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THE EFFECT OF FOOD LABELING, WEIGHT CONSCIOUSNESS, AND GENDER ON EATING BEHAVIOR

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Decisions about food are something that most individuals make multiple times each day. These choices are influenced by a number of factors, some of which may operate on a subconscious level. That is, the ways in which individuals pick food and drink is influenced by both conscious and subconscious processes. In order to better understand this procedure, the Food Choice Process Model was developed by Furst and colleagues (1996) as a way to label, illustrate, and organize the complex set of events that go into food related decisions.

**Food Choice Process Model**

Furst, Connors, Bisogni, Sobal, and Falk (1996) propose that food choice involves multiple global factors that vary in their degree of influence and interaction. The degree to which these factors influence someone may vary not only from person to person, but also from situation to situation. Consider an individual who is trying to lose weight, eat healthily, and feed her family of “picky” eaters. Consider also that this individual works full-time and has limited time for meal preparation. As this individual selects food to prepare for dinner, her health and nutrition goals, relationship factors, cost of the foods, attractiveness of the foods, and convenience of preparation will all play a role in her food decisions and potential enjoyment of her meal.

The Food Choice Process Model (Furst, Connors, Bisogni, Sobal & Falk, 1996) suggests that our personal system should be influential in our food choices. The global category of personal system is further broken down into six subcategories which include sensory perceptions, monetary considerations, convenience, health/nutrition, managing relationships, and quality. Of particular interest to our study are the categories of sensory perceptions, health/nutrition, and quality of the food product. Furst and collaborators described sensory
perceptions as involving the taste, texture, smell, and appearance of a food. These researchers found that individuals were sometimes willing to compromise on taste if the food met one of their other values such as health or quality of the product. Taste also tended to vary across the life course, being impacted by age and situation. The subcategory of health and nutrition includes concerns such as disease control or prevention, weight control, and bodily wellness. Health conscious food choices could involve avoidance of certain types of foods and active movement toward other types of products seen as having nutritional value. Furst and colleagues reported that the perceived quality of a food product was often used in making food related choices, and was sometimes the most relevant value to individuals. However, participants’ definitions of quality were extremely subjective.

The Food Choice Process Model exhibits how complex and varied eating behaviors are, and also how individual experiences and situations can impact them. The categories within a personal system play a role in the decisions individuals make about food. Each category may have more salience to some individuals than others, and the categories may interact with each other in order to produce choices. Understanding the processes behind the choices people make is important if one wishes to influence or change these choices. In the face of mounting health concerns and rising obesity rates in America, understanding more about what influences people’s healthy (or unhealthy) choices is key. The purpose of this study is to examine how the labeling of food, gender, and weight consciousness affects preferences and amount of a particular food product consumed by college students.
Labeling of Food

The way in which food products are labeled has many facets that must be considered. Nutrition labeling is present in the hopes that the information contained on those labels will be utilized to inform, and possibly to encourage healthier food choices. Labeling is also used as a means of selling a food product to consumers on the merit of its health benefits or supposed healthiness. These claims must be examined more deeply in order to make fully informed decisions.

Williams (2005) conducted a review of research on the understanding and utilization of health claims for food products. Within this larger examination he cites a study completed for the FDA in which participants were interviewed on a number of food choice factors. Participants reviewed three products and 10 different label types, nutritional claims of varying lengths, the positioning of these claims, and various product endorsements. The researcher was interested in the impact of these variables on participants’ perception of healthiness and purchase intent. Results showed that health claims led individuals to see the product associated with the claims as healthier, a health claim on the front of the product made consumers less likely to read nutrition information on the back, and shorter health claims were more successful in delivering their message to consumers than longer ones. Furthermore, participants’ beliefs about health benefits tended to rely on previous knowledge about a product rather than information on the package. These and other findings (e.g., Ebneter, Latner, & Nigg, 2013) are suggestive of a “health halo” effect. That is, a food product’s health claims influence individuals to have higher expectations about that product’s healthiness and are related to positive attitudes about the nutritional value of the product.
The effect of low-fat food labeling on food intake was examined by Ebneter, Latner, and Nigg (2013). These researchers also included estimations of calorie content, taste ratings, and health attributions as variables of interest. They hypothesized that a low-fat label would lead participants to believe other aspects of the food were healthier than they were in reality, resulting in higher rates of consumption, greater beliefs of healthiness, and lower calorie estimates. There were four experimental conditions: low-fat-labeled with caloric information, low-fat-labeled without caloric information, regular-fat-labeled with caloric information, and regular-fat-labeled without caloric information. As expected, participants significantly underestimated the caloric content of low-fat-labeled foods and also associated those foods with having a higher health value.

In a related study, McCann and colleagues (2013) investigated the impact of fat and caloric content information on food consumption in both normal and overweight adults. When participants believed that food contained less fat and fewer calories, they consumed more food, but the reverse was not found – when participants believed that food contained more fat and calories they did not seem to take that as a signal to consume less food. When participants were led to believe their food contained less fat and fewer calories, those who consumed the most tended to be overweight men.

Another test of the health halo effect was provided by Provencher, Polivy, and Herman (2008). These researchers examined the impact of beliefs about the healthiness of food on consumption. They were also interested in the ways in which the categories of restrained eating and weight salience might impact consumption. The researchers hypothesized that describing a food product as healthy versus unhealthy would increase food intake levels among participants. They also hypothesized that participants would estimate healthy food products as having fewer
calories than unhealthy food products, that restrained eaters would consume more of a healthy food product than their unrestrained counterparts, and that the opposite would be found with unhealthy food products. In addition, they postulated that weight salience would cause restrained eaters to have lower food intake levels in both the healthy and unhealthy food categories. Female college students were recruited to participate in a “market research study investigating various dimensions of new snack products.” Participants were randomly assigned to one of two conditions: healthy snack or unhealthy snack. In the healthy snack condition, the researchers informed participants that oatmeal cookies were high in fiber and contained healthy ingredients. In the unhealthy snack condition, participants were told that oatmeal cookies were gourmet, made with decadent ingredients and that they had a great sweet taste. Participants were instructed to taste the cookie and then rate it on a number of dimensions. Weight and height information was collection from each participant, either before the taste task (weight salient condition) or after the taste task (non-weight salient condition). Provencher and colleagues found a main effect only for beliefs about healthiness of food on the amount of food consumed. Participants consumed more in the healthy snack condition, as a function of the way in which the food was described, than in the unhealthy condition. No differences were evident between restrained or unrestrained eaters or as a function of weight salience. As expected, food was perceived as healthier in the healthy condition than the unhealthy condition. In addition, a significant interaction was shown for restraint status and weight salience. When restrained eaters were made aware of their weight, the healthy rating of the food was lower when compared to their unrestrained counterparts. While restraint status and weight salience did not seem to make a difference in how much food was consumed, those in the healthy food condition ate almost 35% more than those in the unhealthy condition. One possible explication for this trend is that having
a higher intake of supposedly healthy food was seen as more normative to participants. These beliefs about normative consumption also appear to have a stronger effect in overweight and restrained eaters. The researchers found that restrained eaters tended to have a higher BMI than their unrestrained counterparts. (Provencher, Polivy, & Herman, 2008)

**Weight Consciousness**

The Food Choice Process Model also suggests that the value of health and nutrition, which incorporates weight control, can influence individuals to avoid foods they view as unhealthy or seek out foods they view as having nutritional value (Furst, Connors, Bisogni, Sobal, & Falk, 1996). It follows that an individual’s level of weight consciousness would influence their ratings of food. We define weight consciousness as an individual’s awareness of their own weight and its effect on their daily lives. Individuals who are high in weight consciousness will monitor their weight regularly and actively work to maintain their weight. Oakes and Slotterback (2002) reported dieting status to be an important factor in determining rankings of food healthfulness. While dieters ranked fat content as the most important food choice factor, non-dieters ranked the freshness of food as the most important factor.

However, other studies have not shown an effect of weight or dieting on behaviors related to food choice. For example, Stran and Knol (2013) found that how often participants checked and used food labels was not greatly impacted by weight or weight maintenance behaviors. Similarly, individuals whose weight was made salient to them before engaging in a taste test of a cookie did not differ in how much they ate compared to those who were not reminded of their current weight (Provencher, Polivy, & Herman, 2008).
No study to date has examined the effect of a more comprehensive variable of weight consciousness on food or taste preferences. Based on the Food Choice Process Model we hypothesize that those who score higher on weight consciousness will eat less than those who score lower on weight consciousness. We predict an interaction between weight consciousness and product type, such that those who are high in weight consciousness will eat more of a “healthy” granola bar than of a “gourmet” granola bar. Those who are high in weight consciousness and receive a “healthy” granola bar will eat less than those who are low in weight consciousness and receive a “healthy” granola bar.

Gender

Several studies concerning food have focused specifically on gender differences within their research. Oakes and Slotterback (2001a, 2001b, and 2002) generated multiple studies that examined gender differences in the way individuals evaluate the health benefits of food. To gauge what sort of health information is utilized by male and female undergraduates when making decisions regarding food consumption, Oakes and Slotterback (2001a) gave participants a list of 72 foods and asked them to rate the foods on a 5-point Likert scale “in terms of how good the food was for them.” Females reported that they were more informed about food, read nutritional labels more frequently, and that they consumed healthy snacks and meals more often than their male counterparts. The researchers found multiple differences between genders in whether food was regarded as healthy or not. Men rated high fat foods, foods that were moderate in nutritional content, and foods that were high in nutritional content as healthier than women did.
Oakes and Slotterback (2001b) extended this line of research with older participants who were between the ages of 25 to 80. The researchers hypothesized that both genders would employ stereotypes when judging food names and when rating the healthfulness of foods. They postulated that the use of stereotypes when judging food would be more marked in women than in their male counterparts. Participants rated the healthfulness of 33 food names and descriptions of the foods’ nutritional profiles. The results indicated similar findings for the group of older adults as for college students. That is, females tended to utilize less information than their male counterparts when appraising the healthiness of food names and descriptions. Women paid the most attention to fat content, while men also considered vitamin and mineral content in their ratings.

Next, Oakes and Slotterback (2002) investigated the relationships between gender, food and dieting status. Participants were asked to consider seven food characteristics they might employ when selecting food. They then ranked their top three food characteristics out of a list of seven. Freshness and fat content were found to be the most important categories, followed by either natural/unprocessed and sodium content. The categories that were ranked least important were the food’s protein and vitamin/mineral content. Gender was not found to be an influential factor in determining these rankings. However, dieting status did appear to influence the rankings. Individuals who reported being on a diet rated fat content as most their most important category to consider.

In a test of the Food Choice Process Model, Stran and Knol (2013) surveyed men and women with the Diet Behavior and Nutrition Questionnaire within the National Health and Nutrition Examination Survey (NHANES). Specifically, Stran and Knol examined how demographic and psychosocial factors were related to how often participants reported checking
and using food label information. Participant race, educational attainment, marital status, household size, income, and personal systems were considered. Results showed that food label usage differed among men and women; women had higher check scores and higher use scores than their male counterparts. In addition, men and women between the ages of 51 and 70 had significantly higher check and use score than younger individuals.

To specifically examine how eating behaviors differ between men and women, Li, Concepcion, Lee, Cardinal, Ebbeck, Woekel, and Readdy (2012) surveyed male and female undergraduate students. The researchers used a 17-item survey that estimated the amount fruits and vegetables consumed, the percentage of energy acquired from fat, and the amount of dietary fiber consumed by participants. Results showed that women consumed less energy from fat, less fiber, and lower amounts of fruits and vegetables than their male counterparts.

In a similar study, Leblanc, Begin, Couneau, Dodin, and Lemieux (2014) also sought to examine gender differences in nutritional intake. Surveying both men and women, the researchers examined dietary variables, food consumption and preparation behaviors, and metabolic profiles. It was found that men consumed more energy, that a greater amount of this energy was coming from lipids, and that they had a lower amount of energy coming from carbohydrates than their female counterparts.

In summary, a review of the literature suggests mixed findings with regard to gender and the general topic of food labeling and perceived healthfulness of foods. While some research indicates that women tend to report greater knowledge of food labels and also higher usage of this knowledge (Oakes & Slotterback, 2001a, Stran & Knol, 2013), other studies have found that women do not use as much information as their male counterparts (Oakes & Slotterback 2001b).
A consistent finding across multiple studies is that women tend to emphasize fat content as the most important factor in determining a food’s healthiness, while men consider fat content along with other factors such as vitamin and mineral content (Oakes & Slotterback 2001a, Oakes & Slotterback, 2001b). Further research is called for to help clarify any differences between men and women when it comes to the perception of healthy food. When discussing gendered differences in eating behaviors, multiple studies (Leblanc, Begin, Couneau, Dodin, & Lemieux, 2014, Li et al., 2012) found that men consumed more energy from fat than women. We hypothesize that those who receive a “healthy” granola bar will eat more, and that men will eat more overall. We predict an interaction effect between gender and granola bar labeling type, such that women will eat less in the “gourmet” granola bar condition than men.

**Rationale for Current Study**

As stated previously, understanding more about what influences people’s healthy (or unhealthy) choices is key to learning how to influence decision making in a positive way. What, and how much, people eat can play an important role in weight control and health management. While there is some research on the role that gender plays in the perception of the healthiness of food, research that examines both gender and the effect that food labeling has on eating behavior is limited. Often, studies that examine the effect of food labeling tend to only recruit female participants, which reduces the generalizability of the results. The purpose of this study will be to examine the effects of food labeling, weight consciousness, and gender on food consumption and the perceptions of the taste and healthfulness of a food product. Our hypotheses are as follows: (1) There will be an interaction between weight consciousness and product type, such that those who are high in weight consciousness will eat more of a “healthy” granola bar than of a “gourmet” granola bar; (2) Individuals who are high in weight consciousness and receive a
“healthy” granola bar will eat less than those who are low in weight consciousness and receive a
“healthy” granola bar; (3) Those who receive a “healthy” granola bar will eat more; (4) men will eat more than women; and (5) There will be an interaction effect between gender and granola bar labeling type, such that women will eat less in the “gourmet” granola bar condition than men.

Based on the literature review, no other specific outcomes are proposed for the three other possible predictions.
Method

Participants

Participants were 101 undergraduate students at Georgia Regents University – Augusta who were recruited through SONA, an online research participant pool system. Participants may have received class credit or extra credit for participating in the study. Of the 101 participants, 44 identified as African American (43.6%), 37 identified as European American (36.6%), 9 identified as mixed ethnicity (8.9%), 7 identified as Asian (6.9%), and 4 identified as Hispanic (4%). Nineteen of the participants were males (18.8%), and 82 were females (81.2%). Participant age ranged from 18 to 39 ($M = 22.09$ years). Participants were automatically excluded from participation in the study if they had allergies to the ingredients in the granola bar food product that was sampled.

Measures and Materials

Granola Bars

All participants were given the same brand of granola bars, Kellogg's Nutri Grain Chocolatey Crunch. These bars, along with three other granola bars were tasted and rated by an undergraduate honors class on the dimensions of taste, nutritional, and gourmet qualities. The Kellogg bars received the highest ratings on taste ($M = 4.06, SD = 0.90$), nutrition ($M = 3.00, SD = 0.71$), and gourmet qualities ($M = 2.65, SD = 0.93$) during pilot testing.

Taste Rating Questionnaire

The Taste Rating Questionnaire, designed by the author, is an 8-item survey that measures individuals’ opinions on the granola bar that they believed they taste tested for the
study. Questions related to the taste of the granola bars include, “How would you rate the overall taste of this granola bar?” and “I would consider the granola bar to be a gourmet product.” Five of the items are scored on a 5-point likert scale. One item, “How would you rate the overall taste of this granola bar?” is scored on a 5-point likert-type scale from not at all tasty (1) to very tasty (5). Another item, “How would you rate the nutritional quality of this granola bar?” is scored on a 5-point likert-type scale from not at all healthy (1) to very healthy (6). Finally, the item, “How likely are you to purchase this granola bar in the future?” is rated on a 5 point likert-type scale from not at all likely (1) to very likely (5).

**Weight Consciousness Questionnaire**

The Weight Consciousness Questionnaire, designed by the author, is a 10-item inventory that measures individuals’ attention to weight and eating. All items are measured on a 5-point Likert scale. Questions related to participant’s attention to weight and eating include, “I know how much I weigh on any given day” and “My food choices are influenced by my current weight.”

**Demographics Questionnaire**

Demographic information collected from each participant included age, race, gender, weight, and height information.

**Measurement of Amount Eaten**

A digital kitchen scale was used to measure the amount of granola bar(s) eaten. The weight of the remaining granola bars was recorded in ounces.
Procedure

Participants arrived at the laboratory where they were informed that they were taking part in a market-research study involving a taste-rating task in which they were tasting and rating a new type of snack bar, they were also asked about any existing food allergies that they may have had. Specifically, a plate containing three granola bars was offered to the participants, along with the taste-rating questionnaire and a glass of water. The granola bars were then described by the experimenter, and this description varied based on what condition the participant was randomly assigned to (“healthy granola bar” vs. “gourmet granola bar”). In the “healthy” granola bar condition, the bars were described by the experimenter as follows “the granola bar that you have to taste today is a new high in fiber oatmeal snack that contains antioxidants, and is made with healthy ingredients. I’m sure you have heard that oatmeal is good for you due to the soluble fiber it contains. This granola bar is also low in saturated fat and free from trans-fat.” In the “gourmet” granola bar condition, the bars were described by the experimenter as follows “the granola bar you have to taste today is a decadent, handmade treat filled with luscious high quality ingredients including steel cut oats and imported chocolate pieces that give the bar a great sweet taste. These new granola bars are a delight to consume.” Participants had a card with this information in front of them as the researcher read the description of the snack bar. The experimenter then asked participants to taste the granola bar and rate it through a series of questions on the provided taste-rating form. Participants were told that they could eat as many granola bars as they needed to be able to produce accurate ratings, and to feel free to continue to help themselves to the granola bars after they had finished the taste-rating questionnaire. After participants finished the ratings, the plate of granola bars was taken away and weighed to determine the amount of granola bars
eaten by each participant. Participants were then asked to complete the remaining questionnaires. After completion of the questionnaires they were fully debriefed as to the nature of the study.

**Results**

We performed a manipulation check by reviewing responses on the taste rating questionnaire. Specifically, we checked that participants in the healthy condition perceived the granola bar as healthy and that individuals in the “gourmet” condition perceived the granola bar as gourmet. In the healthy condition, when responding to the question “How would you rate the nutritional quality of this granola bar?” participants rated the granola bar with a score of $M = 4.10, SD = 0.76$. This mean indicates that these participants did perceive the granola bar to be a healthy product. For the question “I would consider this granola bar to be a gourmet product,” participants in the healthy condition rated the granola bar with a score of $M = 3.22, SD = 0.92$. In the gourmet condition, when responding to the question “How would you rate the nutritional quality of this granola bar?” participants rated the granola bar with a score of $M = 3.56, SD = 0.76$. When responding to the question “I would consider this granola bar to be a gourmet product,” these participants rated the granola bar with a score of $M = 3.00, SD = 0.97$. This mean reflects a neutral rating and indicates that participants in the gourmet condition did not perceive the granola bar to be a gourmet product. In fact, all participants appeared to perceive the granola bar as relatively nutritious.

To assess how much of the granola bars were eaten during the experiment, we created a difference score for the weight of the granola bars before and after the taste test. We subtracted the weight of the bar in ounces after experiment from the weight of the bar in ounces before the experiment. This weight difference variable was our primary dependent variable.
We intended to perform a median split on the variable of weight consciousness to create two groups using the responses from the weight consciousness questionnaire. A Cronbach’s alpha on the scale resulted in a coefficient of .65. A coefficient of .8 or above suggests good internal consistency for a measure. Since the coefficient was too low to create a summary score, individual questionnaire items were used as independent variables. We performed median splits for two variables: “I know how much I weigh on any given day” and “My food choices are influenced by my current weight.” For the variable of “My weight is related to my satisfaction with life” we left out the neutral category (ratings of 3, \( n = 31 \)) in our analysis because a median split would not have yielded two distinct groups.

Table 1 shows means and standard deviations for key variables in the analysis by labeling condition. We tested the first hypothesis that there would be an interaction between weight consciousness and product type, such that those who were high in weight consciousness would eat more of a “healthy” granola bar than of a “gourmet” granola bar with three 2 x 2 between subjects ANOVAs. For each ANOVA the weight difference variable served as the dependent measure. The first ANOVA with the labeling condition (healthy versus gourmet) and the weight consciousness item “I know how much I weigh on any given day” (higher versus lower scores) did not produce a significant interaction, \( F(49) = 0.78 \ p > 0.05 \). There were no significant main effects. The second ANOVA with the labeling condition (healthy versus gourmet) and the weight consciousness item “My weight is related to my satisfaction with life” (higher versus lower scores) did not produce a significant interaction, \( F(30) = -0.11 \ p > 0.05 \). There were no significant main effects. The third ANOVA with the labeling condition (healthy versus gourmet) and the weight consciousness item “My food choices are influenced by my current weight”
(higher versus lower scores) also did not produce a significant interaction, $F(49) = -0.90 \ p > -0.05$. Once again, there were no significant main effects.

The second hypotheses that individuals who are high in weight consciousness and received a “healthy” granola bar would eat less than those who are low in weight consciousness and received a “healthy” granola bar was tested with a 2 x 2 between subjects ANOVA with the labeling condition (healthy versus gourmet) and the weight consciousness item “My weight is related to my satisfaction with life” as the independent variables. There was no significant interaction, $F(69) = 0.46 \ p > 0.05$. This hypothesis was also tested with an ANOVA with the labeling condition (healthy versus gourmet) and the weight consciousness item “My food choices are influenced by my current weight.” This analysis did not produce a significant interaction, $F(100) = 0.91 \ p > 0.05$.

We used an independent samples t-test to test the third hypothesis that those who received a “healthy” granola bar would eat more. This analysis produced no significant results, with individuals in the healthy condition eating only marginally more ($M = 0.63$, $SD = 0.50$), than individuals in the gourmet condition ($M = 0.57$, $SD = 0.52$), $F(99) = 0.62 \ p > 0.05$.

The fourth hypothesis that men would eat more than women was analyzed with an independent samples t-test. This analysis produced no significant results, but there was a trend that may have proven significant with more participants. Male participants consumed $M = 0.76$, $SD = 0.42$, while female participants consumed $M = 0.56$, $SD = 0.52$, $F(99) = 1.54 \ p > 0.05$.

The final hypothesis, that there would be an interaction effect between gender and granola bar labeling type, such that women would eat less in the “gourmet” granola bar condition than men, was not able to be examined due to a low number of male participants.
We also conducted correlational analyses to investigate associations among our variables. There were few correlations with how much participants ate. Those who ate more did report more hunger, $r(99) = 0.28$, $p = 0.004$ and that they paid more attention to their weight. $r(99) = 0.23$, $p = 0.02$. Both of these correlations are positive and small. We found that participant weight was significantly correlated with the questions from our weight consciousness questionnaire regarding how often participants paid attention to their weight $r(99) = 0.24$, $p = 0.016$ and body shape satisfaction $r(99) = -0.38$, $p < 0.001$. The correlation coefficient of $r = -0.38$ between participant weight and body shape satisfaction suggested a moderate relationship. Other Pearson correlations indicated that those who rated the taste of the granola bars positively also found them to be nutritious, $r(99) = 0.31$, $p = 0.001$, and gourmet $r(99) = 0.34$, $p = 0.001$. 
Discussion

Our hypotheses were not supported in this sample of college students. No discernible differences were found in eating behavior between the healthy and gourmet conditions, and level of weight consciousness. We were unable to test our hypothesis regarding granola bar condition and gender due to a low number of men in our sample. There were several small correlations with the amount of granola bars that participants ate. Individuals who ate more also reported more hunger and that they paid more attention to their weight. We also found small to moderate associations between participant weight and how often participants paid attention to their weight and participant weight and body shape satisfaction. Individuals who weighed more were less satisfied with their body shape.

This study served as a partial test of The Food Choice Process Model (Furst, Connors, Bisogni, Sobal, & Falk, 1996), which proposes that food choices can be influenced by six categories which include your senses, money, convenience, health/nutrition, your relationships, and the quality of food. The categories that were particularly relevant to our study were those of your senses, health/nutrition, and the quality of the food product. This model claims to exhibit how complex and varied eating behaviors are, and also how individual experiences and situations can impact them. We believed that participants who were presented with either “healthy” or “gourmet” granola bars would use the conditions as cues for their sensory perceptions. These cues were hypothesized to influence the perceived health and quality of the bars, and to impact participants’ enjoyment of the bars. Based on our data, the categories of your senses, health/nutrition, and the quality of the food product, did not have the expected impact on individuals’ eating behavior in this sample.
Previous studies, such as the one conducted to test the health halo effect by Provencher, Polivy, and Herman (2008), did find a main effect for beliefs about healthiness of food on the amount of food consumed. Participants ate more in the healthy snack condition, due to the way the food (oatmeal cookie) was described, than in the unhealthy condition. As expected, food was perceived as healthier in the healthy condition than the unhealthy condition. We did find that the granola bar product was viewed as a healthy product within the healthy condition to a greater extent than within the gourmet condition. In our study, participants did not eat more in the healthy condition than in the gourmet condition. Unlike, Provencher, Polivy, and Herman, we did not find support for the health halo effect.

The study and the results were limited by multiple factors. One of the biggest limitations involved the sample size that we were able to acquire. Due to numerous factors such as time constraints and low student turnout, we were unable to run enough participants to reach sufficient power. We also had a low male participant turnout, which caused us to be unable to test one of our main hypotheses regarding granola bar condition and gender. A larger sample size may have produced more support for our hypotheses. Many of the mean differences between our groups were in fact in the hypothesized direction.

Another key limitation involved our manipulation of the granola bar as a gourmet product. After analyzing the data from the questions designed to check our label manipulation, we discovered that our participants did not perceive the granola bars in the gourmet condition as a gourmet product. Instead, they perceived them more as a healthy product. In fact, participants in the healthy labeling condition rated the bars slightly higher on the question “this granola bar is a gourmet product,” than those in the gourmet condition. This finding means that we were not
truly testing two separate and distinct conditions of healthy and gourmet; all of the bars were perceived as healthy, with the bars in the healthy condition just being viewed as “healthier.”

The product that we chose to test our predictions, and the way in which we presented it to the participants might also have had an impact on our results. Unlike Provencher, Polivy, and Herman (2008) who used oatmeal cookies as the product being taste tested by their participants, we chose to use granola bars. It is possible that granola bars are more likely to be viewed as a healthy product by individuals, so our participants had a hard time believing that the granola bars they were sampling were gourmet.

The terms we used to describe the bars to participants were also slightly different. While our study and the Provencher, Polivy, and Herman (2008) study used the term healthy, we decided against using the term unhealthy that was used in the previous study and to instead use the term gourmet. Participants may have had a different idea of what the term gourmet means, and instead of relating it to unhealthy and decadent products may have seen it as another way to describe something as healthy. We also received anecdotal evidence that the size of the granola bars may have limited the amount that participants felt was acceptable to eat. The three bars were each left intact out of the package, which meant each participant had one and a half servings on a plate. Perhaps if the bars had been cut into smaller bite-size pieces, participants would have had a harder time keeping track of how much they had eaten and they would not have felt limited by the perception that they had already consumed a full serving of the granola bars.

Future research of this type should consider ways to counter the problems and limitations faced by this study. A larger sample size should be obtained in order to fully test the predictions and continue to test the validity of the health halo effect with multiple products and conditions.
Strategies to increase male participant turnout also should be explored to be able to test predictions related to gender. Previous research in this area has tested only female participants or has not examined gender as a variable. Other products should be subjected to rigorous pilot testing to determine which work for a “gourmet” or “healthy/unhealthy” label. Finally, future researchers should carefully consider the size of the portions offered to participants. Smaller portion sizes may allow participants to eat more freely.

In summary, this study did not provide support for the Food Choice Process Model or the health halo effect in a sample of college students. Given the present limitations, it could be argued that the current study is not a valid test of either of these theories. The study was hampered by several limitations including a lack of power to find differences between groups, a small sample of male participants, and an ineffective manipulation of the gourmet granola bar labeling condition.
References


http://dx.doi.org/10.1037/hea0000045

### Table 1
Means and Standard Deviations of Key Variables by Condition

<table>
<thead>
<tr>
<th>Variable</th>
<th>Healthy ($n = 46$)</th>
<th>Gourmet ($n = 46$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount Eaten $^a$</td>
<td>0.63</td>
<td>0.57</td>
</tr>
<tr>
<td></td>
<td>0.49</td>
<td>0.52</td>
</tr>
<tr>
<td>Granola Bar is Nutritious</td>
<td>4.10</td>
<td>3.56</td>
</tr>
<tr>
<td></td>
<td>0.75</td>
<td>0.76</td>
</tr>
<tr>
<td>Granola Bar is a Gourmet Product</td>
<td>3.22</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>0.92</td>
<td>0.97</td>
</tr>
<tr>
<td>How Likely To Purchase these Bars</td>
<td>3.47</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td>1.19</td>
<td>0.95</td>
</tr>
<tr>
<td>Often Pay Attention To Weight</td>
<td>4.06</td>
<td>4.08</td>
</tr>
<tr>
<td></td>
<td>0.86</td>
<td>1.08</td>
</tr>
<tr>
<td>Know How Much They Weigh on Given Day</td>
<td>3.25</td>
<td>3.48</td>
</tr>
<tr>
<td></td>
<td>1.16</td>
<td>1.23</td>
</tr>
<tr>
<td>Satisfactory Weight is Important Life Goal</td>
<td>3.86</td>
<td>4.06</td>
</tr>
<tr>
<td></td>
<td>1.13</td>
<td>1.02</td>
</tr>
<tr>
<td>Food Choices Influenced By Current Weight</td>
<td>3.02</td>
<td>3.50</td>
</tr>
<tr>
<td></td>
<td>1.27</td>
<td>1.22</td>
</tr>
</tbody>
</table>

$^a$Amount eaten is a difference score of ounces after experiment subtracted from ounces before the experiment.
Appendix A: Taste Rating Questionnaire

1. How would you rate the overall taste of this granola bar?

   1  2  3  4  5
   Not at all  Neutral  Very
   Tasty       Tasty

2. How would you rate the nutritional quality of this granola bar?

   1  2  3  4  5
   Not at all  Neutral  Very
   Healthy    Healthy

3. Respond to the following statement:

   I would consider this granola bar to be a gourmet product.

   1  2  3  4  5
   Strongly Disagree  Neutral  Strongly Agree

4. The texture of this granola bar is appealing

   1  2  3  4  5
   Strongly Disagree  Neutral  Strongly Agree
   Disagree
5. This granola bar looks appetizing

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly</td>
<td>Neutral</td>
<td>Strongly</td>
<td>Disagree</td>
<td>Agree</td>
</tr>
</tbody>
</table>

6. This granola bar has a definite chocolate taste

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly</td>
<td>Neutral</td>
<td>Strongly</td>
<td>Disagree</td>
<td>Agree</td>
</tr>
</tbody>
</table>

7. This granola bar tastes stale, not fresh

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly</td>
<td>Neutral</td>
<td>Strongly</td>
<td>Disagree</td>
<td>Agree</td>
</tr>
</tbody>
</table>

8. How often do you normally eat granola bars?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. How likely are you to purchase this granola bar in the future?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all</td>
<td>Neutral</td>
<td>Very</td>
<td>Likely</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B: Weight Consciousness Questionnaire

Please respond to each of the following statements by circling one of the responses below the statements.

1. I rarely pay attention to my weight

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>Neutral</td>
<td>Strongly Agree</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. I know how much I weigh on any given day

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>Neutral</td>
<td>Strongly Agree</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. I work to maintain my weight

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>Neutral</td>
<td>Strongly Agree</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. I am satisfied with my body shape

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>Neutral</td>
<td>Strongly Agree</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. My weight is not related to my satisfaction with life
6. A satisfactory weight is an important goal for me in life

7. My food choices are influenced by my current weight

8. I often think about the long term effects of my diet on my health

9. I consider myself to be a healthy eater

10. An unhealthy meal causes me a great deal of guilt
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strongly Disagree</td>
<td>Neutral</td>
<td>Strongly Agree</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix C: Demographics Questionnaire

Please provide the following information about yourself:

1. Age _____

2. Sex: ___Male    ___Female

3. Race:
   ___ African American  ___ Asian    ___ Caucasian
   ___ Hispanic        ___ Mixed Ethnicity  ___ Other: _______

Height ______________

Please give us your best estimate of your current weight.
Weight______________

How stable is your weight generally? Put an X by the best response

__________ My weight fluctuates greatly up and down

__________ I have been gaining weight gradually in the recent past

__________ I have been losing weight gradually in the recent past

__________ My weight tends to be fairly consistent

How hungry are you?

1    2    3    4    5
Not hungry  Somewhat hungry  Very hungry