ANCHORING EFFECTS IN COMPARATIVE NUTRITION CLAIMS:
THE PRESENCE OF ANCHOR BRAND
AND THE ROLE OF SCALE

by

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ABSTRACT

Although anchoring effects have been considered highly robust and pervasive in decision-making, the theory of anchoring and adjustment has been rarely applied in studying comparative advertising or health claims. This dissertation fills the gap by examining the effects of brand anchoring on people’s nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and purchase intention. It also examines whether different scales (percentage vs. fraction) on which a nutritional attribute is expressed has any advertising effect. Furthermore, this dissertation extends the investigation into the possible moderating roles of personal involvement, health consciousness, and product experience in anchoring procedures.

In order to examine the anchoring effect in comparative nutrition claims, a 2 (without anchor brand vs. with anchor brand) × 2 (expanded scale vs. contracted scale) × 2 (products) mixed-factorial experiment was carried out. Data were collected from 304 students recruited from a business school at a Western university.

Findings revealed significant differences across anchoring conditions for the granola bar ad, but not for the chocolate ad, which supported the case-by-case approach adopted by the FTC in regulating health claims and warranted future studies on additional product categories. Results also showed that using an anchor brand or an expanded scale to describe nutrition content resulted in an inflated perception of product benefits and more favorable attitudes toward the ad.

This dissertation offers insight into the effectiveness of using comparative nutrition claims to attract consumers and the importance of developing remedies to protect consumers from confusing claims. Furthermore, the research results are consistent with existing anchoring
research suggesting that an anchoring process is generally not moderated by traditionally recognized moderating factors in comparative advertising research, including personal involvement, health consciousness, and product experience. The theoretical implications and practical applications of the research findings are finally discussed.
DEDICATION

To 24-year-old me, 24 岁那年的沈玢.

You were nowhere near perfect, but you were happy.
You didn’t know what was love, but you were brave.

I just want you to remember, Bin,

“Sing like no one is listening.
Dance like no one is watching.
Love like you’ve never been hurt.
Live like it is heaven on earth.”
LIST OF ABBREVIATIONS AND SYMBOLS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tbody>
<tr>
<td>$a$</td>
<td>Cronbach’s index of internal consistency</td>
</tr>
<tr>
<td>$d.f.$</td>
<td>Degrees of freedom: number of values free to vary after certain restrictions have been placed on the data</td>
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<td>$F$</td>
<td>Fisher’s $F$ ratio: A ratio of two variances</td>
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<td>$\bar{X}$</td>
<td>Mean: the sum of a set of measurements divided by the number of measurements in the set</td>
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<tr>
<td>$p$</td>
<td>Probability associated with the occurrence under the null hypothesis of a value as extreme as or more extreme than the observed value</td>
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<tr>
<td>$r$</td>
<td>Pearson product-moment correlation</td>
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<tr>
<td>$t$</td>
<td>Computed value of $t$ test</td>
</tr>
<tr>
<td>SD</td>
<td>Standard deviation</td>
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<td>$n$</td>
<td>Number</td>
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<tr>
<td>$X^2$</td>
<td>Chi-square, the classic goodness-of-fit index</td>
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<td>$\eta^2$</td>
<td>Eta$^2$: the proportion of variance that is accounted for</td>
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Less than: $<$
More than: $>$
Equal to: $=$
ACKNOWLEDGMENTS

I am pleased to have this opportunity to thank the faculty members and my family who guided me, helped me, stood by me, and supported me throughout the time taken to complete this dissertation.

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Finally, to my mama and baba, I love you both forever.
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CHAPTER I

INTRODUCTION

The prevalent use of nutrient content descriptors and health claims in food advertising, such as “low fat,” “high in oat bran,” “reduced sodium,” or “good source of protein,” has spurred interest on their implications in advertising effects and advertising regulations. On one hand, several studies have found that on-pack nutrition claims lead to more favorable attitudes toward the advertised products and brands (Andrews, Burton, & Netemeyer, 2000; Andrews, Netemeyer, & Burton, 1998; Levin & Gaeth, 1988; Moorman, 1990; Paek, Yoon, & Hove, 2011). On the other hand, researchers have suggested that these claims may mislead consumers into overestimating the overall nutritional quality of the advertised products. For instance, a nutrient attribute that is featured in a health claim, “low fat,” may mislead people to believe that the advertised product also has other health benefits, such as “low sugar,” as indicated by Esch and his colleagues (Esch, Schmitt, Redler, & Langner, 2009).

People tend to rely on an initial assessment of a stimulus to make final judgments on the target object. This psychological process is referred to as “anchoring and adjustment” (Tversky & Kahneman, 1974). Consumers, for example, might misinterpret the meaning of “less sodium” and consider the advertised product a true low sodium food (Murphy, Hoppock, & Rusk, 1998). When estimating the value of a product, such as the price of a house, people have a common tendency to anchor on the first number they see, such as the initial list price of the house. In other words, the first piece of information has a stronger influence than do the rest pieces of information in people’s decision making (Strack & Mussweiler, 2003). Anchoring helps people
to reduce the complexity of information processing and simplify judgmental operations (Tversky & Kahneman, 1974).

In nutritional content advertising, viewers are subject to anchoring effects when forming an impression of an advertised product/brand while comparing it to other products/brands. For example, people perceived fewer calories when exposed to the advertising copy “Our Cracker Has 60 Calories, Only 1/2 the Calories in Other Crackers” than to the advertising copy “Our Cracker Has 60 Calories” (Paek et al., 2011). Paek et al. (2011) explained that “providing a contrasting anchor puts the value to be judged in relative terms and makes the absolute value seem lower or higher than if it had been presented without an anchor” (p. 163). The Food and Drug Administration (FDA) has specified in *A Food Labeling Guide* (2009, October) that when a nutrient content claim is made, “(a) variety of information is required… to prevent the claim from being misleading” (P. 72). The Federal Trade Commission (1994) has also expressed concerns that consumers may misunderstand the actual meaning of a comparative nutrition claim.

The theory of anchoring and adjustment suggests that the retrieval of target information is disproportionate and biased because attributes similar to the anchor can garner more attention from decision makers while attributes different from the anchor may not be so salient. Therefore, the information that is selected and featured in a comparative nutrition claim (e.g., “than the leading brand”) may affect how people perceive the advertised food product, because it may serve as an anchor or a point of reference for comparison. According to Miniard et al. (2006), although consumers generally find it is easier to accept less blatant comparative expressions in nutrient content advertising (e.g., “the leading brand,” “other brands,” or “all other brands”), the effects of these indirect comparative claims remain questionable.
The present study uses anchoring as the theoretical basis to explore the impact of such claims mainly because anchoring provides a basic explanatory mechanism to explain human judgments when facing incomplete and deceptive information. Shimp (1978, 1983) suggested that comparative expressions in advertising are incomplete and deceptive in nature because they are susceptible to multiple interpretations. Pechmann and Ratneshwar (1991) maintained that consumers are unlikely to spontaneously think about a particular brand as a comparison point when processing indirect comparative claims, such as “25% less fat than other brands.”

In fact, indirect comparatives can be even more implicit in that a numeric value (“25% less fat”) itself can suggest a comparative meaning without being associated with “the leading brand” or “other brands.” On one hand, studies on health claims have predominantly focused on “halo effects” of a certain nutrient attribute (Andrews et al., 2000; Moorman, 1990; Paek et al., 2011). On the other hand, few research has examined how the same nutrient attribute (e.g., “less fat”) might influence consumers’ interpretations when it is presented in different units or at different scales (e.g., expanded or contracted; “25% less fat” or “1/4 less fat”), or when the nutrient attribute is associated with different food products (Paek et al., 2011).

The present study applies anchoring effects to explore the impact of different scales used in comparative ads mainly because anchoring has long been applied to study consumers’ attitudes toward numeric features of products (Pandelaere et al., 2011). According to Silverglade (1991), nutrition claims are generally trivial and misleading for many consumers. Paek et al. (2011) further argued that numeric interpretations of the narrative nutrient criteria have been increasingly used on food packaging, which creates more disadvantages for consumers. In the psychology of judgment, anchoring has been widely applied to numeric inferences, even when the anchor values were uninformative and extreme (Tversky & Kahneman, 1974).
Besides the characteristics of health claims, individuals’ health claims processing might also be affected by the characteristics of individuals. Advertising research has revealed that highly motivated people are more likely to thoroughly evaluate the comparisons in health claims, because higher motivations generally leads to greater cognitive efforts to evaluate health information (Adams & Geuens, 2007; Paek et al., 2011; van Kleef et al., 2005). For instance, Wansink and Chandon (2006) found that health claims suggesting low fat and serving size can reduce overeating among normal-weight consumers, but not among those who were overweight.

Although advertising studies suggest that personal involvement may affect how people respond to health claims, anchoring research on incentives have provided counter evidence. For instance, Tversky and Kahneman (1974) found that offering participants payment for accuracy did not reduce anchoring. In addition, research has revealed that judges and lawyers who are more professionally involved in legal decision-making are as susceptible to anchoring effects as non-legal experts. If a stronger effortful adjustment could reduce anchoring-based biases, individuals with higher motivation or stakes should be influenced by anchoring to a less extent (Busemeyer & Goldstein, 1992), which, however, has never been found in anchoring research. Thus, it begs the question who are more susceptible to anchoring, or how the level of personal involvement may affect an anchoring process.

Along the same vein, people’s health consciousness and prior product experience may also affect how they process an anchored nutrition claim. It is possible that people with greater health concerns and/or more product experience have a greater motivation to process the information provided by an anchored nutrition claim, which in turn, leads to greater attention to and elaboration of its promoted information (Adams & Geuens, 2007). It is also possible that a high level of product usage leads consumers to engage in cognitive defense because they may rely on
their prior experience and beliefs to evaluate the healthiness of a product, thus are less likely to be affected by claim information (Smith & Wortzel, 1997). Therefore, the anchoring manipulation of health claims, if takes its effect, may be further moderated by people’s health consciousness and product usage.

Although anchoring effects have been considered highly robust and pervasive in decision-making (Mussweiler, Englisch, & Strack, 2004), the theory of anchoring has been rarely applied in studying comparative advertising or health claims. This dissertation fills the gap by addressing three major issues. The first purpose of this dissertation is to examine whether nutrition claims with an anchor brand are more effective than those without an anchor brand. More specially, this study seeks to examine whether people’s nutritiousness perception of food products, attitudes toward the ad, attitudes toward the brand, and purchase intention are affected in a more favorable way when they are exposed to a nutrition claim with an anchor (“the leading brand”) than without an anchor brand. The second goal of this dissertation is to address the void by examining people’s perceptions of different units of nutrient content (e.g., “40% less fat” vs. “2/5 less fat”). More specifically, it tests whether nutritional value of food products anchored at different scales (percentage vs. fraction) has advertising effects on people. Furthermore, the present study contributes to the advertising literature by extending the investigation into the combined effects of the presence of an anchor brand and the role of a scale on consumers’ brand/ad attitudes and purchase intentions. Finally, the study explores the moderating roles of personal involvement, health consciousness, and product experience in the relationship between the anchoring procedure and the advertising effect.

The organization of this dissertation is as follows. The first chapter has introduced the topic of this dissertation by discussing the characteristics and the prevalent use of health claims in food
advertising, briefly reviewing the theoretical development and empirical evidence of the anchoring effect, and stating the significance and purpose of this study. Based on these established premises, the second chapter provides a review of the relevant literature from six aspects: (1). WHAT: Judgment Tasks of Anchoring that Have Been Examined; (2). HOW: Psychological Mechanisms and Stages of Anchoring; (3). WHY: Reasons that Anchoring Occurs; (4). WHERE: I. Applied Areas of Anchoring Effects; II. Its Application in Comparative Nutrition Claims; (5). WHEN: Conditions for Anchoring to Occur; (6). WHO: People Affected by Anchoring and Adjustment.

Subsequently, Chapter III focuses on the experimental design and the method of this dissertation, specifying the pretests, research stimuli, procedure, and the treatment manipulations of the independent variables of this experiment. Chapter IV describes the data collection and data analysis processes and presents the research findings, focusing on the statistical results of the hypotheses and research questions posited in this study. Chapter V expands on the main findings of the study and discusses the overall contributions of this dissertation. First, the results drawn from statistical analyses in Chapter IV are presented based on the order of the three hypotheses and three research questions the researcher has proposed. Next, the theoretical implications and practical applications of the research findings are discussed in detail. Finally, the limitations of this study are outlined along with the suggestions for future research regarding the role of anchoring in comparative nutrition claims.
CHAPTER II
LITERATURE REVIEW

In many life situations, people are provided with only limited information, thus leading to cognitive bias because of overemphasis on one aspect of a complex situation and discounting others. Under most of these circumstances, human heuristics serve as efficient and effective mental shortcuts for people in making decisions and forming judgments, although they cannot guarantee an optimal solution for problem solving or learning acquisition. In a classic work on heuristics, *Judgment under Uncertainty: Heuristics and Biases*, Tversky and Kahneman (1974) described a variety of intuitive decisions and identified three types of human heuristics: availability, representativeness, and anchoring and adjustment. Their research served as the springboard for heuristics and biases research, challenged the notion that human beings are rational thinkers, and set the theoretical ground for heuristics on decision making (Plous, 1989).

Of the three widely accepted heuristics, anchoring refers to a process in which “people make estimates by starting from an initial value that is adjusted to yield a final answer…(and)…adjustments are typically insufficient” (Tversky & Kahneman, 1974, p. 1128). In a classic cognitive experiment (Epley & Gilovich, 2004; Stanovich & West, 2008), research participants were asked to estimate whether the tallest redwood tree in the world was taller or shorter than 85 or 1,000 feet, followed by answering a specific value of the tallest redwood tree in the world. In this experiment, 85/1,000 served as the numerical anchors for the second question. Although 1,000 feet looked obviously extreme for a tree (The tallest redwood tree is 370 feet in height), it did contaminate people’s estimations. The higher anchor value (1,000 feet)
led to an overestimation of the height of the tallest redwood tree, average of which was 989 feet, while the lower anchor value (85 feet) resulted in an underestimation, average of which was 127.4 feet (Stanovich & West, 2008).

Although anchoring effects are considered one of “the most robust and ubiquitous psychological phenomena in judgment and decision making” (Mussweiler et al., 2004, p. 196), the application of anchoring has been rarely found in studying comparative advertising and/or health claims. This dissertation proposes to study comparative nutrient content claims from the approach of anchoring effects, thus the literature review addresses not only the characteristics of comparative advertising and health claims, but also the theoretical development and empirical evidence of anchoring effects. The discussion will be included in the following sections: (1). WHAT: Judgment Tasks of Anchoring that Have Been Examined; (2). HOW: Psychological Mechanisms and Stages of Anchoring; (3). WHY: Reasons that Anchoring Occurs; (4). WHERE: I. Applied Areas of Anchoring Effects; II. Its Application in Comparative Nutrition Claims; (5). WHEN: Conditions for Anchoring to Occur; (6). WHO: People Affected by Anchoring and Adjustment.

The first two sections motivate the discussion by offering the concept of anchoring, introducing phenomena related to anchoring effects, and reviewing what is currently known about the processes of anchoring. Next, major explanations that anchoring occurs are discussed. The fourth section specifically discusses anchoring effects in the context of comparative advertising and comparative nutrition claims. More importantly, this section explains why anchoring effects have potential implications in studying comparative nutritional claims. Subsequently, in the section WHEN, determinants of anchoring effects are discussed, including sufficient attention and associative errors, followed by proposals of three hypotheses.
Specifically, the study examined whether exposure to a nutrition claim stating the product had less fat “than the leading brand” and/or using an expanded scale to describe the fat content would result in more favorable nutritiveness perception, more favorable attitudes toward the ad, more favorable attitudes toward the brand, and higher purchase intention. The last section focuses on the possible moderating roles of personal involvement, health consciousness, and product usage in anchoring procedures, which were posited as research questions in the present study.

It has been acknowledged among many academics that the underlying premise of comparative advertising is the assumption that it provides more information compared with its non-comparative counterpart (Barry, 1993). As Schwaiger, Rennhak, Taylor, Cannon noted (2007), the macro goal of the trend in using comparative advertising “is to create an environment in which consumers have access to better information for making their decision” (p. 2). However, empirical studies indicate that comparative advertising is not a superior informative format to generate positive attitude toward brands or advertising (Barry, 1993; Schwaiger et al., 2007; Thompson & Hamilton, 2006). A substantial body of research has focused on consumers’ information processing in explaining the effectiveness of this ad format. For instance, research has compared the level of elaboration activated by comparative and noncomparative ads. Compared with noncomparative ads, comparative ads may activate more cognitive defense among consumers, thus weakening the persuasiveness of ad information (Belch, 1981). Studies have also gone further by proposing different types of encoding frames to investigate the variety of comparisons. Pechmann and Ratneshwar (1991) suggest that consumers will not spontaneously think about a specific brand or a brand currently used when processing an indirect comparative ad (e.g., “we are better than other brands”), whereas Miniard, Barone, Rose, and Manning (2006) suggest that consumers will spontaneously identify a specific competitor, such
as a well-known brand, in this process. Thus, it remains unclear about how individuals process comparative messages in advertising.

When comparative format is used in nutritional content advertising, additional considerations must be taken into account. First of all, nutrient content claims feature objective attributes of food products, which tend to generate more positive attitudes than ads featuring subjective product attributes (Barry, 1993). Secondly, although most consumers believe that they need more health claims to help them identify healthy food (Williams, 2005), the extent to which consumers use these claims is questionable. For instance, a survey conducted by the UK Food Standards Agency (2004) indicated that only 20% consumers reported using health claims when looking for information about a food product. Another study (Donovan Research, 2001) revealed that most consumers only read food labeling when they purchase a food product for the very first time. Finally, numeric values and criteria have been increasingly developed and used to define nutrient levels, which are unique characteristics of comparative food advertising.

**WHAT: Judgment Tasks of Anchoring that Have Been Examined**

Because of its pervasiveness and robustness in a variety of judgments, the term anchoring has been used in several different ways (Mussweiler et al., 2004). Its use can be grouped into three categories: Chapman and Johnson (2002) defined anchoring as a procedure “in which a salient but uninformative number is presented to subjects before they make a numeric judgment” (p. 121). Secondly, anchoring and adjustment may refer to an end result of a psychological experiment (e.g., Van Auken & Adams, 2005). Van Auken and Adams (2005) reported that the presence of an anchor brand led to a competitive advantage of the sponsor’s brand through an enhanced perception of great value. Finally, it could be used as a theory to explain and predict a psychological effect of the first piece of information on human judgments (Adaval & Wyer,
anchor the theoretical foundation in studying comparative nutrition claims and nutritional content advertising.

Studies on anchoring effects have revealed that both informative and/or uninformative numbers can serve as anchors. Early experiments on anchoring effects predominantly used arbitrarily determined numbers, such as spinning a roulette wheel or throwing a dice, to serve as the first piece of information (e.g., Stanovich & West, 2008; Tversky & Kahneman, 1974). When operationalized by informative numbers, similar effects on people’s judgments were also identified (e.g., Tversky & Kahneman, 1974). In addition, anchoring effects caused by unreasonable or even extreme numbers, such as the year Da Vinci was born (in 1952 or in -300), were found to be as strong as those produced by reasonable numbers (Strack & Mussweiler, 1997). The following section will review these judgment tasks that have been examined in anchoring research.

Uninformative numbers may serve as anchors. In one of the initial experiments on anchoring effects (Tversky & Kahneman, 1974), research participants watched a spinning roulette wheel, which was manipulated by the researchers to stop at either 10 or 65. Following the observation, participants were asked to estimate the percentage of African countries in the United Nations. Consistent with research findings that replicated this study (e.g., Stanovich & West, 2008), an anchoring effect was found: participants who observed 10 as the stopping point made an estimation of 25% on average, whereas the average of the other group whose roulette wheel stopped at 65 answered 45% (Tversky & Kahneman, 1974). Although the two anchors were not informative (There are 53 African countries in the United Nations), they biased people’s judgments.
Informative numbers may also serve as anchors. In another early research conducted by Tversky and Kahneman (1974), participants were asked to calculate the same product in two different orders: $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$ or $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$. Because participants were asked to give their answer within 5 seconds, there was not enough time for them to compute all the numbers. The medium product given by the first group, with numbers from small to large, was 512; the medium product given by the second group, with a reversed order, was 2,250. Clearly, participants in this experiment displayed an expected anchoring effect. This research finding implied that presentation order had effects: how the sequence started affected the weight numbers and/or multiplications received. The order of the presented messages would lead to different weighting of them, thus influencing people’s final estimation.

Anchoring effects are also identified when anchors suggest unreasonable or even impossible responses. Strack and Mussweiler (1997) asked participants a series of questions, such as the year Da Vinci was born (in 1952 or in 19300), Mahatma Gandhi’s age when he died (age 9 or age 140), and the length of a whale (900m or 0.2m). These values were deliberately distorted by researchers, yet they still misled participants into biased estimates. Similarly, Quattrone et al. (1984) asked people whether the average temperature in San Francisco was higher or lower than 558 degrees, whether a college textbook was cheaper or more expensive than $7,128.53, and whether the top ten albums owned by the band The Beatles was more or less than 100,025 copies. People who were first asked to determine whether the correct answer was greater or less than the extreme anchors later provided greater absolute values than those who were not initially primed with extreme anchors. Additionally, anchoring effects caused by unreasonable numbers were found to be as strong as those produced by reasonable numbers (e.g., Strack & Mussweiler, 1997).
Anchors may be formed internally or provided externally. A selling price of $120 for a pair of shoes appears to be a bad deal if the internal standard price is $45, but seems to be a bargain if the point of reference is $245. Caverni and Pris (1990) also found that past records of middle school students stored in their teachers’ memory influenced the grades of their new assignment. Mussweiler and Strack (2000) found that participants reacted more rapidly to words such as “snow” or “hot” after being asked whether the annual average temperature in Germany was higher or lower than 5 °C or 20 °C.

Individuals’ susceptibility to externally suggested anchors has generally attracted more attention of researchers, policy makers, and practitioners in industries such as advertising and marketing. Facing a competitive personal computer market in the late 1980s, Dell Inc. entered the industry by presenting itself as a “comparable” brand to the established pioneer, Compaq Computer, and framed the quality and price of their products by “associating” with Compaq Computer (Smith & Wortzel, 1997). Different from Compaq Computer, Dell Inc. did not manufacture any components. What Dell Inc. did was buying components, assembling personal computers with lower cost, and selling directly to consumers at around 15% discount (Rivkin et al., 1999). Smith and Wortzel (1997) noted that Compaq’s price and performance served as a suggested point of reference of the promoted brand, Dell, and helped Dell to attract more consumers.

In sum, anchoring is a common human heuristic that influences a variety of judgments and decisions. Anchoring effects can lead to cognitive bias because anchors, whether primed internally or framed externally, lead people to rely on the first piece of information. People start with an anchor and make adjustments to it to reach their final estimates. Anchors could be informative and/or uninformative, reasonable and/or unreasonable. Anchoring effects caused by
unreasonable or extreme numbers were found to be as strong as those produced by reasonable numbers.

Since 1970s, anchoring effects have been studied in many decision tasks, such as judgment under uncertainty (Tversky & Kahneman, 1974), overattribution and unit formation (Quattrone, 1982), intuitive statistical inference (Lovie, 1985), utility measurement (Hershey & Schoemaker, 1985), social inference and self-regulation (Gilbert, Krull, & Pelham, 1988), determinants of confidence (Griffin & Tversky, 1992), risk perception (Yamagishi, 1994), responses to fact-based questions (Jacowitz & Kahneman, 1995), and the below-average effect (Kruger, 1999).

**HOW: Psychological Mechanisms and Stages of Anchoring**

A number of studies have proposed ideas to explain anchoring processes. Chapman and Johnson (2002) delineated a three-stage flow to interpret an anchoring mechanism, including information retrieval and selection, information integration, and response formation (see Appendix A: Figure 1). According to the three-stage model, anchoring may be caused by multiple factors, and two or even more stages may occur simultaneously. Adaval and Wyer (2011) argued that early research overemphasized the input stage of an anchoring process, while anchoring might only occur at the output stage of information processing. While Chapman and Johnson (2002) suggested that anchoring leads to assimilation effects but not contrast effects, Paek et al. (2011) argued that anchoring may occur through both assimilation processes and contrast processes. The following section will review these concepts and arguments.

The first stage of an anchoring mechanism, according to Chapman and Johnson (2002), is to activate certain information regarding the target. This information may be retrieved by searching memory or by being exposed to an environment. Mussweiler and Strack (1999) found that when asked whether a typical German car is cheaper or more expensive than 40,000 German marks,
participants considered attributes of expensive cars spontaneously, whereas attributes of cheap
cars became available and accessible when the question was anchored at 20,000 German marks.
Presence of the anchor in an environment also influences the information being retrieved.
Urbany, Bearden, and Weilbaker (1988) examined how people responded to different suggested
prices. Participants did not accept prices that were 150% greater than the regular price, yet still
considered higher priced products having better qualities and higher market prices.

At the second stage of an anchoring mechanism, individuals integrate the information into
an overall evaluation of the target. Chapman and Johnson (2002) further suggested that a piece of
information may be given greater weight if it is compatible with the anchor, or if the anchor can
be incorporated as a part of the information. Englich, Mussweiler, and Strack (2006) suggested
that the sentencing bias found in the criminal decisions might be caused by an increased
accessibility of arguments that were compatible with the arbitrarily determined sentencing
demand. More specifically, legal experts who were exposed to a suggested high sentencing
demand responded more quickly to the incriminating statements, such as previous convictions or
violation of probation, than those who were exposed to a low sentencing demand. Englich et al.
(2006) suggested that high sentencing anchor made the incriminating arguments more salient and
accessible. Similarly, in Mussweiler and Strack’s study (2000), people reacted more rapidly to
the word, “hot,” after being asked whether the annual average temperature in Germany was
higher or lower than 20 ºC than those who received 5 ºC as the suggested average temperature.

At the final stage, people make decisions or judgments based on an external scale, such as
German marks, dollars, or years of sentencing. Adaval and Wyer (2011) argued that anchoring
may occur at the final stage as a result of information processing when “people transform the
implications of their subjective perceptions of the stimulus into an overt response” (p. 356). The
researchers cited the order-ranking experiment to corroborate their arguments. Participants in this experiment rank-ordered a series of social issues based on issue importance either from high to low or from the opposite direction. Following the ranking task, they evaluated each social issue individually, namely, the magnitude ratings. The study revealed that compared with participants who were exposed to a low-to-high importance scale, participants who had evaluated an issue along a high-to-low importance scale also indicated a higher absolute score regarding the importance of the issue along the magnitude scale.

On the other hand, researchers have not reached agreement on whether anchoring occurs through both assimilation and contrast processes, or only through assimilation processes. Paek et al. (2011) argued that anchoring influences people’s judgments of similarity, for instance, people could easily relate a 5-calorie drink to no-calorie diet drinks. As anchoring effects have been widely studied in different areas, the idea of “only similar anchors” may no longer stand. Evaluative contrast effects have also been found in anchoring. Take the advertisement of Chrysler sports car line for example (Smith & Wortzel, 1994). By “associating” with racing cars that were produced by the legendary Lamborghini Diablo, Chrysler sports cars tried to engage its consumers in an anchoring activity when thinking about the acceleration power, although the two car lines have much dissimilarity.

In a contrast process, the anchor determines the baseline for the target response. By contrast with a value, the stimulus or target object is considered either above or below the value. In comparative advertising research, for instance, Levin and Gaeth (1988) found that health claims such as “75% lean” garnered more favorable attitudes than those claiming “25% fat.” Although both expressions had the same meaning, they caused different levels of contrast by using positive
or negative frames. Paek et al. (2011) noted that consumers viewed “10 calories” as a smaller value when associated with “30 calories” in a health claim than when associated with no calories.

Therefore, although early researchers described anchoring as an assimilating process, contrast effects were also identified in research areas such as comparative nutrition claims. In addition, the three-stage flow proposed by Chapman and Johnson (2002) provides a basic, illustrative, and dynamic model to explain anchoring effects. The first and second stages emphasize information retrieval and integration, which have drawn more attention than the final stage: response formation. Adaval and Wyer (2011) argued that anchoring effects might simply occur as a result of information processing. As anchoring might occur at any stage in a cognitive process, it is important to understand its locus and its associative effects at that locus in order to debias this effect (Chapman & Johnson, 2002).

WHY: Reasons that Anchoring Occurs

Researchers have attempted to explain anchoring effects from several approaches, which reflect the diversity of the issues that are associated with the same theory. Within the interdisciplinary literature, the idea of insufficient adjustment has been adopted most frequently to interpret this heuristic mechanism (Chapman & Johnson, 2002). When applied in nutrition labeling research, anchoring effects were also explained in conjunction with the economics of information approach (Stigler, 1961). In an attempt to provide a general explanation for anchoring effects, Strack and Mussweiler (1997) talked about selective accessibility, followed by the proposal of Selective Activation, Reconstruction, and Anchoring (SARA) model (Pohl, Eisenhauer, & Hardt, 2003). This section will review these approaches and their implications in anchoring research.
In early anchoring research, two groups of explanations were developed because of researchers’ focus on people’s insufficient adjustment (Chapman & Johnson, 2002). The first group of explanations states that decision makers do not bear a prior value or a particular range of plausible values in memory. When judging a stimulus, individuals first enter a plausible range of values for the stimulus and select an anchor value within the range, and then adjust either upward or downward along the selected range. The broader the selected range of values is, the greater the anchoring effects will be; the identified anchor generally locates at the boundary of the selected range, thus is typically an extreme value (Quattrone, Lawrence, Finkel, & Andrus, 1981).

The second group of explanations is based on the idea that information processing requires cognitive effort. Insufficient cognitive effort and/or insufficient cognitive resources stop individuals from deliberation too soon, thus leading to a final estimate that sits closely to the anchor. For instance, if a pizza is sliced up into multiple pieces and displayed horizontally after removing from the plate, people cannot accurately estimate the quantity of the pieces, whereas this effect does not display if the pieces are still left at the plate (Pelham, Sumarta, & Myaskovsky, 1994). Along the same vein, researchers explained how consumers weigh the costs and benefits of utilizing nutrition claims from the economics of information approach (Stigler, 1961). Consumers tend to terminate their searches for product information when the marginal value of the search is exceeded by the marginal cost, but they will increase their searches when perceived risks are relatively high (Avery, 1996). For instance, consumers are more willing to spend time and effort to process a health claim regarding the amount of fat rather than the amount of sodium, because fat has more visible effects on human body (Keller, Landry, Olson, & Velliquette, 1997).
Although research on lack of cognitive effort suggests that insufficient adjustment may underlie some anchoring processes, studies on incentives have provided counter evidence. If a stronger effortful adjustment could reduce anchoring-based biases, individuals with higher motivation or stakes should be influenced by anchoring to a less extent (Busemeyer & Goldstein, 1992). However, Tversky and Kahneman (1974) found no reduced anchoring even by offering participants payment for accuracy. Mussweiler et al. (2004) also revealed that explicitly warning participants about the anchor did not diminish its influence on decision making. Finally, if cognitive effort makes a difference, experts with professional training and better task abilities are expected to exhibit less anchoring-based biases. However, the idea has already been challenged by findings regarding legal practitioners and real estate agents (e.g., Englich et al., 2006; Northcraft & Neale, 1987).

In evaluating whether price anchors influenced people’s willingness to pay, Adaval and Wyer (2011) followed the notions of “anchoring and adjustment” and “selective accessibility.” The researchers found that by comparing a product to a price anchor, consumers had better accessibility to features that exemplify a product sold at that price. Similarly, researchers argued that audience with better knowledge of a food product were more capable of understanding its nutrition claims, thus are more likely to make better use of these claims (Smith & Wortzel, 1997). However, the idea of selective accessibility was challenged by a line of research: cross-category anchors. In Nunes and Boatwright’s study (2004), passersby on a beachfront were willing to offer a higher price for a CD if the sweatshirts sold at the adjacent stand cost $80 than if they cost $10. Clearly, the utility features of CDs and sweatshirts were not directly related, but an anchoring effect was still identified.
To study co-branded identities, Esch et al. (2009) reviewed the Selective Activation, Reconstruction, and Anchoring (SARA) model, which focused on information retrieval and information organization. Their study revealed that a brand with high awareness served as the anchor in a co-branded entity and its brand characteristics became more salient and accessible, which were generalized by consumers to another brand in the co-branded entity. According to the SARA model, both internal and external sources may lead to retrieval cues; how well the retrieved information is connected determines the organization process. Given that constituent brands may come from different brands, such as Citibank-American Airlines credit cards or McDonald’s co-promotion with Coca-Cola, Esch et al. (2009) partnered SARA model with customer-based brand equity model to discuss the influence of brand knowledge.

In sum, anchoring effects and attempted explanations have been addressed in various studies, which suggest the diversity of contexts that anchoring might occur. Initially, psychologists accounted for anchoring effects using insufficient adjustment: uncertainty for the true value and a lack of cognitive effort. Yet, only limited evidence has been revealed to support the presumption that an insufficient adjustment process underlies the anchoring (Chapman & Johnson, 2002). When applied in nutrient content claims, anchoring effects were also explained in conjunction with the economics of information approach. Finally, marketing researchers have adopted the idea of selective accessibility and models such as SARA to explain anchoring-based biases.

**WHERE: I. Applied Areas of Anchoring Effects**

Anchoring research has shown that although individuals adjust their judgments to accommodate situational factors, they tend to stop adjusting before reaching an accurate answer which is logically warranted (Epley & Gilovich, 2004). It is argued that the applied areas of
anchoring are much diverse than previously expected and it is almost impossible to delineate the
boundaries of anchoring effects (Chapman & Johnson, 2002). The idea of anchoring was initially
proposed in 1968 to explain an economic phenomenon: preference reversal. Not until 1974 was
“anchoring and adjustment” coined in heuristic psychology. Following a number of “self-
centered” psychology studies in the 1980s, anchoring and adjustment has been applied in
understanding how people perceive salient issues and non-salient issues. Since the 1990s, it has
been studied in marketing research and comparative nutrition claims. This section will address
the aforementioned domains and relevant studies. The next section will discuss the potential
application of anchoring effects in comparative nutrition claims and nutrient content advertising.

Preference Reversals. Notions of anchoring were first brought up by Slovic and
Lichtenstein (1968) in explaining preference reversals. In a preference reversals experiment,
participants are asked to decide which one of two gambles is more attractive to them. They are
asked to choose between a pair of gambles to play and also place minimum selling prices on both
the bets. A preference reversal occurs when a participant places a lower selling price on the
gamble they prefer, but a higher selling price on the gamble that is less appealing.

Preference reversals research generally involves two response modes, choice and valuation,
over paired outcome-oriented gambles. Lichtenstein and Slovic (1971) and many other
economists have used binary lotteries as research stimuli. Each pair of the lotteries consists of a
probability bet (P bet) and a monetary bet ($ bet). P bets suggest a high chance of winning a low
payoff; $ bets suggest a low chance of winning a high payoff. For instance, in one of the
examined lottery pairs, the P bet had a relatively high probability (34/36) of winning a relatively
low payoff ($2.5) and a probability (2/36) of losing $0.5. The $ bet of this pair had a relatively
low probability (14/36) of winning a relatively high payoff ($8.5) and a probability (22/36) of
losing $1.5. Although the expected value for the P bet (3.5) and the $ bet (3.56) were roughly equal, participants were much more likely to choose the P bet and place a higher minimal selling price for $ bet than to choose the $ bet and place a higher minimal selling price for P bet.

The robustness of preference reversals found in experimental settings and Las Vegas casinos (e.g., Lichtenstein & Slovic, 1973) has called into question the four axioms of the expected utility theory in defining a rational decision maker. According to Lichtenstein and Slovic (1971), the four axioms are completeness, transitivity, independence and continuity. The axiom completeness suggests that for any two alternatives A or B, an individual can always determine his preference: either A \geq B or A \leq B. The axiom transitivity suggests that following the axiom completeness, the individual can make consistent decisions: if A \geq B and B \geq C, then A \geq C. Hence, if an individual prefers to play P bet to $ bet, he will be assumed to place a higher minimum selling price on P bet. However, violations of these axioms have always been identified in studies of preference reversals (Cox & Grether, 1996; Grether & Plott, 1979; Holt, 1986; Tversky, Slovic, & Kahneman, 1990).

Psychologists consider preference reversals a result of response mode, in other word, how the preference question is anchored: choice or valuation. When asked to choose between paired lotteries, individuals may first anchor on the probabilities of wins and then make adjustments for differences in the amount of money they may win or loss. When asked to place a minimum selling price on each of the paired lotteries, individuals may first anchor on the amount of money they would win in the two bets and then make adjustments for differences in the probabilities of win or loss. Therefore, it is the response mode that drew individuals’ attention to different aspects of the same activity, leading to the reversed preference decisions.
Self-centered Studies. Since the seminal study on preference reversals, anchors have been found to influence many judgment phenomena in cognitive psychology and experimental economics. In “self-centered” psychology studies, anchoring and adjustment provides a theoretical foundation for judgment of self-efficacy (Cervone & Peake, 1986), belief updating (Hogarth & Einhorn, 1992), expression of values (Busemeyer & Goldstein, 1992), and prediction of future performance (Czaczkes & Ganzach, 1996). Anchoring-based egocentric biases were also found in areas such as the illusion of transparency and the spotlight effect (Gilovich, Medvec, & Savitsky, 2000; Gilovich & Savitsky, 1999). In the illusion of transparency experiments, for instance, it is common for public speakers to have exaggerated sense of how evident their nervousness was perceived by their audience (Savitsky & Gilovich, 2003).

Salient Issues. Issues that confront people in life are subject to anchoring effects. To make sense of the weather forecast, American people travelling in Europe tend to convert temperatures displayed on a Celsius scale to a Fahrenheit scale. Europeans staying in the United States generally engage in an opposite conversion (Pandelaere, Briers, & Lembregts, 2011). Consumers are inclined to overestimate the value of a foreign price or a foreign budget when the foreign denomination is greater than that of the domestic currency, in that the face value or the anchor number becomes more accessible than its true value (Blankenship, Wegener, Petty, Detweiler-Bedell, & Macy, 2008). Individuals tend to believe that a cancer is more dangerous if statistics shows that 1,286 out of 10,000 people were affected by it than if the report says 24.14 of 100 people died of the cancer (Yamagishi, 1997).

Non-salient Issues. Issues that are not as salient as weather, product prices, or disease are also prone to anchoring effects. To examine whether head movements influenced people’s adjustment from the anchors, Epley and Gilovich (2001) asked people 16 anchoring questions,
marketing research. In marketing research, electronic products and relevant features have predominantly served as tested anchors. Smith and Wortzel (1997) examined the influences of prior product knowledge and anchor frames in a context of video camera purchases. Krishna, Wagner, and Adaval (2006) found that participants were influenced by the prices of other cameras but not prices of binoculars when determining how much they would pay for a specific camera. Pandelaere et al. (2011) studied perceptions of attribute difference by manipulating attribute information of television quality ratings and dishwasher warranty levels. The researchers also used prices and qualities of home cinema systems to study unit effects and preference reversals. In examining asymmetries in cross-category anchoring, Adaval and Wyer (2011) found that price anchors of an electronic product, such as a DVD player, affected prices that consumers were willing to pay for an article of clothing, such as a pair of shoes.

WHERE: II. Application in Comparative Nutrition Claims

Few studies have investigated anchoring effects in the context of comparative advertising or comparative nutrition claims. It is generally acknowledged that comparative advertisements are perceived more persuasive than their non-comparative counterparts (Wilkie & Farris, 1975). Comparative advertising is advocated as an effective way “to encourage a particular point of reference during encoding of the information about the advertised brand” (Rose, Miniard, Barone,
Manning, & Till, 1993, p. 316). According to Barry (1993), the underlying premise of comparative appeals relies on external points of reference to “provide consumers with more information and can, therefore, lead to more effective decision-making in the consumption process” (p. 19).

Although comparative advertising has been gaining popularity, research findings regarding its impact remain inconsistent and controversial (Barry, 1993; Belch, 1981; Rose et al., 2006). Several studies have found that comparative ads can generate more favorable brand/ad attitudes and purchase intentions (Demirdjian, 1983; Golden 1979; Pechmann & Stewart, 1990; Schwaiger et al., 2007; Shimp & Dyer, 1978). Other studies have revealed that the advertised brand may be misidentified, consumer skepticism can increase, and advertising credibility can be weakened by the comparative ad format (Grossbart, Muehling, & Kangun, 1986; Iyer, 1988; Pechmann & Stewart 1990; Schwaiger et al., 2007; Swinyard, 1981). There has also been empirical evidence showing similar attitudinal and intentional changes between comparative ads and noncomparative ads (Belch, 1981; Droge, 1989; Grossbart et al., 1986; Sujan & Dekleva, 1987).

The mixed research findings suggest the need to identify conditions where comparative ads or noncomparative ads could be more effective. Researchers have proposed detailed taxonomies to define different comparative formats (Barry, 1993; Buchanan & Smithies, 1989; Muehling & Kangun, 1985; Wilkie & Farris, 1975). Based on these definitions, comparative arguments can be verbal or visual, implicit or explicit, inferior or superior. If a particular competitive brand is identified as a point of reference, the ad is referred to as a direct comparative ad. By contrast, indirect comparative advertising uses “the leading brand” or “other brands” to represent a
comparison point, instead of using a specific competitor’s name (Pechmann & Ratneshwar, 1991).

Although advertisers have shown increased interest in using indirect comparatives to promote food products, such as “25% less fat than the leading brand of mayonnaise,” its effectiveness has received little attention in the advertising literature (Miniard et al., 2006). Miniard et al. (2006) argued that consumers may find it is easier to accept the less blatant competitive nature of indirect comparative advertising. Pechmann and Ratneshwar (1991) maintained that consumers are unlikely to spontaneously think about a particular brand as a comparison point when processing indirect advertising, so that they may feel less defensive in their responses to the comparative claims.

Research has also revealed that indirect comparative advertising is much more common in East Asia and some European countries (e.g., Japan, Philippines, and United Kingdom) because of their nonconfrontational culture (Boddewyn, 1988; Miracle, Chang, & Taylor, 1992). When applied in nutrition claims on food packaging, indirect comparatives can be even more implicit in that a numeric value (“98% less fat”) itself can suggest a comparative meaning without being associated with “the leading brand” or “other brands.”

The present study uses anchoring as the theoretical basis to explore the impact of such claims in that it involves considerations of these characteristics. First of all, anchoring provides a basic explanatory mechanism to explain human judgments when facing incomplete and deceptive information. Shimp (1978, 1983) suggested that comparative expressions in advertising are incomplete and deceptive in nature because they are susceptible to multiple interpretations. Silverglade (1991) argued that nutrition claims are generally trivial and confusing, which create a disadvantage for consumers in choosing healthy diet. In addition, numeric
interpretations of the narrative nutrient criteria have been increasingly used on food packaging, which can be misleading and frustrating (Paek et al., 2011). In the psychology of judgment, anchoring has been widely applied to numeric inferences, even when the anchor values were uninformative and extreme (Tversky & Kahneman, 1974).

Secondly, anchoring has long been applied to study consumers’ attitudes toward objective product features. Research has shown that comparative claims featuring objective product attributes tend to be more persuasive than those featuring subjective or emotional attributes (Barry, 1993). Pechmann (1996) found a halo effect of comparative nutrition claims, which encouraged consumers to overgeneralize a health benefit to some omitted, yet seemingly relevant product features. Anchoring has already been used as a theoretical foundation to study objective product attributes, such as price claims in advertising, which were found to affect consumers’ product evaluation (Burton & Biswas, 1993).

Finally, the primary subject of interest in anchoring research is the importance of the first piece of information in individuals’ information processing. Comparative advertising is advocated as an effective strategy for products/brands when they are first introduced to consumers because a comparison claim helps to reduce market entry barriers (Shimp, 1978). According to Barry (1993), comparisons are of more value in promoting unknown brands than well-known brands. Advertising studies have also predominantly used hypothetical or unknown brands as the advertised brand to capture the persuasiveness of comparative ad claims (Rose et al., 1993). Similar results have also been found when nutrition claims and food products are involved. Research has revealed that (Donovan Research, 2001) most people only read nutrition claims when they were considering purchasing a new product or switching to a different brand. These research findings are consistent with the classic paradigm used to examine anchoring
effects, which involves posing a novel message to participants and asking them to evaluate a target object.

Therefore, although anchoring has received far less attention in comparative advertising literature, it has potential implications in examining the influence of this ad format. This dissertation adopts anchoring as the theoretical basis to examine the impact of comparative nutritional claims for three major reasons. First of all, anchoring constitutes a basic explanatory mechanism to explain individuals’ attitudinal changes when facing incomplete and deceptive information. Nutrition claims are considered trivial and deceptive. Secondly, anchoring has long been applied to study consumers’ attitudes toward objective product features. Numeric nutrient criteria are objective, yet confusing attributes for many consumers. Finally, the classic paradigm used to explore anchoring effects matches a typical health claim exposure context.

**WHEN: Conditions for Anchoring to Occur**

Anchoring requires certain conditions to produce and develop. An anchoring process occurs when the anchor draws sufficient attention from people so that it serves as a possible response to the target question (Wilson, Houston, Etling, & Brekke, 1996). Adaval and Wyer (2011) asked participants to think about either how much they wanted to pay for a pair of sports shoes or their past experience with sports shoes before getting exposed to high or low price anchors. The study revealed a significant interaction between price retrieval task and primed prices, but not between experience retrieval task and primed prices. Similarly, Van Auken and Adams (2005) reported that the presence of BMW Z3 and detailed features (e.g., steering and aerodynamics) in the ad of Mazda Miata MX-5 increased the availability of similar features and perceived quality of Miata MX-5. Positive features of the anchor brand (BMW Z3) that were prominently displayed cast a halo over the target brand (Miata MX-5).
Research has revealed that health claims on food packaging can grab the attention of consumers and increase the sales of food products (Williams, 2005). Ippolito and Mathios (1991) studied the cereal market in the United States during a transition period in which health claims were initially forbidden (1978-1984) but later (1985-1987) allowed on cereal packages. Their study revealed that the introduction of health claims significantly improved people’s knowledge about fiber-cancer relationship, increased people’s consumptions of fiber cereal, and urged cereal producers to make more innovations. Since Kellogg’s adoption of health claims in 1984, more and more advertisers and food producers have realized the profitable and marketing values of getting consumers’ attention through nutrition claims. For instance, Paul, Ink, and Geiger’s study (1999) showed an increased purchase rate of the Quaker Oats after its use of health claims.

Besides getting the attention of consumers, associative errors are another driving force of anchoring effects (Arkes, 1991). Jacowitz and Kahneman (1995) argued that the retrieval of target information is disproportionate and biased in that attributes similar to the anchor garner more attention from decision makers while attributes different from the anchor were not so salient. As argued above, an assimilation process of anchoring amounts to a shift in people’s judgment toward the anchor. Van Auken and Adam (2005) suggested that an assimilation in brand anchoring should positively bias people’s perceptions of the target brand toward the anchor brand.

Several studies have attempted to measure the effects of associative errors in an anchoring procedure. Participants in Esch et al.’s study (2009) evaluated fictitious brand alliances of toothpaste either in the high-low awareness condition (Colgate/Signal) or low-low awareness condition (Signal/Sensodyne). Their study revealed that the profile value of the high-low awareness brand alliance (Colgate/Signal) was significantly close to the value of Colgate, which
was the top-of-the-mind brand in pretest, and that the profile value of the low-low awareness brand alliance (Signal/Sensodyne) did not show any clear pattern. Similarly, Ford, Hastak, Mitra, and Ringold (1996) found that products with cholesterol-heart disease claims garnered more positive points on heart/fat rating scales than products without such health claims. Ford et al. (1996) concluded that the display of health claims altered how consumers weighed specific nutrition content.

Several studies provided similar evidence. Andrews et al. (1998) randomly interviewed 365 food shoppers at geographically different malls in the United States. Their study confirmed the halo implications of nutrient content claims, which generated more favorable attitudes toward the product and higher purchase intentions. Furthermore, with the presence of nutrition claims, an overall unhealthy food product was considered healthier. Roe et al. (1999) also conducted a mall-intercept study and reported that consumers misattribute health benefits to food products after viewing nutrient-content claims, thus leading to increased purchase intentions. Mathios (1998) examined the impact of Nutrition Labeling and Education Act (NLEA) on the cooking oils market in New York. After the US congress prohibited the use of health claims to advocate low saturated fat and high monounsaturated fat cooking oils (NLEA, 1990), a shift of purchases was found toward less healthful cooking oils.

Although the presence of health claims has been found to be positively correlated with advertising effects, how they are presented may affect consumers’ attitudes and purchase intentions (Paek et al., 2011; Williams, 2005). In general, consumers are unfavorably disposed to over broad or absolute claims (Bruhn et al., 2002). In addition, consumers are in favor of succinct, less complex, and split claims (Naylor, Droms, & Haws, 2009). Over used nutrition claims, such as a single word “Healthy,” may lead to discounted perception of food products.
among consumers. Andrews et al. (2000) manipulated print advertisements of soup from this perspective in examining the influence of advertisement claim types (general vs. specific) and disclosure types (absolute disclosure vs. relative disclosure vs. evaluative disclosure) on consumers’ perceptions of the sodium level of soup. Their study reported that the specific advertisement claim type (e.g., “1/3 less salt”) resulted in more positive responses regarding sodium content than the general claim type (e.g., “healthier”). The researchers also called for more studies in this regard.

In the single investigation that could be found to examine the anchoring hypothesis in the context of nutrition claims, Paek et al. (2011) revealed some mixed findings: in their pilot study, nutrition claims presented with an anchor generated more favorable copy preference, attitude toward the ad, attitude toward the brand, and higher purchase intention than the nutrition claims without an anchor. In the main study, however, the anchoring effects were only identified for one of the two examined products (cracker and sandwich): sandwich. Paek et al. (2011) explained that the verbal claim of the cracker ad may have gotten insufficient attention because of the distraction of the creative ad image. In other words, the study failed to do a manipulation check to verify that participants paid enough attention to the verbal anchor.

Another possible explanation may be related to how the anchor was manipulated in their study. Paek et al. (2011) used the expressions, such as “in other sandwich brands” and “in other crackers” (p. 162), to operationalize the anchors. According to Miniard et al. (2006), little is known about whether different types of indirect comparatives in advertising, such as “the leading brand,” “other brands,” or “all other brands” (p. 53), vary in their effectiveness. This study will further explore the anchoring effects in comparative nutrition claims by using “the leading brand” as the anchor.
Anchoring research in consumer behavior has demonstrated a biased cognitive processing toward the attributes similar to the anchor brand when forming impressions of the target brand (Jacowitz & Kahneman, 1995; Van Auken & Adam, 2005). Therefore, the presence of the anchor in a health claim, “the leading brand,” should be more likely to lead consumers to engage in an associative error by shifting their judgment relative to the leading brand than without such an anchor. In addition, consumers exposed to comparative nutrient information (e.g., 25% less fat) with an anchor brand (“the leading brand”) are more likely to integrate their impressions of the leading brand into their final evaluation of the target brand. Similarly, consumers’ prior purchase attitudes and experience of the leading branded product are more likely to serve as a point of reference when they make purchase decisions about the advertised brand. Therefore, the first hypothesis is proposed as followed:

H1: Exposure to a nutrition claim with an anchor (“the leading brand”) will lead to more favorable nutritiousness perception (H1a), more favorable attitudes toward the ad (H1b), more favorable attitudes toward the brand (H1c), and higher purchase intention (H1d) than a nutrition claim without an anchor brand.

As is discussed above, a unique characteristic of food advertising is that numeric values and criteria have been increasingly used to define the nutrient levels of various food products. For instance, the granola bar brand Cascadian Farm made a claim on the packaging of its vanilla granola bars, saying “25% less sugar than our previous recipe,” whereas Kellogg’s states that its recent frosted flakes cereal has “1/3 less sugar than original Kellogg’s frosted flakes.” Both claims include a comparison to the old version of the food products, but different numeric scales
are adopted (percentage vs. fraction) to describe the sugar level. The difference is not uncommon in current market. For instance, *Smucker’s* uses “1/2 less sugar” to describe its strawberry fruit spread, whereas *Quaker* uses “25% less sugar” to describe its chewy granola bar.

Despite the fact that food companies have great freedom in terms of designing their health claims, there is insufficient evidence to support their decisions (van Kleef, van Trijp, & Luning, 2005). In addition, a review of global regulatory environment for health claims conducted by World Health Organization (Hawkes, 2004) revealed that little scientific research is available regarding the effects of health claims on nutrition education and public health. To the best of my knowledge, previous research has not examined consumers’ responses to the different scales used by comparative nutrition claims (percentage vs. fraction). Thus, this study will fill this gap by examining how consumers respond to nutrition claims that are presented on a 1-100 scale or a 1-10 scale, which are commonly used by food companies nowadays.

Based on the theory and research findings of anchoring and adjustment, anchors must be salient to draw people’s attention and they tend to be more salient when presented at expanded scales than at contracted scales. A case in point would be face-value effect (Raghubir & Srivastava, 2002). People generally spend more money in a foreign country if the value of a unit of its currency is greater than the value of a unit of people’s own currency (Jonas, Greitemeyer, Frey, & Schulz-Hardt, 2002). For example, A pair of shoes that costs $50 in United States seems more expensive for US consumers in China (¥ 304.68) than in Great Britain (£ 30.85). This phenomenon is also called “unit effect.” Pandelaere et al. (2011) explained that “consumers tend to ignore the unit in which information is provided and focus on the sheer number instead” (p. 308).
Similar research has also lent credentials to the notion of unit effect that the more units a scale has, the more differences are perceived between two relative attributes that are presented at the scale. For instance, people were more willing to pay for an expedited delivery of 31 days than an expedited delivery of one month (Pandelaere et al., 2011). In Burson, Larrick, and Lynch’s study (2009), participants were asked to choose between two movie rental plans. Their study reported that participants were more likely to choose the cheaper plan if the availability of movies was displayed on a weekly basis, but they preferred the more expensive plan if the available movies were displayed on a year basis. Burson et al. (2009) argued that switching from a day-based scale to a year-based scale may increase perceived differences between alternatives.

Few researchers have explained why individuals are more sensitive to expanded scales than contracted scales (Pandelaere et al., 2011). According to Tversky and Kahneman (1974), in an anchoring procedure, the anchor first comes to mind as a baseline and the target question is answered either above or below this baseline. An expanded scale thus may make the degree of being above or below more obvious. For instance, customers thought that they gained longer warranty period if it was 84 or 108 months, rather than 7 or 9 years (Pandelaere et al., 2011). Along the same vein, when a comparative health claim is made on an expanded scale (e.g., “50% less sugar” against “1/2 less sugar”), the gap between two options involves more units, which may lead to an inflated perception of attribute alternatives. Thus, the inflated perception may affect people’s attitudes toward the advertised product and the brand in a more favorable way.

In addition, Smith and Wortzel (1997) found a boosted interest in the target brand and an increased purchase interest when enlarging the gap between the suggested sale price and the market price. Gaston-Breton (2006) suggested that the boosted transactions for the French brands after the launch of the euro were due to French consumers’ misperceptions of price difference.
between expensive and cheap brands in that euros made the difference perceived smaller. Along the same vein, when a comparative health claim is made on an expanded scale, consumers may have greater purchase intentions by associating more purchase benefits with the advertised products. Therefore, applying different scales in describing nutrition content is supposed to result in different advertising effects.

Research on unit effect has demonstrated that the more units a scale has, the more gaps will be perceived between two options that are displayed at the scale (Pandelaere et al., 2011). According to the theory of anchoring, an expanded scale may make the degree of being above/below the baseline more salient, which may create an inflated perception of difference. Therefore, consumers exposed to a nutrition claim with an expanded anchor scale (e.g., 25% less fat on a 0-100 scale) may associate more benefits with the advertised brand or product than those exposed to a contracted anchor scale (e.g., 1/4 less fat on a 1-4 scale). By associating more purchase benefits (e.g., health benefits) with the advertised product/brand, consumers may also have greater purchase interests. In addition, the combination of an expanded scale and a leading brand should influence consumers’ brand/ad attitudes and purchase intentions in the most favorable way, because consumers’ final evaluation of the target product/brand is not only based on their misperceptions of the expanded scale, but also their impressions of the leading brand.

Based on the above literature, the following hypotheses are proposed:

H2: Exposure to a nutrition claim with an expanded anchor scale (e.g., 25% less fat on a 0-100 scale) will lead to more favorable nutritiousness perception (H2a), more favorable attitudes toward the ad (H2b), more favorable attitudes toward the brand (H2c), and higher purchase intention (H2d) than with a contracted anchor scale (e.g., 1/4 less fat on a 1-4 scale).
H3: The presence of an anchor brand (without vs. with) and the type of an anchor scale (expanded vs. contracted) will interact such that an expanded scale with the leading brand as the anchor (e.g., 25% less fat than the leading brand) will elicit the most favorable outcomes in terms of people’s nutritiousness perception (H3a), attitudes toward the ad (H3b), attitudes toward the brand (H3c), and purchase intention (H3d) whereas a contracted scale without a brand as the anchor (e.g., 1/4 less fat) will lead to the least favorable outcomes.

**WHO: People Affected by Anchoring and Adjustment**

Heuristics seem to be a key component of anchoring effects. Although many researchers maintain that heuristics are mental shortcuts that are inevitable because of the limitations of the human brain (Shah & Oppenheimer, 2008), another theoretical perspective suggests that highly involved individuals may spend a great deal of cognitive effort when processing persuasive messages, thus are more likely to avoid mental shortcuts (Petty & Cacioppo, 1979). According to Zaichkowsky (1985), personal involvement is defined as “a person’s perceived relevance of the advertisement based on inherent needs, values, and interests” (p. 342). Researchers have argued that people with higher personal involvement have higher motivation to process advertising information (Celsi & Olson 1988; Gotlieb & Sarel, 1991; Zaichkowsky, 1985), which can lead to greater cognitive efforts to evaluate the comparisons in health claims (Adams & Geuens, 2007; Paek et al., 2011; van Kleef et al, 2005).

Research has revealed that personal involvement is a significant variable affecting individuals’ health claims processing. In Engell et al.’s study (1998), the negative correlation between the information about fat content and food preference was only identified among people who were more concerned with their health. In van Kleef et al.’s study (2005), people who felt more vulnerable were more likely to thoroughly evaluate health information. In Wansink and
Chandon’s study (2006), health claims suggesting low fat and serving size can reduce overeating among normal-weight consumers, but not among those who were overweight. In Naylor et al.’s study (2009), people who were more health-conscious were more susceptible to functional food health claims.

Although research in nutrient content advertising has suggested that the level of personal involvement may affect how consumers respond to health claims (Engell et al., 1998; Gotlieb & Sarel, 1991; Naylor et al., 2009; van Kleef et al., 2005; Wansink & Chandon, 2006), anchoring appears to be independent of personal involvement (Englich & Mussweiler, 2001; Northcraft, Mussweiler, & Strack, 2006). Take the domain of legal decision-making as an example. It seems highly unlikely that judges, prosecutors, and/or lawyers who have years of criminal law training and experience would be affected by randomly determined numbers when generating a sentence in a murder case. Compared with student participants who were asked to estimate the height of the tallest redwood tree in the world, legal experts are more deeply involved in a legal decision process in that they are not only professionally prepared but also required to be responsible with their decisions. In addition, their decisions clearly have more social impact.

However, research in legal context has found anchoring effects among legal experts. For instance, Englich, Mussweiler, and Strack (2006) recruited lawyer participants from different German courts and examined their judicial decisions on criminal sentencing in a shoplifting case. Participants first played a prosecutor’s role and determined the sentencing demand by throwing a pair of dice, which had already been manipulated by researchers (e.g., either three months or nine months). Participants then read the case materials and the defense attorney’s sentencing decisions. Finally, they reported their sentencing demand. Results indicated that although the prosecutor’s sentencing decision was randomly determined by throwing dices and the
participating lawyers were fully aware of it, they were affected by the sentencing anchors. High sentencing anchor (nine months) led to a high sentencing demand (m = 7.8); low sentencing anchor (three months) led to low a sentencing demand (m = 5.2).

It is difficult for people to avoid or eliminate anchoring (e.g., Strack & Mussweiler, 1997). Research indicated that even when people have been informed to avoid anchoring, the effects still occur. In another criminal sentencing study (Englich et al., 2006), participating legal professionals who had an average of more than 10 years of courtroom experience were told to be cautious about the randomly assigned sentencing demand, the anchor still worked as effective as if the participants were not informed. Similarly, Northcraft and Neale (1987) asked real estate agents and students to appraise a house after a tour. Both the groups expressed that the presented anchor, the listing price of the property, should have nothing to do with their evaluations, but pricing appraisals still showed an anchoring effect.

On one hand, research in nutrient content advertising has suggested that higher personal involvement may motivate consumers to make more cognitive efforts when processing comparative health claims (Gotlieb & Sarel, 1991). On the other hand, research has revealed that legal decision makers/real estate agents who are more professionally trained and committed are as susceptible to anchoring effects as inexperienced individuals. Although anchoring effects have been considered particularly robust in decision-making (Mussweiler et al., 2004), it remains unclear whether the anchoring effect found in health claims processing, if any, is moderated by personal involvement with the food product (chocolate/granola bar) and/or product attribute (e.g., fat). Therefore, the following research question is proposed:
RQ1: How does personal involvement moderate the anchoring effect found in health claims, if any, on consumers’ nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and purchase intention?

Previous research suggested that the level of attention paid to health information and the level of comprehension of relevant material differs in the extent to which individuals are motivated to take care of their health (Baltas, 2000; Celsi & Olson 1988; Gotlieb & Sarel, 1991). Highly motivated individuals are more likely to actively search and process information about nutritional value of food products (Naylor et al., 2009; van Kleef et al., 2005; Wansink & Chandon, 2006). Brucks, Mitchell, and Staelin (1984) found that people who were more health-oriented paid more attention to health claims and processed nutrition information more effectively. Adams and Geuens (2007) also found that participants who were health-conscious with their diet were more likely to be persuaded by nutrient content claims than other arguments (e.g., taste), whereas the difference was not observed among those with a low health concern.

According to Jayanti and Burns (1998), health consciousness is defined as “the extent to which health concerns are integrated to a person’s daily activities” (p.10). People with high health concerns hold more favorable attitudes toward wellness-oriented measures, such as exercising, eating healthy, reducing weight, ceasing smoking, and using of supplements (Adams & Geuens, 2007; Dutta-Bergman, 2004; Jayanti & Burns, 1998). Accordingly, they are more willing to process the detailed nutritional information and more capable of making good use of the comparative nutrition claims (Chapman & Johnson, 2002). For instance, van Kleef et al. (2005) found that an individual’s health status (e.g., lack of energy) affected how he perceived
health messages and that people are more sensitive and susceptible to health claims addressing a health issue with which they have personal experience.

Along the same vein, the extent to which people are familiar with the product category may affect how they process comparative nutrition claims. Although many consumers only read food labeling and nutrition claims when they purchase a food product for the very first time (Donovan Research, 2001), first-time buyers are more likely than experienced users to overgeneralize product features (Pechmann, 1996). Shimp (1983) argued that prior product experience could help people from overgeneralizing the health-related information and/or accepting misleading implications of health claims. Furthermore, consumers with more product experience may also have greater interests, knowledge, and resources to evaluate the information provided by claims (Andrews et al., 2000; Williams, 2005).

In contrast, Roe et al. (1999) found that product usage and prior beliefs about nutritional value of a food product may override the presence of a health claim. Pandelaere et al. (2011) stated that people who habitually consume a food product are also more likely to have a salient product category attitude. According to Fazio (1986), consumers who have more experience with a product category may already have a better idea of its approximate nutrient composition, thus are more likely to discount the health claim information. Thus, although consumers are most sensitive and responsive to health claims when they first purchase a product (Donovan Research, 2001), it remains open to question how prior product experience affects their perceptions of the product’s health benefits.

The literature provides empirical evidence that health claims processing is affected by individual difference factors, in particular, health consciousness (e.g., exercising, eating healthy, reducing weight, etc.) and product usage (e.g., consumption level of chocolate/granola bar). In
general, the more involved consumers are, the more cognitive effort they are to spend on processing the comparative nutrition claims (Petty & Cacioppo, 1979). It is possible that people with greater health concerns and/or more product experience have greater motivation to process the information provided by an anchored nutrition claim, which in turn, leads to greater attention to and elaboration of its promoted information. However, it is also possible that a high level of product usage leads consumers to engage in cognitive defense because they may rely on their prior experience and beliefs to evaluate the healthiness of a product, thus are less likely to be affected by claim information (Smith & Wortzel, 1997). Therefore, the anchoring manipulation of health claims, if takes its effect, may be further moderated by people’s health consciousness and product usage.

RQ2: How does health consciousness (e.g., level of exercising; satisfaction with fitness) moderate the anchoring effect found in health claims, if any, on consumers’ nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and purchase intention?

RQ3: How does product usage (e.g., level of chocolate/granola bar consumption) moderate the anchoring effect found in health claims, if any, on consumers’ nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and purchase intention?
CHAPTER III
METHODOLOGY

In order to examine the role of anchoring in individuals’ perceptions of comparative nutrition claims, a 2 (without anchor brand vs. with anchor brand) × 2 (expanded scale vs. contracted scale) × 2 (products) experimental design was employed. The experiment was a mixed factorial design with two between-subjects factors and one within-subjects factor. Product was used as a repeated, within-subjects factor to replicate anchoring effects and to enhance statistical power. Brand and scale were both between-subjects factors, that is, a participant was viewing only one of the four combinations with these two factors. But participants viewed that combination twice, through the repeated factor of product. For each of the food products, a set of front packaging design was created. Each participant evaluated one version of the packaging design for two food products of the same category, so that each participant evaluated two packaging designs in total.

Products & Packaging Designs

Prior to the main experiment, two pretests were conducted, one of which was to determine participants’ involvement level of the examined products and the other was to assess the appropriateness of the two fictitious brand names created for the main experiment. It should be noted that participants’ product involvement measured in the pretest is different from their personal involvement measured in the main experiment, which involves personal relevance to products, ads, and purchase decisions.
Based on previous research on nutrition claims and existing industry regulations (Andrews et al., 2000; Paek et al., 2011; van Kleef et al., 2005), a list of 10 food products was presented for participants to review in the first pretest: chicken soup, mashed potatoes, yogurt, crackers, chocolate, granola bar, potato chips, beef jerky, roast peanuts, and cashew nuts. Data were collected from 84 students recruited from a business school at a Western university, who were 19 years of age or older. Participants were asked to indicate how often they ate these food on a scale of 1 (not at all) to 7 (very frequently). Participants were also asked to indicate how they were involved with each of the 10 food products on four seven-point semantic differential scales, including whether the product (e.g., chicken soup) was unimportant – important, irrelevant – relevant, means nothing – means a lot to them, and not needed – needed.

The internal consistency of the five items was assessed by performing reliability checks using Cronbach’s alpha, which loaded reliably for the 10 food products respectively, $\alpha_{\text{chicken soup}} = .92$, $\alpha_{\text{mashed potatoes}} = .95$, $\alpha_{\text{yogurt}} = .94$, $\alpha_{\text{crackers}} = .95$, $\alpha_{\text{chocolate}} = .94$, $\alpha_{\text{granola bar}} = .94$, $\alpha_{\text{potato chips}} = .93$, $\alpha_{\text{beef jerky}} = .96$, $\alpha_{\text{roast peanuts}} = .96$, and $\alpha_{\text{cashew nuts}} = .96$. Cronbach’s alpha analyses also showed a negligibly raised overall value for chicken soup (from .921 to .925), and granola bar (from .940 to .944), if the item, “On a scale of 1 to 7, how often do you eat chicken soup (granola bar),” was deleted. In sum, the scale had excellent internal reliability (George & Mallery, 2003). The mean scores of each scale were computed for further statistical analysis.

A descriptive statistical analysis on participants’ product involvement (see Table 2) revealed that chocolate had the highest involvement score ($\bar{X} = 5.46, SD = 1.53$), followed by yogurt ($\bar{X} = 4.64, SD = 1.43$), and mashed potatoes ($\bar{X} = 4.52, SD = 1.66$). Participants were least involved with roast peanuts ($\bar{X} = 3.38, SD = 1.54$), cashew nuts ($\bar{X} = 3.50, SD = 1.67$), and beef jerky ($\bar{X} = 3.58, SD = 1.7$). Granola bar had a moderate involvement score ($\bar{X} = 4.18, SD = 1.53$).
A paired-samples $t$ test was conducted to assess whether participants varied in their responses across the two examined products: chocolate and granola bar. Results indicated that participants were significantly more involved with chocolate than with granola bar ($t (82) = 5.97, p < .001$).

Table 1. Product Involvement

<table>
<thead>
<tr>
<th>Product</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chocolate</td>
<td>83</td>
<td>5.4627</td>
<td>1.52665</td>
<td>-1.076</td>
<td>.829</td>
</tr>
<tr>
<td>Yogurt</td>
<td>81</td>
<td>4.6444</td>
<td>1.42969</td>
<td>-.516</td>
<td>.141</td>
</tr>
<tr>
<td>Mashed potatoes</td>
<td>83</td>
<td>4.5157</td>
<td>1.66312</td>
<td>-.496</td>
<td>-.601</td>
</tr>
<tr>
<td>Potato chips</td>
<td>82</td>
<td>4.4878</td>
<td>1.66002</td>
<td>-.334</td>
<td>-.759</td>
</tr>
<tr>
<td>Granola bar</td>
<td>84</td>
<td>4.1833</td>
<td>1.53237</td>
<td>-.225</td>
<td>-.621</td>
</tr>
<tr>
<td>Chicken soup</td>
<td>82</td>
<td>3.7317</td>
<td>1.46741</td>
<td>.172</td>
<td>-.527</td>
</tr>
<tr>
<td>Crackers</td>
<td>83</td>
<td>3.6506</td>
<td>1.62055</td>
<td>-.082</td>
<td>-.842</td>
</tr>
<tr>
<td>Beef jerky</td>
<td>84</td>
<td>3.5786</td>
<td>1.70471</td>
<td>.114</td>
<td>-.765</td>
</tr>
<tr>
<td>Cashew nuts</td>
<td>83</td>
<td>3.4988</td>
<td>1.66934</td>
<td>.097</td>
<td>-.886</td>
</tr>
<tr>
<td>Roast peanuts</td>
<td>83</td>
<td>3.3783</td>
<td>1.54004</td>
<td>.113</td>
<td>-.738</td>
</tr>
</tbody>
</table>

A descriptive statistical analysis on participants’ consumption rate was also performed (see Table 3), which indicated that chocolate had the highest consumption score ($\overline{X} = 5.05, SD = 1.68$), followed by potato chips ($\overline{X} = 4.66, SD = 1.65$), and yogurt ($\overline{X} = 4.34, SD = 1.78$). Food products that had the lowest consumption scores were roast peanuts ($\overline{X} = 2.98, SD = 1.66$), chicken soup ($\overline{X} = 2.98, SD = 1.5$), and cashew nuts ($\overline{X} = 2.99, SD = 1.77$). Granola bar had a moderate consumption score ($\overline{X} = 3.79, SD = 1.73$). A paired-samples $t$ test was conducted to assess whether participants varied in their responses across the two examined products: chocolate and granola bar. Results indicated that participants significantly consumed more chocolate than granola bar ($t (83) = 5.28, p < .001$). Based on the descriptive statistics and paired-sample $t$-tests results, the products that were examined in the main study, chocolate and granola bar, represent different product involvement levels.
Table 2. Product Consumption Rate

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chocolate</td>
<td>84</td>
<td>5.05</td>
<td>1.678</td>
<td>-.562</td>
<td>-.611</td>
</tr>
<tr>
<td>Potato chips</td>
<td>83</td>
<td>4.66</td>
<td>1.647</td>
<td>-.463</td>
<td>-.613</td>
</tr>
<tr>
<td>Yogurt</td>
<td>82</td>
<td>4.34</td>
<td>1.779</td>
<td>-.292</td>
<td>-.919</td>
</tr>
<tr>
<td>Mashed potatoes</td>
<td>84</td>
<td>3.81</td>
<td>1.759</td>
<td>-.056</td>
<td>-.948</td>
</tr>
<tr>
<td>Granola bar</td>
<td>84</td>
<td>3.79</td>
<td>1.729</td>
<td>.326</td>
<td>-.712</td>
</tr>
<tr>
<td>Crackers</td>
<td>84</td>
<td>3.50</td>
<td>1.711</td>
<td>.081</td>
<td>-1.068</td>
</tr>
<tr>
<td>Beef jerky</td>
<td>84</td>
<td>3.10</td>
<td>1.698</td>
<td>.574</td>
<td>-.611</td>
</tr>
<tr>
<td>Cashew nuts</td>
<td>83</td>
<td>2.99</td>
<td>1.736</td>
<td>.593</td>
<td>-.621</td>
</tr>
<tr>
<td>Chicken soup</td>
<td>84</td>
<td>2.98</td>
<td>1.497</td>
<td>.770</td>
<td>-.136</td>
</tr>
<tr>
<td>Roast peanuts</td>
<td>84</td>
<td>2.98</td>
<td>1.657</td>
<td>.413</td>
<td>-.904</td>
</tr>
</tbody>
</table>

In addition to the pretest, further consideration was given to the determination of the two food products. First of all, student participants were recruited to participate in this study and they were the driving consumption group of the selected food products. Research has shown that U.S. consumers aged 18-24 ate chocolate 113 times a year on average, followed by 101 times a year eaten by those aged 25-34 and 94 times a year eaten by those aged 35-44 (Lindell, 2011). Research has also indicated that 82% of U.S. consumers aged 18-24 ate granola bars, which was the leading consumption segment of the population (Mintel, 2013). Secondly, it is common for packages of these food products to feature health claims. Similar combinations that resemble realistic nutrition claims on these products increase the external validity of the experiments.

Food packaging designs used in this experiment were modified from existing designs to maintain their advertising quality and increase ecological validity. These products have never been advertised in the participants’ area. The layout of the pictures, the placement of the nutrition claims, the font and color of the characters remained the same for the chocolate ads and the granola bar ads, respectively (see Figure 2 and 3).
The purpose of the second pretest was to assess whether the two fictitious brand names were appropriate to be used for the main experiment: *Rokolate* for chocolate and *Greenchy* for granola bar. The two brand names were created to limit cognitive residual caused by prior ad exposure and brand experience so that they should sound phonetically different from existing brands and disassociate with certain product benefits (Baker, 1999; Hoyer & Brown, 1990). The two brand names were pretested on two aspects: name familiarity and benefit association implied by the name (Baker, 1999; Keller, Heckler, & Houston, 1998).

For each brand name, two seven-point scales were presented: the brand name seems unfamiliar to me – familiar to me, and the brand name definitely implies a product category benefit – does not imply a product category benefit. Data were collected from 72 students recruited from a business school at a Western university, who were 19 years of age or older. Participants rated *Rokolate* as an unfamiliar chocolate brand ($\bar{X} = 1.54$, $SD = 1.13$) and it implied relatively low benefit association ($\bar{X} = 2.4$, $SD = 1.5$). Similarly, participants considered *Greenchy* an unfamiliar granola bar brand ($\bar{X} = 1.22$, $SD = 0.76$) and the brand implied low brand benefits ($\bar{X} = 2.21$, $SD = 1.6$). Therefore, it was verified that *Rokolate* and *Greenchy* were appropriate brand names to be tested in the main experiment.

**Treatment Manipulations**

The two independent variables were manipulated through making nutrition claims on the packages. Table 1 and Figure 2-3 show the treatment manipulations for the experiment. The first independent variable, “with or without an anchor brand,” was manipulated by including or not including “the leading brand” as the anchor brand in the health claims. The second independent variable, “expanded or contracted scale,” was manipulated by using percentage or fraction to describe the same nutrient attribute.
Table 3. Treatment Manipulations

<table>
<thead>
<tr>
<th></th>
<th>Without Anchor Brand</th>
<th>With Brand Anchor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expanded Scale</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chocolate</td>
<td>25% less fat</td>
<td>25% less fat than the leading brand of chocolate</td>
</tr>
<tr>
<td>Granola Bar</td>
<td>40% less fat</td>
<td>40% less fat than the leading brand of granola bar</td>
</tr>
<tr>
<td><strong>Contracted Scale</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chocolate</td>
<td>1/4 less fat</td>
<td>1/4 less fat than the leading brand of chocolate</td>
</tr>
<tr>
<td>Granola Bar</td>
<td>2/5 less fat</td>
<td>2/5 less fat than the leading brand of granola bar</td>
</tr>
</tbody>
</table>
Figure 2 Research Stimuli: Chocolate Packaging Design
Figure 3. Research Stimuli: Granola Bar Packaging Design
More specifically, for the chocolate product, the nutrition claims on the packaging designs were: 1). 25% less fat (expanded scale without anchor brand); 2). 25% less fat than the leading brand of chocolate (expanded scale with anchor brand); 3). 1/4 less fat (contracted scale without anchor brand); 4). 1/4 less fat than the leading brand of chocolate (contracted scale with anchor brand). Fat-reduced chocolates are common in the market. For instance, *Whoopers Whoppers* chocolate has a health claim on its latest packaging, “25% Less Fat;” *Hershey’s Simple Pleasure* milk chocolate has a similar health claim, indicating “30 LESS FAT compared with the leading milk chocolate;” *Bell Plantation Powdered Peanut Butter Chocolate* claims that it has “85% Less Fat Calories Than Traditional Peanut Butter.”

For the granola bar product, the nutrition claims on the packaging designs were: 1). 40% less fat (expanded scale without anchor brand); 2). 40% less fat than the leading brand of granola bar (expanded scale with anchor brand); 3). 2/5 less fat (contracted scale without anchor brand); 4). 2/5 less fat than the leading brand of granola bar (contracted scale with anchor brand). Snack bars (granola bars) are commonly associated with fat claims. For instance, *Sunbelt Bakery*, *Health Valley*, *Kellogg’s* and *Kroger* all have a simple label on the packages of their granola bar products, “Low Fat,” whereas *Kashi* uses a health claim, “5g fat per serving,” to advertise its GOLEAN bar. In addition, *Quake Oats* claims that its reduced-fat granola bar has 40% less fat than other brands; *Kellogg's Special K* has Granola products featuring “3g of total fat,” “47% less fat,” and “50% less fat.”

**Product Attribute: Fat**

All nutrition claims on the food packages focused on how well the product performed on the fat attribute. Fat was chosen to serve as the featured attribute for three reasons. First of all, both the U.S. government and consumers are concerned about the growing obesity and
overweight epidemic. Nearly 70% of U.S. adults were overweight or obese (Flegal, Carroll, Ogden, & Curtin, 2010). More than 63% Americans considered obesity the public health priority which has had not just personal consequences but also societal impact (PewResearch, 2013). Therefore, a growing theoretical and research support is needed for education efforts and government policies that deal with overeating and fat consumptions.

Secondly, because fat has visible impact on body shape, people pay greater attention to the amount of fat of food products than food attributes that have less visible consequences, such as fiber (Baltas, 2000). Research has revealed that consumers prefer food products that are labeled as reduced fat, low fat, or fat free (Keller et al., 1997). Finally, consumers’ preference of fat-related labeling and health claims has also motivated food producers and marketers to improve the nutritional profile of their food products by creating more fat-modified products (Ippolito & Mathios, 1993). Therefore, it is quite common for marketers and advertisers to feature the fat attribute in various ways on food packaging to attract consumers.

**Participants and Procedure**

After garnering IRB approval (see Appendix C: IRB), the research recruited participants from a business school of a Western university. Although student participants may not be generalizable to other segments of the population, a homogeneous sample would strengthen the reliability of the study by controlling for confounding variables. Participants who agreed to participate in this experiment were given a link to the survey, which was hosted by Qualtrics. To introduce the experiments, participants were told that they were invited by a full-service branding and packaging design agency to evaluate packaging designs that were currently in a testing phase. The design company had over 10 years experience in product branding especially for food, gourmet and health products. Participants were assured that the design company was
interested in their gut feelings instead of their accuracy, and they were urged to respond on the basis of their intuition as many food shoppers do in the marketplace.

After reading the cover story, participants were told that each participant was going to evaluate two packaging designs for two newly launched food products. Participants were randomly assigned to one of the conditions and viewed the ad for Rokolate chocolate for 30 seconds. Participants then completed a nutrition rating scale, an attitude toward advertising scale, an attitude toward brand scale, a purchase intention scale, a personal involvement inventory, and a manipulation check. The same procedure was replicated for the packaging design of Greency granola bar. The order of the two package designs was rotated to exclude order effects from the analysis.

After evaluating the packaging designs, participants filled out a short questionnaire about individual difference factors, including health consciousness and product usage, and a questionnaire about demographic factors, including age, gender, race, and year in school. They were told that the information was collected for statistical purposes. Following the data collection, participants were given the opportunity to report any suspicions about the experiments, and then debriefed and thanked.

**Measurement**

*Nutrition Rating.* Nutrition rating (NR) in this study refers to perceived nutritional value of a food product. Several studies used a single item to measure consumers’ nutritional value perceptions (e.g., Andrews et al., 1998; Paek et al., 2011; Roe et al., 1999). For instance, Andrews et al. (2000) asked participants to indicate the healthiness of the advertised soup brand with responses ranging from 1 (healthy for you) to 7 (unhealthy for you). Some other studies used a combination of general healthiness questions and content attribute questions. For instance,
Adams and Geuens (2007) asked participants such questions as whether the product has a high or low nutritional value, has a lot or a little sugar, and is good or bad for teeth. The Cronbach’s alpha of the research using two or more items all registered .85 or above (e.g., Adams & Geuens, 2007; Andrews et al., 2000). Therefore, three items were used to assess the nutrition ratings of food products in the present study. For each food product, a seven-point semantic differential scale were presented: not very nutritious – very nutritious; not very healthy – very healthy; low level of fat – high level of fat.

**Attitude toward Advertising.** Attitude toward advertising (Aad) has been conceptualized as a “predisposition to respond in a favorable or unfavorable manner to a particular advertising stimulus during a particular exposure situation” (Mackenzie, Lutz & Belch, 1986, p. 130). The Aad scale in this study consisted of seven items suggested by Mitchell and Olson (1981) and Madden, Allen, and Twible (1988). Participants were asked how they perceived the packaging designs on seven-point semantic differential scales: bad – good, dislike – like, boring – interesting, not appealing – appealing, irritating – not irritating, unpleasant – pleasant, and unfavorable – favorable. These items have been used in several studies, which registered high internal consistency (e.g., Adams & Geuens, 2007; Holmes & Crocker, 1987; Martin, Lang, & Wong, 2003; Paek et al., 2011; Sciglimpaglia, Belch, & Cain 1979; Yan, Hyllegard, & Blaesi, 2012).

**Attitude toward Brand.** Attitude toward brand (Abr) were also be measured on seven-point semantic differential scales. The Abr scale included four items, which were adopted very frequently in previous research (e.g., Andrews et al., 2000; Auken & Adams, 2005; Martin et al. 2003; Jain, Agrawal, & Maheswaran, 2006): bad – good, unlikable – likable, negative – positive, and unfavorable – favorable. For instance, Paek et al. (2011) used the exact four items to
measure the anchoring effects of health claims and the Cronbach’s alpha of the scale in their study was .96.

**Purchase Intention.** Purchase intention (PI) refers to the likeliness of a person to purchase the product (Lutz, MacKenzie, & Belch, 1983). Several studies used a single item to measure this variable, which asked participants either how likely or how definite participants were to choose the advertised brand (e.g., Roe et al., 1999; Thompson & Hamilton, 2006; Yan et al., 2012), while some other studies used a combination of the two questions (e.g., Martin et al., 2003; Sawyer & Howard, 1991). In addition, some questions may be added to this combination to consist a purchase intention scale, such as the probability of purchase (e.g., Bearden, Lichtenstein, & Teel, 1984; Dodds, Monroe, & Grewal, 1991; Gotlieb & Sarel, 1991; Paek et al., 2011; Smith & Wortzel, 1997), the chance to buy or use the advertised product (Adams & Geuens, 2007), the willingness to buy a product (Dodds et al., 1991), or the certainty of purchase (Paek et al., 2011). Therefore, the present study assessed participants’ purchase intention with three items on seven-point semantic differential scales: (1). How likely would you purchase the product? unlikely – likely. (2). The probability that I would consider buying the product is: low – high. (3). My willingness to buy the product is: definitely not – definitely. These three items were not only used frequently by researchers, but also showed high internal consistency in previous research.

**Personal Involvement Inventory (PII).** Personal involvement were measured by a ten-item semantic differential scale developed by Zaichkowsky (1985; 1994). The original scale had twenty items, which was designed to measure the level of personal relevance to products, ads, and purchase decisions. According to Zaichkowsky (1994), the average reported Cronbach Alpha of PII in measuring product involvement was above .95, and this value was greater
than .96 when PII was applied to measure advertising involvement. Although the scale had registered a very high reliability, it has been criticized for being redundant, and many researchers only selected subsets of the PII to measure involvement (Zaichkowsky, 1994). Given that the scale would still be considered highly reliable with a Cronbach Alpha greater than .90, it was reduced by Zaichkowsky to 10 items (1994). In addition, the 10-item PII has been more applicable to advertising research than its old version (Beard, 2002).

Using seven-point semantic differential scales, participants in this study were asked to indicate their agreement on ten items, including whether the advertised product (chocolate/granola bar) is important or unimportant (reverse coded), boring – interesting, relevant – irrelevant (reverse coded), exciting – unexciting (reverse coded), means nothing – means a lot to me, appealing – unappealing (reverse coded), fascinating – mundane (reverse coded), worthless – valuable, involving – uninvolved (reverse coded), and not needed – needed. Based on the same ten items, participants were asked to indicate their involvement with the fat content of the advertised products.

*Individual Difference Factors.* Besides personal involvement, two other moderating variables were examined in this study: health consciousness and product usage. Health consciousness refers to “the extent to which health concerns are integrated to a person’s daily activities” (Jayanti & Burns, 1998, p.10). A high level of health consciousness leads to more positive attitudes toward health-oriented activities, such as exercising, eating healthy, reducing weight, ceasing smoking, and using of supplements (Adams & Geuens, 2007; Dutta-Bergman, 2004; Jayanti & Burns, 1998).

Health consciousness were measured with five items, three of which were adapted from the healthy activities scale developed by Dutta-Bergman (2004). These items have already been
adopted in several other studies and showed a relatively high internal consistency (e.g., Harris & Epton, 2010; Paek et al., 2011). Items that were not directly related to the present study were removed from the scale, such as “smoking cigarettes” and “drinking alcohol.”

More specifically, participants in this study were asked to rate each of the following health behaviors on a scale of 1 (not at all) to 7 (very frequently) on how often they performed to maintain their health: “eating a diet that is low in fat,” “eating a lot of fruits, vegetables, and grains,” “exercising.” Additionally, participants were asked to indicate how satisfied they were with their fitness and how satisfied they were with their body weight on a scale of 1 (not at all) to 7 (very satisfied). Finally, product usage were assessed with two items. Participants were asked to indicate how often they ate granola bar and how often they ate chocolate on a scale of 1 (not at all) to 7 (very frequently).

**Manipulation Check.** A manipulation check for the recall of nutrition claims were performed by asking participants to indicate what they saw on the packages of chocolate and granola bar. For instance, for the chocolate product, participants were asked to choose among the four options: 1). 25% less fat; 2). 25% less fat than the leading brand of chocolate; 3). 1/4 less fat; 4). 1/4 less fat than the leading brand of chocolate. The same procedure was replicated for the granola bar product.
CHAPTER IV

RESULTS

The aim of this study was to examine the role of anchoring in individuals’ perceptions of comparative nutrition claims. This section describes the data collection and data analysis processes. A manipulation check is first reported for the recall of nutrition claims that were developed to be used in the main experiment. Subsequently, a demographic profile of the sample, statistical results of the hypotheses and research questions posited in this study are presented. Finally, a summary table is presented at the end of this section to summarize the research findings in this study.

Manipulation Check

Similar to the main experiment, participants were told that they were invited to evaluate packaging designs that were currently in a testing phase. Data were collected from 132 students recruited from a business school at a Western university, who were 19 years of age or older. After randomly assigned to one of the four treatments, participants evaluated the two packaging designs and were asked to recall the nutrition claims they just viewed. For instance, for the granola bar product, participants were asked to indicate what they saw on the product package: 1). 40% less fat; 2). 40% less fat than the leading brand of granola bar; 3). 2/5 less fat; 4). 2/5 less fat than the leading brand of granola bar. A Chi-square analysis showed significant differences in recall of nutrition claims on the granola bar package among participants assigned to different groups, $X^2 (6, N = 131) = 85.69, p < .001$ (see Table 4). Significant differences were also found in recall of nutrition claim for the chocolate package between the four treatment
groups, $X^2 (9, N = 129) = 117.59, p < .001$ (see Table 4). It is noteworthy to point out that among the participants who were assigned to the third treatment group (without anchor brand & contracted scale), no one accurately recalled the nutrition claim on the granola bar package ("2/5 less fat"), whereas 84.4% of them accurately recalled the nutrition claim on the chocolate package ("1/4 less fat"). Although the relationship between the recall and the psychological state created by viewing nutrition claims remains questionable, the results showed that the treatments and participants’ recall were dependent. Thus, the nutrition claim manipulations were retained for both the food products in the main experiment.

### Table 4. Recall × Manipulations Crosstabulation

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Granola Bar</td>
<td>$N = 32$</td>
<td>$N = 28$</td>
<td>$N = 33$</td>
<td>$N = 38$</td>
</tr>
<tr>
<td>1 ($N = 37$)</td>
<td>68.8%</td>
<td>21.4%</td>
<td>15.2%</td>
<td>10.5%</td>
</tr>
<tr>
<td>2 ($N = 31$)</td>
<td>9.4%</td>
<td>71.4%</td>
<td>12.1%</td>
<td>10.5%</td>
</tr>
<tr>
<td>3 ($N = 0$)</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>4 ($N = 63$)</td>
<td>21.9%</td>
<td>7.1%</td>
<td>72.7%</td>
<td>78.9%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Chocolate</td>
<td>$N = 32$</td>
<td>$N = 28$</td>
<td>$N = 32$</td>
<td>$N = 37$</td>
</tr>
<tr>
<td>1 ($N = 47$)</td>
<td>81.2%</td>
<td>35.7%</td>
<td>12.5%</td>
<td>18.9%</td>
</tr>
<tr>
<td>2 ($N = 20$)</td>
<td>3.1%</td>
<td>46.4%</td>
<td>3.1%</td>
<td>13.5%</td>
</tr>
<tr>
<td>3 ($N = 40$)</td>
<td>12.5%</td>
<td>3.6%</td>
<td>84.4%</td>
<td>21.6%</td>
</tr>
<tr>
<td>4 ($N = 22$)</td>
<td>3.1%</td>
<td>14.3%</td>
<td>0.0%</td>
<td>45.9%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Study Participants

Participants of the main experiment were recruited from a business school of a Western university. After accounting for incomplete and multiple individual responses, a total of 304 valid responses were included in the analysis. Of the 304 respondents, 53% ($n = 161$) were male.
and 47% (n = 143) were female. The mean age of participants was 21.67 years (SD = 3.84 years).
The majority of the sample was Asian (56.9%), with Caucasian/White (21.7%) and Native Hawaiian/other Pacific Islander (11.5%) comprising the next two largest groups, followed by the remainder being other (4.9%), Hispanics (3%), African American (1.6%), and American Indian/Native Alaskan (0.3%). Participants were randomly assigned into one of the four experimental conditions: expanded scale without anchor brand (n = 75), expanded scale with anchor brand (n = 75), contracted scale without anchor brand (n = 77), and contracted scale with anchor brand (n = 77). On average, participants viewed the ad for Rokolate chocolate for 19.59 seconds; participants viewed the ad for Greenchy granola bar for 21.47 seconds.

**Scale Reliability and Validity**

Reliability analyses of the scales used to measure the dependent variables were performed using Cronbach’s alpha. All the scales were measured twice in the study, one for chocolate and one for granola bar. According to George and Mallery (2003), a reported Cronbach’s alpha of 0.7 and higher is deemed acceptable for a scale to be considered reliable. The first measure scale, nutrition rating, was neither found to be reliable for chocolate (α = .641), nor for granola bar (α = .643). Cronbach’s alpha analysis to check for reliability if item is deleted revealed a significantly increased internal consistency for chocolate (α = .878) and granola bar (α = .886), if the following item was deleted, “On a scale of 1 to 7, please indicate your feelings toward this food product (granola bar): low level of fat – high level of fat” (reverse coded). Therefore, this item was removed from the nutrition rating scale of the food products.

The dependent variable, Attitude toward Advertising, was found to be reliable for both chocolate (α = .942) and granola bar (α = .937). Similarly, the Attitude toward Brand scale was considered reliable for both the food products (α_{chocolate} = .957; α_{granola bar} = .963). Finally, the
purchase intention scale was found to be reliable for both the food products ($\alpha_{\text{chocolate}} = .948$; $\alpha_{\text{granola bar}} = .952$). For all the three dependent variables, no single item was found to increase the reliability if deleted from its corresponding measure scale.

Reliability analyses using Cronbach’s alpha were also performed for personal involvement with chocolate ($\alpha = .927$), personal involvement with granola bar ($\alpha = .914$), personal involvement with fat attribute ($\alpha = .889$), and health consciousness ($\alpha = .727$), with no single item increasing the reliability if deleted from the four scales, respectively.

In addition to reliability analyses, a series of exploratory factor analysis (EFA) were performed to measure the construct validity of the dependent variables, Attitude toward Advertising and Attitude toward Brand. EFA was not performed for nutrition rating and purchase intention as the two measure scales consisted of limited items. Given that all items were expected to load under one factor and they would be removed if loaded under a different factor, no rotation was included in the analyses. Results confirmed the construct validity of the Attitude toward Advertising scale and the Attitude toward Brand scale for both the food products. Table 5 exhibits the variance and eigenvalues for each scale.

<table>
<thead>
<tr>
<th></th>
<th>Eigenvalues</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aad-Chocolate</td>
<td>5.21</td>
<td>74.48</td>
</tr>
<tr>
<td>Aad-Granola Bar</td>
<td>5.18</td>
<td>74.03</td>
</tr>
<tr>
<td>Abr-Chocolate</td>
<td>3.55</td>
<td>88.63</td>
</tr>
<tr>
<td>Abr-Granola Bar</td>
<td>3.6</td>
<td>90.08</td>
</tr>
</tbody>
</table>

*Note. Aad = attitude toward advertising, and Abr = attitude toward brand.*

**Hypotheses Testing and Research Questions**

In order to examine H1-H3, a multivariate analysis of variance (MANOVA) was initially considered appropriate because there were multiple dependent variables in the present study.
Because for both the products, the skewness and the kurtosis were between -1 and 1 for the dependent variables, the data were considered normally distributed. Therefore, Pearson correlations were utilized to explore the relationship between the dependent variables (see Table 6 and 7). The analysis revealed a relatively strong correlation between attitude toward advertising and attitude toward brand (Chocolate: $r_p (292) = .776, p < .001$; Granola Bar: $r_p (298) = .755, p < .001$), between attitude toward advertising and purchase intention (Chocolate: $r_p (292) = .693, p < .001$; Granola Bar: $r_p (298) = .735, p < .001$), and between attitude toward brand and purchase intention (Chocolate: $r_p (292) = .633, p < .001$; Granola Bar: $r_p (298) = .669, p < .001$). According to Leech, Barrett, and Morgan (2005), MANOVA supports the analysis of multiple dependent variables altogether, but 1) the dependent variables should be correlated with one another at a relatively low level to minimize the risk of multicollinearity; 2) “the dependent variables should be related conceptually” (p.162). On one hand, relatively strong correlations were revealed between the dependent variables. On the other hand, in terms of construct validity, there is no reason to believe that the four dependent variables in this study were conceptually related. Given that both the criteria were not met for performing MANOVA tests, a more defensible approach, ANOVA, was adopted for hypotheses testing.

Table 6. Pearson Correlations for the Dependent Variables (Chocolate)

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>NR</th>
<th>Aad</th>
<th>Abr</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR</td>
<td>1.000</td>
<td>.216**</td>
<td>.154**</td>
<td>.314**</td>
</tr>
<tr>
<td>Aad</td>
<td>1.000</td>
<td>.776**</td>
<td>.693**</td>
<td></td>
</tr>
<tr>
<td>Abr</td>
<td>1.000</td>
<td>.633**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PI</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note. Significance indicated by *p ≤ .05, **p ≤ .01, ***p ≤ .001. NR = nutritiousness perception, Aad = attitude toward advertising, Abr = attitude toward brand, and PI = purchase intention.*
Table 7. Pearson Correlations for the Dependent Variables (Granola Bar)

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>NR</th>
<th>Aad</th>
<th>Abr</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aad</td>
<td></td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abr</td>
<td></td>
<td></td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>PI</td>
<td></td>
<td></td>
<td></td>
<td>1.000</td>
</tr>
</tbody>
</table>

**Note.** Significance indicated by *p ≤ .05, **p ≤ .01, ***p ≤ .001. NR = nutritiousness perception, Aad = attitude toward advertising, Abr = attitude toward brand, and PI = purchase intention.

In addition, similar to the results of the first pretest, a paired-samples t test revealed significant differences in participants’ responses across the two examined products (t(292) = -4.68, p < .001), and that participants were significantly more involved with chocolate (\( \bar{X} = 4.01, SD = 1.22, \text{Skewness} = -.286, \text{Kurtosis} = .478 \)) than with granola bar (\( \bar{X} = 3.62, SD = 1.07, \text{Skewness} = -.294, \text{Kurtosis} = .793 \)). Thus, the ANOVA tests were performed for the two products, respectively.

**Hypothesis 1** predicted that exposure to a nutrition claim with an anchor (“the leading brand”) would lead to more favorable nutritiousness perception (H1a), more favorable attitudes toward the ad (H1b), more favorable attitudes toward the brand (H1c), and higher purchase intention (H1d) than a nutrition claim without an anchor brand. First, descriptive statistics were performed to ensure the normality of the data. Because both the skewness and kurtosis were between -1 and 1 for each and all of the dependent variables, the data were considered normal. Next, a one-way ANOVA was performed for each of the four dependent variables for granola bar. The p-value for the Levene’s test was not significant (p > .05) in all the ANOVA tests, confirming the assumption of equal variances.

The ANOVA results further revealed a significant main effect (see Table 8) for participants’ nutritiousness perception (F(1, 298) = 4.96, p < .05, \( \eta^2 = .016 \)) and attitudes toward the ad (F(1,
299) = 6.8, \( p < .05, \eta^2 = .022 \). The main effect of anchor brand was not significant on attitudes toward the brand \( (F (1, 300) = 3.65, p = .057, \eta^2 = .012) \) and purchase intention \( (F (1, 302) = 2.22, p = .138, \eta^2 = .007) \). On average, a significantly higher nutritional value of granola bar was reported in the with-an-anchor-brand condition \( (\bar{X} = 5.37, SD = 1.07) \) than in the without-an-anchor-brand condition \( (\bar{X} = 5.09, SD = 1.06) \). Participants in the with-an-anchor-brand condition also showed significantly more favorable attitudes toward the ad \( (\text{with: } \bar{X} = 4.8, SD = 1.3; \text{without: } \bar{X} = 4.41, SD = 1.24) \). Although the main effect was not significant on attitudes toward the brand and purchase intention, participants in the with-an-anchor-brand condition showed the tendency to have more favorable attitudes toward the brand \( (\text{with: } \bar{X} = 5.01, SD = 1.37; \text{without: } \bar{X} = 4.7, SD = 1.43) \) and higher purchase intention \( (\text{with: } \bar{X} = 4.07, SD = 1.69; \text{without: } \bar{X} = 3.79, SD = 1.59) \).

### Table 8. Analysis of Variance Results for Anchor Brand for Granola Bar

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Without an anchor brand M (SD)</th>
<th>With an anchor brand M (SD)</th>
<th>( F )</th>
<th>d.f.</th>
<th>( \eta^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR</td>
<td>5.09 (1.06)</td>
<td>5.37 (1.07)</td>
<td>4.96*</td>
<td>1, 298</td>
<td>.016</td>
</tr>
<tr>
<td>Aad</td>
<td>4.41 (1.24)</td>
<td>4.8 (1.3)</td>
<td>6.8*</td>
<td>1, 299</td>
<td>.022</td>
</tr>
<tr>
<td>Abr</td>
<td>4.7 (1.43)</td>
<td>5.01 (1.37)</td>
<td>3.65</td>
<td>1, 300</td>
<td>.012</td>
</tr>
<tr>
<td>PI</td>
<td>3.79 (1.59)</td>
<td>4.07 (1.69)</td>
<td>2.22</td>
<td>1, 302</td>
<td>.007</td>
</tr>
</tbody>
</table>

*Note. Significance indicated by \(* p \leq .05, \text{**} p \leq .01, \text{***} p \leq .001\). NR = nutritiousness perception, Aad = attitude toward advertising, Abr = attitude toward brand, and PI = purchase intention.*

The same statistical procedure was replicated for the chocolate packaging design. The ANOVA results showed that the assumptions of normality and equal variances were met. However, the main effect of anchor brand was not found to be significant for each of the dependent variables.
**Hypothesis 2** predicted that exposure to a nutrition claim with an expanded anchor scale (e.g., 25% less fat on a 0-100 scale) would lead to more favorable nutritiousness perception (H2a), more favorable attitudes toward the ad (H2b), more favorable attitudes toward the brand (H2c), and higher purchase intention (H2d) than with a contracted anchor scale (e.g., 1/4 less fat on a 1-4 scale). First, descriptive statistics were performed to ensure the normality of the data. Because both the skewness and kurtosis were between -1 and 1 for each and all of the dependent variables, the data were considered normal. Next, a one-way ANOVA was performed for each of the four dependent variables for granola bar. The p-value for the Levene’s test was not significant ($p > .05$) in all the ANOVA tests, confirming the assumption of equal variances.

The ANOVA results revealed a significant main effect (see Table 9) for participants’ nutritiousness perception ($F (1, 298) = 7.86, p < .01, \eta^2 = .026$) and attitudes toward the ad ($F (1, 299) = 4.47, p < .05, \eta^2 = .015$). The main effect of anchor scale was not significant on attitudes toward the brand ($F (1, 300) = 3.41, p = .066, \eta^2 = .011$) and purchase intention ($F (1, 302) = .44, p = .508, \eta^2 = .001$). On average, a significantly higher nutritional value of granola bar was reported in the expanded scale condition ($\bar{X} = 5.41, SD = 1.08$) than in the contracted scale condition ($\bar{X} = 5.06, SD = 1.04$). Participants in the expanded scale condition also showed significantly more favorable attitudes toward the ad (expanded scale: $\bar{X} = 4.76, SD = 1.21$; contracted scale: $\bar{X} = 4.45, SD = 1.35$). Although the main effect was not significant on attitudes toward the brand and purchase intention, participants in the expanded scale condition showed more favorable attitudes toward the brand (expanded scale: $\bar{X} = 5.01, SD = 1.43$; contracted scale: $\bar{X} = 4.71, SD = 1.38$), and higher purchase intention (expanded scale: $\bar{X} = 4, SD = 1.63$; contracted scale: $\bar{X} = 3.87, SD = 1.67$).
The same statistical procedure was replicated for the chocolate packaging design. The ANOVA results showed that the assumptions of normality and equal variances were met. However, the main effect of anchor scale was not found to be significant for each of the dependent variables.

**Hypothesis 3** predicted that the presence of an anchor brand (without vs. with) and the type of an anchor scale (expanded vs. contracted) would have interactive advertising effects. First, descriptive statistics were performed to ensure the normality of the data. Because both the skewness and kurtosis were between -1 and 1 for each cell of the design, the data were considered normal. Next, a 2-way ANOVA was performed to test for interaction effects between the two independent variables. Levene's test of homogeneity indicated that the variances were homogeneous ($p > .05$). For the granola bar packaging design, the interaction effects were not found on participants’ nutritiousness perception ($F (1, 296) = .08, p = .777, \eta^2 = .000$), attitudes toward the ad ($F (1, 297) = .8, p = .372, \eta^2 = .003$), attitudes toward the brand ($F (1, 298) = .4, p = .528, \eta^2 = .001$), and/or purchase intention ($F (1, 300) = .001, p = .979, \eta^2 = .000$). Similarly, for the chocolate packaging design, the interaction effect was not found on participants’ nutritiousness perception ($F (1, 297) = .27, p = .607, \eta^2 = .001$), attitudes toward the ad ($F (1, 298) = .37, p = .547, \eta^2 = .001$), and purchase intention ($F (1, 300) = .001, p = .979, \eta^2 = .000$).
(297) = 2.34, \( p = .127, \eta^2 = .008 \), attitudes toward the brand \((F(1, 294) = 2.56, p = .111, \eta^2 = .009)\), and/or purchase intention \((F(1, 300) = .506, p = .477, \eta^2 = .002)\). Thus, Hypothesis 3 was not supported.

**RQ1-3** explored how personal involvement, health consciousness, and product usage might moderate the anchoring effects found in health claims, if any. Given that the main effects and interactions of the anchoring conditions were not found for the chocolate ad in hypotheses testing, only the granola bar ad was included in the analyses of moderating effects. In order to answer research questions 1-3, a series of general liner model (GLM) were used. Before performing the statistical tests, descriptive statistics were performed to ensure the normality of the data. Consistent with the results for hypotheses testing, all the dependent variables were normally distributed. Additionally, the skewness was between -1 and 1 and the kurtosis was between -1 and 2 for all the covariates, the data were considered normally distributed (see Table 10).

<table>
<thead>
<tr>
<th>Covariate</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>PII with Granola Bar</td>
<td>298</td>
<td>3.62</td>
<td>1.07</td>
<td>-.294</td>
<td>.793</td>
</tr>
<tr>
<td>PII with Fat Attribute</td>
<td>299</td>
<td>4.24</td>
<td>1.12</td>
<td>-.537</td>
<td>1.217</td>
</tr>
<tr>
<td>Health Consciousness</td>
<td>303</td>
<td>4.65</td>
<td>1.11</td>
<td>-.142</td>
<td>-.426</td>
</tr>
<tr>
<td>Product Usage</td>
<td>304</td>
<td>4.08</td>
<td>1.86</td>
<td>-.077</td>
<td>-1.122</td>
</tr>
</tbody>
</table>

**Research question 1** explored how personal involvement might moderate the anchoring effects found in health claims, if any, on consumers’ nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and purchase intention. Given that *personal involvement* was measured in terms of two aspects, *personal involvement with granola bar* and *personal...*
involvement with fat attribute, two sets of the GLM tests were performed with each of the two aspects serving as the covariate in the analysis.

Before performing GLM, a series of one-way ANOVA was performed to examine whether the covariate differed across the independent variable groups. Results indicated that there was no significant difference in personal involvement with granola bar between the with- and without-an-anchor-brand group \((F (1, 296) = .003, p = .959)\), or between the expanded- and the contracted-scale group \((F (1, 296) = .000, p = .991)\). Similarly, there was no significant difference in personal involvement with fat attribute between the with- and without-an-anchor-brand group \((F (1, 297) = .051, p = .822)\), or between the expanded- and the contracted-scale group \((F (1, 291) = 3.261, p = .072)\). In addition, the scatterplots of the covariates confirmed the assumption of a linear relationship between the covariates and the dependent variables. Next, GLM tests revealed that the p-value for the Levene’s test was not significant \((p > .05)\) for the four dependent variables, respectively, confirming the assumption of equal variances.

The GLM results indicated that the interaction between personal involvement with granola bar and anchor brand was not significant for each of the four dependent variables. Thus, personal involvement with granola bar was not significantly found to moderate the effects of brand anchoring on NR, Aad, Abr, or PI. Normally, when there is no significant interaction, there is no need to give further analysis. But for the sake of thorough exploration and in the hope of reviewing potential trend in the data, the following analyses are still presented for references only.

After applying the covariate (see Table 11), the significant main effect of anchor brand became slightly stronger for participants’ nutritiousness perception \((F (1, 292) = 5.61, p < .05, \eta^2 = .019)\) and attitudes toward the ad \((F (1, 292) = 8.84, p < .01, \eta^2 = .029)\). The main effect went
from nonsignificant to significant for attitudes toward the brand \((F(1, 292) = 4.46, p < .05, \eta^2 = .015)\), but remained nonsignificant for purchase intention after applying the covariate.

Table 11. GLM Results I for Personal Involvement with Granola Bar

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Without an anchor brand M (SD)</th>
<th>With an anchor brand M (SD)</th>
<th>(F)</th>
<th>(d.f.)</th>
<th>(\eta^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR-Unadjusted</td>
<td>5.09 (1.06)</td>
<td>5.37 (1.07)</td>
<td>4.96*</td>
<td>1, 298</td>
<td>.016</td>
</tr>
<tr>
<td>NR-Adjusted</td>
<td>5.08 (.85)</td>
<td>5.373 (.85)</td>
<td>5.61*</td>
<td>1, 292</td>
<td>.019</td>
</tr>
<tr>
<td>Aad-Unadjusted</td>
<td>4.41 (1.24)</td>
<td>4.8 (1.3)</td>
<td>6.8*</td>
<td>1, 299</td>
<td>.022</td>
</tr>
<tr>
<td>Aad-Adjusted</td>
<td>4.2 (.95)</td>
<td>4.9 (.95)</td>
<td>8.84**</td>
<td>1, 292</td>
<td>.029</td>
</tr>
<tr>
<td>Abr-Unadjusted</td>
<td>4.71 (1.38)</td>
<td>5 (1.43)</td>
<td>3.65</td>
<td>1, 300</td>
<td>.012</td>
</tr>
<tr>
<td>Abr-Adjusted</td>
<td>4.5 (.11)</td>
<td>5.01 (.11)</td>
<td>4.46*</td>
<td>1, 292</td>
<td>.015</td>
</tr>
</tbody>
</table>

Note. Significance indicated by *\(p \leq .05\), **\(p \leq .01\), ***\(p \leq .001\). NR = nutritiousness perception, Aad = attitude toward advertising, and Abr = attitude toward brand.

Similarly, the interaction between personal involvement with granola bar and anchor scale was not significant for each of the four dependent variables. Thus, personal involvement with granola bar was not significantly found to moderate the effects of anchor scale on NR, Aad, Abr, or PI. Therefore, the following nonsignificant results are presented for references only. After applying the covariate (see Table 12), the effect size of anchor scale remained the same for participants’ nutritiousness perception \((F(1, 292) = 7.89, p < .01, \eta^2 = .026)\) and became slightly stronger for attitudes toward the ad \((F(1, 293) = 5.62, p < .05, \eta^2 = .019)\). Furthermore, the main effect went from nonsignificant to significant for attitudes toward the brand \((F(1, 294) = 4.88, p < .05, \eta^2 = .016)\), but remained nonsignificant for purchase intention after applying the covariate.
Table 12. GLM Results II for Personal Involvement with Granola Bar

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Contracted Scale M (SD)</th>
<th>Expanded Scale M (SD)</th>
<th>F</th>
<th>d.f.</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR-Unadjusted</td>
<td>5.06 (1.04)</td>
<td>5.41 (1.08)</td>
<td>7.86**</td>
<td>1, 298</td>
<td>.026</td>
</tr>
<tr>
<td>NR-Adjusted</td>
<td>5.07 (.09)</td>
<td>5.4 (.09)</td>
<td>7.89**</td>
<td>1, 292</td>
<td>.026</td>
</tr>
<tr>
<td>Aad-Unadjusted</td>
<td>4.45 (1.35)</td>
<td>4.76 (1.21)</td>
<td>4.47*</td>
<td>1, 299</td>
<td>.015</td>
</tr>
<tr>
<td>Aad-Adjusted</td>
<td>4.45 (.1)</td>
<td>4.76 (.1)</td>
<td>5.62*</td>
<td>1, 293</td>
<td>.019</td>
</tr>
<tr>
<td>Abr-Unadjusted</td>
<td>4.71 (1.38)</td>
<td>5 (.143)</td>
<td>3.41</td>
<td>1, 300</td>
<td>.011</td>
</tr>
<tr>
<td>Abr-Adjusted</td>
<td>4.69 (.11)</td>
<td>5.03 (.11)</td>
<td>4.88*</td>
<td>1, 294</td>
<td>.016</td>
</tr>
</tbody>
</table>

*Note.* Significance indicated by ∗p ≤ .05, ∗∗p ≤ .01, ∗∗∗p ≤ .001. NR = nutritiousness perception, Aad = attitude toward advertising, and Abr = attitude toward brand.

On the other hand, the interaction between *personal involvement with fat attribute* and *anchor brand* was also found nonsignificant for each of the four dependent variables. Thus, *personal involvement with fat attribute* was not significantly found to moderate the effects of brand anchoring on NR, Aad, Abr, or PI. Similarly, in order to thoroughly explore the data, the following nonsignificant results are presented. After applying the covariate (see Table 13), the effect size of anchor brand remained almost the same for participants’ nutritiousness perception ($F (1, 293) = 4.92, p < .05, η² = .017$) and attitudes toward the ad ($F (1, 294) = 7.52, p < .01, η² = .025$). The main effect remained nonsignificant for attitudes toward the brand and purchase intention.
Table 13. GLM Results I for Personal Involvement with Fat Attribute

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Without an anchor brand M (SD)</th>
<th>With an anchor brand M (SD)</th>
<th>F</th>
<th>d.f.</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR-Unadjusted</td>
<td>5.09 (1.06)</td>
<td>5.37 (1.07)</td>
<td>4.96*</td>
<td>1, 298</td>
<td>.016</td>
</tr>
<tr>
<td>NR-Adjusted</td>
<td>5.08 (.09)</td>
<td>5.37 (.09)</td>
<td>4.92*</td>
<td>1, 293</td>
<td>.017</td>
</tr>
<tr>
<td>Aad-Unadjusted</td>
<td>4.41 (1.24)</td>
<td>4.8 (1.3)</td>
<td>6.8*</td>
<td>1, 299</td>
<td>.022</td>
</tr>
<tr>
<td>Aad-Adjusted</td>
<td>4.4 (.1)</td>
<td>4.81 (.1)</td>
<td>7.52**</td>
<td>1, 294</td>
<td>.025</td>
</tr>
</tbody>
</table>

Note. Significance indicated by *p ≤ .05, **p ≤ .01, ***p ≤ .001. NR = nutritiousness perception, and Aad = attitude toward advertising.

Similarly, the interaction between personal involvement with fat attribute and anchor scale was not significant for each of the four dependent variables. Thus, personal involvement with fat attribute was not significantly found to moderate the effects of anchor scale on NR, Aad, Abr, or PI. Therefore, the following nonsignificant results are presented for references only. After applying the covariate (see Table 14), the effect size of anchor scale remained the same for participants’ nutritiousness perception ($F (1, 293) = 7.75, p < .01, η² = .026$) and became stronger for attitudes toward the ad ($F (1, 294) = 6.59, p < .05, η² = .022$). The main effect went from nonsignificant to significant for attitudes toward the brand ($F (1, 295) = 4.32, p < .05, η² = .014$), but remained nonsignificant for purchase intention.
### Table 14. GLM Results II for Personal Involvement with Fat Attribute

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Contracted Scale</th>
<th>Expanded Scale</th>
<th>$F$</th>
<th>d.f.</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR-Unadjusted</td>
<td>5.06 (1.04)</td>
<td>5.41 (1.08)</td>
<td>7.86**</td>
<td>1, 298</td>
<td>.026</td>
</tr>
<tr>
<td>NR-Adjusted</td>
<td>5.06 (.09)</td>
<td>5.41 (.09)</td>
<td>7.75**</td>
<td>1, 293</td>
<td>.026</td>
</tr>
<tr>
<td>Aad-Unadjusted</td>
<td>4.45 (1.35)</td>
<td>4.76 (1.21)</td>
<td>4.47*</td>
<td>1, 299</td>
<td>.015</td>
</tr>
<tr>
<td>Aad-Adjusted</td>
<td>4.42 (.1)</td>
<td>4.8 (.11)</td>
<td>6.59**</td>
<td>1, 294</td>
<td>.022</td>
</tr>
<tr>
<td>Abr-Unadjusted</td>
<td>4.71 (1.38)</td>
<td>5 (1.43)</td>
<td>3.41</td>
<td>1, 300</td>
<td>.011</td>
</tr>
<tr>
<td>Abr-Adjusted</td>
<td>4.69 (.12)</td>
<td>5.03 (.12)</td>
<td>4.32*</td>
<td>1, 295</td>
<td>.014</td>
</tr>
</tbody>
</table>

*Note.* Significance indicated by *p ≤ .05, **p ≤ .01, ***p ≤ .001. NR = nutritiousness perception, Aad = attitude toward advertising, and Abr = attitude toward brand.

**Research question 2** explored how *health consciousness* might moderate the anchoring effects found in health claims, if any, on consumers’ nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and purchase intention. Before performing GLM tests for the granola bar ad, a series of one-way ANOVA was performed to examine whether the covariate differed across the independent variable groups. Results indicated that there was no significant difference in *health consciousness* between the with- and without-an-anchor-brand group ($F (1, 
301) = .81, p = .369$), or between the expanded- and the contracted-scale group ($F (1, 301) = .417, p = .519$). In addition, the scatterplots of the covariate confirmed the assumption of a linear relationship between the covariate and the dependent variables. Next, GLM tests revealed that the p-value for the Levene’s test was not significant ($p > .05$) for the four dependent variables, respectively, confirming the assumption of equal variances.

The results further indicated that the interaction between *health consciousness* and *anchor brand* was not significant for each of the four dependent variables. Thus, *health consciousness* was not significantly found to moderate the effects of *brand anchoring* on NR, Aad, Abr, or PI.
Similar to RQ1, the following nonsignificant analyses are presented for references only. After applying the covariate (see Table 15), the main effect of anchor brand remained almost the same for participants’ nutritiousness perception ($F(1, 296) = 4.82, p < .05, \eta^2 = .016$) and attitudes toward the ad ($F(1, 297) = 6.2, p < .05, \eta^2 = .02$). The main effect remained nonsignificant for attitudes toward the brand and purchase intention after applying the covariate.

### Table 15. GLM Results I for Health Consciousness

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Without an anchor brand M (SD)</th>
<th>With an anchor brand M (SD)</th>
<th>$F$</th>
<th>d.f.</th>
<th>$\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR-Unadjusted</td>
<td>5.09 (1.06)</td>
<td>5.37 (1.07)</td>
<td>4.96*</td>
<td>1, 298</td>
<td>.016</td>
</tr>
<tr>
<td>NR-Adjusted</td>
<td>5.09 (.85)</td>
<td>5.36 (.85)</td>
<td>4.82*</td>
<td>1, 296</td>
<td>.016</td>
</tr>
<tr>
<td>Aad-Unadjusted</td>
<td>4.41 (1.24)</td>
<td>4.8 (1.3)</td>
<td>6.8*</td>
<td>1, 299</td>
<td>.022</td>
</tr>
<tr>
<td>Aad-Adjusted</td>
<td>4.42 (.1)</td>
<td>4.79 (.1)</td>
<td>6.2*</td>
<td>1, 297</td>
<td>.02</td>
</tr>
</tbody>
</table>

*Note. Significance indicated by *p ≤ .05, **p ≤ .01, ***p ≤ .001. NR = nutritiousness perception, and Aad = attitude toward advertising.*

Similarly, the interaction between *health consciousness* and *anchor scale* was not significant for each of the four dependent variables. Thus, *health consciousness* was not significantly found to moderate the effects of *anchor scale* on NR, Aad, Abr, or PI. Similar to RQ1, the following nonsignificant analyses are presented for references only. After applying the covariate (see Table 16), the effect size of anchor scale remained almost the same for participants’ nutritiousness perception ($F(1, 296) = 8.41, p < .01, \eta^2 = .028$) and attitudes toward the ad ($F(1, 297) = 4.92, p < .05, \eta^2 = .016$). However, the main effect went from nonsignificant to significant for attitudes toward the brand ($F(1, 298) = 4.07, p < .05, \eta^2 = .013$), but remained nonsignificant for purchase intention.
Table 16. GLM Results II for Health Consciousness

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Contracted Scale M (SD)</th>
<th>Expanded Scale M (SD)</th>
<th>F</th>
<th>d.f.</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR-Unadjusted</td>
<td>5.06 (1.04)</td>
<td>5.41 (1.08)</td>
<td>7.86**</td>
<td>1, 298</td>
<td>.026</td>
</tr>
<tr>
<td>NR-Adjusted</td>
<td>5.05 (.09)</td>
<td>5.41 (.09)</td>
<td>8.41**</td>
<td>1, 296</td>
<td>.028</td>
</tr>
<tr>
<td>Aad-Unadjusted</td>
<td>4.45 (1.35)</td>
<td>4.76 (1.21)</td>
<td>4.47*</td>
<td>1, 299</td>
<td>.015</td>
</tr>
<tr>
<td>Aad-Adjusted</td>
<td>4.44 (.1)</td>
<td>4.77 (.1)</td>
<td>4.92*</td>
<td>1, 297</td>
<td>.016</td>
</tr>
<tr>
<td>Abr-Unadjusted</td>
<td>4.71 (1.38)</td>
<td>5 (1.43)</td>
<td>3.41</td>
<td>1, 300</td>
<td>.011</td>
</tr>
<tr>
<td>Abr-Adjusted</td>
<td>4.69 (.11)</td>
<td>5.01 (.11)</td>
<td>4.07*</td>
<td>1, 298</td>
<td>.013</td>
</tr>
</tbody>
</table>

Note: Significance indicated by ∗p ≤ .05, ∗∗p ≤ .01, ∗∗∗p ≤ .001. NR = nutritiousness perception, Aad = attitude toward advertising, and Abr = attitude toward brand.

**Research question 3** explored how product usage might moderate the anchoring effects found in health claims, if any, on consumers’ nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and purchase intention. Before performing GLM tests, a series of one-way ANOVA was performed to examine whether the covariate differed across the independent variable groups. Results indicated that there was no significant difference in product usage between the with- and without-an-anchor-brand group (F (1, 302) = .214, p = .644), or between the expanded- and the contracted-scale group (F (1, 302) = .679, p = .411). In addition, the scatterplots of the covariate confirmed the assumption of a linear relationship between the covariate and the dependent variables. Next, GLM tests revealed that the p-value for the Levene’s test was not significant (p > .05) for the four dependent variables, respectively, confirming the assumption of equal variances.

The results further indicated that the interaction between product usage and anchor brand was not significant for the four dependent variables. Thus, product usage was not significantly found to moderate the effects of brand anchoring on NR, Aad, Abr, or PI. Similar to RQ1 and
RQ2, for the purpose of thorough exploration and in the hope of reviewing potential trend in the data, the following analyses are still presented. In addition, after applying the covariate (see Table 17), the main effect of anchor brand remained almost the same for participants' nutritiousness perception \( (F (1, 297) = 5.34, p < .05, \eta^2 = .018) \) and attitudes toward the ad \( (F (1, 298) = 7.87, p < .05, \eta^2 = .026) \). However, the main effect went from nonsignificant to significant for attitudes toward the brand \( (F (1, 299) = 4.3, p < .05, \eta^2 = .014) \), but remained nonsignificant for purchase intention after applying the covariate.

Table 17. GLM Results I for Product Usage

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Without an anchor brand M (SD)</th>
<th>With an anchor brand M (SD)</th>
<th>( F )</th>
<th>d.f.</th>
<th>( \eta^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR-Unadjusted</td>
<td>5.09 (1.06)</td>
<td>5.37 (1.07)</td>
<td>4.96*</td>
<td>1, 298</td>
<td>.016</td>
</tr>
<tr>
<td>NR-Adjusted</td>
<td>5.09 (.09)</td>
<td>5.37 (.09)</td>
<td>5.34*</td>
<td>1, 297</td>
<td>.018</td>
</tr>
<tr>
<td>Aad-Unadjusted</td>
<td>4.41 (1.24)</td>
<td>4.8 (1.3)</td>
<td>6.8*</td>
<td>1, 299</td>
<td>.022</td>
</tr>
<tr>
<td>Aad-Adjusted</td>
<td>4.41 (.1)</td>
<td>4.8 (.1)</td>
<td>7.87**</td>
<td>1, 298</td>
<td>.026</td>
</tr>
<tr>
<td>Abr-Unadjusted</td>
<td>4.71 (1.38)</td>
<td>5 (1.43)</td>
<td>3.65</td>
<td>1, 300</td>
<td>.012</td>
</tr>
<tr>
<td>Abr-Adjusted</td>
<td>4.69 (.11)</td>
<td>5.02 (.11)</td>
<td>4.3*</td>
<td>1, 299</td>
<td>.014</td>
</tr>
</tbody>
</table>

Note. Significance indicated by \*\( p \leq .05 \), \*\*\( p \leq .01 \), \*\*\*\( p \leq .001 \). NR = nutritiousness perception, Aad = attitude toward advertising, and Abr = attitude toward brand.

Similarly, the interaction between product usage and anchor scale was not significant for the four dependent variables. Thus, product usage was not significantly found to moderate the effects of anchor scale on NR, Aad, Abr, or PI. As is explained above, the following nonsignificant results are still presented for references only. After applying the covariate (see Table 18), the effect size of anchor scale remained almost the same for participants’ nutritiousness perception \( (F (1, 297) = 8.68, p < .01, \eta^2 = .028) \), and became slightly stronger for
attitudes toward the ad \( (F(1, 298) = 5.75, p < .05, \eta^2 = .019) \). Furthermore, the main effect went from nonsignificant to significant for attitudes toward the brand \( (F(1, 299) = 4.42, p < .05, \eta^2 = .015) \), but remained nonsignificant for purchase intention.

Table 18. GLM Results II for Product Usage

<table>
<thead>
<tr>
<th>Dependent variables</th>
<th>Contracted Scale M (SD)</th>
<th>Expanded Scale M (SD)</th>
<th>( F )</th>
<th>d.f.</th>
<th>( \eta^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR-Unadjusted</td>
<td>5.06 (1.04)</td>
<td>5.41 (1.08)</td>
<td>7.86**</td>
<td>1, 298</td>
<td>.026</td>
</tr>
<tr>
<td>NR-Adjusted</td>
<td>5.06 (.09)</td>
<td>5.41 (.09)</td>
<td>8.68**</td>
<td>1, 297</td>
<td>.028</td>
</tr>
<tr>
<td>Aad-Unadjusted</td>
<td>4.45 (1.35)</td>
<td>4.76 (1.21)</td>
<td>4.47*</td>
<td>1, 299</td>
<td>.015</td>
</tr>
<tr>
<td>Aad-Adjusted</td>
<td>4.44 (.1)</td>
<td>4.78 (.1)</td>
<td>5.75*</td>
<td>1, 298</td>
<td>.019</td>
</tr>
<tr>
<td>Abr-Unadjusted</td>
<td>4.71 (1.38)</td>
<td>5 (1.43)</td>
<td>3.41</td>
<td>1, 300</td>
<td>.011</td>
</tr>
<tr>
<td>Abr-Adjusted</td>
<td>4.69 (.11)</td>
<td>5.02 (.11)</td>
<td>4.42*</td>
<td>1, 299</td>
<td>.015</td>
</tr>
</tbody>
</table>

Note. Significance indicated by \(*p \leq .05, \text{**}p \leq .01, \text{***}p \leq .001\). NR = nutritiousness perception, Aad = attitude toward advertising, and Abr = attitude toward brand.

Finally, table 19 summarizes the research findings of this study.
<table>
<thead>
<tr>
<th></th>
<th>Hypotheses and Research Questions</th>
<th>Statistical Approach</th>
<th>Findings</th>
</tr>
</thead>
</table>
| H1 | Exposure to a nutrition claim with an anchor (“the leading brand”) will lead to more favorable advertising effects than a nutrition claim without an anchor brand. | One-way ANOVA       | H1a: Supported*  
H1b: Supported*  
H1c: Not supported  
p = .057  
H1d: Not supported  
p = .138 |
|   | IV: anchor brand (without vs. with)  
DVs: nutritiousness perception (H1a)  
attitudes toward the ad (H1b)  
attitudes toward the brand (H1c)  
purchase intention (H1d) | | |
| H2 | Exposure to a nutrition claim with an expanded anchor scale will lead to more favorable advertising effects than with a contracted anchor scale. | One-way ANOVA       | H2a: Supported**  
H2b: Supported*  
H2c: Not supported  
p = .066  
H2d: Not supported  
p = .508 |
|   | IV: anchor scale (expanded vs. contracted)  
DVs: nutritiousness perception (H2a)  
attitudes toward the ad (H2b)  
attitudes toward the brand (H2c)  
purchase intention (H2d) | | |
| H3 | The presence of an anchor brand (without vs. with) and the type of an anchor scale (expanded vs. contracted) will interact such that an expanded scale with the leading brand as the anchor will elicit the most favorable advertising outcomes. | Two-way ANOVA | Not supported. |
| RQ1 | How does personal involvement moderate the anchoring effect found in health claims, if any, on consumers’ nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and purchase intention? | GLM | Moderating Role:  
Not significant |
| RQ1-1 | IV: anchor brand (without vs. with)  
Covariate: personal involvement with the product  
DVs: nutritiousness perception (RQ1-1a)  
attitudes toward the ad (RQ1-1b)  
attitudes toward the brand (RQ1-1c)  
purchase intention (RQ1-1d) | | |
| RQ1-2 | | After adjustment:  
RQ1-1a: Stronger*  
RQ1-1b: Stronger**  
RQ1-1c: Become significant*  
RQ1-1d: Not significant |
| RQ1-3 | IV: anchor scale (expanded vs. contracted)  
|       | Covariate: personal involvement with the product  
|       | DVs: nutritiousness perception (RQ1-2a)  
|       | attitudes toward the ad (RQ1-2b)  
|       | attitudes toward the brand (RQ1-2c)  
|       | purchase intention (RQ1-2d)  
|       | After adjustment:  
|       | RQ1-2a: the same**  
|       | RQ1-2b: Stronger*  
|       | RQ1-2c: Become significant*  
|       | RQ1-2d: Not significant  |
| RQ1-4 | IV: anchor brand (without vs. with)  
|       | Covariate: personal involvement with fat attribute  
|       | DVs: nutritiousness perception (RQ1-3a)  
|       | attitudes toward the ad (RQ1-3b)  
|       | attitudes toward the brand (RQ1-3c)  
|       | purchase intention (RQ1-3d)  
|       | After adjustment:  
|       | RQ1-3a: Stronger*  
|       | RQ1-3b: Stronger**  
|       | RQ1-3c: Not significant  
|       | RQ1-3d: Not significant  |
| RQ2   | How does health consciousness moderate the anchoring effect found in health claims, if any, on consumers’ nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and purchase intention?  
|       | GLM  
|       | Moderating Role: Not significant  
| RQ2-1 | IV: anchor brand (without vs. with)  
|       | Covariate: health consciousness  
|       | DVs: nutritiousness perception (RQ2-1a)  
|       | attitudes toward the ad (RQ2-1b)  
|       | attitudes toward the brand (RQ2-1c)  
|       | purchase intention (RQ2-1d)  
|       | After adjustment:  
|       | RQ2-1a: the same*  
|       | RQ2-1b: the same*  
|       | RQ2-1c: Not significant  
|       | RQ2-1d: Not significant  |
| RQ2-2 | IV: anchor scale (expanded vs. contracted)  
|       | Covariate: health consciousness  
|       | DVs: nutritiousness perception (RQ2-2a)  
|       | attitudes toward the ad (RQ2-2b)  
|       | attitudes toward the brand (RQ2-2c)  
|       | purchase intention (RQ2-2d)  
|       | After adjustment:  
|       | RQ2-2a: Stronger**  
|       | RQ2-2b: Stronger*  
|       | RQ2-2c: Become significant  
<p>|       | RQ2-2d: Not significant  |</p>
<table>
<thead>
<tr>
<th>RQ3</th>
<th>How does product usage moderate the anchoring effect found in health claims, if any, on consumers’ nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and purchase intention?</th>
<th>GLM</th>
<th>Moderating Role: Not significant</th>
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<tr>
<td>RQ3-1</td>
<td>IV: anchor brand (without vs. with) Covariate: product usage DVs: nutritiousness perception (RQ3-1a) attitudes toward the ad (RQ3-1b) attitudes toward the brand (RQ3-1c) purchase intention (RQ3-1d)</td>
<td>After adjustment: RQ3-1a: Stronger* RQ3-1b: Stronger** RQ3-1c: Become significant* RQ3-1d: Not significant</td>
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<tr>
<td>RQ3-2</td>
<td>IV: anchor scale (expanded vs. contracted) Covariate: product usage DVs: nutritiousness perception (RQ3-2a) attitudes toward the ad (RQ3-2b) attitudes toward the brand (RQ3-2c) purchase intention (RQ3-2d)</td>
<td>After adjustment: RQ3-2a: Stronger** RQ3-2b: Stronger* RQ3-2c: Become significant* RQ3-2d: Not significant</td>
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*Note. Significance indicated by *p ≤ .05, **p ≤ .01, ***p ≤ .001.*
CHAPTER V
DISCUSSION

Since the first use of health claims on Kellogg’s cereal packages in 1984, there has been an ongoing debate about the effectiveness of health claims in helping consumers make informed choices and stimulating the production of healthier food products. It is a challenge to enable informed consumer decisions while simultaneously protecting them from deceptive advertising. It is also a challenge to encourage competition on healthier food supplies while simultaneously preventing the use of potentially misleading nutrition claims among manufactures and advertisers. These challenges make works in comparative nutrition claims and anchoring effects literature both interesting and valuable.

This dissertation used the theory of anchoring and adjustment as the basis to examine the advertising effects of comparative nutrition claims. The theory of anchoring and adjustment has long been applied to study consumer choices when facing incomplete and misleading advertising information, especially when the choices involve numeric features, such as prices, rental plans, and warranty levels (Pandelaere et al., 2011). However, its theoretical potential has received far less attention in studying comparative nutrition claims.

This dissertation explored anchoring effects in comparative nutrition claims in three distinct ways. First of all, this study experimentally compared people’s nutritiousness perception of food products, attitudes toward the ad, attitudes toward the brand, and purchase intention in different brand anchoring conditions. Specifically, the study examined whether a nutrition claim stating the product had less fat “than the leading brand” would result in a halo effect. The second
objective of this dissertation was to fill the gap in examining consumers’ perceptions of nutritional quality of food products anchored at different nutritional scales (e.g., “40% less fat” vs. “2/5 less fat”). Finally, this dissertation extended the investigation into the moderating roles of personal involvement, health consciousness, and product usage in anchoring effects.

This chapter expands on the main findings of the study and discusses the overall contributions of this dissertation. First, the results drawn from statistical analyses in Chapter IV are presented based on the order of the three hypotheses and three research questions the researcher has proposed. Next, the theoretical implications and practical applications of the research findings are discussed in detail. Finally, the limitations of this study are outlined along with the suggestions for future research regarding the role of anchoring in comparative nutrition claims.

**Summary of Results**

The results of this dissertation increased the understanding of anchoring effects in individuals’ perceptions of comparative nutrition claims. Participants of this study were recruited from a business school of a Western university. The sample sizes of male and female participants were nearly equal. The mean age of participants was 21.67 years, representing the driving consumption group of the examined food products, chocolate and granola bar. A majority of the participants in the study were Asian, White, Native Hawaiian, and other Pacific Islander, which reflects the demographic makeup of the university from which the sample was drawn. Participants reported that they were highly involved with chocolate and consumed chocolate frequently. In addition, their involvement with granola bar registered a medium level and was significantly lower than their involvement with chocolate, confirming the use of the two food products as proper carriers of the nutrition claims investigated in this study. Finally, the equal
distribution of the sample into the four cells of the design, control of research stimuli, and reliability and validity of the measure scales added legitimacy to the research findings.

The experiment of this study was designed to examine whether exposure to a nutrition claim with an anchor (“the leading brand”) would lead to more favorable advertising effects than a nutrition claim without such an anchor. Given that there was a significant difference in participants’ involvement with the two food products, the statistical analyses were performed for the granola bar ad and the chocolate ad, respectively. For the granola bar ad, participants who were exposed to the nutrition claim anchored at “the leading brand” reported a significantly higher nutritional value of the product. They also showed significantly more favorable attitudes toward the ad. Although significant difference was not found in participants’ attitudes toward the brand and purchase intention, exposure to a nutrition claim with “the leading brand” as the anchor led to more favorable brand attitudes and higher purchase intention. This finding adds to our understanding of indirect comparative claims (e.g., “the leading brand”), which may vary in their propensity to engage people in advertising processing. On the other hand, for the chocolate ad, the main effect of brand anchoring was not found on participant’s nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and/or purchase intention. This finding suggests that participants’ involvement with the product and the product categories may play a role in consumers’ perceptions of nutrition claims.

In addition to understanding brand anchoring in nutrition claims, the experiment also examined the effect of numerical scales used to describe the nutrient levels on consumers’ advertising attitudes and purchase intentions. For the granola bar ad, the results revealed an inflated perception of nutritional quality of the product and more positive attitudes toward the ad among participants who were exposed to an expanded scale (“40% less fat”) than to a contracted
scale (“2/5 less fat”). Although significant difference was not found in participants’ attitudes toward the brand and purchase intention, applying an expanded scale in describing the nutrition content resulted in more favorable effects. This finding offers insight into the effectiveness of using percentage versus fraction to describe the nutrition content of food products to attract consumers, and the importance of developing remedies to protect consumers from confusing claims. On the other hand, for the chocolate ad, the main effect of anchor scale was not found on participant’s nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and/or purchase intention. Consistent with the research results regarding brand anchoring, consumers may treat nutrition claims differently when they are associated with different food categories.

This study also sought to explore whether the presence of an anchor (“the leading brand”) and the type of a scale (expanded vs. contracted) would have interaction effects. For both the granola bar ad and the chocolate ad, the interaction effects were not found on participants’ nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and/or purchase intention. This finding suggested that the effect of the presence of “the leading brand” in a nutrition claim was not dependent on the type of the anchor scale used to describe the fat content of the two products, or vice versa.

Finally, the moderating roles of personal involvement, health consciousness, and product usage were analyzed respectively in each of the significant anchoring procedures. Given that the main effects and the interaction effects were not found for the chocolate ad in hypotheses testing, only the granola bar ad was included in the analyses of moderating effects. The first research question measuring the moderating mechanism of personal involvement did not identify a significant interaction between personal involvement with granola bar and the presence of an anchor brand, or between personal involvement with fat attribute and the presence of an anchor
brand. The significant interaction was neither found between personal involvement with granola bar and anchor scale, nor between personal involvement with fat attribute and anchor scale. However, after factoring personal involvement into the anchoring process, participants’ nutritiousness perception either remained the same or became stronger, their attitudes toward the ad became stronger, and their attitudes toward the brand went from nonsignificant to significant.

Similarly, health consciousness was not significantly found to moderate the effects of brand anchoring/anchor scale on participants’ nutritiousness perception, attitudes toward the ad, attitudes toward the brand, and purchase intention. However, after factoring health consciousness into the anchoring process, the main effect of anchor scale became stronger on participants’ nutritiousness perception and attitudes toward the ad. Furthermore, the main effect of anchor scale went from nonsignificant to significant on attitudes toward the brand.

Finally, the moderating role of product usage was not supported because the interactions between product usage and brand anchoring, or between product usage and anchor scale, were not significant for the four dependent variables. However, after factoring product usage into the anchoring process, the main effects of anchor brand and anchor scale both became stronger on participants’ nutritiousness perception and attitudes toward the ad. Furthermore, the main effect of anchor scale went from nonsignificant to significant on attitudes toward the brand.

**Theoretical Implications and Practical Applications**

**Implications for the “case-by-case” approach**

Through the preceding discussion of key research findings, it is apparent that this dissertation provides new insight to the effects of on-pack nutrition claims on consumers’ information acquisition and product perception. To begin with, significant differences were found across anchoring conditions in consumers’ nutritiousness perception and attitudes toward
the packaging design for granola bar, but not for chocolate. The failure to identify anchoring effects for the chocolate ad may be due to participants’ high involvement with this product. In the pretest, chocolate had the highest involvement score ($\bar{X} = 5.46, SD = 1.53$) and the highest consumption score ($\bar{X} = 5.05, SD = 1.68$), which displayed a ceiling effect showing that consumers might have established attitudes toward chocolate or preconceived belief about its nutritional value.

Results of the pretest, as well as the main experiment, also revealed that participant were significantly more involved with chocolate than with granola bar, and that they significantly consumed more chocolate than granola bar. According to Gilbert (1991), consumers’ product involvement affects their receptiveness to a message addressing certain product features. Involvement indicates how much an individual is motivated to process a relevant message (Petty & Cacioppo, 1986). It is possible that higher involvement with chocolate motivated people to pay more attention to its nutrition claim, thus spend more cognitive efforts in processing the advertising information. It is also possible that people’s deep fondness for chocolate and their initial belief of nutritional value of chocolate were so strong that their preference of an anchoring condition could not be identified in this experiment.

Along the same vein, because participants’ involvement with granola bar was at the medium level, their initial product attitudes would not be much extreme, thus the anchoring effect of nutrition claims were less likely to be discounted. It is noteworthy to point out that participants’ involvement with granola bar was not significantly found to moderate anchoring effects, yet after taking this factor into consideration, the main effects of anchor brand and anchor scale both became stronger on participants’ nutritiousness perception and attitudes toward the ad. In
addition, the main effects went from nonsignificant to significant on participants’ attitudes toward the brand.

Another possible explanation is related to the different functions and types of food products. Wansink and Chandon (2006) suggested that consumers’ receptiveness to a health claim and their corresponding food consumption were affected by the perceived functions of the food product (e.g., hedonic food). Based on the same reason, the anchoring effect may vary across product functions and product types. Different research results found between the chocolate ad and the granola bar ad also suggest the importance of accounting for peoples’ initial beliefs about nutritional value of food products and preconceived attitudes toward certain product categories. On the other hand, although the order of the two package designs was rotated in the main experiment to exclude order effects from the analysis, it may still affect the robustness of an anchoring effect because the primary subject of interest in anchoring research is the importance of the first piece of information in individuals’ information processing. In other words, the order of the presented messages would lead to different weighting of them, thus influencing people’s final estimation.

While people may differ in how they perceive the importance of a piece of information regarding the function and/or type of a product, they may also differ in their preference of product attributes when evaluating the nutritional value of a product. It is possible that the level of fat plays a more important role in people’s evaluation of granola bar, whereas they draw on other food attributes, such as the level of cocoa, when making a similar evaluation of chocolate. As was suggested by Baltas (2001), nutritional attributes may vary in their relative importance in consumers’ preference and consumption patterns, and the relative importance may also vary across product categories.
An alternative explanation regarding the mixed findings between granola bar and chocolate lies in the fact that consumers’ reliance on the number of units on a scale is “a general tendency” (Pandelaere et al., 2011, p.319). In the present study, the operationalization of the anchor scale was generally arbitrary. For the chocolate ad, the expanded scale was operationalized by 25%, whereas a greater contrast, 40%, was used to represent the expanded scale for the granola bar ad. It is possible that the operationalization of the chocolate ad was not pronounced enough so that the anchoring effect did not ensue. Thus, more research is needed to assess whether there is a tipping point on the scale that triggers the anchoring effect.

Furthermore, the research finding supported the case-by-case approach adopted by the FTC in regulating health claims. Caswell (1992) maintained that nutrition claim legislation narrows comprehension discrepancy among consumers and stimulates competition on nutritional quality. However, since the implementation of the National Labelling and Education Act (NLEA) in 1990, there has been a shift in American consumers’ choice toward less healthy products, because the NLEA regulations disqualify many food products from making any nutrition claims on their packages (Williams, 2005). Due to the case-by-case approach and heterogeneous interpretation of nutrition claims, it would be desirable to design and replicate similar experiments as the one conducted in this dissertation on other food categories, thus providing policy makers and food advertisers with better guidance as to what specific nutrition claims may reduce confusions.

**Brand anchoring in comparative nutrition claims**

This dissertation provides a validation of brand anchoring in the context of comparative nutrition claims. It has shown that exposure to a nutrition claim with an anchor (“the leading brand”) led to more favorable nutritiousness perception and more favorable attitudes toward the
packaging design. Although anchoring is considered a general and robust psychological phenomenon in decision-making (Mussweiler et al., 2004), it has been rarely applied to study comparative advertising and/or nutrition claims. In the case of comparative nutrition claims, consumers’ established impressions of “the leading brand,” “other brands,” or “the old version” would be integrated into a new stimulus, of which they form product/brand attitudes and make purchase decisions.

In the present study, the selection of “the leading brand” served as the given anchor on which people could rely. It is argued that anchoring may occur either through assimilation processes or contrast processes (Auken & Adam, 2004). In theory, the use of “the leading brand” in nutrition claims served as the cue for a shift in consumers’ evaluations toward the anchor brand, thus enhancing the perceived nutritional quality of the food product through an assimilation process. This explanation also aligned with Ford et al.’s (1996) research finding that products with a cholesterol-heart disease claim resulted in more positive scores on the heart/fat rating scale than products without such a claim. Similarly, in the initial investigation of anchoring effects in the context of nutrition claims, Paek et al. (2011) found that “other sandwich brands” served to create a perception of nutritional value of the advertised sandwich product.

According to Tversky and Kahneman (1974), anchoring constitutes a basic explanatory mechanism to explain individuals’ attitudinal changes when facing incomplete and deceptive information. Shimp (1978, 1983) argued that comparative expressions in advertising are incomplete and deceptive in nature because they are susceptible to multiple interpretations. In this study, the operationalization of brand anchoring (“the leading brand”) reasonably matched the characteristics of advertisement of this genre. In addition, indirect comparatives in nutrition
claims can be even more implicit in that a numeric value (“40% less fat”) itself can suggest a comparative meaning without being associated with “the leading brand” or “other brands.”

Research has demonstrated that anchoring procedure works better with objective product attributes and less well-known brands because familiarity with the stimuli may create counter-arguments (Burton & Biswas, 1993). In this study, participants were invited to evaluate food products with fictitious brand names and nutrition claims featuring an objective product attribute (fat content). It is therefore expected that brand anchoring can be identified in this experiment because based on the theory of anchoring and adjustment, consumers’ prior experience with the leading branded product is likely to serve as a point of reference when they form an impression of the advertised product.

In the present study, anchoring effects found on consumers’ attitudes toward the overall healthiness of granola bar and toward its packaging design, however, did not extend to the measures of their attitudes toward the brand and purchase intention. One reason is that these measures may likely represent constructs or linkages that are more remote in an individual’s processing network of relationships for nutrition claims. It is possible that consumers’ perception of a product’s nutritional quality does not play a key role in determining consumers’ purchase decisions. There are other factors that need to be accounted for, such as price and/or taste of the product. For instance, Guthrie and his colleagues (1995) found that consumers who valued taste more than nutritional quality and product safety used health claims less often. Therefore, future studies should be cautious in using the measure of purchase intention to capture anchoring effects of nutrition claims.

Although anchoring effects were not found to be significant on consumers’ attitudes toward the brand and purchase intention, those in the with-an-anchor-brand condition showed more
favorable attitudes toward the brand and higher purchase intention when contrasted with those in the without-an-anchor-brand condition. Furthermore, consumers with higher product involvement and more product experience showed a statistically significant assimilation effect toward the leading brand, compared with those having relatively low product involvement and those having less product experience. In general, this result demonstrates the importance of using more appropriate measures and accounting for factors that are more relevant and diagnostic to capture anchoring effects.

**Unit effect in comparative nutrition claims**

This dissertation demonstrates that the choice of scale to describe nutrient values may have certain consequences for consumers’ perceptions and product preferences. As predicted, exposure to a nutrition claim with an expanded anchor scale (40% less fat on a 0-100 scale) led to more favorable nutritiousness perception and more favorable attitudes toward the ad than with a contracted anchor scale (2/5 less fat on a 1-5 scale). This result was consistent with previous research findings on the unit effect, suggesting that the more units a scale has, the more differences are perceived between two relative attributes that are presented at the scale (Burson et al., 2009). Pandelaere et al. (2011) explained that increasing the number of scale units to present a product attribute may increase consumers’ sensitivity to attribute differences between alternatives.

When consumers receive information about quality and/or price attributes for different options, they tend to pay more attention to the sheer number of the attribute difference (e.g., 40% vs. 2/5) and ignore the scale (e.g., Percentage vs. Fraction) on which the information is expressed, thus may be subject to anchoring and adjustment (Burson et al., 2009). Correspondingly, the same attribute difference may become more pronounced on a scale with more units than on a
scale with fewer units. Anchoring is thus thought to be a general psychological phenomenon in consumer research, underlying a wide variety of information processing approaches (Adaval & Wyer, 2011; Burson et al., 2009; Pandelaere et al., 2011; Smith & Wortzel, 1997; Van Auken & Adams, 2005). Every time consumers compare product attributes involving quantitative information, they may resort to numerosity heuristic if they do not adequately take into account the scale on which the information is specified (Adaval & Wyer, 2011).

Based on the theory of anchoring and adjustment, it is conceivable that expanding the scale makes it easier for consumers to differentiate between alternatives and increases the relative weight given to the attribute described on such a scale. Paek et al. (2011) further argued that people tend to make adjustments through contrast processes when evaluating quantitative information of a nutrition claim. In this situation, claiming the advertised granola bar having “40% less fat” may have increased the contrast or the ease with which participants can discriminate its fat content from other granola bar products, including the one with “2/5 less fat.” Furthermore, people may wrongfully believe that more options were available with intermediate attribute levels.

Similar to the research findings regarding brand anchoring, the hypothesized unit effect found on consumers’ attitudes toward the overall healthiness of granola bar and toward its packaging design was not found on their attitudes toward the brand and purchase intention. One possible explanation is that perceived nutrient value of a product does not play a key role in determining consumers’ brand attitudes and purchase decision. In the main experiment, although the main effect of anchor scale was originally not significant for attitudes toward the brand ($p = .066$), it became significant after taking into account people’s product involvement, health consciousness, and/or product usage. That is to say, there are other factors that need to be
considered and remain to be examined, such as preconceived brand preference, consumers’
ability to process quantitative information, and/or the factors that were examined in the present
study.

Another possible explanation is that people’s attitudes toward the brand and purchase
intention might not be the most appropriate way to measure the unit effect for comparative
nutrition claims. Earlier work on the unit effect has predominantly focused on prices and budgets,
and thus has primarily used perceived price differences, WTP (willingness to pay), and purchase
intention as the measure scales (Adaval & Wyer, 2011; Burson et al., 2009; Pandelaere et al.,
2011). For instance, Gaston-Breton (2006) revealed that the launch of euro narrowed the
perceived price gap between luxury brands and cheaper private brands, thus leading to increased
transactions for luxury brands among French consumers. By contrast, Pandelaere et al. (2011)
suggested that the unit effect did not occur for the price dimension when consumers were
exposed to quality information expressed in different units. As such, the direct approach to
capture the unit effect of comparative nutrition claims should involve asking participants how
they have perceived the product attribute that is expressed on different scales, and/or how large
they have considered the differences.

It is notable that in the pretest, among the participants who were assigned to the third
treatment group (without an anchor brand & contracted scale), no one accurately recalled the
nutrition claim on the granola bar package (“2/5 less fat”), whereas 84.4% of them accurately
recalled the nutrition claim on the chocolate package (“1/4 less fat”). In contrast with the pretest
results, the main effect of anchor scale was not found for chocolate, but for granola bar. This
research finding provides useful insight to the future of anchoring and adjustment within the
growing discipline of marketing communication. Previously, Esch et al. (2009) stated that
“retrieval” and “organization” (p.385) are the two major factors that determine which piece of information serves as the anchor. More specifically, images that can be easily retrieved and well connected are more likely to become the anchor.

This dissertation challenges the role of “retrieval” in an anchoring process. On one hand, although most of the participants assigned to the third treatment group (without an anchor brand & contracted scale) can easily recall what they saw on the chocolate package, they did not engage in an anchoring process. As is discussed above, it might be due to a ceiling effect, created by participants’ high involvement with chocolate. In Pandelaere et al.’s study (2011), the difference in consumers’ WTP (willingness to pay) between the 10-unit and 1000-unit scales was not found when the focal home cinema system was nearly perfect, but was found when the quality of the system was considered poor.

On the other hand, although no participant can accurately recall what he/she saw on the granola bar package after being assigned to view the nutrition claim, “2/5 less fat,” a significant difference in perceived nutritiousness was found. It supported the argument made by O’Keefe (2003) that “Variation in the psychological state of interest is created by exposure to different message conditions, but the message variations are not themselves of interest; they are simply a methodological device for creating variance in the psychological state. In such a design there is no need for a message manipulation check” (p. 255). Sigall and Mills (1998) also suggested that if the independent variables in a psychological study are psychological states, manipulation checks might not be needed.

In marketing research, consumers regularly receive and compare quantitative information about products and brands. This dissertation extends this stream of research in several respects. First of all, it has shown that using an expanded scale to describe nutrition content may result in
inflated perceptions of product benefits. Specifically, a significantly higher nutritional value of granola bar was reported in the expanded scale condition (“40% less fat”) than in the contracted scale condition (“2/5 less fat”). Secondly, such a change in consumer perceptions can lead to more favorable attitudes toward the ad and/or packaging design. In addition, this dissertation may have carried out one of the first few experiments to show a unit effect in the context of comparative nutrition claims.

From a legal perspective, “implementation of required changes in packaging was costly, but was estimated to make eventual savings in the long run due to decreases in healthcare cost” (Baltas, 2001, p.715). In 1990, the EC Directive on Nutrition Labelling was passed to regulate the use of nutrition claims across the European Union member states (Morris, 1993). Under the directive, vitamins and minerals must be expressed in terms of a percentage of recommended daily allowance, as well as an absolute amount; nutrition facts must be expressed per 100g. In the case of comparative nutrition claims, this standard, however, is not legally binding. Similarly, in United States, the National Labelling and Education Act (NLEA) did not regulate the presentation standard of quantitative nutrient information for comparative nutrition claims. Results of this dissertation, regarding the unit effect found in comparative nutrition claims, suggest that policy makers should consider using standardized labeling in that it may help to reduce information processing effort and facilitate information comprehension.

**Moderating Mechanisms**

This dissertation discovered that personal involvement, health consciousness, and product usage did not significantly moderate the anchoring effects found in health claims, calling to question whether there are other factors that might affect the extent to which anchoring influences people’s receptiveness to advertising information. As shown by the findings, the three
factors affected the anchoring processes in a generally consistent way, albeit not statistically significant. Specifically, participants formed more favorable attitudes toward the ad, the brand, and the nutrient value of the product when the anchoring procedure was assisted by personal involvement, health consciousness, or product usage. Furthermore, after taking into account these factors, main effects of the anchoring conditions on participants’ attitudes toward the brand may have changed from nonsignificant to significant.

In traditional comparative advertising research, consumers’ motivation has been considered a key factor in affecting information processing (Andrews et al., 2000). On one hand, research has suggested that personal involvement could be an important variable that motivates consumers to form product/brand attitudes that are consistent with their existing beliefs and preferences (Andrews et al., 2000; Celsi & Olson 1988; Gotlieb & Sarel, 1991). On the other hand, people who are more health-oriented may have greater motivation to process advertising information, and motivation has been considered a significant indicator of cognitive effort to evaluate the comparisons in health claims (Adams & Geuens, 2007; Paek et al., 2011; van Kleef et al, 2005). Along the same vein, enduring product experience is said to be able to increase the effectiveness of comparative advertising because consumers with more product experience may also have greater interests, resources, and motivation to engage in information processing (Andrews et al., 2000; Williams, 2005). Thus, it is believed that the underlying mechanism of interpersonal differences in comprehension and utilization of comparative advertising information lies in the connections between individual difference factors and people’s motivation to utilize their cognitive effort during ad processing.

This dissertation sheds some light on whether individual differences (personal involvement, health consciousness, and product usage), or differences in motivation and cognitive effort, will
necessarily moderate the heterogeneous interpretation of comparative nutrition claims across the anchoring conditions. Prior research on the unit effect has suggested that when consumers are processing quantitative information that is expressed on an unfamiliar scale, they tend to translate it to a familiar scale (Burson et al., 2009). For instance, in order to understand the weather forecast, American people travelling in Europe tend to convert temperatures displayed on a Celsius scale to a Fahrenheit scale. Europeans staying in the United States generally engage in an opposite conversion (Pandelaere et al., 2011). The same translation may be carried out when people are traveling abroad and trying to figure out the value of a foreign currency (Blankenship et al., 2008).

However, such was not the case in the present study. Translating the fat content of a food product from percentage to fraction does not seem to make the attribute information easier to interpret. It is different from the scenario in which residents in U.S. prefer Fahrenheit to Celsius. There is no particular reason for people to translate the scale to a different one even though the expanded scale with 100 units (e.g., “40% less fat”) can be easily translated into a contracted scale with 50 units, 10 units, or 5 units (e.g., “2/5 less fat”), because such a translation is not needed for people to better process the nutrition claims. Correspondingly, even with varying levels of personal involvement, health consciousness, and product usage, consumers are subject to anchoring because they may not feel motivated to engage in this form of translation. This argument is also consistent with existing anchoring research suggesting that anchoring is “independent of many potentially moderating variables” and “independent of participants’ motivation” (Mussweiler et al., 2004, p.186).

Under many circumstances, consumers do not spend much cognitive effort in evaluating the units in which attribute information is specified, especially when a preferential scale does not
exist (Pandelaere et al., 2011). This may explain why the three factors did not significantly moderate the anchoring effect found in health claims processing. Pandelaere et al. further pointed out that (2011), “the notion that the attribute information could have been specified in an alternative unit probably does not even enter consumers’ minds” (p.309). By the same token, consumers are unlikely to spontaneously activate an anchor brand (e.g., “the leading brand”) when processing comparative nutrition claims, in that a numeric value (e.g., “40% less fat”) itself can suggest a comparative meaning without being associated with any other brand. In the absence of activation of an anchor brand and in the absence of translation to a different anchor scale, the anchoring effect ensues.

**Limitations and future research**

Taken together, the careful pretesting of product involvement, the nutrition claim selection, the carefully executed experimental procedure, and the use of reliable measure scales seemed to strongly imply that this dissertation provided valid insight into the anchoring effect in comparative nutrition claims and its independence of several moderating factors. Nevertheless, there are a few caveats of this study that need caution and suggest directions for future research.

The first limitation was that only two food products (chocolate and granola bar) and one product attribute (the amount of fat) were used to examine the anchoring effect. As is discussed above, the differences in consumers’ nutritiousness perception and attitudes toward the packaging design found between the two products may result from different levels of product involvement and/or different functions of the food products. Future studies should try to replicate the anchoring procedure for additional types of products. On a more general level, research that systematically compares the role of anchoring for a variety of product categories is warranted. Because a nutrition claim generally features a single nutrient attribute (e.g., the amount of fat),
future research should also explore the anchoring effect for other food attributes (e.g., sugar, cholesterol, and sodium) to see whether the results can be replicated. In addition, future advertising scholarship should examine whether the anchoring effect would be greater for negative ingredients (e.g., fat and sodium) than for positive ingredients (e.g., fiber and vitamins) in that negative information has been demonstrated more persuasive than positive information (Burton & Biswas, 1993).

Based on theoretical arguments in comparative advertising (Brucks et al., 1984; Shimp, 1983; Zaichkowsky, 1985), this dissertation identified three factors (product involvement, health consciousness, and product usage) to be examined as possible moderating roles. While none of the factors was found significantly moderate the anchoring processes, future studies should examine other possible moderating variables. For instance, Pandelaere et al. (2011) maintained that some people are more numerate than other people, thus they may be more sensitive to alternative scales and be more aware of relative differences. Therefore, differences in consumers’ ability to process quantitative information warrant further investigation and provide a fruitful domain to explore anchoring processes.

Also, the present research only studied one type of indirect comparative claims, namely, “than the leading brand.” As Pechmann and Ratneshwar (1991) suggested, an indirect comparison does not specify a particular brand name, but instead uses implicit expressions as a point of comparison, such as “than the old versions,” “than our previous recipe,” “than other brands,” or “than the regular” product. Miniard et al. (2006) argued that indirect comparisons in advertising might differ in their propensity to activate information processing, yet “we know virtually nothing about the form that this type of mental activity may take…and the factors that
could influence it” (p.63). Thus, future research should consider how the role of anchoring varies in different types of comparative claims.

While this study provided evidence for the unit effect and the effects of brand anchoring on people’s perceptions of food products, such an impact was not found to transfer to purchase intention. In measuring the anchoring effect of comparative nutrition claims, future experimental work should go beyond traditional evaluation variables such as attitudes toward the brand and/or purchase intention. In fact, it has been demonstrated that there is a discrepancy between consumers’ responses to health claims in surveys/experiments and their actual behavior in reality (Rayner, Boza, & Higginson, 2001). Williams (2005) noted that, “after more than a decade of experience of health claims on foods, there has been remarkably little direct evaluation of the impact on consumers using these endpoints” (p.18). In Wansink and Chandon’s study (2006), for instance, “low fat” nutrition claims led people to consume larger portions of food. Hence, future studies aiming at a full evaluation of the anchoring effect in comparative advertising would ideally consider not only consumers’ perceptions, attitudes, and purchase intention, but also changes in consumers’ purchase behavior and diet habit.

Last but not least, participants in this study were invited to evaluate the nutrition claims on food packaging and were assigned to anchoring conditions, that is, exposure to the comparative nutrition claims was deliberately enforced and participants’ motivation to process the advertising information would be higher than in a natural ad exposure environment. Despite the fact that this study suffered from the artificiality of the exposure context, an experimental design will likely still be the preferred method for future empirical work on anchoring effects. From a theoretical perspective, if the anchoring conditions closely resembled consumers’ everyday life, in which they tend to view the nutrition claims more casually, consumers would be more likely to be
subject to the anchoring effect. Hence, in the real market where all kinds of products/nutrition claims are available to consumers and where consumers are in a less attentive state, the results of this study should be more prominent and observable.

### Conclusions

In the United State, the FTC has a long-standing history of advocating the use of comparisons in advertising because it believes that comparative claims help consumers make informed choices, reduce information processing efforts, and stimulate the production of healthier food products (Williams, 2005). In Canada, a comparative nutrition claim cannot be used unless the advertised food product “is superior over a comprehensive range of conditions or is qualified to reflect the conditions under which it holds” (Pechmann, 1996, p.1996). In Germany, comparative health claims had been banned for many years and has been legally permitted since September 2000 (Schwaiger et al., 2007). As opposed to the United States and several other European countries, comparative health claims are legally forbidden in France because they are considered deceptive, misleading, and unfair (Rijkens & Miracle, 1986). Similarly, comparisons in food advertising have not gained in popularity in many Asian countries (Schwaiger et al., 2007). Pechmann (1996) noted that advertising legislation regarding comparative claims is inherently arbitrary and further investigation is needed on the effectiveness of such type of claims. Therefore, as a practical matter, research on comparative nutrition claims and anchoring effects promises to be valuable, compelling, and enlightening.

This dissertation extends the current body of literature in several respects, lending support to the use of the theory of anchoring and adjustment as the basis to examine the effectiveness of comparative nutrition claims. To begin with, significant differences in consumers’ nutritiousness perception and attitudes toward the packaging design were found across anchoring conditions for
the granola bar ad, but not for the chocolate ad. This finding supported the case-by-case approach adopted by the FTC in regulating health claims and warranted future studies on additional product categories. The research findings also add to our understanding of indirect comparative claims, which may vary in their propensity to engage consumers in advertising processing.

In addition to understanding brand anchoring in nutrition claims, this dissertation offers initial insight into the effectiveness of using percentage versus fraction to describe the nutrition content of food products to attract consumers, and the importance of developing remedies to protect consumers from confusing claims. Furthermore, the research results were consistent with existing anchoring research suggesting that an anchoring process is generally not moderated by traditionally recognized moderating factors in comparative advertising research, including personal involvement, health consciousness, and product experience. As consumers show continued interest in nutrition and health, and as food companies continue to spend billions of dollars in advertising nutritional properties of products, there is considerable room for research on how comparative nutrition claims are presented, perceived, and evaluated. Future scholarship of this topic warrants attention and provides a promising arena for investigation.
REFERENCES


Appendix A

Figure 1. Three-stage model of an anchoring mechanism. The bottom part lists several potential sub-processes. (Chapman & Johnson, 2002; cited in Gilovich, Griffin, & Kahneman, 2002, p.126)
Appendix B

Measurement

Nutrition Rating Scale

Based on the packaging design for Rokolate chocolate (Greenchy granola bar) you just viewed, how do you feel about Rokolate chocolate (Greenchy granola bar)? On a scale of 1 to 7, please indicate your feelings toward this food product:

1. not very nutritious – very nutritious
2. not very healthy – very healthy
3. low level of fat – high level of fat
**Attitude toward Advertising Scale**

On a scale of 1 to 7, please indicate how you perceived the packaging design you just viewed:

1. bad – good
2. dislike – like
3. boring – interesting
4. not appealing – appealing
5. irritating – not irritating
6. unpleasant – pleasant
7. unfavorable – favorable
Attitude toward Brand Scale

On a scale of 1 to 7, please indicate how you perceived the brand *Rokolate (Greenchy)* on the chocolate (granola bar) package you just viewed:

1. bad – good
2. unlikable – likable
3. negative – positive
4. unfavorable – favorable
Purchase Intention Scale

On a scale of 1 to 7, please answer the following questions or indicate how much you agree with the statements:

2. The probability that I would consider buying the product is: low – high
3. My willingness to buy the product is: definitely not – definitely
Personal Involvement Inventory

To me, the food product chocolate (granola bar) is:

To me, the fat content of a food product is:

1. Important – Unimportant*
2. Boring – Interesting
3. Relevant – Irrelevant*
4. Exciting – Unexciting*
5. Means nothing – Means a lot to me
6. Appealing – Unappealing*
7. Fascinating – Mundane*
8. Worthless – Valuable
9. Involving – Uninvolving*
10. Not needed – Needed

Notes: * indicates item is reverse scored.
Manipulation Check

1. I recall a nutrition claim on the chocolate package saying that:

   A. 25% less fat
   B. 25% less fat than the leading brand of chocolate
   C. 1/4 less fat
   D. 1/4 less fat than the leading brand of chocolate

2. I recall a nutrition claim on the granola bar package saying that:

   A. 40% less fat
   B. 40% less fat than the leading brand of granola bar
   C. 2/5 less fat
   D. 2/5 less fat than the leading brand of granola bar
Demographic Scale

Please answer each of the following questions:

1. What is your age? _______________

2. Gender:  Female  Male

3. Race: Caucasian
   Black or African American
   Hispanic or Latino
   Asian
   American Indian or Native Alaskan
   Native Hawaiian or Other Pacific Islander
   Other

4. Year in School:

   Freshman  Sophomore  Junior  Senior  Masters  PhD
Suspicion Probe

What do you think is the purpose of this research? Please write down your comments.
Appendix C

IRB APPROVAL

February 18, 2014

Ben Shen
College of Communication & Information Sciences
Box 870172

Re: IRB#: 14-OR-044 “Contrast or Assimilation? Anchoring Effects in Comparative Nutrition Claims and Nutritional Content”

Dear Mr. Shen:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your application has been given expedited approval according to 45 CFR part 46. You have also been granted the requested waiver of informed consent. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies

Your application will expire on February 16, 2015. If your research will continue beyond this date, complete the relevant portions of the IRB Renewal Application. If you wish to modify the application, complete the Modification of an Approved Protocol Form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, complete the appropriate portions of the IRB Request for Study Closure Form.

Please use reproductions of the IRB approved stamped consent/assent forms to obtain consent from your participants.

Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Sincerely,

Carpentier T. Myles, M.S.A., C.I.M., C.I.P.
Director & Research Compliance Officer
Office of Research Compliance
The University of Alabama
UNIVERSITY OF ALABAMA INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN PARTICIPANTS
REQUEST FOR APPROVAL OF RESEARCH INVOLVING HUMAN PARTICIPANTS

I. Identifying information

Principal Investigator: Bin Shen
Second Investigator: Shuhua Zhou

Name: Bin Shen
College: C&IS
University: University of Alabama
Address: P.O. Box 870172
Telephone: 205-765-4651
E-mail: bshen2@crimson.ua.edu

Name: Shuhua Zhou
College: C&IS
University: University of Alabama
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Telephone: 205-348-8653
E-mail: szhou@ua.edu

Title of Research Project:

Contrast or Assimilation? Anchoring Effects in Comparative Nutrition Claims and Nutritional Content Advertising

Date Printed: 12/09/2013
Funding Source: none

Type of Proposal: ___ New ___ Revision ___ Renewal ___ Completed ___ Exempt

Attach a renewal application

Attach a continuing review of studies form

Please enter the original IRB # at the top of the page

UA faculty or staff member signature: ________________________________

II. NOTIFICATION OF IRB ACTION (to be completed by IRB):

Type of Review: _____ Full board _____ Expedited

IRB Action:
___ Rejected Date:__________
___ Tabled Pending Revisions Date:__________
___ Approved Pending Revisions Date:__________
___ Approved—this proposal complies with University and federal regulations for the protection of human participants.

Approval is effective until the following date:

Items approved: ___ Research protocol: dated
___ Informed consent: dated
___ Recruitment materials: dated
___ Other: dated

Approval signature ________________________________ Date __________________
INFORMED CONSENT STATEMENT

You are being asked to be in a research study. This study is called “Evaluate Packaging Designs for Food Products.” This study is being done by Bin Shen, a Ph.D. student in the College of Communication and Information Sciences, and Dr. Shuhua Zhou, a professor in the College of Communication and Information Sciences at the University of Alabama.

What is this study about?
Participants are invited to evaluate food packaging designs that are currently in a testing phase. This is a cooperative research project that is being conducted by researchers in our college and a full-service packaging design agency. The design company has over 10 years experience in product branding especially for food, gourmet and health products. We are interested in your gut feelings toward packaging designs, not your accuracy. We need you to respond on the basis of your intuition as many food shoppers do in the marketplace.

What will I be asked to do in this study?
We will ask you to evaluate four packaging designs for four newly launched food products. We also need some nutrition knowledge information and demographic information. This will be used for classification purposes only.

How many other participants will be in this study?
The investigator hopes to recruit 300 students, who are at least 19 years of age, from the College of Communication and Information Sciences at The University of Alabama.

How much time will I spend being in this study?
The experiment will last about 20 minutes.

Will being in this study cost me anything?
The only cost to you from this study is your time.

What are the benefits and risks (problems or dangers) from being this study?
You will get 1/2 class credits for participating in this study. Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty. If you withdraw from the study, your data will be destroyed. You will get 1/2 credits toward a course requirement.

How will my confidentiality be protected?
The information in the study records will be kept confidential. All data will be reported in terms of group average.

What are the alternatives to being in this study?
The alternative to this study is to participate in another study offered on the participant pool website for the same credits, or if you choose not to participate in research at all, you can discuss an alternative assignment with your instructor.

What are my rights as a participant?
Being in this study is totally voluntary. You can stop at any time during the study. You can also skip questions if you want to.

The University of Alabama Institutional Review Board is a committee that looks out for the ethical treatment of people in research studies. They may review the study records if they wish. This is to be sure that people in research studies are being treated fairly and that the study is being carried out as planned.

**Who do I call if I have questions or problems?**

If you have questions at any time about the study or the procedures please contact Bin Shen (email: bshen2@crimson.ua.edu). If you have questions about your rights as a person taking part in a research study, make suggestions or file complaints and concerns, you may call Ms. Tanta Myles, the Research Compliance Officer of the University at (205)-348-8461 or toll-free at 1-877-820-3066. You may also ask questions, make suggestions, or file complaints and concerns through the IRB Outreach Website at http://osp.ua.edu/site/PRCO_Welcome.html. You may email us at participantoutreach@bama.ua.edu.
March 17, 2014

TO: Bin Shen
   Principal Investigator
   Marketing

FROM: Denise A. Lin-DeShetler, MPH, MA
   Director

SUBJECT: CHS #22003- “Evaluate Packaging Designs for Food Products”

This letter is your record of the Human Studies Program approval of this study as exempt.

On March 17, 2014, the University of Hawai‘i (UH) Human Studies Program approved this study as exempt from federal regulations pertaining to the protection of human research participants. The authority for the exemption applicable to your study is documented in the Code of Federal Regulations at 45CFR 46.101(b)(Exempt Category 2).

Exempt studies are subject to the ethical principles articulated in The Belmont Report, found at http://www.hawaii.edu/irb/html/manual/appendices/A/belmont.html.

Exempt studies do not require regular continuing review by the Human Studies Program. However, if you propose to modify your study, you must receive approval from the Human Studies Program prior to implementing any changes. You can submit your proposed changes via email at uhirb@hawaii.edu. (The subject line should read: Exempt Study Modification.) The Human Studies Program may review the exempt status at that time and request an application for approval as non-exempt research.

In order to protect the confidentiality of research participants, we encourage you to destroy private information which can be linked to the identities of individuals as soon as it is reasonable to do so. Signed consent forms, as applicable to your study, should be maintained for at least the duration of your project.

This approval does not expire. However, please notify the Human Studies Program when your study is complete. Upon notification, we will close out your files pertaining to your study.

If you have any questions relating to the protection of human research participants, please contact the Human Studies Program at 956-5007 or uhirb@hawaii.edu. We wish you success in carrying out your research project.