0.93	
	NC8	2.4	0.918	0.92	
	NC9	2.34	0.929	0.91	
	NC10	3.33	4.92	0.88	
	NC11	3.36	3.71	0.87	
	NC12	1.75	0.908	0.93	
	NC13	2.9	2.79	0.91	
	NC14	3.06	2.79	0.94	
	NC15	3.19	4.65	0.9	
	NC16	2.35	1.37	0.91	
	NC17	1.95	0.955	0.91	
	NC18	2.79	1		

APPENDICIES

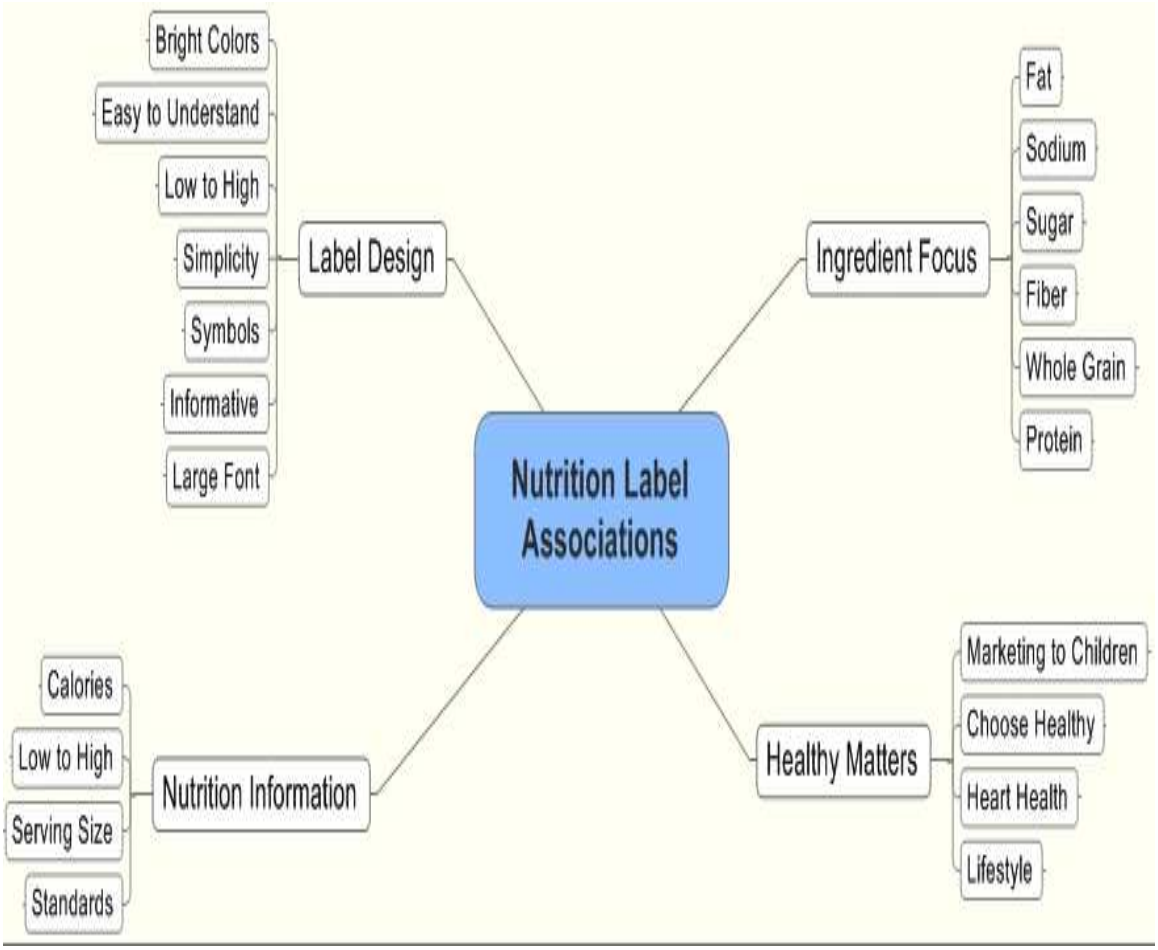
Preliminary Study Stage Four Exploded Box



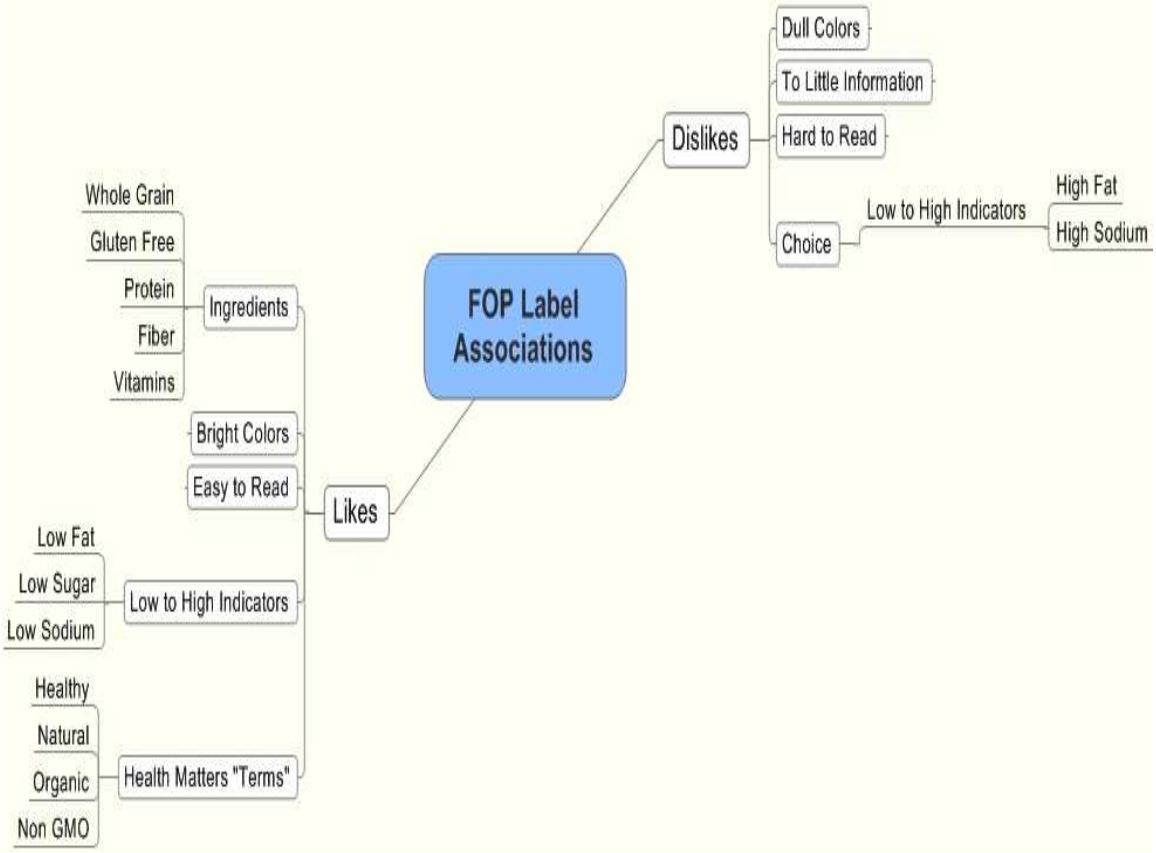
Preliminary Study Stage One Theme Model



Preliminary Study Stage Two Theme Model

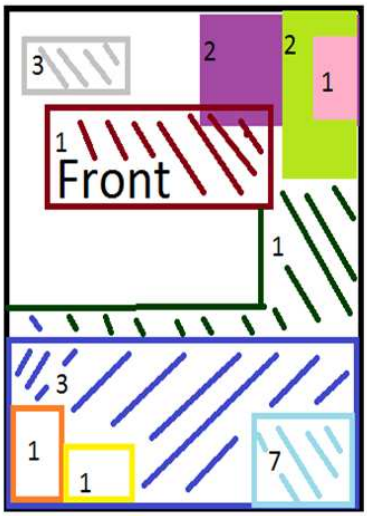


Preliminary Study Stage Three Theme Model



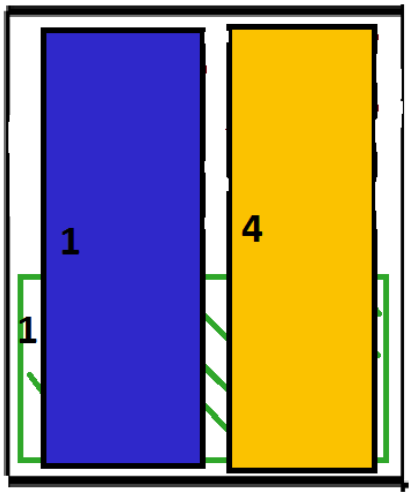
Preliminary Study Stage Four Exploded Box Results

Multiple Labels Front of Box



All of the Front:
1

One Label Back of Box



Whole Back=7

Nenkov, Inman, and Hulland's (2008) Health Consciousness Scale

1. I reflect about my health a lot. (Strongly agree to strongly disagree)
2. I'm very self-conscious about my health. (Strongly agree to strongly disagree)
3. I'm generally attentive to my inner feelings about my health. (Strongly agree to strongly disagree)
4. I'm constantly examining my health. (Strongly agree to strongly disagree)
5. I'm alert to changes in my health. (Strongly agree to strongly disagree)
6. I'm usually aware of my health. (Strongly agree to strongly disagree)
7. I'm aware of the state of my health as I go through the day. (Strongly agree to strongly disagree)
8. I notice how I feel physically as I go through the day. (Strongly agree to strongly disagree)
9. I'm very involved with my health. (Strongly agree to strongly disagree)
   (Bearden et. al, 2011)

(1988) Elaboration of Potential Outcomes Scale

Generation/Evaluation Dimension

1. Before I act, I consider what I will gain or loose in the future as a result of my actions. (Strongly agree to strongly disagree)
2. I try to anticipate as many consequences of my actions as I can. (Strongly agree to strongly disagree)
3. Before I make a Decision, I consider all possible outcomes. (Strongly agree to strongly disagree)
4. I always try to assess how important the potential consequences of my decisions might be. (Strongly agree to strongly disagree)
5. I try to predict how likely different consequences are. (Strongly agree to strongly disagree)
6. Usually, I carefully estimate the risk of various outcomes occurring. (Strongly agree to strongly disagree)

Positive Outcome Focus Dimension

1. I keep a positive attitude that things will always turn out right. (Strongly agree to strongly disagree)
2. I prefer to think about the good things that can happen rather than the bad. (Strongly agree to strongly disagree)
3. When thinking over my decisions, I focus more on their positive end results. (Strongly agree to strongly disagree)

Negative Outcome Focus Dimension

1. I tend to think about the negative outcomes that might occur as the result of my actions. (Strongly agree to strongly disagree)
2. I am often afraid that things might turn out badly. (Strongly agree to strongly disagree)
3. When thinking over my decisions, I focus more on their negative end results. (Strongly agree to strongly disagree)
4. I often worry about what could go wrong as the result of my decisions. (Strongly agree to strongly disagree)

(Bearden et. al, 2011)

Manipulation Check Questions based on the Questions created by Slater & Rounder

1. I found the nutrition label to be credible. (Strongly agree to strongly disagree)

2. I felt that the nutrition label was un-biased. (Strongly agree to strongly disagree)

3. The nutrition label was informative. (Strongly agree to strongly disagree)

4. The nutrition label was interesting. (Strongly agree to strongly disagree)

5. The nutrition label was different from other nutrition labels I have seen. (Strongly agree to strongly disagree)

(Slater & Rounder, 1996)

Need For Cognition Scale

1. I would prefer complex to simple problems. (Strongly agree to strongly disagree)
2. I like to have the responsibility of handling a situation that requires a lot of thinking. (Strongly agree to strongly disagree)
3. Thinking is not my idea of fun. (Strongly agree to strongly disagree)
4. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities. (Strongly agree to strongly disagree)
5. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something. (Strongly agree to strongly disagree)
6. I find satisfaction in deliberating hard and for long hours. (Strongly agree to strongly disagree)
7. I only think as hard as I have to. (Strongly agree to strongly disagree)
8. I prefer to think about small, daily projects to long-term ones. (Strongly agree to strongly disagree)
9. I like tasks that require little thought once I've learned them. (Strongly agree to strongly disagree)
10. The idea of relying on thought to make my way to the top appeals to me. (Strongly agree to strongly disagree)
11. I really enjoy a task that involves coming up with new solutions to problems. (Strongly agree to strongly disagree)
12. Learning new ways to think doesn't excite me very much. (Strongly agree to strongly disagree).
13. I prefer my life to be filled with puzzles that I must solve. (Strongly agree to strongly disagree)
14. The notion of thinking abstractly is appealing to me. (Strongly agree to strongly disagree)
15. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought. (Strongly agree to strongly disagree)
16. I feel relief rather than satisfaction after completing a task that required a lot of mental effort. (Strongly agree to strongly disagree)
17. It's enough for me that something gets the job done; I don't care how or why it works. (Strongly agree to strongly disagree)
18. I usually end up deliberating about issues even when they do not effect me personally. (Strongly agree to strongly disagree)

(Cacioppo, et al., 1984)

Control Example

Nutrition Facts

Serving Size 8 fl oz
Serving Per Container 1

Amount Per Serving

Calories 150	Calories from Fat 70
	% Daily Values*
Total Fat 8g	**12%**
Saturated Fat 5g	**25%**
Trans Fat 0g	
Cholesterol 35mg	**12%**
Sodium 120mg	**5%**
Total Carbohydrate 11g	**4%**
Dietary Fiber 0g	**0%**
Sugars 12g	
Protein 8g	**16%**

*Percent Daily Values are based on a 2,000 calorie diet.

Condition One Example

Nutrition Facts

Serving Size 8 fl oz
Serving Per Container 1

Amount Per Serving	
Calories 150	Calories from Fat 70
	% Daily Values*
Total Fat 8g	**12%**
Saturated Fat 5g	**25%**
Trans Fat 0g	
Cholesterol 35mg	**12%**
Sodium 120mg	**5%**
Total Carbohydrate 11g	**4%**
Dietary Fiber 0g	**0%**
Sugars 12g	
Protein 8g	**16%**

*Percent Daily Values are based on a 2,000 calorie diet.

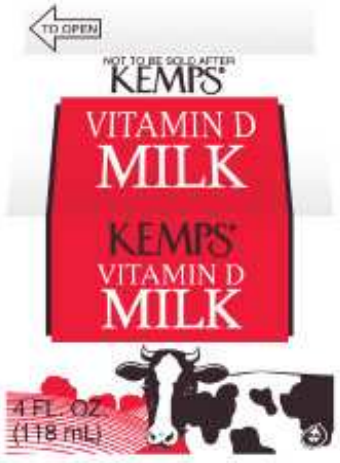
Calorie Distribution

Total: 150

Calories from Protein	32
Calories from Carbohydrate	44
Calories from Fat	72

Calories Per Gram

Protein= 4 Carbohydrate= 4 Fat= 9



Condition Two Example

Nutrition Facts

Serving Size 8 fl oz
Serving Per Container 1

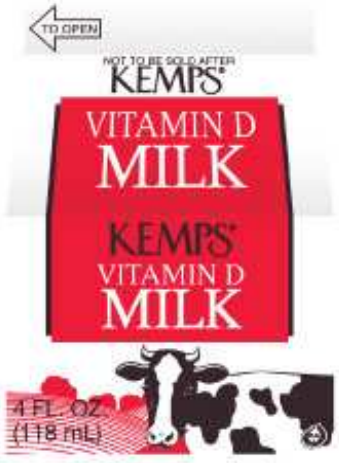
Amount Per Serving

Calories 150	Calories from Fat 70
	% Daily Values*
Total Fat 8g	**12%**
Saturated Fat 5g	**25%**
Trans Fat 0g	
Cholesterol 35mg	**12%**
Sodium 120mg	**5%**
Total Carbohydrate 11g	**4%**
Dietary Fiber 0g	**0%**
Sugars 12g	
Protein 8g	**16%**

*Percent Daily Values are based on a 2,000 calorie diet.

Percentage Breakdown of Daily Recommendations

Age	Carbohydrate	Protein	Fat
1-3 Years	45-65%	30-40%	5-20%
4-18 Years	45-65%	25-35%	10-30%
19 & Older	45-65%	20-30%	10-35%



VITA

Katie Beth Burghardt

Candidate for the Degree of

Master of Science

Thesis: WILL IMPROVEMENTS TO THE NUTRITION FACTS PANEL INCREASE LABEL INVOLVEMENT?

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