THE EFFECT OF NUTRITIONAL INFORMATION FORMAT ON CONSUMER UNDERSTANDING AND DECISION-MAKING: CONTRASTS BETWEEN ENTIRE-PACKAGE NUTRITIONAL INFORMATION AND SINGLE-SERVING SIZE INFORMATION

A thesis submitted in partial fulfillment of the requirements For the degree of Master of Arts in Psychology, Human Factors and Applied Experimental Psychology

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DEDICATION

This thesis is dedicated to the memory of my father:

Masamichi Inoue
ACKNOWLEDGEMENTS

Dr. Jill Quilici – I cannot thank you enough for your support throughout the thesis process and the time you spent reviewing the drafts. Thank you for not giving up on me. You were extremely patient with me and guided me at every step of the way whenever I needed you. I truly feel that I would not have been able to complete the thesis if you had not been my thesis chair.

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Dad – It has been 3 years since you left this world. I think that a part of me still cannot believe you are really gone. I have started seeing a lot of you in me, especially since you passed away. You are the greatest father a girl could ask for.

Mom – Thank you for always believing in me. I feel that our mother-daughter relationship is truly unique and that what we share is indescribable in words. I truly admire the way you continue to grow with grace and strength.

Genki – Thank you for always looking after me. I think that you are the one who worries about me the most because you are my big brother. I cherish our friendship and I know I will never feel alone in the world because of you.

Keikobachan – The smile that appears on your face every time you see me is something I look forward to and one of the biggest reasons to return to Japan. There are only a few years left before you turn 100 and I am looking forward to celebrating the day with you.

To my friends – Thank you all for your support, especially my good friends in Japan. I have known some of you almost my entire life, and you were the first in my life who taught me what it means to have true friendships. You continue to bring joy to my life even though we rarely get to see each other due to the large distance that separates us. Hontou ni arigatou! (Thank you so much!)
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ABSTRACT

The Effect of Nutritional Information Format on Consumer Understanding and Decision-Making: Contrasts between Entire-Package Nutritional Information and Single-Serving Size Information

By
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Master of Arts in Psychology
Human Factors and Experimental Psychology

The purpose of this study, modeled after a study conducted by Antonuk and Block (2006), was to investigate how the indication of the format and total caloric/nutrition contents of an entire food package on the food label affects consumers’ understanding of nutritional information and their dietary decision-making.

The 100 undergraduate students who participated in this study were randomly assigned to one of six conditions. The first independent variable was the healthiness of the snack, featuring a healthy snack or a less healthy snack. The second independent variable was the label type on the package, consisting of the dual-column label, single-column label, and no-label formats. The dual-column label format contains both single-serving nutritional information as well as entire-package nutritional information, while the single-column nutrition fact label contains only single-serving nutritional information.

The study involved five dependent variables: 1) comprehension level; 2) characteristic awareness level; 3) level of motivation to process the labels in the single-column and dual-column label conditions; 4) nutrition fact label format favorability; and 5) dietary choice.

Each participant received a bag containing a snack as well as a questionnaire that
contained a copy of the nutrition fact label from the snack. In addition, the participants were given a series of questions regarding the snacks’ nutritional information presented on the labels, and they were instructed to pay attention to the nutrition fact labels to fill out the questionnaire. After this initial exercise, the participants watched a short comedy video clip and proceeded to answer the post-test questionnaire.

As was hypothesized, the dual-column nutrition label performed significantly better in terms of accurately estimating calorie and protein counts compared to those with the single-column and the no-label formats. However, the use of dual-column labels was not effective in terms of helping the participants to estimate accurate serving sizes or fat and fiber counts; thus, these findings did not support the hypothesis. In addition, unlike the initial hypothesis, the dual-column arrangement did not have a significant effect in reference to increasing the level of motivation of participants to evaluate the labels. In addition, the participants who were given the dual-column label did not eat a significantly smaller amount of snacks compared to the participants with the other label formats.

The results in the current study suggest that the dual-column label format, which supplies good situational cues, is partially effective in the estimation of nutritional content but failed to show effectiveness in other areas. Future studies should assess the dual-column label’s limitations while examining the effectiveness of the dual-column label combined with other graphical and/or pictorial cues that may improve the effectiveness of the dual-column label.
INTRODUCTION

Background

Obesity has become an epidemic in today’s society. The obesity rate in the United States is growing rapidly – from 15.9% in 1995 to 22.2% in 2002 and to 27.5% in 2010 (Centers for Disease Control and Prevention, 1995, 2002, 2010). Studies have indicated that physical activity, such as playing sports, is one of the risk factors for people with obesity as it may increase the occurrence of injuries (Bazelmans et al., 2004), and the significant health burden of obesity has been linked with various chronic diseases and may shorten life expectancy (Peeters, Barendregt, Willekens, Mackenbach, Mamum & Bonnuex, 2003). It has been reported that, second only to smoking, obesity is a leading cause of preventable deaths in the United States, which is associated with approximately 400,000 deaths a year (Mokdad, Marks, Stroup, & Gerberding, 2000). According to Finkelstein, Trogdon, Cohen, and Dietz (2009), an increase of approximately $40 billion in medical expenses was observed between 1998 and 2006 due to obesity, and these costs totaled about $147 billion in 2008 dollars.

Over 20 years have passed since the 1990 passage of the Nutrition Labeling and Education Act (NLEA), a law that directed the FDA to set premarket approval standards for health and nutrition claims for foods. Considering the continued rise in the obesity rate over the intervening years, it is clear that the current system is failing in some areas to promote better health. It may be that we are facing a transitional phase in which there is a vital need to build a more understandable way to inform consumers about the proper amount of food to consume (Antonuk & Block, 2006). The FDA recently responded to this emerging, troubling phenomenon by expressing its intention to develop more
effective food labels that contribute to the emergence of a healthier United States (Philipson, 2005).

**Our Relationship with the Current Nutrition Labels**

The purpose of a food product label is to provide consumers with clear nutrition information for the food product to promote the consumption of a healthier diet. In recent decades, a significant amount of data has been collected to seek a better understanding of the relationships between nutrition fact labels and how consumers benefit as well as how they are being adversely affected by using the nutrition fact labels. Such data suggests that there are notable individual differences in terms of how U.S. consumers approach and understand nutrition fact labels and what part of the label to which they most likely pay attention. The most recent survey conducted by the U.S. Food and Drug Administration (2008) found that more than half of randomly selected adult U.S. consumers look at nutrition fact labels to “get a general idea of the nutritional content of the food” (55%) (U.S. Food and Drug Administration, 2008, Food Label Use, Question C2), and to “see how high or low the food is in things like calories, salt, vitamins, or fat” (66%) (U.S. Food and Drug Administration, 2008, Food Label Use, Question C2). It was also reported that 46% of consumers claimed they “often” checked calorie information on the food label, while 9% stated that they never used the calorie information (U.S. Food and Drug Administration, 2008). This survey also revealed that 34% of adult consumers used the serving size information “often” as a tool to make purchasing decisions, whereas 17% of the consumers never used the serving size information on food products (U.S. Food and Drug Administration, 2008). The survey also revealed that 75% of U.S. consumers used the “gram/milligram amount” as well as “the percentage of daily value
amount” information on the nutrition label on food products (U.S. Food and Drug Administration, 2008). These results suggest that there has been a significant demand for such information in nutrition fact labeling. In fact, the data confirm that a fairly large amount of the U.S. population is interested in understanding the nutritional information. However, do these survey findings suggest that we are learning and making better dietary choices? It is interesting to note that even though U.S. consumers may be showing great interest in the nutrition fact information on food packages, the data show that it has not necessarily led to a lower obesity rate over time (Centers for Disease Control and Prevention, 1995, 2002, 2010).

**What is Causing Obesity?**

While multiple factors can account for rising obesity, including genetic predisposition, physical inactivity, and inconsistent access to healthful foods, researchers have argued that the increasing food portion sizes offered by food manufacturers have a crucial influence on increased energy intake among the U.S. population, and often, the food industry’s marketing practices have been blamed (Seiders & Petty, 2004; Young & Nestle, 2002). The issue of food portions has drawn the attention of a number of researchers, who have stated that larger portions have become a serious problem, as the basic cause of obesity is often considered to be related to excess calorie intake over expenditure (Antonuk & Block, 2006; Diliberti, Bordi, Cocklin, Roe, & Rolls, 2004; Fisher, Arreola, Birch, & Rolls, 2007; Rolls, Morris, & Roe, 2002; Young & Nestle, 2002), and studies have confirmed the phenomenon of increased calorie intake when consumers are offered larger portions – an effect also known as “portion distortion” (Fisher et al., 2007; Kral, Roe, & Rolls, 2004; Raynor & Wing, 2007; Rolls et al., 2002;
Wansink & Kim, 2005). For example, a study conducted by Rolls et al. (2002) reported that subjects who were given meals with larger portions consumed 30% more calories (161 kcal) compared to the subjects who received the meals with the smallest portions. The influence of portion size was also apparent in Wansink and Kim’s (2005) study; they found that adult moviegoers ate 45% more fresh popcorn when they were served a larger portion. The effect of portion distortion was so dominant that, in the presence of larger portions, the moviegoers ate 34% more popcorn compared to those who received smaller portions, even when they were served stale popcorn.

Young and Nestle (2002) argued that the easily accessible food supply in the U.S. market, as well as increased calorie intake, correlates with the increase in portion sizes, which increases the likelihood of people’s becoming overweight and obese. A study conducted by Vermeer, Steenhuis, and Seidell (2010) confirmed that participants felt that larger portion sizes generally meant more value than small portion sizes and that consumers were likely to purchase products that offered larger portions if given a choice. These findings were particularly interesting because the participants were aware that portion size has increased over the past decade, and they actually felt that the recent portion sizes are usually larger than required. These findings suggest that people may tend to be more interested in getting more than what is really required if it means receiving a better value on a product. Nevertheless, it definitely would lead to a vicious cycle in which more and more manufacturers increase product sizes and consumers choose to buy those products over smaller-sized products, which would encourage manufacturers to lean toward selling products with even larger portions.
How Does Larger Portion Size Affect Consumers?

Antonuk and Block (2006) stated that “the objective increase in portion sizes has resulted in variations in consumers’ perceptions of what a standard or appropriate food portion should be” (p.366). The portion size increase in the food industry has been steady yet subtle, so we have been generally unaware of the fact that how we perceive a single-serving size has changed over time. For example, only 2% of 42 college students who consumed cereal were able to estimate its accurate serving size within ±10% of the correct figure, while the other one-third ate at least double the amount of the standard serving size (Bryant & Dundes, 2005). These findings may not be so surprising considering the fact that the overall size of food products in the U.S. market well exceeds the sizes offered in the past, with the exception of sliced white bread (Shiue, 2010; Steenhuis & Vermeer, 2009; Young & Nestle, 2002), yet the current “serving size” on nutritional information labeling is based on what was considered standard based on surveys conducted during the 1970s and 1980s (Shah, Adams-Huet, Elston, Hubbard, & Carson, 2010) – before the “supersize” era started.

The FDA has recently been advising consumers to pay specific attention to serving size information to gauge and control portion size in response to the alarming gap between serving size and actual food consumption, as well as to the fact that the actual portions that people consume in one sitting has increased dramatically over the past few decades (Shiue, 2010). Meanwhile, national newspapers such as The New York Times have pointed out a longstanding problem of nutrition fact labels – “the official serving sizes for many packaged foods are just too small” (Neuman, 2010). This does not help in preventing obesity at all. In fact, it could mislead consumers regarding how many
calories they are actually consuming, as the food packages’ nutritional values as well as caloric counts depend on the per-serving information on the nutrition facts labels. (Neuman, 2010). Bryant and Dundes (2005) explained that this portion size escalation is happening because, currently, the FDA does not demand that manufacturers follow its regulations that supposedly set the appropriate serving size based on the amount of food usually consumed by Americans today (U.S. Food and Drug Administration, 2004). Because of this, manufacturers can post unrealistically small serving sizes, and Bryant and Dundes (2005) sounded the alarm regarding this deceptive effect by stating that such labeling could make the package appear to be filled with a greater amount of a product while giving a faulty impression of a reduced amount of fat and sugar in the product (Bryant & Dundes, 2005). For example, a candy bar may be consumed in one sitting; however, the package may state that it contains 3 servings while the calorie count that appears on the label is 160. If the consumer is not careful, he/she may be misled into thinking that the snack contains only 160 calories instead of 480 calories. This could create the illusion of a healthier product. Bryant and Dundes (2005) expressed concern that such a case may often occur for Americans because many of us have busy lives and often cannot take the time to mentally calculate the caloric/nutritional information of what we actually consume based on the standard nutritional label format, which displays only per-serving information.

According to a past study, the common issue with the current nutrition fact label format is that they are too confusing, as they “take too much time” and are “too hard to understand” (Kristal, Levy, Patterson, Li, & White, 1998, p. 1214) due to the current nutrition fact label format, which displays only single-serving size information. This
study suggests that, if the nutritional information, especially the serving size and calorie count information, were presented in a more intuitive format, consumers would be able to make informed dietary choices by being aware of the content of what they eat, which would help to promote better health (Bryant & Dundes, 2005). As the obesity rate keeps rising, it has become essential for each consumer to be able to read and understand nutritional information correctly so that they can apply the knowledge in everyday life.

How Do We Achieve That?

A non-profit consumer group, the Center for Science in the Public Interest (CSPI, 2004), has argued that “consumers deserve to be able to see at a glance how many calories or how much fat or sugar there is in a single-serving container” and has petitioned the FDA to develop a dual-column nutrition fact label format. The proposed dual-column nutrition fact label contains an extra column that displays the complete caloric/nutritional information for the entire package in addition to the standard, per-serving nutritional information so consumers will be able to determine the exact number of calories as well as other dietary information about food products (see Figure 1).

![Figure 1. Dual-column nutrition label format proposed by the CSPI](image)
A 2006 study conducted by Antonuk and Block focused on the use of the dual-column labels and argued that their use would provide a better situational cue to help consumers easily recognize “the multiple servings within the single package” (p. 367). Each of the participants in their study received a bag of M&M chocolates. They also received a separate nutrition label, which was either in the dual-column or single-column label format. Subsequent to being exposed to the nutritional label, the participants viewed a short video while they were told that they would be permitted to eat the snack if they wanted to do so. The number of M&M chocolates left in the each bag was counted at the end of the study. Their research found that a dual-column nutrition fact label was effective in reducing snack consumption among non-dieters compared to the single-column label that listed nutritional information for one serving. Nonetheless, it was found that the label type did not influence the dieters’ eating behavior. Antonuk and Block described the effectiveness of the dual-column label by stating that, “although dieters ate significantly less than non-dieters when exposed to the single-column label, when they were exposed to the dual-column label, non-dieters consumed an amount that more closely matched the amount consumed by dieters” (p. 368). This demonstrates that the dual-column label was effective in reducing amount of snack consumption even when the participants might not have been closely monitoring their calorie intake (i.e., non-dieters).

These findings suggest that non-dieters are more likely to monitor their eating behavior when they are informed about the number of servings they are consuming, which substantiates Antonuk and Block’s (2006) assertion that the dual-column labels provide “alternative cues to raise awareness about portion size to help minimize mindless overconsumption” (p. 368). To the best of the author’s knowledge, the study
conducted by Antonuk and Block (2006) is the only available study that investigated the effectiveness of dual-column nutrition fact labels. However, the focus of the present study is not on the variance between dieters and non-dieters; instead, its target is to measure the comprehension level as well as the likability of a nutrition fact label in three different formats applied to snacks.

These past research findings may suggest that clearly stated food serving size information could lead to a better understanding among consumers of their diet as well as raise their awareness and create the groundwork for consumers to more accurately make decisions depending on their health needs and personal preferences.

**Current Study**

The current study is unique because only a limited amount of research has been conducted to measure the actual amount of food consumed by the participants, even though the relationship between portion size and weight gain has been widely recognized (Wansink, 2004; Young & Nestle, 2002). The aim of the present study is to discover how the provision of the complete caloric/nutritional information for an entire food package on the food label affects consumers’ understanding of nutritional information by comparing three different nutrition fact label formats: a dual-column nutrition fact label format containing both single-serving nutritional information as well as entire-package nutritional information; a single-column nutrition fact label containing only single-serving nutritional information; and no nutrition label, a format that contains no nutrition fact label information. The study also investigates how the labeling affects consumers’ decision-making for a healthier diet.

This study also examines the impact of the different nutritional label formats in
reference to different types of snacks (i.e., M&M versus pretzel). It was important to use snack products that are generally perceived as less healthy (M&M) and healthy (pretzel). These snacks were chosen despite the pretzel’s relative healthfulness compared to the chocolate snacks, pretzels could contain high caloric content depending on the amount consumed. Thus, looking at the impact of nutritional labels on the two different types of snacks would provide more details about on how being able to access the dual-column nutritional label would influence the participants’ knowledge in terms of nutritional information as well as how the different label formats would affect their participants’ behaviors.

Hypotheses

First, I propose that, in both the “healthy” and “less healthy” product conditions, the participants who are assigned to the dual-column label condition will be able to more accurately estimate the snacks’ serving size information than the participants in the single-column label condition. In addition, I predict that the participants with the dual-column label format will also be able to recall more accurate nutrient information for the snacks (i.e., the calorie count, fat count, fiber count, and protein count) compared to the participants with the single-column label format and that the participants in the single-column condition will be able to understand more accurate nutrient information compared to the participants in the no-label condition. This was hypothesized because the dual-column nutrition label format already displays the total caloric and nutritional information, and it provides additional cues to raise awareness about the portion size and nutrition facts for the snack (Antonuk & Block, 2006), while the single-column label format provides only per-serving information. This advantage of the dual-column
nutrition label format over the other label formats will eliminate the consumer’s burden of having to perform arithmetic, which will be, more often than not, quite error-prone. The participants in the no-label format are expected to perform the worst in estimating accurate nutritional information compared to the other condition groups, as they will have the least amount of information.

Second, I hypothesize that, regardless of the snack’s “healthiness,” the participants who are assigned to the dual-column labels will report the greatest motivation to evaluate labels due to the ease of interpreting information compared to the single-column label. If this hypothesis is true, it could also suggest that consumers would be more likely to pay attention to the dual-column labels compared to the single-column label and the no-label formats. It is important to note that the participants in the no-label condition will not be included in the analysis, as they will not be exposed to a label to evaluate.

Third, I predict that the participants will be more likely to have a preferable impression of a product when it is presented with the dual-column nutrition fact label over products with the single-column nutrition fact label due to its more salient format for nutrition content interpretation. Also, I expect that the snacks with the no-label format will be perceived least favorably compared to the other label formats due to the lack of information.

Finally, I hypothesize that the participants with the dual-column label format will eat the least amount of snacks compared to the participants with the single-column label format regardless of the snack type. I further hypothesize that, regardless of the snack type, the participants with the no-label format will eat more than those with the single-
column label format. In other words, the dual-column label format will succeed the most in regulating the amount of snacks consumed by the participants, followed by the single-column label format, which will be more effective than the no-label format. In addition, I anticipate that, in the presence of the dual-column label format, the participants with the less healthy snack will eat a smaller amount of snacks compared to the participants with the healthy snack because the participants with the dual-column label format will be more aware of what and how much they are eating. Also, when given a single-column label, the average difference in the amount of healthy vs. less healthy snacks consumed by the participants may not be as substantial as for those in the dual-column label condition, as these participants will not have access to such conspicuous nutrition fact labels, but it is expected to be greater than that of the participants in the no-label condition. Furthermore, when given no label, the average difference in the amount of healthy vs. less healthy snacks consumed by the participants will be minimal compared to the dual-column and single-column label conditions. The participants in the no-label condition, in the absence of nutrition label information, are more likely to be mindless about how much snack they consume regardless of the type of snack. On the other hand, the participants in the dual-column nutrition label condition will be supplied with the greatest amount of information and, thus, be able to make conscious decisions for a healthier diet. These hypotheses follow the work of Antonuk and Block (2006), who suggested that the dual-column label provides additional cues that help to raise awareness about portion size and, thus, prevent consumers from the overconsumption of calories - the portion distortion effect. As Wansink (2004) indicated in his study, a “food environment,” which signifies “the way food is provided or presented,” (p. 456) contributes directly to consumption volume. This
shows that people’s consumption volume may be impacted at an unconscious level if people do not try to be fully aware of how much they eat. If consumers are not aware of how much they eat, it will most likely lead to the over-consumption of calories, which could lead to obesity. Thus, with the implementation of a more straightforward dual-column nutrition label format that presents information in a very visible and effective manner, it is hypothesized that consumers will be able to monitor their consumption amount and eat a moderate amount of snacks and food that will not exceed their recommended daily calorie intake.
METHOD

Participants

One hundred twenty-eight participants were recruited from either upper-division psychology courses or the lower-division psychology subject pool at California State University, Northridge. They participated for extra credit or as a course requirement. They were not allowed to participate if they did not have normal or corrected-to-normal vision, if they had food allergies, or if they had any health issue that did not permit them to consume caffeine. Of the eligible participants, the 28 participants who rated two or below on a “snack likability scale” or chose not to eat the snack during the experiment were excluded from the data analysis (see Table 1). The snack likability scale was designed to determine how much the participants liked the snack using a 7-point Likert scale (1 = "Not at all" to 7 = "Very much").

The demographic information collected from participants indicated that, of the 100 participants in this study, 33 (33.0%) were male and 67 (67.0%) were female. Their ages ranged from 18 to 23 with a mean age of 19.33 and a median age of 19.00. Among the participants, 17 (17.0%) claimed that they were on a diet, while the other 83 (83.0%) confirmed that they were not on a diet. It was also revealed that only 6 (6.0%) of the participants considered themselves “underweight,” and 58 (58.0%) responded that they had a “normal weight,” while 36 (36.0%) participants regarded themselves as “overweight.”

Each participant was assigned to one of six conditions using a random sampling generator program. The participants’ distribution among the conditions resulted in the following: 17 (17.0%) in the “dual-column & healthy snack” condition; 16 (16.0%) in the
“dual-column & less healthy snack” condition; 16 (16.0%) in the “single-column & healthy snack” condition; 18 (18%) in the “single-column & less healthy snack” condition; 14 (14%) in the “no-label & healthy snack” condition; and 19 (19.0%) in the “no-label & less healthy snack” condition.

<table>
<thead>
<tr>
<th>Label Type</th>
<th># of Participants</th>
<th># of Participants Eliminated</th>
<th># of Participants Used in Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-Column &amp; Healthy Snack</td>
<td>19</td>
<td>3</td>
<td>16</td>
</tr>
<tr>
<td>Dual-Column &amp; Less Healthy Snack</td>
<td>24</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Single-Column &amp; Healthy Snack</td>
<td>20</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Single-Column &amp; Less Healthy Snack</td>
<td>22</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>No-Label &amp; Healthy Snack</td>
<td>20</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>No-Label &amp; Less Healthy Snack</td>
<td>23</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>TOTAL</td>
<td>128</td>
<td>28</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1. Number of Participants Eliminated Based on Snack Likability Scale or Due to Not Eating the Snack

Design

A 2 x 3 between-subjects factorial design was used to conduct this experiment. There were two independent variables. The first independent variable was the healthiness of the snack [with two levels: Rold Gold Classic Style Tiny Twists Pretzel (healthy snack) and M&M’s Milk Chocolate candies (less healthy snack)]. The second
independent variable was the label type (dual-column label, single-column label, and no-label). The single-column nutrition fact label condition group was exposed to a label that included the nutritional information on the Nutrition Facts panel that is commonly seen on food packages currently available on the market. The dual-column nutrition fact label condition group was provided with a label that included an additional column containing the nutritional information for the whole package, in addition to the single-serving nutritional information contained in the single-column nutrition fact label. The no-label condition provided no nutrition fact label to participants and was employed as a control group. The dependent variables of this study comprised five variables: 1) level of understanding of the products in terms of nutrition content (comprehension level); 2) snack characteristic awareness scale (characteristic awareness level); 3) motivation to process the labels (in the single-column and the dual-column label conditions); 4) participants' impression of each nutrition fact label format/condition, including the no-label condition (favorability); and 5) amount (weight) of snacks left in the bag after viewing a short video (dietary choice). In addition to these five dependent variables, data on the participants’ general awareness of health issues as well as their daily health practices were collected as discrete variables during the post-test questionnaire phase of the experiment (see Table 2).
<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Questions in the Questionnaire Pack</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comprehension Level</td>
<td>• How many calories are in this bag of chocolate/pretzel snacks? (fill-in-the-blank)</td>
</tr>
<tr>
<td></td>
<td>• How many grams of fat are in this bag of chocolate/pretzel snacks? (fill-in-the-blank)</td>
</tr>
<tr>
<td></td>
<td>• How many grams of fiber are in this bag of chocolate/pretzel snacks? (fill-in-the-blank)</td>
</tr>
<tr>
<td></td>
<td>• How many grams of protein are in this bag of chocolate/pretzel snacks? (fill-in-the-blank)</td>
</tr>
<tr>
<td></td>
<td>• How many servings are in this bag of chocolate snack? (fill-in-the-blank)</td>
</tr>
<tr>
<td>Characteristics Awareness Level</td>
<td>• “Do you think the snack you just ate has the following characteristics? Please circle one under each characteristic type. The snack contains:”</td>
</tr>
<tr>
<td></td>
<td>o Calories (7-point Likert scale from 1 (Low amount) to 7 (High amount)).</td>
</tr>
<tr>
<td></td>
<td>o Fat (7-point Likert scale from 1 (Low amount) to 7 (High amount)).</td>
</tr>
<tr>
<td></td>
<td>o Fiber (7-point Likert scale from 1 (Low amount) to 7 (High amount)).</td>
</tr>
<tr>
<td></td>
<td>o Calcium (7-point Likert scale from 1 (Low amount) to 7 (High amount)).</td>
</tr>
<tr>
<td>Motivation to Process the Labels</td>
<td>• “To what extent were you trying hard to evaluate the information on the nutrition label? (Please circle one)”</td>
</tr>
<tr>
<td></td>
<td>o 7-point Likert scale from 1 (Not at all) to 7 (Very much)</td>
</tr>
<tr>
<td>Favorability</td>
<td>• “How much did you like the snack?”</td>
</tr>
<tr>
<td></td>
<td>o 7-point Likert scale from 1 (Not at all) to 7 (Very much)</td>
</tr>
<tr>
<td>Dietary Choice</td>
<td>• “For this experiment, you were given a certain amount of pretzel/chocolate snacks. How many pretzels/chocolates do you usually eat in one sitting? Please select one that best describes your response.</td>
</tr>
<tr>
<td></td>
<td>o Less than I was given</td>
</tr>
<tr>
<td></td>
<td>o About the same amount as I was given</td>
</tr>
<tr>
<td></td>
<td>o More than I was given</td>
</tr>
<tr>
<td></td>
<td>o Other (please describe briefly)</td>
</tr>
</tbody>
</table>

Table 2. List of dependent variables in the questionnaire pack
Materials and Equipment

The materials included a bag of snacks that contained either M&M Milk Chocolate candies or Rold Gold Tiny Twists pretzels, a pre-test questionnaire (Questionnaire Packet A) that also contained one of the nutrition label formats, including the no-nutrition fact label format, a five-minute comedy video clip, and a post-test questionnaire (Questionnaire Packet B).

1) Snacks

Each participant received a bag that contained either 50 M&M's candies or 33 pieces of Rold Gold pretzels. A label was attached to each bag that stated that the amount of the snack was 1.5 ounces and, coincidentally, 1.5 servings. The recommended standard serving size information, which was taken from the actual M&M's Milk Chocolate candies and Rold Gold Tiny Twists pretzel products, was used as a basis to determine the amount of each snack placed in the bag. For example, the M&M's recommended serving size fluctuates, and the larger package indicates that 1.5 ounces is a single serving instead of the 1.69 ounces of a single serving found on the smaller package. In this experiment, the participants were provided with 50 M&M's candies, which is equivalent to 1.5 servings. The reason that the smaller 1.5-ounce single-serving size was chosen as a single-serving portion for this experiment instead of the 1.69-ounce single-serving size was because package size affects consumption amount due to the pervasive influence of contextual cues for consumption (Antonuk & Block, 2006). Thus, the experimenter concluded that it was best to avoid an uninvited yet possible influence that could lead to the participants’ over-consumption of the snacks resulting from the provision of a greater amount of snacks than the suggested amount for a single serving. Research also has
suggested that providing smaller serving sizes “allows for a more conservative test of the impact of the experiment, as it creates a consumption norm below that suggested by the actual food label” (Antonuk & Block, 2006, p. 367).

2) Questionnaire Packet A (Pre-Test Questionnaire)

Each participant received a pre-test questionnaire (Questionnaire Packet A) that included a picture of one of the three nutrition label formats (i.e., single-column label, dual-column label, and no-label). Questionnaire Packet A was a 3-page packet printed on 8.5” x 11” letter-sized paper. Each participant received one of the three formats for their snack condition depending on the group to which they were randomly assigned. A total of six different versions of Questionnaire Packet A were developed, one for each condition group: the two different types of snacks [i.e., Rold Gold Tiny Twists pretzel (healthy snack) and M&M’s Milk Chocolate candies (less healthy snack)] linked with each of three different types of nutrition fact label formats (i.e. single-column label, dual-column label, and no-label). The single-column label condition group and the dual-column label condition group were exposed to the aforementioned label format, while the participants in the no-label condition group did not see a label on the questionnaire sheet. The purpose of Questionnaire Packet A was to ensure that the participants attended to the nutrition fact labels and responded to questions about the snacks’ nutritional information (e.g., number of calories and amount of fat and vitamins). The questionnaire includes five fill-in-the-blank questions and two multiple-choice questions. Some examples of the questions are as follows:

• How many calories are in this bag of chocolate/pretzel snacks? (fill-in-the-blank)
• The bag of chocolate/pretzel snacks contains x% of the total daily value for vitamin C. (multiple choice)

• How many servings are in this bag of chocolate/pretzel snacks? (fill-in-the-blank)

The questions shown above are followed by two confidence-level rating questions with a 7-point Likert scale that are present only in the dual-column label and the single-column label format questionnaires. The instructions are: “How well did you understand the information presented on the label? (Please circle one)” and “How much did you like this nutrition fact label? (Please circle one).” The seven scales are from 1 (Not at all) to 7 (Very much).

For the no-label condition group, the participants were given a questionnaire packet that asks identical questions except for the 7-point Likert scale questions that ask about the "nutrition label." Furthermore, for questions that ask about the number of calories and the amount of fat and vitamins in the snacks, the participants were asked to answer using their "best guess." See Appendices A, B, C, D, E, and F.

3) Five-Minute Video Clip

The five-minute video clip, which contains content unrelated to nutrition issues, was selected to eliminate a possible bias effect. The incorporation of this comedy video clip in the current study aimed to divert the participants’ attention from the previous questionnaire and, possibly, the fact that they were participating in a psychology experiment while providing participants with ample time to consume some of the snacks. In the clip, titled “Ted’s Birthday,” a crowd pretends to be the friends of a random person in a bar whom they call Ted. They pretend that it is Ted’s birthday, while “Ted” has no idea who the people are or where they came from.
4) Questionnaire Packet B (Post-Test Questionnaire)

Questionnaire Packet B consisted of questions such as the “snack likability scale,” which asks whether they liked the snack using a 7-point Likert scale (1 = "Not at all" to 7 = "Very much"). The participants who scored below 3 on this question were not included in the analysis. Other types of questions that ask about the perception of nutrient amounts (i.e., calories, fat, fiber, and calcium) contained in the snacks using a 7-point Likert scale (e.g., 1 = “Low number of calories” to 7 = “High number of “calories”) are included to assess the participants’ awareness of the snack’s characteristics. Other types of questions included: "To what extent did you try to evaluate the information on the nutrition label?" (motivation level to process the labels) and the participants’ impression of each nutrition fact label format/condition (with the exception of the no-label format condition). Furthermore, demographic information such as the participants’ age, gender, ethnicity, educational level, current health, and general health consciousness/interest in staying healthy, etc., was also collected using this follow-up questionnaire. See Appendices G, H, I, J, K, and L.

Procedure

The experimental sessions were held between 3:00 p.m. and 6:00 p.m. to avoid lunch and dinner time, when there was a likelihood that the participants would be sated. A group of one to five participants who were randomly assigned to one of the six conditions using a random number generator program participated in each experimental session. Everyone in a session received the same condition. The participants received a consent form that they were required to sign before participating in the experiment. Upon receiving a bag containing either 50 M&M's candies or 33 Rold Gold pretzels with the
serving-size label as well as Questionnaire Packet A (pre-test questionnaire), the participants who were assigned to the dual-column and single-column label conditions were instructed to pay attention to the nutrition fact labels displayed on the questionnaire sheet. The participants who were assigned to the no-label condition were asked to answer the questionnaire to best of their knowledge without receiving any supplemental nutritional information about the snacks. The participants then proceeded to fill out the questionnaire, which was followed by the collection of the completed survey by the experimenter. The participants then watched the five-minute video clip. They were told that they could eat the provided snacks if they liked during the video. It is important to note that during the video, the experimenter moved to an area in the room where the participants could not see her to eliminate as much as possible the likelihood of the Hawthorne effect, an effect where a subject alters or improves his/her behavior due to the knowledge that he/she is being studied. After watching the short video, the participants were asked to return the snack bags to the experimenter and fill out Questionnaire Packet B (post-test questionnaire). Each experiment session took approximately 30 minutes. The participants were then debriefed, thanked, and released. After the experiment, the experimenter weighed the remainder of each snack bag and recorded the information for the analysis.
RESULTS

Comprehension Level

The first hypothesis predicted that the participants who were assigned to the dual-column label condition would be more accurate in their serving size estimates than the participants in the single-column condition. Additionally, the participants in the single-column condition were expected to be more accurate than those in the no-label condition regardless of the type of snack they were given. Each participant estimated the number of servings per bag during the experiment. The accuracy of the serving size estimates was measured using the formula "estimate - actual serving size." The “actual serving size” in the current study refers to the size of the bag of snacks that each participant received at the beginning of the experiment. In both snack conditions, each participant received a snack that weighed 1.5 oz., which is considered to be 1.5 servings based on the snacks’ nutritional information.

I also hypothesized that the participants would be able to estimate the nutrient information of the snacks more accurately in the dual-column label condition than in the single-column condition and that the single column would lead to a more accurate estimate than the no-label condition. To calculate the proportions of actual values for the two snacks, the accuracy of the nutritional information estimates was measured using the following formula:

\[
\frac{\text{Estimated nutrient information} - \text{Actual nutrient information}}{\text{Actual nutrient information}}
\]

The “actual nutrient information” in the current study refers to the nutrient information for the snack that each participant received at the beginning of the experiment. All the minus signs were then dropped to calculate absolute values. In addition, the estimated
serving sizes, numbers of calories, and amounts of fat, fiber, and protein that were ±3 standard deviations from the mean were considered outliers. Outliers on each variable were eliminated for analyses on that particular variable (see Table 3).

<table>
<thead>
<tr>
<th>DVs</th>
<th>Label Type / Snack Type</th>
<th>Number of Participants Eliminated</th>
<th>Number of Participants Included in the Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving Size Estimates</td>
<td>Dual-Column</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Single-Column</td>
<td>2</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>No-Label</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>Healthy</td>
<td>0</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>4</td>
<td>49</td>
</tr>
<tr>
<td>Calorie Count Estimates</td>
<td>Dual-Column</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Single-Column</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>No-Label</td>
<td>2</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Healthy</td>
<td>2</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>0</td>
<td>53</td>
</tr>
<tr>
<td>Fat Count Estimates</td>
<td>Dual-Column</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Single-Column</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>No-Label</td>
<td>1</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Healthy</td>
<td>1</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>Fiber Count Estimates</td>
<td>Dual-Column</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Single-Column</td>
<td>2</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>No-Label</td>
<td>1</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Healthy</td>
<td>2</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>1</td>
<td>52</td>
</tr>
<tr>
<td>Protein Count Estimates</td>
<td>Dual-Column</td>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Single-Column</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>No-Label</td>
<td>1</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Healthy</td>
<td>1</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>1</td>
<td>52</td>
</tr>
</tbody>
</table>

Table 3. Outliers and Number of Participants Included in the Analysis

A series of 2 x 3 between-subjects ANOVAs were conducted to assess hypothesis #1. The interaction of the label condition and type of snack with respect to serving size accuracy was not significant \( F(2, 90) = .550, p = .579 \). The analysis found that the main effect of the label condition on the accuracy of the serving size estimates was not
significant $[F(2, 90) = .560, p = .573]$. The main effect of the type of snack was significant $[F(1, 90) = 4.981, p = .028, \eta^2 = .052]$. This result revealed that the participants who received the less healthy snack ($M = 1.543, SD = .693$) responded significantly more accurately when estimating the serving size compared to the healthy snack condition groups ($M = 2.851, SD = 4.067$). Also, this result suggests that the participants who received the healthy snack estimated the serving amount that they thought they received to be significantly greater compared to the participants who received the less healthy snack. In other words, the participants in the healthy snack condition were more likely to overestimate the snack serving size than the participants who received the less healthy snack, who were less likely to overestimate the amount of snack they received.

As shown in Table 4, the participants who were exposed to the single-column label with the less healthy snack were able to identify the serving size most accurately. The participants who received the healthy snack with no label were the least accurate in estimating the snack serving size.

<table>
<thead>
<tr>
<th>Label Type</th>
<th>Snack Type</th>
<th>Healthy and Less Healthy Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Healthy</td>
<td>Less Healthy</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Standard Error</td>
</tr>
<tr>
<td>Dual-Column</td>
<td>2.031</td>
<td>.729</td>
</tr>
<tr>
<td>Label</td>
<td>Single-Column</td>
<td>3.029</td>
</tr>
<tr>
<td>Label</td>
<td>No-Label</td>
<td>3.571</td>
</tr>
</tbody>
</table>

Table 4. Means, Standard Deviation and Standard Errors of Label Type and Snack Type for Serving Size Raw Estimates
To further analyze the effects of the label types on different nutritional information (hypothesis #1), another series of ANOVAs were conducted. The absolute values for the calorie count, fat count, fiber count, and protein count estimates were calculated to measure the effects of label type across the different snack conditions.

A 2 x 3 between-subjects ANOVA found that the interaction effect of the label condition and type of snack on the calorie count estimate accuracy was not significant \( F(2, 92) = .708, p = .495 \) (see Table 5). The main effect of the label condition on the accuracy of calorie count estimates was significant \( F(2, 92) = 26.530, p < .001, \eta^2 = .366 \). Pairwise comparisons were conducted using the Tukey HSD post-hoc test to determine the relationship between the calorie count estimate accuracy and the label type. The results showed that the participants who were exposed to the dual-column label \( (M = .0465, SD = .107) \) were significantly more accurate in estimating the calorie counts than the participants in the single-column condition \( (M = .294, SD = .217) \), who were significantly more accurate than the participants in the no-label condition \( (M = .428, SD = .271) \). The main effect of the type of snack on calorie estimates was not significant \( F(1, 92) = .124, p = .725 \).
<table>
<thead>
<tr>
<th>Type of Label Given to the Participant</th>
<th>Type of Snack Given to the Participant</th>
<th>Mean</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-Column Label</td>
<td>Healthy</td>
<td>.021</td>
<td>.053</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>.072</td>
<td>.053</td>
</tr>
<tr>
<td>Single-Column Label</td>
<td>Healthy</td>
<td>.331</td>
<td>.051</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>.260</td>
<td>.050</td>
</tr>
<tr>
<td>No-Label</td>
<td>Healthy</td>
<td>.444</td>
<td>.061</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>.417</td>
<td>.048</td>
</tr>
</tbody>
</table>

Table 5. Accuracy of Calorie Count Estimates across Label Types and Types of Snack

In addition to the calorie count estimates, the participants were also asked to provide estimates of the amount of fat, fiber, and protein in the received snack. ANOVAs conducted on the accuracy of fat estimates found a significant interaction effect of the label condition and type of snack on fat count accuracy was significant \( F(2, 92) = 5.805, p = .004, \eta^2 = .112 \) (see Figure 2). Post-hoc comparisons using the Tukey HSD test indicated that there was a significant difference between the “dual-column label & healthy snack” condition \((M = .369, SD = 1.372)\) and the “no-label & healthy snack” condition \((M = 3.615, SD = 4.053)\). These results indicate that the participants in the “dual-column & healthy snack” condition group performed significantly better in estimating accurate fat counts compared to the participants in the “no-label & healthy snack” condition group. The findings support the notion that the dual-column label is more effective in conveying the fat count information than the no-label format. Another significant difference was found between the “dual-column label & healthy snack” condition and the “dual-column label & less healthy snack” condition \((M = 1.924, SD = 3.190)\). This indicates that the “dual-column label & healthy snack” condition group was
able to estimate the snacks’ fat counts more accurately compared to the “dual-column label & less healthy snack” condition group. Furthermore, there was a significant difference between the “single-column label & healthy snack” condition \( (M = .988, SD = 2.086) \) and the “no-label & healthy snack” condition \( (M = 3.615, SD = 4.053) \). This indicates that the participants in the “single-column & healthy snack” condition group performed significantly better in estimating accurate fat counts compared to the participants in the “no-label & healthy snack” condition group. These findings support the notion that the single-column label is more effective in conveying the fat count information than the no-label format. Finally, a significant difference was found between the “single-column label & less healthy snack” condition \( (M = .778, SD = 1.554) \) and the “no-label & healthy snack” condition \( (M = 3.615, SD = 4.053) \). This reveals that the participants in the “single-column label & less healthy snack” condition group were able to more accurately estimate the snacks’ fat counts than the participants in the “no-label & healthy snack” condition group. As shown in Figure 2 below, the “no-label & healthy snack” condition group performed worst in estimating accurate fat counts compared to the other five condition groups. The main effect of the label on the accuracy of fat estimates was significant \( [F(2, 92) = 3.668, p = .029, \eta^2 = .074] \). However, post-hoc comparisons using the Tukey HSD test did not indicate that the dual-column label condition \( (M = 1.146, SE = .415) \) was significantly different from the single-column label condition \( (M = .883, SE = .403) \) and the no-label condition \( (M = 2.378, SE = .423) \). Taken together, these results suggest that the dual-column label had an effect on the participants’ estimation of more accurate fat counts, but the estimates were not as accurate as those for the single-column label format. The participants with the no-label
format performed the worst in estimating fat counts accurately. The main effect of the type of snack was not significant \([F (1, 92) = .623, p = .432]\). These results indicate that the participants who received the healthy snack \((M = 1.515, SD = 2.898)\) estimated the snack’s fat amount slightly less accurately than those who received the less healthy snack \((M = 1.263, SD = 2.095)\).

Figure 2. Accuracy of the Fat Count Estimates Across Label Types and Types of Snack

A 2 x 3 between-subjects ANOVA found that the interaction of the label condition and type of snack on fiber count accuracy was not significant \([F (2, 91) = .341, p = .712]\) (see Table 6). On the other hand, a significance was found for the main effect of the label type condition on the accuracy of fiber estimates \([F (2, 91) = 3.624, p = .031,\)
$\eta^2 = .074]$. Paired comparisons were conducted using the Tukey HSD post-hoc test to investigate the relationship between the fiber count estimate accuracy and the label type. It was found that the participants in the dual-column label condition were less accurate ($M = 3.188, SE = 1.257$) than those in the single-column label condition ($M = .552, SE = 1.238$). The participants in the no-label condition ($M = 5.331, SE = 1.279$) were the least accurate among the label type conditions. These findings suggest that the participants in the single-column condition group were able to more accurately estimate the snacks’ fiber counts than the participants in the dual-column condition group. The main effect of the type of snack was not significant [$F (1, 91) = .041, p = .839$].

<table>
<thead>
<tr>
<th>Type of Label Given to the Participant</th>
<th>Type of Snack Given to the Participant</th>
<th>Mean</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-Column Label</td>
<td>Healthy</td>
<td>3.313</td>
<td>1.777</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>3.063</td>
<td>1.777</td>
</tr>
<tr>
<td>Single-Column Label</td>
<td>Healthy</td>
<td>.969</td>
<td>1.777</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>.135</td>
<td>1.724</td>
</tr>
<tr>
<td>No-Label</td>
<td>Healthy</td>
<td>4.346</td>
<td>1.972</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>6.316</td>
<td>1.631</td>
</tr>
</tbody>
</table>

**Table 6. Accuracy of the Fiber Count Estimates Across Label Types and Types of Snack**

Another ANOVA was conducted to examine the accuracy of the protein amount estimates. The interaction of the label condition and type of snack with respect to protein count accuracy was not significant [$F (2, 92) = .143, p = .867$] (see Table 7). A significant main effect was found for the label condition on the accuracy of the protein amount estimates [$F (2, 92) = 11.214, p < .001, \eta^2 = .196$]. Paired comparisons were conducted using the Tukey HSD post-hoc test to investigate the relationship between the
protein count estimate accuracy and the label type. It was revealed that the participants were able to estimate the protein counts significantly more accurately in the dual-column label condition \((M = .095, SE = .387)\) than in the single-column label condition \((M = .387, SE = .204)\), and participants in the single-column label condition resulted significantly more accurate than in the no-label condition \((M = 1.449, SE = .215)\). The main effect for the type of snack was not significant \([F(1, 92) = .050, p = .823]\).

These results suggest a mixed result for the first hypothesis. Part of the hypothesis was not supported, as the dual-column format did not prove to have a significant positive effect on accurately estimating serving size, fat, and fiber counts information when compared to the single-column format. However, the dual-column label format significantly increased accuracy of estimating calorie counts and protein counts when compared to the single-column label format. As predicted in the initial hypothesis, the no-label condition group performed worst in estimating the serving size and all the nutrient information (i.e., calorie counts, fat counts, fiber counts, and protein counts).

<table>
<thead>
<tr>
<th>Type of Label Given to the Participant</th>
<th>Type of Snack Given to the Participant</th>
<th>Mean</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-Column Label</td>
<td>Healthy</td>
<td>.063</td>
<td>.298</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>.128</td>
<td>.298</td>
</tr>
<tr>
<td>Single-Column Label</td>
<td>Healthy</td>
<td>.441</td>
<td>.289</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>.332</td>
<td>.289</td>
</tr>
<tr>
<td>No-Label</td>
<td>Healthy</td>
<td>1.346</td>
<td>.331</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>1.553</td>
<td>.274</td>
</tr>
</tbody>
</table>

Table 7. Accuracy of the Protein Count Estimates Across Label Types and Types of Snack
**Motivation to Evaluate Label**

The second hypothesis predicted that the participants who were assigned to the dual-column label condition would report greater motivation to evaluate labels compared to the participants in the single-column label condition. The participants in the no-label condition were excluded from this analysis, as they were not exposed to a label to evaluate.

How well participants tried to evaluate the information on the label was measured. A 2 x 2 between-subjects analysis of variance revealed that the interaction effect of the label condition and type of snack on motivation was not significant \([F(1, 63) = .751, p = .389]\) (see Table 8). There was no significant difference in motivation between the dual-column label condition (\(M = 4.00, SD = 1.606\)) and the single-column condition (\(M = 3.86, SD = 1.556\) \([F(1, 63) = .134, p = .716]\)). The main effect for the type of snack was not significant \([F(1, 63) = .549, p = .462]\). Therefore, since the participants with the dual-column label format did not show significantly greater motivation to evaluate the labels compared to the participants with the single-column labels format, hypothesis #2 was not supported.

<table>
<thead>
<tr>
<th>Type of Label Given to the Participant</th>
<th>Type of Snack Given to the Participant</th>
<th>Mean</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-Column Label</td>
<td>Healthy</td>
<td>3.688</td>
<td>.397</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>4.313</td>
<td>.397</td>
</tr>
<tr>
<td>Single-Column Label</td>
<td>Healthy</td>
<td>3.882</td>
<td>.385</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>3.833</td>
<td>.375</td>
</tr>
</tbody>
</table>

*Table 8. Participants’ Motivation to Evaluate the Information on the Label*
Favorability

The third hypothesis predicted that products presented with the dual-column label would be perceived more favorably compared to the products presented with a single-column label due to the more salient format for presenting nutrition content information. It was also hypothesized that the participants would perceive the no-label condition with the lowest level of favorability. The participants’ rating of snack favorability for the dual-column label format, the single-column label format, and the no-label format were measured to determine whether the label type influenced the participants’ liking of the snacks. A 2 x 3 between-subjects analysis of covariance was conducted.

The covariate of the estimated absolute serving size counts explained a significant amount of variance in snack favorability \([F (1, 89) = 4.978, p < .028, \eta^2 = .053]\). It was also revealed that the covariate of the estimated absolute calorie counts explained a significant amount of variance in snack favorability \([F (1, 89) = 5.559, p < .021, \eta^2 = .059]\); the covariate of the estimated absolute fat counts explained a significant amount of variance in snack favorability \([F (1, 89) = 7.082, p < .009, \eta^2 = .074]\); and the covariate of the estimated absolute fiber counts explained a significant amount of variance in snack favorability \([F (1, 89) = 4.165, p < .044, \eta^2 = .045]\).

A Pearson product-moment correlation coefficient was obtained to evaluate the relationship between the snacks’ favorability and the nutrient counts estimated by the participants. The results show that there was a significant positive correlation between snack favorability and the participants’ calorie count estimates \([r (97) = .285, p = .005]\). This indicates that the participants’ favorability ratings for the snacks correlated with increases in estimated calorie counts. No significant correlations were found between the
snack favorability and participants’ serving size count estimates \[ r (96) = -0.074, p = .471 \]; participants’ fat count estimates \[ r (97) = -0.011, p = .918 \]; and participants’ fiber count estimates \[ r (96) = -0.170, p = .097 \].

The interaction effect of the label condition and type of snack on snack favorability was not significant \[ F (2, 89) = 2.746, p < .070 \] (see Table 9). The main effect of the label condition on snack favorability was not significant \[ F (2, 89) = .751, p < .006 \]. The main effect of the type of snack on snack favorability was significant \[ F (1, 89) = 9.553, p < .003, \eta^2 = .097 \]. These findings indicated that the type of snack was, in fact, prominent in influencing snack favorability and that the participants in the less healthy snack condition \( M = 5.56, SD = 1.316 \) rated the snack as significantly more favorable compared to those in the healthy snack condition \( M = 4.91, SD = 1.320 \).

Thus, hypothesis #3 was not supported as the dual-column label format did not have a significant impact on favorability ratings of the snacks.

<table>
<thead>
<tr>
<th>Type of Label Given to the Participant</th>
<th>Type of Snack Given to the Participant</th>
<th>Mean</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-Column Label</td>
<td>Healthy</td>
<td>4.860</td>
<td>.329</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>5.798</td>
<td>.331</td>
</tr>
<tr>
<td>Single-Column Label</td>
<td>Healthy</td>
<td>5.303</td>
<td>.303</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>5.276</td>
<td>.305</td>
</tr>
<tr>
<td>No-Label</td>
<td>Healthy</td>
<td>4.356</td>
<td>.380</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>5.763</td>
<td>.296</td>
</tr>
</tbody>
</table>

Table 9. Snack Favorability Across Label Types and Types of Snack

Dietary Choice

The fourth hypothesis predicted that the participants who were given the dual-column labels for both the “healthy” and “less-healthy” snacks would eat the least
amount of snacks compared to the single-column label group, who would eat less than the no-label format group. In addition, it was predicted that participants would eat less of the less healthy snack compared to the healthy snack when they were given a dual-column label compared to those who received the snacks with the single-column label or no label, as the participants would be more aware of what they were eating.

A 2 x 3 between-subjects analysis of covariance found that the covariate of nutrition fact recall (i.e., whether a participant thought of nutrition facts while eating) explained a significant amount of variance in snack consumption \[ F(1, 90) = 6.155, p < .015, \eta^2 = .064 \]. Furthermore, the covariate of the hunger level explained a significant amount of variance in snack consumption \[ F(1, 90) = 6.680, p < .011, \eta^2 = .069 \], and the covariate of gender explained a significant amount of variance in snack consumption \[ F(1, 90) = 8.787, p < .004, \eta^2 = .089 \] (see Figure 3).

![Figure 3. Amount of Snacks Consumed (oz) Across Label Types and Genders](image-url)
A Pearson product-moment correlation was analyzed to assess the relationship between the amount of snacks consumed by the participants and whether they thought of nutrition facts while eating. There was a significant negative relationship between the two variables \( r(99) = -0.221, p < 0.028 \). This suggests that the participants’ snack consumption increased when they did not think about the nutrition fact information while eating. The analysis also found another significant negative correlation between the gender of the participants and the amount of snacks they consumed \( r(100) = -0.376, p < 0.001 \).

A one-way between-subjects ANOVA showed that the male participants \( (M = 0.612, SD = 0.465) \) ate significantly more of the snacks than the female participants \( (M = 0.346, SD = 0.197) \) during the experiment \( [F(1, 98) = 16.151, p < 0.001] \). There was another significant negative correlation between the gender of the participants and their hunger level \( r(100) = -0.251, p < 0.012 \). A one-way between-subjects ANOVA indicated that the male participants’ hunger level \( (M = 4.30, SD = 1.879) \) was significantly higher than that of the females \( (M = 3.36, SD = 1.658) \) \( [F(1, 98) = 6.571, p < 0.012] \). In addition, a significant negative correlation was found between gender and exercise frequency \( r(100) = -0.235, p < 0.018 \). It was found that the male participants in this study reported greater exercise frequency per week \( (2.7 \text{ times per week}) \) than the female participants \( (1.7 \text{ times per week}) \). Furthermore, there was a significant positive correlation between exercise frequency and the amount of snacks consumed by the participants \( r(100) = 0.209, p < 0.037 \). This shows that the reported exercise frequency increased as the amount of snacks consumed increased.
A significant positive correlation was found between the level of hunger and the amount of snacks consumed by the participants \([r (100) = .294, p < .003]\) and participants’ snack liking and the amount of snacks consumed by the participants \([r (99) = .258, p < .010]\). These results suggest that the participants who were hungrier and/or had higher ratings of snack favorability tended to eat more than those who reported lower levels of hunger or who rated the snacks as having lower favorability. Another significant positive correlation was found between the level of hunger and the participants’ perception of the amount of snack they received \([r (100) = .258, p < .010]\). This suggests that increases in hunger level correlated with increases in the amount of snacks that the participants thought they received during the experiment.

The interaction of the label condition and type of snack on snack consumption was not significant \([F (2, 90) = 1.513, p < .226]\) (see Table 10). The main effect of the label condition on snack consumption was not significant \([F (2, 90) = .791, p < .456]\). As opposed to the initial hypothesis, the results revealed the participants in all three label conditions ate about the same amount. The main effect of the snack type on snack consumption was not significant \([F (2, 90) = .791, p < .456]\), which shows that the snack label type did not impact the amount of snack consumed.

These findings lead us to reject hypothesis #4, which proposed that the dual-column label would be effective in reducing snack consumption regardless of the snack type. It was revealed that the participants’ gender, exercise frequency per week, hunger level, and liking of snack were found to have an impact on their snack consumption, while it was found that the label type did not have impact on reducing snack consumption.
<table>
<thead>
<tr>
<th>Type of Label Given to the Participant</th>
<th>Type of Snack Given to the Participant</th>
<th>Mean</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual-Column Label</td>
<td>Healthy</td>
<td>.459</td>
<td>.074</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>.507</td>
<td>.079</td>
</tr>
<tr>
<td>Single-Column Label</td>
<td>Healthy</td>
<td>.550</td>
<td>.072</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>.343</td>
<td>.071</td>
</tr>
<tr>
<td>No-Label</td>
<td>Healthy</td>
<td>.415</td>
<td>.081</td>
</tr>
<tr>
<td></td>
<td>Less Healthy</td>
<td>.360</td>
<td>.069</td>
</tr>
</tbody>
</table>

Table 10. Amount of snacks consumed (.oz) across label types and types of snack

**Additional Analyses**

The participants' BMI (i.e., Body Mass Index) value was calculated using the participants' height and weight data collected during the study. Using a Pearson product-moment correlation analysis, there was no significant relationship between the participants' BMI value and the amount of attention that the participants paid to evaluate the information on the nutrition fact labels \[r (67) = .163, p = .187\]. Similarly, BMI value and the covariate of nutrition fact recall (i.e., whether a participant thought of information on nutrition fact labels while eating) was also non-significant \[r (99) = .069, p = .498\]. Furthermore, the correlation between BMI value and whether the participant thought himself/herself health conscious was also found to be non-significant \[r (100) = .070, p = .487\].
DISCUSSION

Comprehension Level

As predicted in the initial hypothesis, the results indicated that the dual-column label group had significantly increased accuracy in calorie count estimates compared to when the snack was presented with the single-column label. This shows that the dual-column label played a significant role in conveying more accurate caloric information compared to the single-column label. In addition, even though it was not significant, the participants in the dual-column label condition performed slightly better in estimating the serving size compared to those who received the single-column label. Also, it was revealed that the main effect of the type of snack was significant for the serving size. A between-subjects ANOVA found that the participants in the less healthy snack group (M&M) were more likely to underestimate the serving size compared to the healthy snack group (pretzels). This may be due to the fact that the size of the bag that contained the pretzels was slightly larger due to the individual size of the pretzels compared to the size of individual M&Ms, even though the serving size of each snack was identical (1.5 oz.). The participants may have gauged the serving size based on the size of the snack bag. It is also possible that this phenomenon resulted from the participants’ wishful thinking such that they may have been more likely to underestimate the serving size of the snack they favored so that they would not feel guilty about consuming more of the “less healthy” snack. As predicted by the hypothesis, the participants in the no-label condition performed the worst in estimating the serving size and calorie counts accurately.
In terms of nutrient information, it was hypothesized that the dual-column format would improve the estimation of fat, fiber, and protein counts. Even though the single-column label format was found to be slightly more effective for the participants in estimating accurate fat and fiber counts compared to the dual-column label and no-label formats, the single-column format was not effective enough to have a significant impact on accurate estimation of the nutrition information. On the other hand, the dual-column format was observed to be significantly more effective in the estimation of accurate protein counts compared to the single-column label and no-label formats. This particular finding could be due to, as predicted in the hypothesis, the dual-column format more effectively conveying nutritional information to the participants. However, this result needs to be replicated further, because memory for protein information was the only nutrient among the three (i.e., fat, fiber and protein) that was found to have been significant impacted when presented in the dual-column format compared to the single-column format or the no-label format. In all of the cases described above, the no-label format yielded the least accuracy in estimating accurate fat, fiber, and protein counts. This particular finding indicates that, although there is variance in the effectiveness of the dual-column and single-column label formats, as discussed above, it is certain that the presence of a nutrition fact label is effective in conveying dietary information.

Overall, the first hypothesis was partially supported in that the dual-column label format supplied a good situational cue that aided in the estimation of accurate calorie counts and protein counts by showing the multiple servings enclosed in a single package, which provided more salient information to the participants. These particular findings support the study results (Antonuk & Block, 2006) indicating that the dual-column label
was effective in helping participants to grasp portion size information due to its more intuitive nutrition label format compared to the standard, single-column format. This could suggest that, as portion sizes are getting larger and consumers tend to eat bigger portions, dual-column information may help to cut down on mindless over-consumption.

On the other hand, even though the single-column format was not effective enough to have a significant impact on accurate estimation of fat and fiber counts, the participants were able to estimate the fat and fiber counts slightly more accurately with the single-column format than the dual-column format. The reason that the single-column label, which provides only per-serving information, performed better than the dual-column label, which provides the total nutrient information, is unknown. However, it is possible that the participants were overwhelmed by the increased cognitive load imposed by the dual-column label, since they were faced with significantly more information displayed on the dual-column label, or that the participants simply were not used to the dual-column nutrition label format. Since mixed findings were observed during this experiment, as the dual-column label format was more effective in the estimation of the accurate serving sizes as well as calorie counts, it is not possible to draw a simple conclusion. Therefore, this issue needs to be further investigated in future studies to determine the factors that may be associated with these outcomes.

Motivation to Evaluate Labels

A previous study found that the reasons people did not use labels is because they “take too much time” and are “too hard to understand” (Kristal et al., 1998, p. 1214). The current study aimed to determine whether the label format plays a role in attracting the attention of the participants and how the dual-column label helps the participants to
understand the nutrition fact label. The current study hypothesized that, as a result of the provision of a label that is easier to interpret, the participants would show greater motivation to evaluate the label.

The results did not support the hypothesis because the participants in the dual-column label did not show significantly greater motivation to evaluate labels compared to the participants in the single-column label group. These findings could be substantiated by the theory of cognitive dissonance, which posits “when dissonance is present, in addition to trying to reduce it, the person will actively avoid situations and information which would likely increase the dissonance” (Festinger, 1957, p. 3). For example, when an individual favors potato chips that are high in calories and fat, he/she may be inclined to tune out the caloric or fat information on the nutritional labels, as such information is regarded, as a factor that causes “discomforting cognitive dissonance” and is “undesirable” (Lin, Lee, & Yen, 2004, p. 1956). According to Festinger (1957), “a person will expose himself to sources of information that he expects will add new elements that will increase consonance but certainly avoid sources that will increase dissonance.” (p. 30) In the current study, the consonance could have been information that the participants found preferable (i.e., possibly vitamin or fiber information, which people often find beneficial to their diet). However, information that was not preferred by the participants could have been considered dissonance, which they may have wished to ignore (e.g., saturated fat and/or cholesterol counts). In the current experiment, it was found that the dual-column label format, which supposedly raises awareness about the snacks’ nutrient information and portion size, was not necessarily favored by the participants, perhaps because the participants who received the dual-column label wished to ignore its nutrition
and/or portion size information due to its saliency, which provides better cues about the portion size information compared to the single-column label format. Thus, the better cues may not necessarily have been favored by the participants if they wished to consume snacks without knowledge of their calorie intake, as they did not want to be concerned about it. Thus, “avoidance of dissonance” may have led to the participants’ paying less attention to the information displayed on the label. However, it must be noted that this theory did not apply to the calorie count and protein count estimates, where the participants were able to estimate this nutritional information most accurately when they were exposed to the dual-column label format compared to when they were exposed to the single-column or no-label format condition groups. This suggests another possibility: perhaps people are less familiar with fat and fiber information than with calorie and protein information. Thus, this needs to be further investigated to gain a better understanding.

**Favorability**

The results indicate that the participants did not significantly favor the snack presented with the dual-column label format compared to the snack with the single-column label and no-label formats. Instead, it was found that the participants’ favorability ratings for the snacks were correlated with increases in the estimated calorie counts, and they favored the less healthy snack more than the healthy snack regardless of the label type. From these findings, it was concluded that the label type did not influence the favorability ratings of the snacks.

This particular finding that the participants favored the less healthy snack (M&Ms) more than the healthy snack (pretzels) was discussed by Kessler (2009), who
stated that “the combination of sugar and fat is what people prefer and what they will eat most” (p. 14) and connected our attraction to these highly palatable foods to the way our brain functions. Kessler (2009) argued that, “alone among the senses, taste is hardwired to brain cells that respond to pleasure” and that the sense of taste “prompts the strongest emotional response” (p. 36). Such statements indicate how the pleasure of the taste factor leads to increase foods’ appeal and, thus, could increase snack preference.

Furthermore, Kessler (2009) introduced John Salamone’s view, which was derived from the evolutionary perspective. Based on past research that revealed that dopamine prompts human behavior and urges us toward food, while a psychoactive chemical called opioid provides pleasure and motivates us to keep eating, Salamone (cited in Kessler, 2009) argued that those combined roles are essential for human survival because “a part of survival is being able to expend enough energy and be active enough to gain access to the stimuli that are necessary” (p. 42). This evolutionary view could also explain why there was an increase in participants’ snack preference ratings with increases in the estimated calorie count. Therefore, there is a strong association between snack preference and human biological factors, which seem to outweigh the influence of the nutrition label format.

**Dietary Choice**

The current study found that the participants who received the dual-column label format did not consume significantly fewer snacks compared to the participants who were given the single-column label and the no-label formats. Additionally, the participants in the no-label format condition ate the least amount of snacks compared to the single-
column label and the dual-column label format groups. The analysis also revealed no significant effect of snack type on snack consumption amount.

Although these results do not support the hypothesis, a Pearson product-moment correlation that evaluated the relationship between the amount of snacks consumed by the participants and whether they thought of nutrition facts while eating (see page 34) found that the participants’ snack consumption increased when the participants paid less attention to the nutrition fact information. This finding can be supported by the theory of cognitive dissonance, which argues that dissonant purchasers are expected to avoid exposure to dissonance-arousing information, to be extremely sensitive to information favorable to the purchase decision, and to rate this information in a dissonance-reducing direction (Straits, 1964). Thus, it is possible to assume that, when the participants wished to be mindless about how much of the snack they ate (consonance), they may have been more likely to pay less attention to the nutrition fact label (dissonance). Furthermore, it is possible to speculate that the participants simply did not care about the nutritional content or the calorie information. Further research is needed to confirm this speculation.

It was also revealed that the participants’ perception of the amount of snacks they thought they received increased as their hunger level increased. Additionally, the participants’ snack consumption increased as their ratings of snack favorability increased. It was also interesting to find that the amount of snack consumed increased as the reported exercise frequency increased. A study conducted by Church et al. (2009) revealed that overweight women who exercised 194 minutes per week did not lose a significant amount of weight compared to women who exercised 72 minutes or 136 minutes. He explained this may be due to compensators such that the participants who
exercised more may have had higher calorie intake (Church et al., 2009). This could be because exercise stimulates hunger as human body tries to compensate for the calories lost during exercise and triggers a compensatory urge to eat more. In addition, Cloud (2009) supported Church et al. (2009), indicating that it is more important to monitor what one eats than how much effort one puts into exercise. Cloud (2009) indicated that people tend to reward themselves by eating after exercise, which can stall the exercise effect. Along with this, the current study supports Church et al. (2009) in indicating that an active lifestyle likely leads to a higher hunger level, which may lead to greater snack consumption.

Furthermore, gender was correlated with increased snack consumption. Male participants ate more snacks than female participants. Male participants, who often have greater muscle development and larger body size, may generally eat more, as they need to consume more calories to keep their bodies from atrophying.

In addition, a significant negative correlation was found between the amount of snack consumed by the participants and whether the participants thought of nutritional facts while eating. This finding reveals that increases in health awareness were correlated with decreases in snack consumption. This finding is important to note because it validates the notion that a health-conscious person is more likely to consume less food, which reduces the likelihood of becoming overweight. This finding could suggest that it is essential for one to be able to differentiate what is healthy from what is unhealthy while maintaining the motivation to lead a healthy lifestyle. Finding a personal reward after moderate exercise other than eating food may help in maintaining the motivation to exercise and to pursue a healthy lifestyle.
Limitations and Future Directions

This study was a first step in understanding the impact of the dual-column label format, yet there are limitations in the study. The findings of the current study and its limitations reveal possible paths for future research.

An important limitation of this study is its population. For example, age is a factor that should be explored in subsequent studies, as the current study focused solely on college students, whose ages ranged from 18 to 23. It would also be interesting to see how the dual-column label would impact children, adults, and the elderly population.

It should also be noted that, during the process of analysis, the data of the participants who gave low favorability ratings to the snacks as well as those who chose not to eat the snacks during the experiment were discarded with the goal of focusing on the situations where it is realistic that the consumer may actually purchase and consume the product. Therefore, the results of the current study do not reflect the responses of the participants who did not like or did not eat the snacks. This is a limitation because it is unknown whether the results obtained from the study would hold for the participants who did not like or did not eat the snacks.

Another limitation is the difference between the real study environment and the experimental environment used for this study. The current study was conducted at a psychology lab, which does not resemble an actual store or home environment. It is possible that the participants may encounter more distractions in a real-life setting while interpreting the label information and may not perform in the same way as they did during the experimental study. In addition, the current experiment focused on participants’ behavior on snack consumption rather than on meal consumption. This
could have affected the study outcome, as participants might have worried less about calorie intake from snacks compared to calorie intake from meals since the amounts of snacks used during the experiment were low in calories compared to regular meals. Also, another limitation could be that four participants were assigned to each experimental group. Often, they did not know each other, and it is possible that the nervousness evoked by sitting next to strangers added variability to the participants’ responses. It would be interesting to compare the results with those of a study with more participants assigned to the groups.

In addition, the difference between the label presentation method in a real-life study setting and the experimental setting needs to be noted. In the current study, the nutrition label itself was presented as a sheet rather than on a food package, which is how nutrition labels are usually presented to consumers. This “forced exposure” to the nutrition fact label is not natural to real settings and may not necessarily show the same results in a real environment such as at stores or at home. It is possible that consumers, if not asked to specifically pay attention to the label, unlike in the experimental environment, may decide to rely solely on food packages and their health claims and ignore the nutrition label information when purchasing the product. Thus, it would be interesting to evaluate the impact of a dual-column label on actual food packages to see how participants interpret the information in a real-life environment.

Additionally, the snack type itself could have been a limitation. The two types of snacks (e.g., M&M candies and pretzels) used in the study were different on a number of dimensions, and it is not possible to identify what dimension(s) led to the effects in this study. For example, the pretzels have more sodium than the M&M candies. On the other
hand, the M&M candies have a higher sugar and fat content than the pretzels. Also, the M&M candies contain caffeine, whereas pretzels do not. Also, the calorie content of the pretzels is almost half that of the M&M candies. For future studies, it would be interesting to use different types of snacks that are more similar in their nutritional characteristics.

Furthermore, it should be noted that the sizes of the snack bags were not identical. Due to the individual snack size differences, the bag of M&M candies was smaller than the bag of pretzels even though each snack bag contained 1.5 ounces. Thus, the bag containing M&Ms may have appeared to contain less to the eyes of participants compared to the bags that contained pretzel snacks. Even though data that could show the influence of the snack bag size variance was not collected during the experiment, such size differences might have affected the participants’ responses on estimating snack nutrient information as well as their snack consumption behavior. Thus, for future experiments, it will be important to manipulate snacks that are similar in bag size.

Another area to investigate could be the integration of graphical cues and/or pictograms in addition to the different label format, which should be the dual-column label format. Fitzgerald and France (2001) argued that a graphical element such as color and picture use on product packages has a significant influence on how a person perceives the products and its characteristics. This would be particularly interesting, as a study conducted by Borgmeier and Westenhoefer (2009) found that the presence of a signpost label resulted in better identification of healthier foods compared to un-labeled food. For example, the question of whether it would help to add a pictogram to indicate
whether 10 grams of fat in a product is considered high or low would be a possible topic for the future study.

Another limitation is the results of the random distribution of the participants. Although the participants were randomly assigned to conditions using a random sampling generator program, the end distribution was somewhat uneven, as the participants who answered that they did not like the snack were eliminated from the analysis. In the future, it would be better to collect snack preference information before the study begins and decide whether the participants could participate in the study accordingly.

Finally, the current study was limited in the observation length. The study measured the amount of snacks consumed during a five-minute video. However, this may not reflect a real-life situation in which the participants may have longer than five minutes to consume snacks. It is important that future studies consider this limitation and design the study accordingly.

The importance of pursuing a healthy lifestyle has been increasingly addressed in recent decades as our food environment has changed not only in the United States but also globally. While it is important for governments to educate consumers about the importance of health and ways to pursue a healthy way of living, it is also very important to develop an effective tool to help consumers choose products that help them to practice a healthy lifestyle. The current study investigated the effectiveness of a dual-column nutrition label format as a tool to enhance consumers’ understanding of nutrition labels. Although this study did not reveal the impact of the dual-column label to be as high as initially predicted, there definitely is room to refine the concept for future research. It is my hope that the current study will help to provide a better understanding of how
nutrition labels affect consumers’ responses and to suggest further opportunities to pursue continuous studies in the area of nutrition label formats.
REFERENCES


WELCOME!
The following is a nutrition label of a pretzel snack that you received. Please take time to read this label.

THIS SNACK CONTAINS THE FOLLOWING INGREDIENTS. PLEASE MAKE SURE THAT YOU ARE NOT ALLERGIC TO ANY OF THE INGREDIENTS LISTED BELOW.

Ingredients: Enriched Flour (Wheat Flour, Niacin, Reduced Iron, Thiamin Mononitrate, Riboflavin, Folic Acid), Salt, Corn Syrup, Corn Oil, Yeast, Malt Extract, Sodium Bicarbonate, Ammonium Bicarbonate, and Artificial Flavor.

CONTAINS WHEAT INGREDIENTS
Please answer the following questions to the best of your knowledge:

1) How many calories are in this bag of pretzel snacks?

____________ calories

2) How many grams of fat are in this bag of pretzel snacks?

____________ grams of fat

3) How many grams of fiber are in this bag of pretzel snacks?

______________ grams of fiber

4) How many grams of protein are in this bag of pretzel snacks?

_____________ grams of protein

5) Please choose and circle the correct answer (Select only one)

This bag of pretzel snacks contains:

a) 0% of total % Daily Value for Vitamin C
b) 1 – 2% of total % Daily Value for Vitamin C
c) 3 - 4% of total % Daily Value for Vitamin C
d) There is no information about Vitamin C on this label

6) Please choose and circle the correct answer (Select only one)

This bag of pretzel snacks contains:

a) 0% of total % Daily Value for Calcium
b) 1 – 2% of total % Daily Value for Calcium
c) 3 - 4% of total % Daily Value for Calcium
d) There is no information about Calcium on this label
7) How many servings are in this bag of pretzel snacks?

__________________ servings

8) How well did you understand the information presented on the label?
(Please circle one)

1 2 3 4 5 6 7
Not at all Very much

9) How often do you pay attention to snack food nutrition labels?
(Please circle one)

1 2 3 4 5 6 7
Never Always

PLEASE RETURN THIS QUESTIONNAIRE TO THE EXPERIMENTER WHEN YOU HAVE FINISHED ANSWERING ALL THE QUESTIONS.
WELCOME!
The following is a nutrition label of a chocolate snacks that you received. Please take time to read this label.

### Nutrition Facts

<table>
<thead>
<tr>
<th>Serving Size: 1 ounce (about 33 pieces)</th>
<th>33 pieces</th>
<th>Entire Bag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>140</td>
<td>210</td>
</tr>
<tr>
<td>Calories from Fat</td>
<td>53</td>
<td>80</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>%DV</th>
<th>%DV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat</td>
<td>6g</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>4g</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>3mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>17mg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>%DV</th>
<th>%DV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Carbohydrate</td>
<td>20g</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>&lt;1g</td>
</tr>
<tr>
<td>Sugars</td>
<td>18g</td>
</tr>
<tr>
<td>Protein</td>
<td>1g</td>
</tr>
</tbody>
</table>

| Vitamin A | 0% | 0% |
| Vitamin C | 0% | 0% |
| Calcium   | 3% | 4% |
| Iron      | 1% | 2% |

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.*

<table>
<thead>
<tr>
<th>Calories</th>
<th>2,000</th>
<th>2,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat</td>
<td>Less than 65g</td>
<td>80g</td>
</tr>
<tr>
<td>Sat Fat</td>
<td>Less than 20g</td>
<td>25g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Less than 300mg</td>
<td>300mg</td>
</tr>
<tr>
<td>Sodium</td>
<td>Less than 2,400mg</td>
<td>2,400mg</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>360g</td>
<td>375g</td>
</tr>
<tr>
<td>Fiber</td>
<td>25g</td>
<td>30g</td>
</tr>
</tbody>
</table>

THIS SNACK CONTAINS THE FOLLOWING INGREDIENTS.
PLEASE MAKE SURE THAT YOU ARE NOT ALLERGIC TO ANY OF THE INGREDIENTS LISTED BELOW.

Milk Chocolate (Sugar, Chocolate, Cocoa Butter, Skim Milk, Milkfat, Lactose, Soy Lecithin, Salt, Artificial Flavors), Sugar, Cornstarch, Less than 1% Corn Syrup, Dextrin, Coloring (includes Blue 1 Lake, Red 40 Lake, Yellow 6, Yellow 5, Red 40, Blue 1, Blue 2 Lake, Yellow 6 Lake, Yellow 5 Lake, Blue 2)Gum Acacia.

CONTAINS CAFFEINE. MAY CONTAIN PEANUTS.

Please answer the following questions to the best of your knowledge:
1) How many calories are in this bag of chocolate snacks?

_____________ calories

2) How many grams of fat are in this bag of chocolate snacks?

_____________ grams of fat

3) How many grams of fiber are in this bag of chocolate snacks?

_____________ grams of fiber

4) How many grams of protein are in this bag of chocolate snacks?

_____________ grams of protein

5) Please choose and circle the correct answer (Select only one)

This bag of chocolate snacks contains:

a) 0% of total % Daily Value for Vitamin C
b) 1 – 2% of total % Daily Value for Vitamin C
c) 3 - 4% of total % Daily Value for Vitamin C
d) There is no information about Vitamin C on this label

6) Please choose and circle the correct answer (Select only one)

This bag of chocolate snacks contains:

a) 0% of total % Daily Value for Calcium
b) 1 – 2% of total % Daily Value for Calcium
c) 3 - 4% of total % Daily Value for Calcium
d) There is no information about Calcium on this label

7) How many servings are in this bag of chocolate snacks?
__________________ servings

8) How well did you understand the information presented on the label? (Please circle one)

1                   2                   3                   4                   5                   6                   7

Not at all                           Very much

9) How often do you pay attention to snack food nutrition labels? (Please circle one)

1                   2                   3                   4                   5                   6                   7

Never                           Always

PLEASE RETURN THIS QUESTIONNAIRE TO THE EXPERIMENTER WHEN YOU HAVE FINISHED ANSWERING ALL THE QUESTIONS
WELCOME!
The following is a nutrition label of a pretzel snack that you received. Please take time to read this label.

![Nutrition Facts]

**THIS SNACK CONTAINS THE FOLLOWING INGREDIENTS. PLEASE MAKE SURE THAT YOU ARE NOT ALLERGIC TO ANY OF THE INGREDIENTS LISTED BELOW.**

Ingredients: Enriched Flour (Wheat Flour, Niacin, Reduced Iron, Thiamin Mononitrate, Riboflavin, Folic Acid), Salt, Corn Syrup, Corn Oil, Yeast, Malt Extract, Sodium Bicarbonate, Ammonium Bicarbonate, and Artificial Flavor.

**CONTAINS WHEAT INGREDIENTS**
Please answer the following questions to the best of your knowledge:

1) How many calories are in this bag of pretzel snacks?

_____________ calories

2) How many grams of fat are in this bag of pretzel snacks?

_____________ grams of fat

3) How many grams of fiber are in this bag of pretzel snacks?

_____________ grams of fiber

4) How many grams of protein are in this bag of pretzel snacks?

_____________ grams of protein

5) Please choose and circle the correct answer (Select only one)

This bag of pretzel snacks contains:

a) 0% of total % Daily Value for Vitamin C
b) 1 – 2% of total % Daily Value for Vitamin C
c) 3 - 4% of total % Daily Value for Vitamin C
d) There is no information about for Vitamin C on this label

6) Please choose and circle the correct answer (Select only one)

This bag of pretzel snacks contains:

a) 0% of total % Daily Value for Calcium
b) 1 – 2% of total % Daily Value for Calcium
c) 3 - 4% of total % Daily Value for Calcium
d) There is no information about for Calcium on this label
7) How many servings are in this bag of pretzel snacks?

__________________ servings

8) How well did you understand the information presented on the label?
(Please circle one)

1 2 3 4 5 6 7
Not at all Very much

9) How often do you pay attention to snack food nutrition labels?
(Please circle one)

1 2 3 4 5 6 7
Never Always

PLEASE RETURN THIS QUESTIONNAIRE TO THE EXPERIMENTER WHEN YOU HAVE FINISHED ANSWERING ALL THE QUESTIONS.
WELCOME!
The following is a nutrition label of a chocolate snacks that you received. Please take time to read this label.

**Nutrition Facts**

<table>
<thead>
<tr>
<th>Serving Size: 1 ounce (about 33 pieces)</th>
<th>Servings per container: 1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amount Per Serving</strong></td>
<td></td>
</tr>
<tr>
<td>Calories</td>
<td>140</td>
</tr>
<tr>
<td>Calories from Fat</td>
<td>53</td>
</tr>
<tr>
<td><strong>%DV</strong></td>
<td></td>
</tr>
<tr>
<td>Total Fat</td>
<td>6g  9%</td>
</tr>
<tr>
<td>Saturated Fat</td>
<td>4g  20%</td>
</tr>
<tr>
<td>Trans Fat</td>
<td>0g</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>3mg 1%</td>
</tr>
<tr>
<td>Sodium</td>
<td>17mg 1%</td>
</tr>
<tr>
<td>Total Carbohydrate</td>
<td>20g  7%</td>
</tr>
<tr>
<td>Dietary Fiber</td>
<td>1g  3%</td>
</tr>
<tr>
<td>Sugars</td>
<td>18g</td>
</tr>
<tr>
<td>Protein</td>
<td>1g</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>0%</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>0%</td>
</tr>
<tr>
<td>Calcium</td>
<td>3%</td>
</tr>
<tr>
<td>Iron</td>
<td>1%</td>
</tr>
</tbody>
</table>

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.*

**THIS SNACK CONTAINS THE FOLLOWING INGREDIENTS. PLEASE MAKE SURE THAT YOU ARE NOT ALLERGIC TO ANY OF THE INGREDIENTS LISTED BELOW.**

Ingredients: Milk Chocolate (Sugar, Chocolate, Cocoa Butter, Skim Milk, Milkfat, Lactose, Soy Lecithin, Salt, Artificial Flavors) Sugar, Cornstarch, Less than 1% Corn Syrup, Dextrin, Coloring (includes Blue 1 Lake, Red 40 Lake, Yellow 6, Yellow 5, Red 40, Blue 1, Blue 2 Lake, Yellow 6 Lake, Yellow 5 Lake, Blue 2) Gum Acacia. **CONTAINS CAFFEINE. MAY CONTAIN PEANUTS.**

Please answer the following questions to the best of your knowledge:
1) How many calories are in this bag of chocolate snacks?

_____________ calories

2) How many grams of fat are in this bag of chocolate snacks?

_____________ grams of fat

3) How many grams of fiber are in this bag of chocolate snacks?

_____________ grams of fiber

4) How many grams of protein are in this bag of chocolate snacks?

_____________ grams of protein

5) Please choose and circle the correct answer (Select only one)

This bag of chocolate snacks contains:

a) 0% of total % Daily Value for Vitamin C
b) 1 – 2% of total % Daily Value for Vitamin C
c) 3 - 4% of total % Daily Value for Vitamin C
d) There is no information about for Vitamin C on this label

6) Please choose and circle the correct answer (Select only one)

This bag of chocolate snacks contains:

a) 0% of total % Daily Value for Calcium
b) 1 – 2% of total % Daily Value for Calcium
c) 3 - 4% of total % Daily Value for Calcium
d) There is no information about for Calcium on this label
7) How many servings are in this bag of chocolate snacks?

__________________ servings

8) How well did you understand the information presented on the label?
(Please circle one)

1  2  3  4  5  6  7
Not at all  Very much

9) How often do you pay attention to snack food nutrition labels?
(Please circle one)

1  2  3  4  5  6  7
Never  Always

PLEASE RETURN THIS QUESTIONNAIRE TO THE EXPERIMENTER WHEN YOU HAVE FINISHED ANSWERING ALL THE QUESTIONS.
APPENDIX E: QUESTIONNAIRE PACKET A - NO-LABEL AND HEALTHY SNACK

Participant ID #: _______

WELCOME!

THIS SNACK CONTAINS THE FOLLOWING INGREDIENTS. PLEASE MAKE SURE THAT YOU ARE NOT ALLERGIC TO ANY OF THE INGREDIENTS LISTED BELOW.

Ingredients: Enriched Flour (Wheat Flour, Niacin, Reduced Iron, Thiamin Mononitrate, Riboflavin, Folic Acid), Salt, Corn Syrup, Corn Oil, Yeast, Malt Extract, Sodium Bicarbonate, Ammonium Bicarbonate, and Artificial Flavor.

CONTAINS A WHEAT INGREDIENTS
Please answer the following questions to the best of your knowledge:

1) How many calories are in this bag of pretzel snacks?

_____________ calories

2) How many grams of fat are in this bag of pretzel snacks?

_____________ grams of fat

3) How many grams of fiber are in this bag of pretzel snacks?

_____________ grams of fiber

4) How many grams of protein are in this bag of pretzel snacks?

_____________ grams of protein

5) Please choose and circle the correct answer (Select only one)

   This bag of pretzel snacks contains:
   a) 0% of total % Daily Value for Vitamin C
   b) 1 – 2% of total % Daily Value for Vitamin C
   c) 3 - 4% of total % Daily Value for Vitamin C
   d) There is no information about for Vitamin C on this label

6) Please choose and circle the correct answer (Select only one)

   This bag of pretzel snacks contains:
   a) 0% of total % Daily Value for Calcium
   b) 1 – 2% of total % Daily Value for Calcium
   c) 3 - 4% of total % Daily Value for Calcium
   d) There is no information about for Calcium on this label
7) How many servings are in this bag of pretzel snacks?

__________________ servings

8) How often do you pay attention to snack food nutrition label?  
(Please circle one)

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Never  Always
WELCOME!

THIS SNACK CONTAINS THE FOLLOWING INGREDIENTS. PLEASE MAKE SURE THAT YOU ARE NOT ALLERGIC TO ANY OF THE INGREDIENTS LISTED BELOW.

Ingredients: Milk Chocolate (Sugar, Chocolate, Cocoa Butter, Skim Milk, Milkfat, Lactose, Soy Lecithin, Salt, Artificial Flavors) Sugar, Cornstarch, Less than 1% Corn Syrup, Dextrin, Coloring (includes Blue 1 Lake, Red 40 Lake, Yellow 6, Yellow 5, Red 40, Blue 1, Blue 2 Lake, Yellow 6 Lake, Yellow 5 Lake, Blue 2)Gum Acacia. CONTAINS CAFFEINE. MAY CONTAIN PEANUTS.
Please answer the following questions to the best of your knowledge:

1) How many calories are in this bag of chocolate snacks?

_____________ calories

2) How many grams of fat are in this bag of chocolate snacks?

_____________ grams of fat

3) How many grams of fiber are in this bag of chocolate snacks?

_____________ grams of fiber

4) How many grams of protein are in this bag of chocolate snacks?

_____________ grams of protein

5) Please choose and circle the correct answer (Select only one)

This bag of chocolate snacks contains:

a) 0% of total % Daily Value for Vitamin C
b) 1 – 2% of total % Daily Value for Vitamin C
c) 3 - 4% of total % Daily Value for Vitamin C
d) There is no information about for Vitamin C on this label

6) Please choose and circle the correct answer (Select only one)

This bag of chocolate snacks contains:

a) 0% of total % Daily Value for Calcium
b) 1 – 2% of total % Daily Value for Calcium
c) 3 - 4% of total % Daily Value for Calcium
d) There is no information about for Calcium on this label
7) How many servings are in this bag of chocolate snacks?

_________________________ servings

8) How often do you pay attention to snack food nutrition label?
(Please circle one)

1                   2                   3                   4                   5                   6                   7

Never                   Always
APPENDIX G: QUESTIONNAIRE PACKET B - DUAL-COLUMN AND HEALTHY SNACK

Participant ID #: ________

Let's move on to the next questions! I will ask you a series of questions. It is important that you answer each question honestly.

1) Did you eat any of the pretzel snacks?
   IF “Yes”, Please answer 1a through 1c (Skip 1d)
   IF “No”, Please answer 1d (Skip 1a through 1c)

1a. How much did you like this snack? (Please circle one)

   1                   2                   3                   4                   5                   6                   7
   Not at all          Very much

1b. Were you thinking about the nutrition information (e.g., calories, fat, fiber) while you were eating?

   1                   2                   3                   4                   5                   6                   7
   Not at all          Very much

1c. For this experiment, you were given a certain amount of pretzel snacks. How many pretzels do you usually eat in one sitting? Please select one that best describes your response.

   □ Less than I was given
   □ About the same amount as I was given
   □ More than I was given
   □ Other (please describe briefly)

   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________
1d. If you didn’t eat the pretzel snacks, please provide the reason why you didn’t. Please check mark one that best describes your situation.

☐ I was full  ☐ I do not like pretzels  ☐ I have a health condition(s) that prohibit(s) me from eating pretzels (excluding allergy condition)  ☐ Other (please describe briefly)

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

Please answer the following questions regardless of whether you ate or didn’t eat the snack.

2) To what extent were you trying hard to evaluate the information on the nutrition label? (Please circle one)

1  2  3  4  5  6  7
Not at all  Very much

3) Do you think the snack you just ate OR didn’t eat has the following characteristics? Please circle one under each characteristic type.

3a. The snack contains (Please circle one):

1  2  3  4  5  6  7
Low amount  High amount
Amount of Calories

3b. The snack contains (Please circle one):

1  2  3  4  5  6  7
Low amount  High amount
of fat

3c. The product contains (Please circle one):

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low amount of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fiber</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High amount of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fiber</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3d. The product contains (Please circle one):

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low amount of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>calcium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High amount of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>calcium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4) If your doctor told you to reduce the amount of CALORIES in your diet, how likely is it that you would buy this product? (Please circle one)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very unlikely to buy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very likely to buy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5) If your doctor told you to reduce the amount of FAT in your diet, how likely is it that you would buy this product? (Please circle one)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very unlikely to buy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very likely to buy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6) If your doctor told you to increase the amount of FIBER in your diet, how likely is it that you would buy this product? (Please circle one)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very unlikely to buy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very likely to buy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7) If your doctor told you to increase the amount of CALCIUM in your diet, how likely would you be to buy this product? (Please circle one)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very unlikely to buy</td>
<td>Very likely to buy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8) What was your impression of the snack product you saw earlier? Please circle.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>Neutral</td>
<td>Unhealthy</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

9) What factors influence your food choice in general? Please circle each of the following.

9a. Convenience (easiness of getting food)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least important</td>
<td>Most important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9b. Cost/Price of food product

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least important</td>
<td>Most important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9c. Brand preference

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least important</td>
<td>Most important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9d. Food preference

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least important</td>
<td>Most important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9e. Amount of nutrition in food products

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Most important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9f. Organic (food safeness)

<table>
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9g. Picture / Package design

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Other (Please specify):

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10) Please describe why you think you were asked to provide feedback on the food label? What do you think is the purpose of the study?

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11) How knowledgeable do you think you are about nutrition? (Please circle one)

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<tr>
<td>Not at all</td>
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<tr>
<td>Very Knowledgeable</td>
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</table>
12) How often do you make healthy meal choices? (Please circle one)

Never                                Always

13) How often do you read nutrition labels? (Please circle one)

Never                                Always

14) Do you feel that the price of healthy food limits your ability to eat healthy? (Please circle one)

Yes / No

15) How often do you go grocery shopping?

Average of _______ times a week

16) Are you a primary shopper of your household? (Please circle one)

Yes / No

17) Please circle your college standing:

Freshman     Sophomore     Junior     Senior     Graduate

18) Please circle your gender:

Male     Female

19) How old are you? ________ years old
20) What is your ethnic/racial background? Please circle one.
   a. African American / African
   b. Asian
   c. Caucasian
   d. Latino
   e. Native American
   f. Pacific Islander
   g. Other (please describe) _________________________________
   h. Prefer not to answer

21) What is the highest level of education attained by your mother?
    Please circle one.
   a. Some school
   b. High school
   c. Some College
   d. Two-year college
   e. Four-year college
   f. Post graduate
   g. I don't know
22) What is the highest level of education attained by your father?
   a. Some school
   b. High school
   c. Some College
   d. Two-year college
   e. Four-year college
   f. Post graduate
   g. I don't know

23) Do you consider yourself to be health conscious? Please circle one.
   Yes / No

   If you answer “yes” above, why do you consider yourself so? Please describe.
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

24) How much do you weigh? How tall are you?
   __________lb
   __________ inches ___ feet

25) What is your daily-recommended calorie intake?
   If you don’t know, give it your best guess.
   _________________ calories per day

26) Are you currently on a diet? (Please circle one)
   Yes / No
27) Do you consider yourself to be underweight, normal weight, or overweight? (Please circle one)

Underweight / Normal weight / Overweight

28) Do you exercise regularly? If so, how many times per week do you exercise? Please check one.

☐ I do not exercise regularly

☐ I exercise regularly

IF you exercise regularly, please answer the following questions.

28a. I exercise ______ times per week

28b. How do you rate the intensity of your typical workout? Please circle one

Low / Moderate / High

28c. How many minutes do you usually exercise during each session?

_______________ minutes

PLEASE RETURN THIS QUESTIONNAIRE TO THE EXPERIMENTER WHEN YOU HAVE FINISHED ANSWERING ALL THE QUESTIONS.
I hope you enjoyed the video!
Let’s move on to the next questions! I will ask you a series of questions. It is important that you answer each question honestly.

1) Did you eat any of the chocolate snacks?
   IF “Yes”, Please answer 1a through 1c (Skip 1d)
   IF “No”, Please answer 1d (Skip 1a through 1c)

1a. How much did you like this snack? (Please circle one)

1                   2                   3                   4                   5                   6                   7
Not at all                           Very much

1b. Were you thinking about the nutrition information (e.g., calories, fat, fiber) while you were eating?

1                   2                   3                   4                   5                   6                   7
Not at all                           Very much

1c. For this experiment, you were given a certain amount of chocolate snacks.
   How many of chocolates do you usually eat in one sitting?
   Please select one that best describes your response.

☐ Less than I was given
☐ About the same amount as I was given
☐ More than I was given
☐ Other (please describe briefly)

____________________________________________________________________________________

____________________________________________________________________________________
1d. If you didn’t eat the chocolate snacks, please provide the reason why you didn’t. Please check mark one that best describes your situation.

☐ I was full
☐ I do not like chocolates
☐ I have a health condition(s) that prohibit(s) me from eating chocolates (excluding allergy condition)
☐ Other (please describe briefly)

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Please answer the following questions regardless of whether you ate or didn’t eat the snack.

2) To what extent were you trying hard to evaluate the information on the nutrition label? (Please circle one)

1 2 3 4 5 6 7
Not at all                           Very much

3) Do you think the snack you just ate OR didn’t eat has the following characteristics? Please circle one under each characteristic type.

3a. The snack contains (Please circle one):

1 2 3 4 5 6 7
Low amount of Calories
High amount of Calories

3b. The snack contains (Please circle one):

1 2 3 4 5 6 7
Low amount of fat
High amount of fat
3c. The product contains (Please circle one):

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<tbody>
<tr>
<td>Low amount of fiber</td>
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<td>High amount of fiber</td>
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3d. The product contains (Please circle one):

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<td>Low amount of calcium</td>
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4) If your doctor told you to reduce the mount of CALORIES in your diet, how likely is it that you would buy this product? (Please circle one)

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5) If your doctor told you to reduce the mount of FAT in your diet, how likely is it that you would buy this product? (Please circle one)

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6) If your doctor told you to increase the mount of FIBER in your diet, how likely is it that you would buy this product? (Please circle one)

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7) If your doctor told you to increase the amount of **CALCIUM** in your diet, how likely would you to buy this product? (Please circle one)

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8) What was your impression of the snack product you saw earlier? Please circle.

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<tr>
<td>Healthy</td>
<td>Neutral</td>
<td>Unhealthy</td>
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9) What factors influence your food choice in general? Please circle each of the following.

9a. **Convenience** (easiness of getting food)

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9b. **Cost/Price of food product**

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9c. **Brand preference**

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9d. **Food preference**

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9e. Amount of nutrition in food products

1  2  3  4  5  6  7

Least important  Most important

9f. Organic (food safeness)

1  2  3  4  5  6  7

Least important  Most important

9g. Picture / Package design

1  2  3  4  5  6  7

Least important  Most important

Other (Please specify):

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

10) Please describe why you think you were asked to provide feedback on the food label? What do you think is the purpose of the study?

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

11) How knowledgeable do you think you are about nutrition? (Please circle one)

1  2  3  4  5  6  7

Not at all  Very Knowledgeable
12) How often do you make healthy meal choices? (Please circle one)

1  2  3  4  5  6  7

Never Always

13) How often do you read nutrition labels? (Please circle one)

1  2  3  4  5  6  7

Never Always

14) Do you feel that the price of healthy food limits your ability to eat healthy? (Please circle one)

Yes / No

15) How often do you go grocery shopping?

Average of _______ times a week

16) Are you a primary shopper of your household? (Please circle one)

Yes / No

17) Please circle your college standing:

Freshman Sophomore Junior Senior Graduate

18) Please circle your gender:

Male Female

19) How old are you? _______ years old
20) What is your ethnic/racial background? Please circle one.
   a. African American / African
   b. Asian
   c. Caucasian
   d. Latino
   e. Native American
   f. Pacific Islander
   g. Other (please describe) _________________________________
   h. Prefer not to answer

21) What is the highest level of education attained by your mother?
   Please circle one.
   a. Some school
   b. High school
   c. Some College
   d. Two-year college
   e. Four-year college
   f. Post graduate

22) What is the highest level of education attained by your father?
   a. Some school
   b. High school
   c. Some College
   d. Two-year college
   e. Four-year college
   f. Post graduate
23) Do you consider yourself to be health conscious? Please circle one.

Yes / No

If you answer “yes” above, why do you consider yourself so? Please describe.

___________________________________________________________

___________________________________________________________

___________________________________________________________

24) How much do you weigh? How tall are you?

_________ lb

_________ inches _____ feet

25) What is your daily-recommended calorie intake? If you don’t know, give it your best guess.

______________ calories per day

26) Are you currently on a diet? (Please circle one)

Yes / No

27) Do you consider yourself to be underweight, normal weight, or overweight? (Please circle one)

Underweight / Normal weight / Overweight

28) Do you exercise regularly? If so, how many times per week do you exercise? Please check one.

□ I do not exercise regularly

□ I exercise regularly

IF you exercise regularly, please answer the following questions.

28a. I exercise _______ times per week
28b. How do you rate the intensity of your typical workout?
Please circle one

Low / Moderate / High

28c. How many minutes do you usually exercise during each session?

___________ minutes

PLEASE RETURN THIS QUESTIONNAIRE TO THE EXPERIMENTER WHEN YOU HAVE FINISHED ANSWERING ALL THE QUESTIONS.
APPENDIX I: QUESTIONNAIRE PACKET B - SINGLE-COLUMN AND HEALTHY SNACK

Participant ID #: _______

I hope you enjoyed the video!
Let's move on to the next questions! I will ask you a series of questions. It is important that you answer each question honestly.

1) Did you eat any of the pretzel snacks?
   IF “Yes”, Please answer 1a through 1c (Skip 1d)
   IF “No”, Please answer 1d (Skip 1a through 1c)

1a. How much did you like this snack? (Please circle one)

1  2  3  4  5  6  7
   Not at all                       Very much

1b. Were you thinking about the nutrition information (e.g., calories, fat, fiber) while you were eating?

1  2  3  4  5  6  7
   Not at all                       Very much

1c. For this experiment, you were given a certain amount of pretzel snacks. How many pretzels do you usually eat in one sitting? Please select one that best describes your response.

☐ Less than I was given
☐ About the same amount as I was given
☐ More than I was given
☐ Other (please describe briefly)

______________________________________________________________
______________________________________________________________
1d. If you didn’t eat the pretzel snacks, please provide the reason why you didn’t. Please check mark one that best describes your situation.

☐ I was full
☐ I do not like pretzels
☐ I have a health condition(s) that prohibit(s) me from eating pretzels (excluding allergy condition)
☐ Other (please describe briefly)

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

Please answer the following questions regardless of whether you ate or didn’t eat the snack.

2) To what extent were you trying hard to evaluate the information on the nutrition label? (Please circle one)

1  2  3  4  5  6  7
Not at all  Very much

3) Do you think the snack you just ate OR didn't eat has the following characteristics? Please circle one under each characteristic type.

3a. The snack contains (Please circle one):

1  2  3  4  5  6  7
Low amount of Calories

High amount of Calories

3b. The snack contains (Please circle one):

1  2  3  4  5  6  7
Low amount of fat

High amount of fat
3c. The product contains (Please circle one):

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<td>Low amount of fiber</td>
<td>High amount of fiber</td>
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3d. The product contains (Please circle one):

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4) If your doctor told you to reduce the amount of CALORIES in your diet, how likely is it that you would buy this product? (Please circle one)

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5) If your doctor told you to reduce the amount of FAT in your diet, how likely is it that you would buy this product? (Please circle one)

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6) If your doctor told you to increase the amount of FIBER in your diet, how likely is it that you would buy this product? (Please circle one)

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</table>
7) If your doctor told you to increase the amount of CALCIUM in your diet, how likely would you to buy this product? (Please circle one)

1  2  3  4  5  6  7
Very unlikely to buy

8) What was your impression of the snack product you saw earlier? Please circle.

1  2  3  4  5  6  7
Healthy       Neutral       Unhealthy

9) What factors influence your food choice in general? Please circle each of the following.

9a. Convenience (easiness of getting food)

1  2  3  4  5  6  7
Least important

9b. Cost/Price of food product

1  2  3  4  5  6  7
Least important

9c. Brand preference

1  2  3  4  5  6  7
Least important

9d. Food preference

1  2  3  4  5  6  7
Least important
9e. Amount of nutrition in food products

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Other (Please specify):

___________________________________________________________________
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10) Please describe why you think you were asked to provide feedback on the food label? What do you think is the purpose of the study?

___________________________________________________________________
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___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

11) How knowledgeable do you think you are about nutrition? (Please circle one)

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<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Very Knowledgeable</td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
12) How often do you make healthy meal choices? (Please circle one)

1                   2                   3                   4                   5                   6                   7

Never                                  Always

13) How often do you read nutrition labels? (Please circle one)

1                   2                   3                   4                   5                   6                   7

Never                                  Always

14) Do you feel that the price of healthy food limits your ability to eat healthy? (Please circle one)

Yes / No

15) How often do you go grocery shopping?

Average of _______ times a week

16) Are you a primary shopper of your household? (Please circle one)

Yes / No

17) Please circle your college standing:

Freshman Sophomore Junior Senior Graduate

18) Please circle your gender:

Male Female

19) How old are you? _______ years old
20) What is your ethnic/racial background? Please circle one.
   
   a. African American / African
   b. Asian
   c. Caucasian
   d. Latino
   e. Native American
   f. Pacific Islander
   g. Other (please describe) ________________________________
   h. Prefer not to answer

21) What is the highest level of education attained by your mother? Please circle one.
   
   a. Some school
   b. High school
   c. Some College
   d. Two-year college
   e. Four-year college
   f. Post graduate

22) What is the highest level of education attained by your father?
   
   a. Some school
   b. High school
   c. Some College
   d. Two-year college
   e. Four-year college
   f. Post graduate
23) Do you consider yourself to be health conscious? Please circle one.

Yes / No

If you answer “yes” above, why do you consider yourself so? Please describe.

___________________________________________________________

____________________________________________________________

____________________________________________________________

24) How much do you weigh? How tall are you?

_________lb

_________ inches _____ feet

25) What is your daily-recommended calorie intake? If you don’t know, give it your best guess.

______________ calories per day

26) Are you currently on a diet? (Please circle one)

Yes / No

27) Do you consider yourself to be underweight, normal weight, or overweight? (Please circle one)

Underweight / Normal weight / Overweight

28) Do you exercise regularly? If so, how many times per week do you exercise? Please check one.

□ I do not exercise regularly

□ I exercise regularly

IF you exercise regularly, please answer the following questions.

28a. I exercise _______ times per week
28b. How do you rate the intensity of your typical workout?  
Please circle one

Low / Moderate / High

28c. How many minutes do you usually exercise during each session?

______________ minutes

PLEASE RETURN THIS QUESTIONNAIRE TO THE EXPERIMENTER WHEN YOU HAVE FINISHED ANSWERING ALL THE QUESTIONS.
APPENDIX J: QUESTIONNAIRE PACKET B - SINGLE-COLUMN AND LESS

HEALTHY SNACK

Participant ID #: ______

I hope you enjoyed the video!
Let’s move on to the next questions! I will ask you a series of questions. It is important that you answer each question honestly.

1) Did you eat any of the chocolate snacks?
   IF “Yes”, Please answer 1a through 1c (Skip 1d)
   IF “No”, Please answer 1d (Skip 1a through 1c)

1a. How much did you like this snack? (Please circle one)

1                   2                   3                   4                   5                   6                   7
Not at all          Very much

1b. Were you thinking about the nutrition information (e.g., calories, fat, fiber) while you were eating?

1                   2                   3                   4                   5                   6                   7
Not at all          Very much

1c. For this experiment, you were given a certain amount of chocolate snacks. How many chocolates do you usually eat in one sitting? Please select one that best describes your response.

☐ Less than I was given
☐ About the same amount as I was given
☐ More than I was given
☐ Other (please describe briefly)

________________________________________________________________________________________

________________________________________________________________________________________
1d. If you didn’t eat the chocolate snacks, please provide the reason why you didn’t. Please check mark one that best describes your situation.

☐ I was full  
☐ I do not like chocolates  
☐ I have a health condition(s) that prohibit(s) me from eating chocolates (excluding allergy condition)  
☐ Other (please describe briefly)

____________________________________________________________

____________________________________________________________

____________________________________________________________

Please answer the following questions regardless of whether you ate or didn’t eat the snack.

2) To what extent were you trying hard to evaluate the information on the nutrition label? (Please circle one)

1                   2                   3                   4                   5                   6                   7

Not at all                                                                                                          Very much

3) Do you think the snack you just ate OR didn’t eat has the following characteristics? Please circle one under each characteristic type.

3a. The snack contains (Please circle one):

1                   2                   3                   4                   5                   6                   7

Low amount of Calories

High amount of Calories

3b. The snack contains (Please circle one):

1                   2                   3                   4                   5                   6                   7

Low amount of fat

High amount of fat
3c. The product contains (Please circle one):

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<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low amount of fiber</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High amount of fiber</td>
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</table>

3d. The product contains (Please circle one):

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<tbody>
<tr>
<td>Low amount of calcium</td>
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<td></td>
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<tr>
<td>High amount of calcium</td>
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</table>

4) If your doctor told you to **reduce** the mount of **CALORIES** in your diet, how likely is it that you would buy this product? (Please circle one)

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<tr>
<td>Very unlikely to buy</td>
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<tr>
<td>Very likely to buy</td>
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</table>

5) If your doctor told you to **reduce** the mount of **FAT** in your diet, how likely is it that you would buy this product? (Please circle one)

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<tbody>
<tr>
<td>Very unlikely to buy</td>
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<tr>
<td>Very likely to buy</td>
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</table>

6) If your doctor told you to **increase** the mount of **FIBER** in your diet, how likely is it that you would buy this product? (Please circle one)

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<tbody>
<tr>
<td>Very unlikely to buy</td>
<td></td>
<td></td>
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<tr>
<td>Very likely to buy</td>
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</table>
7) If your doctor told you to increase the amount of CALCIUM in your diet, how likely would you to buy this product? (Please circle one)

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<tbody>
<tr>
<td>Very unlikely to buy</td>
<td></td>
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<tr>
<td>Very likely to buy</td>
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</table>

8) What was your impression of the snack product you saw earlier? Please circle.

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<tbody>
<tr>
<td>Healthy</td>
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<tr>
<td>Neutral</td>
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<tr>
<td>Unhealthy</td>
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</table>

9) What factors influence your food choice in general? Please circle each of the following.

**9a. Convenience (easiness of getting food)**

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<tbody>
<tr>
<td>Least important</td>
<td></td>
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<tr>
<td>Most important</td>
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</tbody>
</table>

**9b. Cost/Price of food product**

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</thead>
<tbody>
<tr>
<td>Least important</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Most important</td>
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</table>

**9c. Brand preference**

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<tbody>
<tr>
<td>Least important</td>
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<tr>
<td>Most important</td>
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</table>

**9d. Food preference**

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</thead>
<tbody>
<tr>
<td>Least important</td>
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<tr>
<td>Most important</td>
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</table>
9e. Amount of nutrition in food products

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<tbody>
<tr>
<td></td>
<td>Least</td>
<td></td>
<td>Most</td>
<td>important</td>
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9f. Organic (food safeness)

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<tbody>
<tr>
<td></td>
<td>Least</td>
<td></td>
<td>Most</td>
<td>important</td>
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9g. Picture / Package design

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<tr>
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<td>Least</td>
<td></td>
<td>Most</td>
<td>important</td>
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</table>

Other (Please specify):

___________________________________________________________________

___________________________________________________________________

___________________________________________________________________

10) Please describe why you think you were asked to provide feedback on the food label? What do you think is the purpose of the study?

___________________________________________________________________

___________________________________________________________________

___________________________________________________________________

___________________________________________________________________

___________________________________________________________________

11) How knowledgeable do you think you are about nutrition? (Please circle one)

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</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td></td>
<td>Very</td>
<td>Knowledgeable</td>
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<td></td>
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</tbody>
</table>
12) How often do you make healthy meal choices? (Please circle one)

<table>
<thead>
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<th></th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Always</td>
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</table>

13) How often do you read nutrition labels? (Please circle one)

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<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Always</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14) Do you feel that the price of healthy food limits your ability to eat healthy? (Please circle one)

Yes / No

15) How often do you go grocery shopping?

Average of _______ times a week

16) Are you a primary shopper of your household? (Please circle one)

Yes / No

17) Please circle your college standing:

Freshman Sophomore Junior Senior Graduate

18) Please circle your gender:

Male Female

19) How old are you? _______ years old
20) What is your ethnic/racial background? Please circle one.
   a. African American / African
   b. Asian
   c. Caucasian
   d. Latino
   e. Native American
   f. Pacific Islander
   g. Other (please describe) ______________________________________
   h. Prefer not to answer

21) What is the highest level of education attained by your mother? Please circle one.
   a. Some school
   b. High school
   c. Some College
   d. Two-year college
   e. Four-year college
   f. Post graduate

22) What is the highest level of education attained by your father?
   a. Some school
   b. High school
   c. Some College
   d. Two-year college
   e. Four-year college
   f. Post graduate
23) Do you consider yourself to be health conscious? Please circle one.
  Yes  /  No

If you answer “yes” above, why do you consider yourself so? Please describe.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

24) How much do you weigh? How tall are you?
  __________lb
  __________ inches ___ feet

25) What is your daily-recommended calorie intake? If you don’t know, give it your best guess.
  ________________ calories per day

26) Are you currently on a diet? (Please circle one)
  Yes  /  No

27) Do you consider yourself to be underweight, normal weight, or overweight? (Please circle one)
  Underweight  /  Normal weight  /  Overweight

28) Do you exercise regularly? If so, how many times per week do you exercise? Please check one.
  □  I do not exercise regularly
  □  I exercise regularly

IF you exercise regularly, please answer the following questions.

28a. I exercise _______ times per week
28b. How do you rate the intensity of your typical workout?  
Please circle one

Low / Moderate / High

28c. How many minutes do you usually exercise during each session?

______________ minutes
APPENDIX K: QUESTIONNAIRE PACKET B - NO-LABEL AND HEALTHY SNACK

Participant ID #: _______

I hope you enjoyed the video!
Let’s move on to the next questions! I will ask you a series of questions. It is important that you answer each question honestly.

1) Did you eat any of the pretzel snacks?
   IF “Yes”, Please answer 1a through 1c (Skip 1d)
   IF “No”, Please answer 1d (Skip 1a through 1c)

1a. How much do you like this snack? (Please circle one)

   1                   2                   3                   4                   5                   6                   7

   Not at all   Very much

1b. Were you thinking about the nutrition information (e.g., calories, fat, fiber) while you were eating?

   1                   2                   3                   4                   5                   6                   7

   Not at all   Very much

1c. For this experiment, you were given a certain amount of pretzel snacks. How many pretzels do you usually eat in one sitting? Please select one that best describes your response.

   □ Less than I was given
   □ About the same amount of what I was given
   □ More than I was given
   □ Other (please describe briefly)

   ____________________________________________________________
   ____________________________________________________________
1d. If you didn’t eat the pretzel snacks, please provide the reason why you didn’t. Please check mark one that best describes your situation.

☐ I was full
☐ I do not like pretzels
☐ I have a health condition(s) that prohibit(s) me from eating pretzels (excluding allergy condition)
☐ Other (please describe briefly)

____________________________________________________________
____________________________________________________________
____________________________________________________________

Please answer the following questions regardless of whether you ate or didn’t eat the snack.

2) Do you think the snack you just ate OR didn’t eat has the following characteristics? Please circle one under each characteristic type.

2a. The snack contains (Please circle one):

<table>
<thead>
<tr>
<th>1</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low amount of Calories</td>
<td>High amount of Calories</td>
<td></td>
<td></td>
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</table>

2b. The snack contains (Please circle one):

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<tbody>
<tr>
<td>Low amount of fat</td>
<td>High amount of fat</td>
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</table>

2c. The product contains (Please circle one):

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</tr>
</thead>
<tbody>
<tr>
<td>Low amount of fiber</td>
<td>High amount of fiber</td>
<td></td>
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</tbody>
</table>
2d. The product contains (Please circle one):

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<tbody>
<tr>
<td>Low amount of</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>High amount of</td>
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<td></td>
</tr>
<tr>
<td>calcium</td>
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</table>

3) If your doctor told you to reduce the amount of **CALORIES** in your diet, how likely is it that you would buy this product? (Please circle one)

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<th>6</th>
<th>7</th>
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</thead>
<tbody>
<tr>
<td>Very unlikely to buy</td>
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<tr>
<td>Very likely to buy</td>
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4) If your doctor told you to reduce the amount of **FAT** in your diet, how likely is it that you would buy this product? (Please circle one)

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5) If your doctor told you to reduce the amount of **FIBER** in your diet, how likely is it that you would buy this product? (Please circle one)

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6) If your doctor told you to increase the amount of **CALCIUM** in your diet, how likely is it that you would buy this product? (Please circle one)

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</table>
7) What factors influence your food choice in general? Please circle each of the following.

**7a. Convenience (easiness of getting food)**

1 2 3 4 5 6 7

Least important Most important

**7b. Cost/Price of food product**

1 2 3 4 5 6 7

Least important Most important

**7c. Brand preference**

1 2 3 4 5 6 7

Least important Most important

**7d. Food preference**

1 2 3 4 5 6 7

Least important Most important

**7e. Amount of nutrition in food products**

1 2 3 4 5 6 7

Least important Most important

**7f. Organic (food safeness)**

1 2 3 4 5 6 7

Least important Most important
7g. Picture / Package design

1  2  3  4  5  6  7

Least important  Most important

Other (Please specify):

___________________________________________________________________
___________________________________________________________________
___________________________________________________________________

8) Please describe why do you think you were asked to provide feedback on the food label? What do you think the purpose of the study?

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________

9) How knowledgeable do you think you are about nutrition? (Please circle one)

1  2  3  4  5  6  7

Not at all  Very knowledgeable

10) How often do you make healthy meal choices? (Please circle one)

1  2  3  4  5  6  7

Never  Always

11) How often do you read nutrition labels? (Please circle one)

1  2  3  4  5  6  7

Never  Always
12) Do you feel that the price of healthy food limits your ability to eat healthy? (Please circle one)

Yes / No

13) How often do you go grocery shopping?

Average of _______ times a week

14) Are you a primary shopper of your household? (Please circle one)

Yes / No

15) Please circle your college standing:

Freshman Sophomore Junior Senior Graduate

16) Please circle your gender:

Male Female

17) How old are you? _______ years old

18) What is your ethnic/racial background? Please circle one.

a. African American / African

b. Asian

c. Caucasian

d. Latino

e. Native American

f. Pacific Islander

g. Other (please describe) ________________________________

h. Prefer not to answer
19) What is the highest level of education attained by your mother? Please circle one.

a. Some school
b. High school
c. Some College
d. Two-year college
e. Four-year college
f. Post graduate
g. I don’t know

20) What is the highest level of education attained by your father?

a. Some school
b. High school
c. Some College
d. Two-year college
e. Four-year college
f. Post graduate
g. I don’t know

21) Do you consider yourself to be health conscious? Please circle one.

Yes / No

If you answer “yes” above, why do you consider yourself so? Please describe.

_________________________________________________________

_________________________________________________________

_________________________________________________________
22) How much do you weigh? How tall are you?

__________ lb

__________ inches _____ feet

23) What is your daily-recommended calorie intake?
   If you don’t know, give it your best guess.

____________________ calories per day

24) Are you currently on a diet? (Please circle one)

Yes / No

25) Do you consider yourself to be underweight, normal weight, or overweight?
   (Please circle one)

Underweight / Normal weight / Overweight

26) Do you exercise regularly? If so, how many times per week do you
    exercise? Please check one.

☐ I do not exercise regularly

☐ I exercise regularly

IF you exercise regularly, please answer the following questions.

26a. I exercise _______ times per week

26b. how do you rate the intensity of your typical workout? Please circle one

Low / Moderate / High

26c. how many minutes do you usually exercise during each session?

______________ minutes

PLEASE RETURN THIS QUESTIONNAIRE TO THE EXPERIMENTER WHEN YOU
HAVE FINISHED ANSWERING ALL THE QUESTIONS.
I hope you enjoyed the video!
Let's move on to the next questions! I will ask you a series of questions. It is important that you answer each question honestly.

1) Did you eat any of the chocolate snacks?
   IF “Yes”, Please answer 1a through 1c (Skip 1d)
   IF “No”, Please answer 1d (Skip 1a through 1c)

   1a. How much do you like this snack? (Please circle one)

   1 2 3 4 5 6 7

   Not at all                              Very much

   1b. Were you thinking about the nutrition information (e.g., calories, fat, fiber) while you were eating?

   1 2 3 4 5 6 7

   Not at all                              Very much

   1c. For this experiment, you were given a certain amount of chocolate snacks. How many chocolates do you usually eat in one sitting?

   Please select one that best describes your response.

   □ Less than I was given
   □ About the same amount of what I was given
   □ More than I was given
   □ Other (please describe briefly)

   ______________________________________________________

   ______________________________________________________
1d. If you didn’t eat the chocolate snacks, please provide the reason why you didn’t. Please check mark one that best describes your situation.

☐ I was full
☐ I do not like chocolates
☐ I have a health condition(s) that prohibit(s) me from eating chocolates (excluding allergy condition)
☐ Other (please describe briefly)

______________________________________________________________
______________________________________________________________
______________________________________________________________

Please answer the following questions regardless of whether you ate or didn’t eat the snack.

2) Do you think the snack you just ate OR didn't eat has the following characteristics? Please circle one under each characteristic type.

2a. The snack contains (Please circle one):

1 2 3 4 5 6 7

Low amount of Calories

High amount of Calories

2b. The snack contains (Please circle one):

1 2 3 4 5 6 7

Low amount of fat

High amount of fat

2c. The product contains (Please circle one):

1 2 3 4 5 6 7

Low amount of fiber

High amount of fiber
2d. The product contains (Please circle one):

1  2  3  4  5  6  7

Low amount of calcium

High amount of calcium

3) If your doctor told you to reduce the amount of CALORIES in your diet, how likely is it that you would buy this product? (Please circle one)

1  2  3  4  5  6  7

Very unlikely to buy

Very likely to buy

4) If your doctor told you to reduce the amount of FAT in your diet, how likely is it that you would buy this product? (Please circle one)

1  2  3  4  5  6  7

Very unlikely to buy

Very likely to buy

5) If your doctor told you to reduce the amount of FIBER in your diet, how likely is it that you would buy this product? (Please circle one)

1  2  3  4  5  6  7

Very unlikely to buy

Very likely to buy

6) If your doctor told you to increase the amount of CALCIUM in your diet, how likely is it that you would buy this product? (Please circle one)

1  2  3  4  5  6  7

Very unlikely to buy

Very likely to buy
7) What factors influence your food choice in general? Please circle each of the following.

7a. Convenience (easiness of getting food)

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7b. Cost/Price of food product

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7c. Brand preference

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7d. Food preference

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7e. Amount of nutrition in food products

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7f. Organic (food safeness)

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7g. Picture / Package design

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Other (Please specify):

___________________________________________________________________
___________________________________________________________________

8) Please describe why do you think you were asked to provide feedback on the food label? What do you think the purpose of the study?

___________________________________________________________________
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___________________________________________________________________

9) How knowledgeable do you think you are about nutrition? (Please circle one)

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<td>Not at all</td>
<td>Very knowledgeable</td>
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10) How often do you make healthy meal choices? (Please circle one)

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<td>Always</td>
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11) How often do you read nutrition labels? (Please circle one)

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12) Do you feel that the price of healthy food limits your ability to eat healthy? (Please circle one)
   Yes / No

13) How often do you go grocery shopping?
   Average of ______ times a week

14) Are you a primary shopper of your household? (Please circle one)
   Yes / No

15) Please circle your college standing:
   Freshman  Sophomore  Junior  Senior  Graduate

16) Please circle your gender:
   Male  Female

17) How old are you?  ________ years old

18) What is your ethnic/racial background? Please circle one.
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   c. Caucasian
   d. Latino
   e. Native American
   f. Pacific Islander
   g. Other (please describe) ________________________________
   h. Prefer not to answer
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Yes / No

If you answer “yes” above, why do you consider yourself so? Please describe.

________________________________________________________________________
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________________________________________________________________________
22) How much do you weigh? How tall are you?

__________ lb

__________ inches ___ feet

23) What is your daily-recommended calorie intake?
If you don’t know, give it your best guess.

__________________ calories per day

24) Are you currently on a diet? (Please circle one)

Yes / No

25) Do you consider yourself to be underweight, normal weight, or overweight?
(Please circle one)

Underweight / Normal weight / Overweight

26) Do you exercise regularly? If so, how many times per week do you exercise? Please check one.

☐ I do not exercise regularly

☐ I exercise regularly

IF you exercise regularly, please answer the following questions.

26a. I exercise ______ times per week

26b. how do you rate the intensity of your typical workout? Please circle one

Low / Moderate / High

26c. how many minutes do you usually exercise during each session?

_____________ minutes