8-2012

The Competitive Front-of-Package Labeling of Consumer Packaged Goods: Cutting Through The Clutter

Christopher Newman
University of Arkansas, Fayetteville

THE COMPETITIVE FRONT-OF-PACKAGE LABELING OF CONSUMER PACKAGED GOODS: CUTTING THROUGH THE CLUTTER

THE COMPETITIVE FRONT-OF-PACKAGE LABELING OF CONSUMER PACKAGED GOODS: CUTTING THROUGH THE CLUTTER

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Business Administration

By

Christopher L. Newman
University of Mississippi
Bachelor of Business Administration in Marketing, 2005
University of Alabama
Master of Science in Marketing, 2007

August 2012
University of Arkansas

ABSTRACT

At no point in U.S. history have food product packages displayed so many symbols and statements regarding nutrition and health benefits (Nestle 2010). However, despite this explosion of front-of-package (FOP) health communications, obesity and health-related problems of U.S. consumers continue to be a critical concern. Therefore, it is important for marketers, retailers, manufacturers, and public policy makers to develop a more complete understanding of consumers' processing and utilization of health information on food packages, as well as how this information affects product evaluations and choices.

Therefore, this dissertation utilizes a processing fluency theoretical framework (e.g., Zajonc 1968; Jacoby and Dallas 1981; Novemsky et al. 2007) to attempt to increase our understanding of how FOP icons that vary in nature (i.e., subjective interpretive icons, objective quantitative icons, single nutrient content claims) affect consumers' perceptions, intentions, and choices when presented both independently and simultaneously on food packages. Study 1 examines reductive and interpretive icons on a single product (pizza), while Study 2 demonstrates how additional FOP nutrition information (i.e., a single nutrient content claim) affects the conceptual fluency of health information, perceived product healthfulness, and purchase intentions. Studies 3 and 4 provide a stronger market-based examination of how consumers process FOP health information across multiple brands and product categories in a retail setting. These controlled retail laboratory studies overcome important limitations noted in earlier nutrition labeling studies, such as data collection and evaluations in non-store environments (e.g., Keller et al. 2007; Li, Miniard, and Barone 2000), while demonstrating how different types of FOP icons vary in their effectiveness in positively affecting consumers' choices of healthy products from consideration sets across multiple food categories.

This dissertation is approved for recommendation
to the Graduate Council.

Dissertation Director:

_____

Dr. Elizabeth Howlett

Dissertation Committee:

_____

Dr. Scot Burton

_____

Dr. Ronn Smith

DISSERTATION DUPLICATION RELEASE

I hereby authorize the University of Arkansas Libraries to duplicate this dissertation when needed for research and/or scholarship.

Agreed _____
Christopher L. Newman

Refused _____
Christopher L. Newman

ACKNOWLEDGEMENTS

I could not have completed this dissertation – or this degree – without the help of many, many people. First, I'd like to thank my family. My mother and father have played the most important role in my life, and I wouldn't have been in a position to even apply for acceptance in this program in the first place without their unwavering support. Without a doubt, their positive encouragement and patience is the biggest reason for any personal success I may have had. This dissertation is dedicated to my mother who I lost in my first year in the program. Secondly, I'd like to thank my wife Kate for all her support. Specifically, thanks for putting up with me when I was constantly stressed out and being there for me unconditionally through the highs and lows. She put her career and life on the backburner to move from New York City to Fayetteville so I could pursue my own – a sacrifice I hope to repay to her down the line. Also, thanks to her for helping to raise our dog Piggy, as that was a whole other job in itself!

Next, everyone in the marketing department deserves a big "THANK YOU!" for putting up with me over the past 4 years. First, my chair Betsy deserves a huge amount of recognition. You have been much, much more than a chair to me. You have been a confidant and a mentor, but more importantly you have been a good friend – someone who I can always trust and will always there for me. I truly consider you a family member, and I know that our relationship will last forever. Thank you so much for your enduring patience and your willingness to help me with every aspect of life, while all along "shooting me straight" (and sorry for breaking your finger). I also owe Scot a tremendous amount of gratitude. You were always willing to answer any question I had whether it was morning, noon, or night. You pushed me to be the best I could, and I know my dissertation – and my research in general - is much better because of your guidance. I'll repay you by moving to Mississippi so I can never knock on your door and bother you again.

Your productivity should skyrocket now. You're welcome. Lastly, I'd like to thank Ronn for being the third member of my committee. Your positive attitude and advice really helped guide me along – especially when I was on the job market. I appreciate your willingness to serve on my committee while you were an Assistant Professor – something that did not go overlooked in my eyes.

I would also like to thank all the PhD students that helped me along the way – especially those who I have shared an office with. The group, overall, was fantastic to work with and very supportive of one another. I hope that our collaborative spirits continue to thrive long after we part ways, and we can all enjoy each other's success down the line. Special thanks to Yoona for putting up with me while I was on the job market and when I was preparing to defend my dissertation in my last year. She was particularly helpful and positive and created a wonderful environment to work in.

Additionally, I'd like to thank Tom and Jeff for being wonderful, supportive chairs during my four years. I can honestly say that I never once was turned down on any request I ever made – something that is simply unheard of in the doctoral student world. Truly, every resource I ever needed was made available to me, and I am truly thankful for that. Also, another big "thank you" to all the other faculty members in the department; you all are a big reason there is such a positive, nurturing environment on the third floor. I think every single faculty member helped me in some particular way, while not a single one ever hindered me. Lastly, the department couldn't have thrived so much without the help of the wonderful staff and student workers up front. Here's to all the other wonderful staff who have helped me over the years!

I am truly grateful for this experience and place. Go Rebels!!!

TABLE OF CONTENTS

I.	Chapter 1	
	A. Introduction and Overview	2
	B. Overview of Research Context	4
	C. Overview of Conceptual Framework	4
	D. Overview of Methodology	6
	E. Theoretical Contributions	6
	F. Substantive Contributions	7
II.	Chapter 2	
	A. Literature Review	10
	B. Background/Research Problem	14
III.	Chapter 3 – Study 1	
	A. Conceptual Development and Hypotheses	18
	B. Methodology	31
	C. Results	37
	D. Discussion	41
	E. Limitations and Future Research	55
IV.	Chapter 4 – Study 2	
	A. Conceptual Development and Hypotheses	59
	B. Methodology	64
	C. Results	69
	D. Discussion	75
	E. Limitations and Future Research	81
V.	Chapter 5 – Study 3	
	A. Conceptual Development and Hypotheses	86
	B. Methodology	90
	C. Results	97
	D. Discussion	102
	E. Limitations and Future Research	105
VI.	Chapter 6 – Study 4	
	A. Conceptual Development and Hypotheses	108
	B. Methodology	111
	C. Results	116
	D. Discussion	125
	E. Limitations and Future Research	132
VII.	Overall Dissertation Conclusions	135
	A. Theoretical Contributions	139
	B. Managerial Implications	141
	C. Limitations and Future Research	144
VIII.	References	147
IX.	Appendix	161

CHAPTER 1

INTRODUCTION AND OVERVIEW

Imagine you just made a New Year's resolution to eat healthier food and to get in shape, so you decide to go to your local supermarket in search of some healthy rice to make for a dinner side. After driving around the parking lot and finally finding a place to park, you walk into the large, well-lit store. You walk from aisle to aisle, passing product category after product category, looking for the rice selection. You eventually find the appropriate aisle and, ultimately, the retailer's rice offerings. What do you see? Long grain rice, medium grain rice, short grain rice, sweet rice, aromatic rice, Arborio rice, jasmine rice, brown rice, yellow rice, dirty rice, rice with beans, rice with chicken flavor, and even convenient pre-cooked rice. There's rice in boxes and there's rice in bags; large, family size packages and single serving sizes; expensive rice and cheap rice; organic rice and non-organic rice; local rice and foreign rice; national brands and store brands. There's rice on the shelves as low as your ankle, and there's rice on shelves over your head. What do you do?! You feel overwhelmed, but after a few minutes of deliberation, ultimately decide you want cheap white rice.

After narrowing your consideration set, you are left with two options: 1) national brand, bagged white rice, and 2) store brand, boxed white rice. You pick each one up and compare them side-by-side. The store brand is cluttered and confusing, while the national brand is organized and neat. You search for and easily locate nutrition information on the package and quickly analyze it. It seems like a rather healthy choice – and the product's attributes were easy to understand – so you hurriedly make your way to the checkout counter to purchase the national brand. After all, you just spent 15 minutes getting to the rice aisle, and the last thing you need or want is to be confused with the information presented on the final product (s) in your consideration set. Plus, the chicken is already in the oven and a big storm is about to hit. You need to get home.

In today's retail environment, consumers are faced with literally thousands of choices, and it is prudent for manufacturers and retailers to make those decisions as simple as possible. One way to accomplish this is through product differentiation – a strategy to make one's products more attractive to consumers. But unless those benefits are clearly displayed and communicated, manufacturers and retailers may actually do more harm than good in terms of attracting and retaining customers. Such was the case in the previously discussed rice scenario; the national brand more clearly conveyed important information to the consumer than did the store brand and was ultimately selected for purchase over the store brand. In other words, the consumer willingly chose the more expensive option provided by the competition simply because it was easier to understand. There is no doubt that the store brand lost this initial sale, but more importantly, the national brand might have gained a loyal customer for life. So this discussion begs the question – and hence the purpose of this dissertation - "What influence does the perceived processing fluency of nutrition information on product packaging have on consumer choice and evaluative behaviors?" Specifically, this question will be pursued within the context of the food retail industry for a number of reasons that will be discussed later.

Tversky and Kahneman (1974) were the first to show how our daily decision making is often guided by heuristics. One of those "rules of thumb" is the fluency heuristic, a mental technique in which individuals infer that objects that are easier to process have a higher value in respect to other objects that can't be processed as fluently (Jacoby and Brooks 1984). Processing fluency, therefore, is the perceived ease or difficulty that people experience when processing information (i.e., Jacoby and Dallas 1981; Novemsky et al. 2007). This dissertation will look at a number of potential new mediators and moderators of the relationship between processing fluency and consumer behavior within the context of food and nutrition. The next

few sections will briefly introduce 1) the context of this research, 2) the conceptual framework that will be expanded upon, 3) the methodology that will be used, and 4) contributions of the research. All of these areas will be discussed in much greater detail later in this dissertation.

OVERVIEW OF RESEARCH CONTEXT

I chose the food retail industry as context for this dissertation for a number of reasons. First, it is a context with significant public policy and consumer welfare implications. Long ago it was predicted that "consumers will demand more information and disclosure about the products they buy and the prices they pay" (Peterson, St. Marie, and Sturdivant 1977, pg. 111), and that prediction holds true today. With federally mandated labeling requirements such as nutrition labeling and origin labeling, the food industry provides ample opportunities to conduct research with substantive implications. Secondly, it is a context with significant retailing implications. Food has and always will be one of the most essential and widely consumed goods in the world (Appel 1972), thereby making food retailing a research area of the upmost importance. Additionally, with almost 1 in 4 food retailers claiming to have increased their product assortments in 2009 (Taylor and Chaudoir 2009), understanding the implications of processing fluency becomes that much more significant. Lastly, food retailing is an under - researched context in regards to processing fluency, thus providing me with a chance to extend and expand upon the existing conceptual framework in new ways.

OVERVIEW OF CONCEPTUAL FRAMEWORK

As previously mentioned, I wish to expand upon the processing fluency literature. Specifically, I will be exploring how consumers process information shown on consumer packaged food products.

Accessibility bias research has shown that the information that we can more easily retrieve from our memories tends to dominate decisions, opinions, and judgments. In other words, when memory recollection fails, we produce responses that are most accessible, and those responses often reflect habit (Jacoby, Debner, and Hay 2001). Coupling this framework with processing fluency in mind, one can infer that the information that is most easily processed will be the information that is most easily retrieved and, thus, the very information that is used in forming judgments. Therefore, it is presumably imperative that manufacturers and retailers convey not only the appropriate (strategic) information to consumers via their product packages, but also that it is easily comprehendible and concise. This seems especially important in the case that consumers have pre-conceived (and possibly false) notions about a product or product category. For example, consider a situation in which a consumer thinks that all pizza is unhealthy so a manufacturer makes the healthy nutrition information of its pizza easier to process and more accessible to the consumer via a more effective labeling scheme. As a result, the next time that consumer thinks about buying the pizza, she doesn't act on habit or recall previously believed information about the unhealthiness of the product, but rather retrieves the easily accessible, correct information that she gathered from the product package.

I also explore the contrast and assimilation effects of the processing fluency of FOP labeling (Shen, Jiang, and Adaval 2010). Most notably, I examine if the processing fluency of information shown on the packaging of products that retailers carry affect judgments of those retailers. Going back the prior rice purchasing scenario, is it possible that since the store brand rice package was messy and difficult to process, those same negative feelings of confusion, disdain, and displeasure might transfer to the retailer who sells the product?

OVERVIEW OF METHODOLOGY

Three between-subjects experiments are used to test the hypotheses (described in more detail in later chapters). In the first experiment, respondents were presented with different mock front-of-package nutrition labeling schemes to test for any variation in perceived processing fluency. Specifically, a 2 (reductive icon present vs. absent) X 2 (interpretive icon present vs. absent) between-subjects design was utilized. A MANOVA analysis was performed to test for individual effects of these two factors as well as a moderating factor (consumer skepticism toward FOP labeling), and any interactive effects on a number of dependent variables including attitudes, intentions, and perceptions, to name a few.

At least two other experiments will be conducted at later points in time to build upon the first experiment within the context of the retail food industry. One of the two experiments will also involve collecting data in the behavior lab to assess if/how the processing fluency of product packaging affects actual shopping behavior. These other experiments will introduce new potentially moderating and mediating factors for analysis.

CONTRIBUTIONS

Theoretical Contributions

The processing fluency literature is vast and spans across many disciplines. Knowing that consumers' behavior at the point of purchase is influenced by not only previously established memory-based factors (e.g., brand loyalty, brand preferences, prior shopping habits), but also by in-store marketing-based factors (e.g., aisle end caps, positioning, clutter) (Chandon et al 2006), this research seeks to understand how the in-store marketing-based factors such as processing fluency of product labels can affect the previously established memory-based factors.

As competition has increased among goods and services providers, consumers have become increasingly faced with more product offerings and, consequently, more decisions. The retail environment has become cluttered and complicated, so understanding how consumers process tangible product information at the point of purchase is extremely important. This research will contribute to the literature by expanding our current processing knowledge into the context of health and nutrition (as previously discussed), thereby increasing our understanding of how health communications can be more effective.

This research will also provide theoretical contributions by exploring new moderating and mediating influences that have specific consumer welfare, public policy, manufacturing, and retailing implications. I expect this dissertation to demonstrate how product labeling extends in importance beyond just mere product-specific implications to affect consumers' judgments, evaluations, preferences, and attitudes towards brands and retailers.

Substantive Contributions

From a consumer welfare standpoint, product information that can be more fluently processed and, thus more easily retrieved at a later point in time will allow consumers to make more informed decisions when external influences (such as time pressure) won't permit them to undertake a complete decision-making process (Jacoby, Debner, and Hay 2001; Whittlesea and Williams 2000). Further, within the context of food and nutrition, more fluently processed nutrition information about certain foods or food categories could allow consumers to more easily compare and contrast foods on the basis of healthfulness and nutrition, thus making better decisions for themselves and those they shop for, and potentially providing a point of competitive advantage among food marketers (Howlett, Burton, and Kozup 2008).

From a retailing standpoint, understanding how the processing fluency of product labeling can transfer products from consumers' universal sets to retrieval sets and ultimately to consideration sets (and vice-versa) is likely to be of great interest to manufacturers, marketing managers, and retailers, alike. Manufacturers need to better understand how consumers are analyzing their packaging and labeling and the role that that analysis plays in their decision making process, and adjust their design accordingly. Additionally, processing fluency could, indeed, become a point of competition among manufacturers producing similar products. Additionally, as marketing managers begin to more fully understand the implications of this research, they can more knowledgably adjust their product offerings to accommodate higher levels of processing and satisfaction for their customers. Again, this reinforces the notion that labeling schemes can become a point of competition. Lastly, retailers can benefit from this specific research in terms of its implications for the brands they carry. Store brands may be found to be more easily or less easily processed compared to national brands for example, and those levels of perceived processing fluency very well could be transferred to other products labeled with the store brand or to the actual retailer, itself.

In summation, this dissertation will expand upon our knowledge of processing fluency by specifically looking at the effects of differential product labeling schemes' effects on information comprehension and its subsequent use, as well as relevant assimilation and contrast effects on brand traits, retailers, and competitive products.

CHAPTER 2

LITERATURE REVIEW

PROCESSING FLUENCY

Processing fluency is defined as the ease with which individuals can identify and recognize a target (e.g., Jacoby and Dallas 1981). Similarly, it has also been defined as the subjective feelings of ease or difficulty that individuals experience while processing information about an object (Novemsky et al. 2007). Under the umbrella of processing fluency lies two similar, yet distinct constructs: perceptual fluency and conceptual fluency (Lee 2002). Perceptual fluency is defined as the ease of processing of the perceptual features of a stimulus such as modality and shape (e.g., Jacoby and Kelley 1987; Lee and Labroo 2004), while conceptual fluency is defined as the ease of processing the *meaning* of a stimulus (e.g., Whittlesea 1993). For example, repeated exposure to a jar of mayonnaise results in an increase with which the physical features of the jar can be processed (perceptual fluency) and an increase in the ease with which associations to mayonnaise come to mind (conceptual fluency) (e.g., Lee and Labroo 2004). Both constructs will likely be touched upon in this dissertation, although the existing marketing literature has paid far more attention to perceptual fluency than conceptual fluency (Lee, Yoon, and Mitchell 2004).

Processing fluency, in general, is often studied in conjunction with the mere exposure effect - a psychological phenomenon in which people develop preferences for stimuli simply because they have been exposed to the stimuli before and are familiar with it (e.g., Zajonc 1968). It has been continually shown that when the processing fluency of a target is enhanced by prior exposures, a more favorable attitude emerges among those observing the target (e.g., Anand and Sternthal 1991; Bornstein 1989; Seamon et al. 1995). More specifically, exposure to stimuli such as advertisements – whether the exposure is purposeful or incidental – has been shown to influence liking for advertisements in general, as well as for the brand names and product

packages shown in the ads (Janiszewski 1988; Janiszewski 1990; Janiszewski 1993). Similarly, processing fluency has been shown to be related to affect. Winkielman and Cacioppo (2001) assessed affective reactions to pictures with varying levels of processing difficulty and found that the pictures that were easier to process elicited more positive affect. Reber, Winkielman, and Schwarz (1998) discovered that perceptual fluency is used as a cue for discriminating old from new items, and concluded that processing fluency is generally associated with positive affect.

Processing fluency is also commonly examined in conjunction with ease of retrieval or recall. The ease-of-retrieval hypothesis (Schwarz et al. 1991) suggests that people use the perceived ease with which information comes to mind as a heuristic for forming judgments, building upon the availability heuristic (Tversky and Kahneman 1973). For example, Schwarz et al. (1991) discovered that implications of recalled content can be qualified by the difficulty or ease with which that content can be recalled. They concluded that people consider not only *what* they recall in forming judgments, but also the difficulty or ease with which the content can be recalled as an additional source of information to form judgments. Tybout et al. (2005) found that judgments are based on the content of the information considered when relevant knowledge is either highly accessible or not accessible at all. However, between these extremes when information is just moderately accessible, judgments are based on the perceived ease with which relevant information can be retrieved. This ease of retrieval of information is particularly important because of "accessibility bias" (Jacoby, Debner, and Hay 2001). This bias is similar to "habit" in that when recollection or retrieval of information fails, people tend to produce the behavior that is most accessible, and this accessibility bias reflects their habits. For example, recollection can inform people where they parked their cars today, but bias informs people where they *usually* park their cars (Jacoby, Debner, and Hay 2001) – two distinct constructs that only

sometime overlap, but are both affected by processing fluency. It is important to note, however, that some research has concluded that ease of retrieval is used unintentionally and effortlessly, outside of awareness, along with other more conscious inputs to form judgments, suggesting that a source of information may merely need to be accessible to form these judgments (Menon and Raghubir 2003).

Confidence and trust are additional constructs that have been shown to be related to processing fluency. Tsai and McGill (2011) found that consumer choice confidence is affected by processing fluency and moderated by construal levels. Specifically, they showed that fluency increased confidence for people processing at lower construal levels, but actually decreased confidence for those processing at higher construal levels, supporting the notion that the ease of interpretation experienced during judgment – not the content – that leads to the moderating effects (Tsai and McGill 2011). Ulkumen, Thomas, and Morwitz (2008) concluded that processing fluency –as manipulated through temporal framing- affects consumers' confidence regarding their spending budgets. Werth and Strack (2003) examined the effects of confidence and perceptual fluency on the "knew it all along effect" (i.e., "This questions seems so familiar to me, surely I would have known the answer!") (Wood 1978). They induced respondent confidence by manipulating perceptual fluency and found that the knew-it-all-along effect was stronger for respondents experiencing higher perceptual fluency or confidence, whereas respondents experiencing lower perceptual fluency or confidence displayed weaker knew-it-all-along effects (Werth and Strack 2003). Perceptual fluency has also been shown to affect truth judgments. For example, Hansen, Dechene, and Wanke (2008) discovered that highly fluent statements were judged as more truthful than low fluency statements when the fluency was manipulated via differential color contrasts. Similarly, Reber and Schwarz (1999) found

differences in truth judgments after manipulating perceptual fluency through the use of color contrasts.

Knowing that consumers tend to evaluate objects on the basis of the subjective feelings of difficulty or ease that they experience at the time they analyze relevant information about the objects (Schwarz 2004), the relationship between processing fluency and consumers' product evaluations is one that has been expanded upon. Generally speaking, it has been shown that processing fluency has a positive effect on consumers' product evaluations. For example, consumers more easily understand information if it is presented in colors that are easy to comprehend compared to the background colors (Reber and Schwarz 1999), if a product's print font is easy to read (Novemsky et al. 2007), and if they have been exposed to the same or related information before (Labroo and Lee 2006; Lee and Labroo 2004).

Additionally, the relationship between processing fluency and brand evaluations has been examined. For example, conceptual fluency has been shown to affect memory-based choice and consideration-set membership due to increased accessibility of the brand in people's minds (e.g., Lee 2002; Nedungadi 1990). Fransen, Fennis and Pruyn (2010) sought to expand upon the established notion that prior brand exposure through advertising can positively influence brand attitudes, brand choice, and brand consideration. They found that these effects were dependent on the congruency of the communication modality (i.e., visual vs. aural) in which exposure to the advertisements took place, and that perceptual fluency was the underlying mechanism (Fransen, Fennis, and Pruyn 2010).

Despite the vastness of the literature, processing fluency is a psychological phenomenon that is still not fully understood. As some scholars note, "It is becoming increasingly clear that

the presence and magnitude of fluency effects in recognition memory varies according to different stimulus and contextual variables" (Miller, Lloyd, and Westerman 2008, p. 1092; Whittlesea and Leboe 2003; Whittlesea and Williams 1998). Therefore, the crux of this dissertation is to examine processing fluency effects concerning product packaging and labeling – specifically regarding nutrition labeling and other potential sources of package "clutter" that may affect perceptual and/or conceptual fluency. The application of a processing fluency theoretical framework to more fully investigate alternative product labeling systems will, ideally, provide the majority of today's consumers with only as much information as it takes to make a well-informed decision, thereby minimizing both effort *and* error. Stated differently, the objective of the following studies is to better understand how processing fluency can create an optimal balance between reduced consumer decision-making dissonance and the information processing costs incurred by consumers to reduce that dissonance.

With a better understanding of the literature, I will now move on to the specific research questions posed by this dissertation and show how a processing fluency theoretical framework can be utilized to answer these questions. The next section will provide background information for the formulation of those questions, as well as provide justification for the context that the studies will center around.

BACKGROUND/RESEARCH PROBLEM

Each year in the U.S. approximately 25% of all people are on a diet, spending almost $35 billion per year on weight loss products (Federal Trade Commission 2002). Despite these extravagant expenditures, many are unsuccessful in losing and keeping weight off, contributing to a nation of overweight consumers (Andrews, Netemeyer, and Burton 2009). More

specifically, 67% of all U.S. adults are overweight and 33% are considered "obese". It is estimated that by 2015, 75% of all U.S. adults will be overweight and 41% will be obese (Wang and Beydoun 2007). Obesity, largely driven by food and beverage consumption, is a major cause of heart disease (Eckel and Krauss 1998) – a disease that accounts for approximately 29% of all U.S. deaths. Of those deaths, over half occurred among people aged 65 years or younger – age groups that the Center for Disease Control and Prevention (CDC) classify as "premature" (CDC 2004). Obesity is also significantly associated with other serious (some potentially terminal) health problems such as diabetes, high blood pressure, high cholesterol, asthma, and arthritis (Mokdad et al 2003). Because obesity is a very preventable cause of death (Flegal et al. 2004), it is incumbent upon marketers, retailers, manufacturers, and public policy makers to develop a better understanding of how consumers process health information of food products at the retail shelf, as well as how they respond to that information.

To help alleviate these consumer welfare and health issues, a number of initiatives have been implemented to assist consumers with making healthier decisions regarding food purchases at the retail level: Guiding Stars, Heart Check Mark Program, NuVal, and the Smart Choices Program, to name a few. More recently, the Nutrition Keys FOP Labeling System has been proposed by the Food Marketing Institute (FMI) and the Grocery Manufacturers Association (GMA) as a voluntary initiative among food and beverage manufacturers. Nutrition Keys is a labeling system that takes certain important nutrient information – calories and three "nutrients to limit": saturated fat, sodium, and sugars - from the federally mandated Nutrition Facts Panel on the backs of food and beverage packages and summarizes it on the front of the packages. As an option, the FOP labels may include up to two "nutrients to encourage" – nutrients needed by

consumers to create a more healthful diet and lifestyle (e.g., potassium, protein, fiber, vitamin A, vitamin C, vitamin D, iron, and calcium) (FMI 2011).

However, despite these very visible voluntary efforts taken by the food and beverage industry, the effects of the Nutrition Keys labeling system and other recently implemented systems are still not well understood. Knowing that other industries – most notably the tobacco industry - have despondently failed in regards to effective self-regulation, both practitioners and scholars alike have noted that transparency, objective evaluation, meaningful benchmarks, accountability, and clear objectives must be present to help ensure successful self-regulation, concluding that, "We do not yet know whether food industry self-regulation will be helpful or harmful, but allowing an industry to self-regulate without input from government, consumers, or public health advocates can have serious consequences" (Sharma, Teret, and Brownell 2010, p. 245). Therefore, this dissertation seeks to objectively examine the effectiveness of the Nutrition Keys labeling system - as well as alternative product labeling systems – and their effects on consumers, retailers, and manufacturers through the utilization of a processing fluency theoretical framework.

CHAPTER 3

STUDY 1

The focus of this chapter is Experiment 1. Specifically, in this chapter I will: 1) provide a relevant theoretical background, 2) propose the primary hypotheses that will be tested, 3) outline manipulations, procedures, and measures used, 4) report findings of tested hypotheses, and 5) discuss the theoretical and managerial contributions of this research. First, however, I will review more specific, relevant literature that led to the formation of my hypotheses.

CONCEPTUAL DEVELOPMENT AND HYPOTHESES

Effects of FOP Nutrition Information Labeling Systems

There are often discrepancies between concern over labeled food product attributes (e.g., "local", "low fat", "natural", etc.) and actual consumer purchasing behavior. For example, one survey found that food additives were of main concern to consumers (91% thought they should be provided with more information about additives), but only 16% of men and 11% of women changed their purchasing behavior to reflect those concerns (Ministry of Agriculture, Fisheries, and Food 1986). Another study reported that 19% of consumers that were informed about food additives expressed concern about the topic, while another 21% expressed concern but needed more advice on what was good for them (Nelson 1990). A possible reason for these discrepancies is that many consumers lack the confidence and/or the ability to make informed, healthy decisions. This possibility provides a window of opportunity for manufacturers, retailers, and policy makers to provide more easily understandable labels to build consumer self-confidence, as well as confidence in the products and those providing them.

The effects of different nutrition food labeling systems on consumer health and welfare have long been a focal point of both research and debate (e.g., Calfee and Pappalardo 1991; Creyer, Burton and Kozup 2008; Kemp et al. 2007; Kozup, Creyer, and Burton 2003). As

previously mentioned, many U.S. food makers and grocers now voluntarily include a FOP "Nutrition Key" (hereafter referred to as a reductive icon) on foods and beverage packages after the Food and Drug Administration (FDA) deemed the prior industry program, "Smart Choices", misleading (Bourque 2011). In order to educate consumers about the new program, the GMA and the FMI – which represent 70% of the packaged foods in the U.S. - will initially invest over $50 million to promote and advertise the campaign (O'Leary 2011; Thompson Marketing 2011). The objective of the initiative is to present select information about certain nutrients from the federally mandated nutrition facts panel on the back of food packages to consumers on the FOP. Those specific nutrients are: calories, saturated fat, sodium, and sugar. These seem to be practical selections as the International Food Information Council (IFIC) reported that those 4 nutrients are among the 6 most examined nutrients by U.S. consumers on the nutrition facts panel (IFIC 2007). Additionally, participating manufacturers and retailers can voluntarily choose to include 2 "healthy" nutrients – such as potassium, fiber, vitamin A, vitamin C, vitamin D, calcium, iron, or protein - to promote on the Nutrition Key. The new labeling system – hailed as "monumental and historic" by food industry experts (Layton 2011, pg.1) - seems to be catching on quickly; the Best Choice® and Always Save® private label brands are already set to implement the FOP Nutrition Key on their 3,000 food product assortment (PRWeb 2011).

Additionally, a number of other nutrition summary symbols have been implemented on food package designs to promote healthier food choices and have garnered much attention from researchers (e.g., Andrews, Burton, and Kees 2011; Feunekes et al. 2008). They range from icons to logos to rating systems and beyond. Most do not provide specific quantitative nutrition information; rather they are simply dichotomous FOP summary symbols that indicate if a product has cumulatively met certain nutrition criteria or not (hereafter referred to as interpretive

icons). Some examples of these interpretive icons include the American Heart Association's Heart-Check Mark, the National Dairy Council's 3-A-Day, Smart Spot by PepsiCo, and Eat Smart and Drink Smart by Unilever. Additionally, retailing giant Wal-Mart has proposed a simple FOP nutrition symbol for its private label food products – a move that has been called a "game changer" by industry experts (Skiba 2011). These nutrition symbols and rating systems can fall into one of two categories: "better for you" and "fact based" (Panda 2008). The "better for you" symbols – such as grocery chain Hannaford's Guiding Stars - are intended to help consumers pick healthier choices compared to other products, while the "fact based" symbols - such as the National Dairy Council's 3-A-Day Logo- are based on scientific evidence approved by the FDA and the United States Department of Agriculture (USDA) (Panda 2008).

These sweeping changes in the marketplace have not gone unnoticed. In a recent survey of U.S. food shoppers, the results from a 2008 U.S. Food and Drug Administration (FDA) study indicated that that over half (54%) of U.S. consumers reported "often" reading product labels the first time they bought a food item – an increase from 44% in 2002 (FDA 2010). Similarly, a 2007study conducted by the International Food Information Council (IFIC) found that 65% of respondents reported that the healthfulness of food had at least "some" or "great" impact on their food purchasing decisions – a significant increase from 2006 (IFIC 2007). Thus, the healthfulness of food items – and the labels that can provide that information – is indeed major determinants in consumers' food purchasing decisions.

As consumers' use of nutrition information in purchase decisions increases - along with the variation of nutrition labeling systems – differences in the utility and fluency of FOP nutrition labeling have not gone unnoticed, either. This is especially true for the reductive versus interpretive categories of nutrition labels previously discussed. A recent study showed that U.S.

consumers claiming to utilize statements about health benefits in their purchasing decisions decreased from 30% in 2006 to 28% in 2007, while consumers claiming to use statements about nutrition benefits in their purchasing decisions similarly decreased from 48% in 2006 to 44% in 2007 (IFIC 2007). A similar study conducted by the FDA found that over 33% of U.S. consumers only "sometimes" use statements about nutrient claims, while over 25% of respondents claimed they "rarely" or "never" utilize these statements in their purchasing decisions (FDA 2010).

One reason for consumers' hesitation toward interpretive icons can be attributed to the sheer number and variety of them currently found on food product packages. Different symbols and systems rarely use the same criteria to determine whether a product is worthy of a certain symbol, rating, or statement, and most of these nutrition labels only highlight the positive attributes of food items (e.g. high in protein, low in calories) while failing to recognize the negative attributes of those food items (e.g. high in sodium, high in fat) (Andrews, Burton, and Kees 2011; Tuttle 2008). Furthermore, those negative attributes might not meet strict FDA criteria for an implied health claim (Calfee 1991; Calfee and Pappalardo 1991; Ippolito and Mathios 1989). In other words, consumers are often only getting "one side of the story" through interpretive icons - and often that story is the one that food marketers *want* to tell. In fact, it is for this very reason (among others) that the previously mentioned Smart Choices icon was discontinued as the industry program (Neuman 2009; Ruiz 2009).

Other nutrition research has shown that FOP health claims create halo effects (Nesbett and Wilson 1977) that extend to other product attributes (Roe, Levy, and Derby 1999). They have also been shown to exist in nutrition-related advertising (Andrews, Netemeyer, and Burton 1998; Andrews, Netemeyer, and Burton 2009). Additionally, it has been shown that consumers

significantly reduce their use of other package information – or dismiss that information all together – in the presence of nutrient and health claims (Roe, Levy, and Derby 1999). So when consumers process an unfamiliar FOP interpretive icon, it is plausible that they may become suspicious or dismissive of the surrounding FOP information due to halo effects. However, despite what effects a FOP interpretive icon may have on the surrounding FOP information, the actual health message, itself, that is conveyed can have a very positive impact on consumers and should not be underestimated. Existing research on FOP nutrition symbols and icons has shown that that their presence positively impacts the perceived healthfulness of a product (e.g., Urala, Arvola, and Lahteenmaki 2003; Andrews, Burton, and Kees 2011) In fact, health claims have been shown to have significant favorable effects on perceptions of product healthfulness – even in the face of contradictory nutrition information (Ford et al. 1996). Therefore, I predict that:

H1a: The presence (absence) of a FOP interpretive icon will result in higher (lower) levels of perceived product healthfulness.

H1b: The presence (absence) of a FOP interpretive icon will result in lower (higher) levels of perceived trustworthiness of FOP information.

Other research has shown that the more familiar consumers are with a stimulus, the more positive their attitudes are towards it (e.g., Anand and Sternthal 1991; Bornstein 1989; Seamon et al. 1995; Zajonc 1968). Complementary research conducted on the mere exposure effect supports this notion (e.g., Zajonc 1968). Specifically, within the context of nutrition labeling, prior research has shown that preferences for different nutrition labeling systems vary by country, and that those preferences are possibly explained by the notion that consumers in different countries are more familiar with certain systems than others (Van Kleef et al. 2007).

Prior research has indeed shown that consumers are more able to process familiar nutrition information than unfamiliar information (Moorman 1990). Therefore, due to halo effects (Nesbett and Wilson 1977), it is possible that the surrounding FOP information of a product with a reductive icon such as the Nutrition Key (which draws exclusively from the commonly used federally mandated Nutrition Facts panel on the back of the package) would be perceived as more trustworthy than that of a product without a FOP disclosure - especially since consumers rely heavily on source credibility cues when a message is quantitative in nature (Pornpitakpan 2006). These surrounding FOP extrinsic and package design attributes – such as color contrasts, font size and type, shapes, background themes, actual product pictures, and brand or company logos - have been shown to play key roles in healthcare marketers' attempts to attract consumers' attention, provide aesthetic value, create points of differentiation and competition, and ultimately affect consumers' product preference formation (Kauppinen-Raisanen 2010).

Additionally, retailers may also benefit from positive halo effects (Nesbett and Wilson 1977) originating from the presence of a FOP reductive icon on a product it carries, thereby being perceived as more benevolent and sensitive to some consumers' desires to make healthier decisions with factual, easily processed nutrition information. For example, it has been shown that when faced with attribute trade-offs, reference points help to confirm decisions (Luce, Payne, and Bettman 1999). Consumers have been shown to prefer specific levels of nutrients over adjectival descriptors (Scammon 1977), to use specific nutrient levels – especially negative nutrients – to significantly shape their food purchasing decisions (Russo et al. 1986), and to search significantly more for unhealthy products than healthy products (Moorman 1990). Since information such as this can provide greater value to the recipient if it is perceived as originating from a trustworthy source (Moorman, Deshpande, and Zaltman 1993), and halo effects stemming

from health and nutrient claims have been shown to exist (Roe, Levy, and Derby 1999; Andrews, Netemeyer, and Burton 1998), an opportunity exists for retailers to enhance their image and reputation among consumers. Andrews, Burton, and Kees (2011) elaborate on these suppositions by stating, "Interestingly, it may actually be possible for a manufacturer to boost their credibility with consumers by providing both positive and negative attributes, similar to effects found with the use of two-sided claims in advertising" (pg. 25).

These positive halo effects might emerge at the cost of negative halo effects, however. The addition of a FOP reductive icon indeed adds to the "rapidly evolving canvas of symbols and rating systems" commonly found on food products today (Panda 2008, pg. 1), otherwise referred to as "clutter". Consumers often evaluate a product on the basis of the subjective feelings of ease or difficulty that they experience at the time they read information about it (Schwarz 2004), so the addition of a FOP reductive icon will likely increase that processing difficulty compared to when there is not such a disclosure present. Said more simply, the addition of yet *another* disclosure for consumers to process will likely result in lower fluency of FOP information, but the nature of the disclosure, itself, should provide credibility to the FOP information, as well as to the retailer that chose to include the product with the voluntary disclosure in its product mix. Therefore, I predict that:

> **H2a:** The presence (absence) of a FOP reductive icon will result in higher (lower) levels of: a) perceived trustworthiness of FOP information, and b) perceived retailer benevolence.
>
> **H2b:** The presence (absence) of a FOP reductive icon will result in lower (higher) levels of perceived processing fluency of FOP information

Effects Related to Perceived FOP Processing Fluency and Trustworthiness

Perhaps a more conceptually interesting question is the relative effect of additional descriptive FOP nutrition information (i.e., an interpretive icon) in moderating more precise FOP nutrition information (i.e., a reductive icon) on the processing fluency of any surrounding FOP information. As previously mentioned, prior research shows that more positive (negative) affect is elicited when there is higher (lower) perceived processing fluency (Winkielman and Cacioppo 2001; Schwarz 2004; Winkielman et al. 2003). For example, if consumers are better able to process product information that is easy to read (Novemsky et al. 2007), they will consequently have more favorable evaluations of those products (e.g., Schwarz 2004: Labroo and Lee 2006). Additionally, contrast and assimilation effects have been shown to occur regarding processing fluency; that is, feelings toward processing fluency can transfer from one experience to the next or from one product to the other (Shen, Jiang, and Adaval 2010). For example, prior research has shown that as the perceived fluency of information in a magazine article increased (i.e., the font became easier to read), respondents were increasingly likely to have more favorable judgments of a product in a subsequent, related print advertisement because they were treated as part of the same experience (Shen, Jiang, and Adaval 2010). In other words, when these experiences are temporally and thematically related, they are often stored in the mind of consumers as a single, representative fluency experience (Johnson-Laird 1980; Wyer and Radvansky 1999; Shen, Jiang, and Adaval 2010).

Therefore, in the case of FOP nutrition labeling, if the nutrition information is disclosed in a manner that makes it easier for consumers to process, the surrounding FOP information – such as color contrasts, logo complexity, font size and type, or adjective descriptors – may be perceived as easier to process through assimilation effects. Similarly, if the FOP nutrition

information is deemed as difficult to process, the surrounding FOP information can consequently be perceived as more difficult to process. These suppositions are particularly strengthened when one is reminded that all the FOP information is thematically related (i.e., about the same product and on the same package), and therefore a part of the same single processing fluency experience (Shen, Jiang, and Adaval 2010). Furthermore, it has been suggested that a key to processing differences between different types of information may lie in how readily the information conveys meaning (Viswanathan and Childers 1996; Viswanathan and Hastak 2002). For example, Viswanathan (1994) argued that information such as "150 calories" does not convey enough meaning by itself and must be compared with other information to provide context and facilitate accurate interpretation by consumers. These arguments suggest that FOP nutrition information would be most fluent when two complementary sources (i.e., both the reductive icon and the interpretive icon) are provided, as opposed to just the reductive icon (which was hypothesized earlier to decrease fluency when used independently). Therefore, I predict that:

> **H3:** The presence of a FOP interpretive icon moderates the effect of a FOP reductive icon on the perceived fluency of surrounding FOP information. When the interpretive icon is present (absent), the perceived fluency for packages containing a reductive icon is higher (lower).

As hypothesized earlier, the presence of detailed, scientific nutrition information in the form of a reductive icon (one that summarizes information directly from the federally mandated Nutrition Facts panel) will likely increase the perceived trustworthiness of surrounding FOP information. Prior research has indicated that there is a significant, positive relationship between fluency and trust; that is, as stimuli is perceived to be more fluent, consumers invest more trust into the message put forth by the stimuli (Hansen, Dechene, and Wanke 2008; Reber and

Schwarz 1999; Tsai and McGill 2011) and have more confidence in their decisions (Werth and Strack 2003) – especially when that information is perceived as coming from a previously established expert source (Davies and Wright 1994). For example, consumers put more credence into Nutrition Facts information than other FOP nutrition information such as health claims (Garretson and Burton 2000), possibly because source credibility is considered more heavily by recipients when a message is quantitative in nature (Pornpitakpan 2006). Furthermore, consumers tend to ignore implied FOP health information altogether when more diagnostic FOP nutrition information is available (Ford et al. 1996; Mitra et al. 1999). However, when implied health information such as an interpretive icon is coupled with additional, confirmatory information in the form of a reductive icon, perceived trustworthiness will likely increase when compared to a situation in which an interpretive icon is used independently. Therefore, I predict that:

> **H4:** The presence of a FOP reductive icon moderates the effect of a FOP interpretive icon on the perceived trustworthiness of surrounding FOP information. When the FOP reductive icon is present (absent), the perceived trustworthiness for packages containing an integrative summary disclosure is higher (lower).

Effects of Consumer Skepticism Toward FOP Labeling

Despite which FOP nutrition labeling systems manufacturers and retailers choose to use on their food products, consumers often have implicit theories or beliefs about marketers' persuasion activities – a phenomenon that is referred to as *schemer schema* (Bousch, Friestad, and Rose 1994; Friestad and Wright 1994; Wright 1986). More specifically, prior research has shown that consumers generally believe that FOP claims are merely marketing attempts by

manufacturers to sell more of its products and are unaware of government regulations that postulate when claims can be made (Levy 1995). In fact, a *Washington Post* poll found that only 3% of U.S. consumers believe that manufacturers never make misleading health claims about their products, while 1/3 of consumers believe they make them "a lot" (Sugarman and Morin 1992).

These high levels of consumer skepticism toward nutrition and health claims have lead many consumers to view them as persuasion attempts (Szykman, Bloom, and Levy 1997), and consequently substantially discount or even ignore the claims altogether (Friestad and Wright 1994; Garretson and Burton 2000). However, when there are no alternate sources of information available, consumers may simply use the nutrition information that is presented to them to make decisions – even if they are skeptical of it (Szykman, Bloom, and Levy 1997). A number of factors such as font manipulations (Hansen, Dechene, and Wanke 2008) and color contrasts (Reber and Schwarz 1999) can affect how skeptical consumers are of a product's information due to its perceived fluency (or lack thereof).

Retailers carrying food products are not immune from the halo effects of consumer skepticism; simply the name of a retailer has been shown to have effects on consumers' perceptions of quality and value, as well as willingness to purchase products from the retailer (Dodds, Monroe, and Grewal 1991). The food product mixes and assortments that retailers choose to carry – and how they choose to present those products to the consumer - have also been shown to affect consumer perceptions and store choices (Broniarczyk, Hoyer, and McAlister 1998; Morales et al. 2004). For example, product labels of more popular food brands are more likely to be actively processed than those of less popular food brands due to perceived

message credibility, thereby creating additional value for consumers, and thus another point of marketplace competition (Davies and Wright 1994).

Additionally, the manner in which retailers choose to communicate health messages about those products has been shown to be of substantial importance. Critics have often expressed concerns that the food companies with larger marketing budgets can more easily promote the health attributes of their products than companies with fewer resources can – even if the foods promoted by smaller companies have similar or even better nutrients (Tufts University Health and Nutrition Letter 2001) - thereby contributing to related arguments that many health communications are "designed to deceive" (Liebman 1999). Additionally, it has been shown that the same information - obtained from different sources – may be perceived differently depending upon the perceived trustworthiness of the source (Festinger 1957; Schul and Mayo 1999), suggesting that consumers could process identical messages via FOP labeling differently depending upon their levels of skepticism toward the source. Knowing that food marketers' reputations can be considerably harmed if the health communication messages about their products cannot be substantiated or are perceived as questionable (Kozup, Creyer, and Burton 2003), I predict that:

H5: Consumers with low (high) skepticism toward FOP labeling will have: a) higher (lower) perceptions of general FOP information trustworthiness, b) higher (lower) perceptions of product healthfulness, c) higher (lower) product purchase intentions, d) higher (lower) perceptions of retailer trustworthiness, e) higher (lower) perceptions of retailer benevolence, and f) more positive (negative) general attitudes toward retailers.

Furthermore, consumer skepticism toward FOP labeling in general may moderate the effect of the presence of an FOP reductive icon on perceived retailer trustworthiness. Prior research has questioned the ethicality of retailers' attempts to increase sales by manipulating the presentation of their products (e.g., using a likeable endorser or providing flashy packaging) and the manner in which they are displayed (e.g., providing pleasant background music or superior lighting) without adding any additional real value to the consumer (Simonson 1999). However, consumers have been shown to employ coping behaviors to deal with marketers' tactics when they believe that a persuasion attempt is being communicated to them (Friestad and Wright 1994; Keller et al. 1997), and as previously mentioned, that skepticism may lead consumers to discount or completely ignore the marketing message all together (Friestad and Wright 1994). Consumers may also use source effects as a cue to the validity of the information (Davies and Wright 1994; Petty and Cacioppo 1986) and see retailers and the products they carry as (un)trustworthy sources of nutritional information. Indeed, prior research has shown that while FOP nutrition information, itself, may be seen as credible, there can be mixed feelings of the trustworthiness of the authority providing the logo (Vyth et al. 2009) – especially when the provider competes in the relevant industry as opposed to being an independent source such as a scientist, health professional, or consumer organization (van Dillen et al. 2004; Worsley 1989). Therefore, I predict that:

> **H6:** Consumer skepticism toward FOP labeling moderates the effect of the presence of a FOP multi-nutrient quantitative measure on perceived retailer trustworthiness. For consumers with high skepticism toward FOP labeling, there will be little effect of the presence of a FOP reductive icon on perceived retailer trustworthiness. For consumers with low skepticism toward FOP labeling, perceived retailer trustworthiness will be

higher when the FOP multi-nutrient quantitative measure is present than when it is absent.

METHODOLOGY

Pilot Test

Design, Sample, and Procedure

The study utilized a 2 (FOP reductive icon present vs. absent) X 2 (FOP interpretive icon present vs. absent) between-subjects design. These manipulations were on the front of a mock frozen pizza package and were shown to a convenience sample of 140 students from a southeastern university. Each respondent was randomly assigned to one of the four conditions and completed a pencil and paper survey for extra course credit.

The main purpose of this pilot study was to assess consumers' opinions about the perceived fluency of both the reductive icon and the interpretive icon. Perceived processing fluency was assessed through four seven-point bipolar adjective scales (higher scores indicate higher fluency). The endpoints were "very hard to understand/very easy to understand", "very hard to interpret/very easy to interpret", "very hard to process/very easy to process", and "very hard to comprehend/very easy to comprehend" (i.e., "The nutrition information provided on the front of the package was :"). The Cronbach's alpha reliability estimates for the reductive icon and interpretive icon constructs were .96 and .95, respectively. For subjects in the condition in which both the reductive icon and the interpretive icons were present, means for perceived processing fluency of the reductive icon were significantly higher (M=5.86) than for the interpretive icon (M= 5.62) ($p < .01$) indicating that the reductive icon was easier to comprehend than the interpretive icon.

Study 1

Design, Sample, and Procedure

The 363 participants in this national study came from an online survey administered through Amazon Turk (www.mturk.com). Amazon Turk allows for screeners on participation and several were used to ensure that participants were all located in the U.S. and that their prior participation on the site had at least received a 95% average approval rating from those administering previous online tasks to them. Approximately 45% of this sample had at least some college education, the median household income was less than $30,000, approximately 60% (40%) were females (males), and nearly 3/4 (74.1%) of respondents claimed to be the primary shopper in their household. Subject's ages ranged from 18 to 81. Each of the respondents received only one randomly assigned version of the frozen pizza package stimuli and ensuing relevant questions (as previously discussed).

Frozen pizza was chosen for this study in order to be consistent with prior health marketing research that used a nutritionally mixed (moderate) product (e.g., Andrews, Burton, and Kees 2011). The nutrition levels provided to respondents were taken from exactly from a national brand cheese pizza (Tony's Cheese Pizza) commonly found in many retail grocery outlets. Nutrition information was collected and compared from 5 more competing brands with similar cheese pizza offerings to ensure that the nutrition information used was not considerably different from that of a "normal" frozen cheese pizza. All respondents – regardless of condition - were given the option to "flip" the pizza package over to see the entire Nutrition Facts panel on the back of the package before proceeding to answer any specific questions. Certain specific nutrient information was taken directly from this panel and put on the reductive icon that was made available to respondents in the appropriate conditions.

Subjects participated in an online survey using Qualtrics software. They were told that the study pertained to different nutrition labeling systems of frozen pizzas. All respondents were initially shown stimuli that displayed the front of a frozen pizza package, and then were given specific information about the pizza depending on which condition they were randomly assigned to. The stimuli were identical in nearly every aspect: a cheese pizza package with a red banner going across the top of the package that read "Pizza", a label directly underneath that read "Hand Tossed Style Pizzeria Crust", a label at the top that read "Old World Family Recipes", a picture of a cooked cheese pizza in the background with a slice being extracted in the foreground, and a faint image of a red-roofed village on the top corner of the package (see Appendix). The only differences were the manipulation of a reductive icon and the manipulation of an interpretive icon. For subjects in conditions with the reductive icon on the pizza package, an explanation of the disclosure was given (i.e., "This information is taken from the federally mandated Nutrition Facts panel found on the back of the package. It contains information regarding the levels of calories, saturated fat, sodium, and sugar found in the product").

Similarly, for subjects in conditions with the interpretive icon, an explanation of the disclosure was given – although the information was not as precise (i.e., "In order to help consumers more quickly and easily identify healthy food options while grocery shopping, a group of leading food retailers and manufacturers have created the 'Healthy Selection Seal'. A packaged food product is eligible for the Seal if it meets certain nutritional standards. More specifically, if a product has low levels of saturated and *Trans* fat, sodium, and added sugar then it will receive a 'Healthy Selection Seal'. If a product does not meet all the guidelines for saturated and *Trans* fat, sodium, and added sugar then it will not be eligible for the Seal"). It should be noted, however, that the specific quantitative qualifications were not released to

respondents, as most disclosures of this nature are only available to consumers if they proactively seek them out (i.e., search on a company's website). For the condition with both nutrition disclosures, both descriptive statements were provided, while the condition with no nutrition disclosures did not include any descriptive statements. Subjects were asked to carefully read all the information provided to them and to study the pizza package before proceeding to specific questions about the stimuli (to help ensure that respondents carefully considered all the information, a timer was embedded into the survey so that the respondents could not continue to the next page until a certain time period had elapsed).

Consistent with prior nutrition research (Garretson and Burton 2000), a funneling approach was used for question ordering in which more broad questions (e.g., purchase intentions and attitudes) were asked first followed by more specific questions (e.g., processing fluency, trust in FOP labeling, nutrition concern). Groups of questions were presented in different sections of the survey, and respondents were not allowed to go back and change any of their previous answers.

Dependent Measures

A manipulation check was conducted to ensure the effectiveness of the manipulation of the FOP multi-nutrient quantitative and interpretive icons. Respondents were asked "Did you see a 'Healthy Selection Seal' on the front of the package of the food item shown?" to assess awareness of the FOP interpretive icon. Respondents were also asked "Did you see a 'Front of Package Nutrition Label' on the front of the package of the food item shown?" to assess awareness of the FOP reductive icon. The available responses for both questions were "yes" or "no".

All dependent measures were measured so that higher values indicate more favorable responses. Attitudinal, intent, and perception variables were used to assess the predictions made in the study hypotheses. Dependent measures specifically regarding the retailer providing the pizza were each assessed through three seven-point bipolar adjective scales. Endpoints for attitudes toward the retailer (Kozup, Creyer, and Burton 2003) were "unfavorable/favorable", "bad/good", and "negative/positive" (i.e., "Based on the information provided, my overall attitude toward the retailer providing this product is:"). The Cronbach's alpha reliability estimate for this scale was .98. Endpoints for perceived retailer trustworthiness (Kozup, Creyer and Burton 2003) were "not dependable/dependable", "untrustworthy/trustworthy", and "dishonest/honest" (i.e., "Based on the information provided, I believe the retailer providing this product is:"). The Cronbach's alpha reliability estimate for this scale was .97. Endpoints for perceived retailer benevolence were "strongly disagree/strongly agree", "not at all/very much so", and "not probable/very probable" (i.e., "Based on the information provided, I believe that the retailer providing this product has my best interests at heart."). The Cronbach's alpha reliability estimate for this scale was .98.

Product purchase intentions (modified from Howlett, Burton, and Kozup 2008) were also assessed through three seven-point bipolar adjective scales. Endpoints for purchase intentions were "very unlikely/very likely", "not probable/very probable", and "definitely would not/definitely would" (i.e., "Assuming you were interested in purchasing this type of food, how likely are you to buy this specific item given the information shown on the package?"). The Cronbach's alpha reliability estimate for this scale was .97. Perceived product healthfulness (modified from Garretson and Burton 2000) was assessed through two seven-point bipolar adjective scales. Endpoints for product healthfulness were "not at all nutritious/highly nutritious"

and "very unhealthy/very healthy" (i.e., "Please consider the nutrition level of the food product shown. Do you believe that the food product is:"). The Pearson's correlation estimate for this scale was .81 ($p < .01$).

The perceived processing fluency of general FOP information (modified from Lee and Aaker 2004) was assessed through four seven-point bipolar adjective scales. Endpoints were "very hard to understand/very easy to understand", "very hard to interpret/very easy to interpret", "very hard to process/very easy to process", and "very hard to comprehend/very easy to comprehend" (i.e., "In general, the information presented on the front of the package is:"). The Cronbach's alpha reliability estimate for this scale was .94. Additionally, the perceived trustworthiness of general FOP information (modified from Kozup, Creyer, and Burton 2003) was assessed through five seven-point bipolar adjective scales. Endpoints were "not at all dependable/highly dependable", "not at all credible/highly credible", "not at all trustworthy/highly trustworthy", "not at all accurate/highly accurate", "dishonest/honest" (i.e., "In general, the information shown on the front of the package is:"). The Cronbach's alpha reliability estimate for this scale was .96.

Lastly, skepticism toward FOP labeling was assessed through four seven-point bipolar adjective scales that were modified from Obermiller and Spangenberg's (1998) skepticism toward advertising scale. Endpoints were "strongly disagree/strongly agree" (i.e., "I can depend on getting the truth from most front of package product labeling", "Front of package product labeling's aim is to inform the consumer", "Front of package product labeling is generally truthful", and "Front of package product labeling is a reliable source of information about the quality and performance of products"). The Cronbach's alpha reliability estimate for this scale was .92. Consistent with prior nutrition research (e.g., Andrews, Netemeyer, and Burton 2009;

Andrews, Burton, and Kees 2011), a median split was conducted in order to categorize respondents into two groups. This measure was recoded and then as an independent variable in subsequent analyses. The lower skepticism condition (n=184) and higher skepticism conditions (n=179) were well balanced. Correlations between all dependent variables ranged from .12 to .79. For an overview of all measures used in Study 1, please refer to Appendix B.

RESULTS

The objectives of this study focused on the effects of a FOP reductive icon on perceived product healthfulness (H1a) and perceived trustworthiness of FOP information (H1b), as well as the effects of a FOP interpretive icon on perceived trustworthiness of FOP information and perceived retailer benevolence (H2a) and perceived processing fluency of FOP information (H2b). Additionally, the moderating influence of a FOP interpretive icon on the perceived fluency of surrounding FOP information (H3), and the moderating influence of a FOP multi-nutrient disclosure on the trustworthiness of surrounding FOP information (H4) were hypothesized.

Furthermore, the effects of consumer skepticism toward FOP labeling on perceived product healthfulness, product purchase intentions, general FOP trustworthiness, perceived retailer trustworthiness and benevolence, and general attitudes toward retailers (H5). Lastly, the moderating influence of consumer skepticism on perceived retailer trustworthiness was hypothesized (H6). See Table 1 and Table 2 for an overview regarding how the dependent measures were influenced by a FOP reductive icon, a FOP interpretive icon, and consumer skepticism toward FOP labeling, as well as their interactions (higher values indicate more favorable results for all measures). The next section will discuss these results in detail.

Manipulation Check

Crosstab results from the manipulation check indicated that when the FOP reductive icon was present, 97% of respondents reported seeing it; when it was not present, 92% of respondents reported not seeing it (χ^2= 284.46; $p < .001$). Similarly, when the FOP interpretive icon was present, 91% of respondents reported seeing it; when it was not present, 91% of respondents reported not seeing it (χ^2= 239.74; $p < .001$). This pattern of findings indicates satisfactorily high levels of awareness of the FOP nutrition disclosure format manipulations.

Effects of FOP Nutrition Disclosure Formats

Consistent with H1a, the multivariate results indicated a significant main effect of a FOP interpretive icon on perceived product healthfulness, (F (1,355) = 24.29, $p < .001$), suggesting that the pizza was perceived as healthier when the interpretive icon was present (M=3.98) than when it was absent (M=3.39). Consistent with H1b, the significant main effect of a FOP interpretive icon on perceived trustworthiness of FOP information, (F (1,355) = 8.28, $p < .01$), indicated that trust was higher when the interpretive icon was absent (M=5.04) than when it was present (M=4.67).

Consistent with H2a, the multivariate results indicated a significant main effect of a FOP reductive icon on perceived trustworthiness of FOP information, as well as perceived fluency of FOP information The significant main effect for perceived trustworthiness of FOP information, (F (1,355) = 28.13, $p < .001$), indicated that trust was higher when the reductive icon was present (M=5.19) than when it was absent (M=4.51). The significant main effect for perceived processing fluency of FOP information, (F (1,355) = 9.22, $p < .01$), indicated that fluency was higher when the reductive icon was absent (M=6.28) than when it was present (M=5.92).

Consistent with H2b, the multivariate results indicated a significant main effect of a FOP reductive icon on perceived retailer benevolence, ($F(1,355) = 5.77$, $p < .05$), suggesting that benevolence was perceived to be higher when the reductive icon was present (M=4.0) than when it was absent (M=3.67).

Moderating Effects of a FOP reductive icon and a FOP Interpretive icon

Consistent with H3, the FOP reductive icon X FOP interpretive icon interaction was significant for perceived fluency of surrounding FOP information, ($F(1,355) = 9.53$, $p < .01$). The plot of means can be found in Figure 2. In the control condition, perceived fluency was at its highest (M=6.52). However, when a reductive icon was added in isolation, fluency dropped significantly (M=5.82) ($F(1,355) = 18.12$, $p < .001$). In contrast, when the interpretive icon was added in isolation to the control, there was also a significant decrease in fluency (M=6.03) ($F(1,355) = 8.67$, $p < .01$), but it was less of a decrease than when the reductive icon was added. However, despite the increase in complexity of the FOP information environment when both disclosures were included, fluency was higher when both disclosures were present (M=6.04) than when just the reductive icon (M=5.82) was present.

Consistent with H4, the FOP interpretive icon X FOP reductive icon interaction was significant for perceived trustworthiness of surrounding FOP information, ($F(1,355) = 11.41$, $p < .01$). The plot of means can be found in Figure 3. In the control condition, trustworthiness was moderately high (M=4.91). However, when the interpretive icon was added in isolation, trustworthiness significantly decreased to its lowest point (M=4.11) ($F(1,355) = 20.84$, $p < .001$). In contrast, when the interpretive icon was presented in conjunction with the reductive icon,

trustworthiness increased significantly from its lowest point (M=4.11) to its highest point (M=5.22) (F(1,355) = 40.06, $p < .001$).

Effects of Consumer Skepticism Toward FOP Labeling

Consistent with H5, the multivariate results indicate a significant main effect of consumer skepticism toward FOP labeling on: perceived product healthfulness, product purchase intentions, perceived trustworthiness of FOP information, perceived retailer benevolence, perceived retailer trustworthiness, and general attitudes toward retailers. The significant main effect for perceived product healthfulness, (F (1,355) = 18.91, $p < .001$), suggested that the product was perceived as healthier when consumers were less skeptical (M=3.94) than more skeptical (M=3.42) of FOP labeling. The significant main effect for product purchase intentions, (F (1,355) = 7.44, $p < .01$), suggested that the intentions were higher when consumers were less skeptical (M=4.52) than more skeptical (M=4.09) of FOP labeling. Additionally, the significant main effect for perceived trustworthiness of FOP information, (F (1,355) = 49.43, $p < .001$), suggested that trust was higher when consumers were less skeptical (M=5.30) than more skeptical (M=4.40) of FOP labeling.

The significant main effect for perceived retailer trustworthiness, (F (1,355) = 53.20, $p < .001$), suggested that the retailer was perceived as more trustworthy when consumers were less skeptical (M=5.16) than more skeptical (M=4.35) of FOP labeling. The significant main effect for perceived retailer benevolence, (F (1,355) = 48.52, $p < .001$), suggested that the retailer was perceived to be more benevolent when consumers were less skeptical (M=4.32) than more skeptical (M=3.35) of FOP labeling. Lastly, the significant main effect for general attitudes

toward retailers, ($F(1,355) = 35.43$, $p < .001$), suggested that attitudes were more favorable when consumers were less skeptical (M=5.09) than more skeptical (M=4.38) of FOP labeling.

Lastly, consistent with H6, the FOP reductive icon X consumer skepticism toward FOP labeling interaction was significant for perceived trustworthiness of the retailer, ($F(1,355) = 4.74$, $p < .05$). The plot of means can be found in Figure 4. For consumers with high skepticism toward FOP labeling, there was very little difference in the perceived trustworthiness of the retailer when the reductive icon was present (M=4.30) or absent (M=4.40). However, for consumers with low skepticism, the perceived trustworthiness of the retailer was higher in the presence of the reductive icon (M=5.34) than in its absence (M=4.98). Follow-up univariate analyses to test for differences within the low and high skepticism groups revealed no significant effect of the reductive icon's presence on retailer trustworthiness among highly skeptical respondents, ($F(1,355) = .430$, $p > .10$). However, among the respondents with low skepticism toward FOP labeling, there was a significant effect of the multi-nutrient disclosure's presence, ($F(1,355) = 5.46$, $p < .05$), suggesting that the perceived trustworthiness of the retailer increased significantly when the reductive icon was present rather than absent.

DISCUSSION

The primary purpose of this research was to assess consumer reactions to alternative FOP nutrition labeling systems. Specifically, this study examined differences in perceived nutrition information fluency and trustworthiness, product healthfulness perceptions and purchase intentions, and a number of retailer attributes related to the presentation of FOP nutrition information via an integrative symbol or a more precise format in the form of a quantitative Nutrition Key. Additionally, the effects of consumer skepticism toward FOP labeling on many

of those same variables were examined. Another objective included analyzing the moderating roles of said consumer skepticism and a reductive icon. Given the dramatic increases in obesity rates and other health-related diseases in the U.S. (CDC 2010), research in this area is both timely and increasingly important for marketers, public policy makers, and consumer welfare advocates as evidenced by the FDA's recent call for consumer research on FOP symbols (*Federal Register* 2010). Additionally, understanding the effects of package and labeling fluency on consumers is becoming increasingly important for manufacturers and retailers, as well. A discussion of the results of these objectives and their implications follows below.

Main Effects of FOP Interpretive icons and Reductive icons

Consistent with prior research (e.g., Andrews, Burton, and Kees 2011; Viswanathan and Hastak 2002), respondents made inferences about a product's healthfulness based on the presence or absence of FOP nutrition summary information. More specifically, the presence of the summary symbol elicited higher perceptions of the pizza's healthfulness compared to when it was absent despite the respondents not knowing the exact qualifications needed to be met in order to qualify for the symbol. This finding confirms previous research on the positive effect of interpretive icons on a product's overall healthfulness (e.g., Urala, Arvola, and Lahteenmaki 2003).

While the positive influence of the presence of an interpretive icon may not be surprising, it is worth noting that this effect occurred even when the presence of the symbol was found to significantly decrease the perceived trustworthiness of the surrounding FOP information (in comparison to when the symbol was not present on the package). That is, while respondents trusted the implied health message of the symbol, itself, they were wearier of any surrounding

FOP information when it was on the package than when it was not. While prior research has shown that consumers make trade-offs between FOP information and back-of-package (BOP) information regarding which source to put more credence in and ultimately utilize for their food product evaluations (Ford et al. 1996; Mitra et al. 1999), this finding suggests that consumers also make trade-offs regarding what FOP sources of information to trust and use. For example, they may base their product healthfulness evaluations more heavily on the FOP symbol than on whether or not the pizza looks healthy in the provided picture on the FOP.

The presence of a reductive icon, on the other hand, actually increased the perceived trustworthiness of the surrounding FOP information (compared to when it was absent). Despite prior research indicating positive, significant relationships between perceived trustworthiness and processing fluency (Reber and Schwarz 1999; Hansen, Dechene, and Wanke 2008), the surrounding information was perceived to be more difficult to process when the multi-nutrient disclosure was present than when it was not. This may be simply because the reductive icon – despite its credibility - was yet just another source of information to process and added to the FOP "clutter" that the FDA deems as so problematic (Layton 2011). Despite this drawback, respondents still evaluated the retailer providing the product as more benevolent when the Nutrition Key was present than when it was absent. This may stem from consumers' increasing demand for transparency from retailers (Baird 2010), and a belief that retailers that carry products from companies that are more forthcoming about the exact nutrition levels of the products they manufacture are more likely to have the consumers' well-being at heart. Indeed, as more information about where our food comes from and its nutritional value has become available to both retailer buyers and consumers, food retailers are increasingly playing a "gatekeeper" role in terms of what foods are available to consumers at the retail shelf (Newman

and Kopp, 2009). In that aspect, the manner in which retailers choose to present relevant information about food products to their customers significantly influences those customers' perceptions of them.

Moderating Influences of FOP Interpretive icons and Reductive icons

The results indicated that the presence of a FOP interpretive icon moderated the effect of a FOP reductive icon on the perceived fluency of surrounding FOP information. Specifically, when the interpretive icon was present, the perceived fluency for packages containing a reductive icon was higher than when the interpretive icon was unavailable. Said differently, fluency was lower when the reductive icon was presented independently than when it was presented in unison with an interpretive icon. This finding suggests that the summary symbol helped respondents to interpret and/or confirm the precise, quantitative nutrient information provided by the Nutrition Key. These results refute prior findings which indicate that nutrition information and implied health information affect consumer beliefs independently (Ford et al. 1996), suggesting that multiple sources of FOP information can communicate health messages in an effective, complementary fashion.

The results of this study also indicated that the presence of a FOP reductive icon moderated the effect of a FOP interpretive icon on the perceived trustworthiness of surrounding FOP information. Specifically, when the FOP reductive icon was present, the perceived trustworthiness for packages containing an FOP interpretive icon was higher than when the reductive icon was unavailable. Said differently, trustworthiness was lower when the interpretive icon was presented independently on the FOP; but when coupled with a reductive icon, trustworthiness significantly increased. Furthermore, trustworthiness was higher when both

disclosures were used than when neither was. These results support prior nutrition research that has shown that consumers have higher trust in information originating from the Nutrition Facts panel than in information stemming from implied health claims (Levy 1995; Garretson and Burton 2000), and rely more heavily on that information than information from implied health claims when both are simultaneously available (Mitra et al. 1999).

Overall, the results of these interactions indicated that both perceived fluency and trustworthiness of FOP information were higher when both nutrition disclosure formats were used than when either was used independently. The advantages and implications of using both approaches in a complementary fashion will be discussed later in more detail.

Consumer Skepticism Toward FOP Labeling

The results indicated that those respondents with lower skepticism toward FOP labeling had higher perceptions of retailer trustworthiness and benevolence, as well as more positive attitudes toward retailers than those with higher skepticism. Additionally, those with lower skepticism also had higher perceptions of FOP information trustworthiness, higher perceptions of product healthfulness, and higher product purchase intentions. These results confirm previous findings that suggest that the provision of additional nutrition information (such as the Nutrition Facts panel) aids in consumer acquisition and comprehension of nutrition information, with less skeptical consumers acquiring and using that information more as it becomes more readily available to them (Moorman 1996). These findings are also consistent with prior research that has shown that the products retailers carry affect their reputations (Broniarczyk, Hoyer, and McAlister 1998; Morales et al. 2004).

Moderating Influence of Consumer Skepticism Toward FOP Labeling

The results indicated that the presence or absence of the disclosure had little effect on perceived retailer trustworthiness among respondents with high skepticism toward FOP labeling. However, for respondents with low skepticism, a retailer was perceived to be significantly more trustworthy when a reductive icon was present (rather than absent) on a product it carried. These results suggest that halo effects from a retailer's product assortment exist and affect perceptions of that retailer among certain segments of consumers, supporting prior research that has shown that the food product mixes and assortments that retailers choose to carry affects consumer perceptions (Broniarczyk, Hoyer, and McAlister 1998; Morales et al. 2004). These results also support prior research that found that sources that are perceived to be highly credible are more persuasive than sources perceived to be low in credibility (e.g., Horai, Naccari, and Fatoullah 1974; Hoyland and Weiss 1951), and that the same information - obtained from different sources – may be perceived differently depending upon the perceived trustworthiness of the source (Festinger 1957; Schul and Mayo 1999).

GENERAL DISCUSSION

Overall, this research supports previously held suppositions that different types of nutrition information provision may be needed to produce the greatest effect in fighting obesity and other consumption-related diseases (Wansink 2005; Andrews, Netemeyer, and Burton 2009). Prior research has indicated that a FOP symbol - in addition to the traditional BOP nutrition information - may be more effective in helping consumers make healthy choices than BOP nutrition information alone (Geiger et al. 1991; Scott and Worsely 1994; Feunekes 2008). However, the findings of this research suggest that transferring the BOP nutrition information to the FOP in a concise format and coupling it with a FOP summary symbol is an even more

effective presentation of nutrition information if manufacturers, retailers, or policy makers choose to provide FOP nutritional labeling to the general public.

Viswanathan and Hastak (2002) suggested that adding some sort of benchmark could help consumers put nutritional information into context, especially since numerical information often only derives its meaning from direct comparisons to other sources of information and does not have any meaning by itself (Venkatesan, Lancaster, and Kendall 1986). For example, Viswanathan (1994) argued that information such as "150 calories" or "11 grams of sugar" does not convey enough meaning by itself and must be compared with other information to provide context and facilitate accurate interpretation by consumers. These arguments suggest that FOP nutrition information would be most fluent when two complementary sources are provided as opposed to just one or the other. In the case of this research, the presence or absence of a FOP integrative summary icon appears to provide that benchmark when used independently of other FOP nutrition information; however, it seems most effective when coupled with a FOP reductive icon, presumably because it can aid consumers in drawing a more holistic inference about the healthfulness of the product regarding the benefits and consequences arising from the variation in levels of nutrients provided in the quantitative disclosure. It is often difficult for consumers to simultaneously compare the healthfulness of products based on multiple nutrients, and they often simplify that task by picking one or two nutrients (such as fat) to base their comparisons on (Black and Rayner 1992), thereby disregarding other important nutrients in their product evaluations (Food Marketing Institute 1996; Keller et al. 1997). However, if both a FOP integrative summary and reductive icon are available to consumers to assess in a complementary fashion, consumers can then make better evaluations regarding the overall healthfulness of the

product (stemming from the presence or absence of the interpretive icon) in addition to making specific comparisons between products based upon exact levels of individual nutrients.

Additionally, this research indicates that using multiple sources of FOP nutrition information provides consumers with a greater sense of perceived trustworthiness of all FOP information than when using either of the FOP systems independently. Again, these results suggest that positive effects can be obtained by adding additional FOP disclosures – even more so than not having any FOP nutrition information at all. Therefore, other FOP information such as health claims, nutrient claims, or health-related endorsements may be perceived as more credible in the presence of multiple FOP nutrition information disclosures than in the presence of only one disclosure or in their complete absence – an area for future research.

Recent U.S. consumer food shopping data highlights the importance and practicality of this research in regards to consumers' use of multiple sources of FOP nutrition information in the marketplace. A 2007 survey found that two out of every three U.S. consumers check the Nutrition Facts panel when making food purchasing decisions - a significant increase from 2006 (IFIC 2007) . In fact, the Nutrition Facts panel was more commonly used by consumers than a number of other package labels including the size of the product, ingredients used, and brand name. Similarly, a 2008 FDA study reported that of people reading food labels when purchasing a product for the first time, two out of three used those labels to see exactly how high or low a product was in nutrients like vitamins, salt, calories, or fat (FDA 2010) . Because a reductive icon such as the Nutrition Key summarizes 4 of the 6 most widely sought out nutrients from Nutrition Facts Panel (IFIC 2007), it should facilitate the provision that information to consumers in a more accessible fashion on the FOP. Since consumers are becoming more health conscious and are actively seeking out specific levels of individual nutrients, the option to

additionally refer to a FOP interpretive icon such as a Healthier Choice icon should assist with interpreting the levels of those nutrients as they relate to a product's overall healthfulness.

Theoretical Contributions

This research adds to the existing literature in number of ways. Most processing fluency research has focused on the *quality* of stimuli as it relates to fluency (e.g., color, font size, familiarity, etc.). Few studies, however, have focused on the *quantity* of stimuli– especially concerning product package designs. This study focused on the main effects of two different, but related, forms of FOP nutrition disclosures as well as their interactive effects when used simultaneously on a food package. Interestingly, it was determined that the effects of the stimuli were pointedly different when processed independently as compared to when they were processed simultaneously – even though the perceptual features and communications of the stimuli, as well as the product, remained the same.

This research also builds upon Novemsky et al.'s (2007) suggestion for future research on the source of fluency. That is, they deemed it worthwhile to analyze the effects of stimuli when its source was made available to respondents. Within the context of this research, the sources of the FOP disclosures were released (i.e., the reductive icon stemmed directly from the federally mandated Nutrition Facts panel, while the interpretive icon originated from vested industry members such as food retailers and manufacturers). Halo effects from the provision of the FOP disclosures were found when used independently and in conjunction with one another. Specifically, halo effects were found to have an influence on perceived trustworthiness, perceived retailer benevolence, and product healthfulness, to name a few. Thus, these effects can

extend beyond just perceptions of a stimulus, itself, to related stimuli and related providers such as manufacturers and retailers.

Lastly, an influential moderating influence was proposed and tested in this study. It was found that consumer skepticism toward FOP labeling had a main effect on a number of product and retailer-related variables, as well as an interactive effect on perceived retailer trustworthiness. Again, these halo effects were discovered regarding the nature of the FOP nutrition disclosure format. These findings help to better understand the relationship between trust and fluency.

Managerial Implications

Some retailers have more fully recognized the value of FOP nutrition labeling to their customers than others and have already implemented their own FOP interpretive icons for their private label food brands. For example, the largest national supermarket chain in the Netherlands created the "Healthy Choice Clover" for its own brands that can only be found in that chain's stores. Follow-up research found that the symbol positively affected the shopping behavior of consumers shopping at the retailer (Vyth et al. 2009). Consequently, the manner in which retailers choose to display information about the products they carry may soon become a more substantial point of retail competition (Newman and Kopp 2009).

However, the results of this study suggest that there is a segment of U.S. food shoppers that may realize that persuasion attempts are being communicated to them and, consequently, discount or completely ignore the FOP marketing message all together (Friestad and Wright 1994). Knowing that consumers may use source effects as a cue to the validity of the information (Davies and Wright 1994; Petty and Cacioppo 1986), these results suggest that it is

essential for retailers to present products with credible and easily understandable labels to continue to foster goodwill among trusting customers. And while retailers may not be able to "win over" highly skeptical consumers with their product assortments, it is equally important for them to not jeopardize any previously established trust (or to justify any existing mistrust) among those consumers by providing products with information that is *not* easily processed – especially considering that consumers largely shape their shopping behavior based on comparisons of choice sets between competing retailers (Spiggle and Sewall 1987). Furthermore, it is important to consider that if a pervasive group of highly skeptical consumers is going to exist – regardless of the source or provider – a retailer may still be able to gain a competitive advantage *relative* to other retailers by providing products with FOP information that is deemed *more* credible than those that competitors provide. In fact, the key to "winning over" skeptical consumers may simply be transparency; that is increasing the flow of non-misleading information to consumers (Keller et al. 1997) about where the labels come from and how to use them in their purchasing decisions.

By carrying products that are perceived to be more easily processed and more trustworthy, retailers may help to boost their reputations among highly skeptical consumers, while reaffirming previously established positive attitudes and perceptions among the other consumers. Similarly, food manufacturers that provide consumers with more easily processed and transparent labels may be able to boost the credibility of messages about their food packages and boost positive product perceptions and purchase intentions. Using both FOP nutrition labeling systems from this study together can help to eliminate both confirmatory bias (i.e., the tendency to process information in such a manner as to favor previously held expectations [Darley and Gross 1983]) and accessibility bias (i.e., the tendency to produce the most accessible

response when recollection fails – a response that directly reflects habit [Jacoby, Debner, and Hay 2001]). Because FOP nutrition information in the form of a integrative summary symbol or reductive icon is typically encountered before similar nutrition information on the side or back of the package (Kozup, Creyer, and Burton 2003), this more easily processed FOP information can serve to confirm or contradict previously held notions about a product's healthfulness (e.g., Tony's Cheese Pizza) or that of an entire product category (e.g., Frozen Pizza). Therefore, manufacturers providing "traditionally healthy" products such as fruit cups or salad greens can boost their customers' previously held and easily accessible beliefs about their products' healthfulness. Similarly, manufacturers providing products deemed as "traditionally unhealthy" – but may in all actuality be more nutritious than other competing products– can help to curb consumer misperception about their products by proactively providing easily understandable FOP nutrition information for their customers to process and compare against other products.

Implications for Public Policy

At no point in U.S. history have food products ever displayed so many symbols and statements regarding nutrition and health benefits (Nestle 2010). However, this explosion of "nutrition clutter" is not limited to the U.S.. In fact, alternative nutrition labeling systems have been explored worldwide such as the Green Keyhole in Sweden, the Heart Symbol in Finland, the Health Check Symbol in Canada, the Choices logo in the Netherlands, and the Pick the Tick logo in Australia and New Zealand - with some existing for decades now (Vyth et al. 2009). As these systems continue to grow and develop, it is imperative that policy makers understand the potential complications of the sheer number and variety of disclosures becoming available to consumers. As it stands, most marketplace decisions are already perceived as generally difficult by consumers, so food attribute information should be presented in such a way to is easy to

process and facilitates preference formation (Novemsky et al. 2007). Information which is communicated in such a manner as to help consumers compare options along relevant attributes is more likely to promote fluency (Novemsky et al. 2007) than information which makes comparisons difficult or impossible due to differences in measurements of nutrients or qualifications for healthy icons. Facilitation of these fluent comparisons will aid consumers in making healthier decisions for themselves and those they shop for.

Additionally, as products' FOP nutrition information becomes more easily understood by the everyday consumer, manufacturers may be more inclined to make their products healthier to stay competitive in the marketplace. For example, considerable increases in the number and sales of fat-modified foods were reported within only a year after the Nutrition Facts panel became mandatory with the passing of the 1990 Nutrition Labeling Education Act (NLEA) (Levy and Derby 1996). However, responses by industry members must be closely monitored; Nestle (2002) reflected upon cereal giant Kellogg's initial venture into the use of FOP health labeling, writing "The 1984 Kellogg's campaign to promote eating cereals high in fiber as a way to reduce cancer in risk…demonstrated beyond question that health claims increase the market share of specific products, at least in the short term, and subsequent studies have confirmed this observation" (Nestle 2002, p. 286). While this increase in sales attributed to the presentation of health claims may not be surprising to some, the fact that 97of the top 100 U.S. brands of cereals qualified for at least one health claim very well could be (Geiger1998). Therefore, coupling an interpretive icon with exact levels of nutrients in the form of a reductive icon is imperative to ensure that holistically unhealthy products with unique qualifications for a claim or icon are not evaluated as holistically healthy. Because consumers often view a food as healthier if it carries a health claim and are often discouraged from seeking further nutrition information about a

product if it provides a health claim (Williams 2005), the proposed multiple disclosure approach seems even more necessary and practical.

However, because motivation to process information is influenced by the ability to do so (Petty and Cacioppo 1986), an increase in FOP nutrition information warrants an increase in consumer education regarding the comprehension and utilization of these disclosures. Feenstra (1990) argues that a lack of knowledge about nutrition information can lead consumers to ignore it as an important factor in their purchasing decisions. An increase in FOP nutrition information could very well cause some consumers to feel overwhelmed or confused and, consequently, become dismissive of the information all together. Therefore, it is imperative that policy makers create an integrative, standardized FOP nutrition labeling system that drastically reduces the quantity of unrelated existing systems and subsequently educate consumers, manufacturers, and retailers about the proper uses of it. Davies and Wright (1994) acknowledged the importance of consistent food labeling, writing "Knowledge cannot be easily assimilated if the presentation and contents of labeling are not standardized" (pg. 61). Once a standardized system is in place, consumers should develop more positive attitudes toward the labels (Bornstein 1989) and ultimately become more trusting of the information as exposure to it increases (Hasher, Goldstein, and Toppino 1977). The question of who nutrition labeling *really* helps (i.e., consumers or manufacturers) has often been asked (Wright 1997). If it is, indeed, really in place to assist consumers with making healthier choices, then standardized labeling formats and requirements should be the obvious path for policy makers.

Lastly, when considering the design of a FOP nutrition system (standardized or not), a number of variables must be considered. Research has shown that individual differences exist among consumers regarding their preferred levels of detail of nutrition information on food

packages (Grunert and Wills 2007). For example, women have been shown to prefer to use FOP interpretive icons in their purchasing decisions more than men (Vyth et al. 2009). Additionally, the extent to which individuals process food labels and information is influenced by both ability and motivation (Davies and Wright 1994). For example, FOP symbols might be too small to be noticed by certain groups of consumers such as the elderly (Food Standards Agency 2006), while FOP reductive icons may be too complicated to understand for certain groups of consumers such as the educationally disadvantaged (Verkleij and van Kreijl 2004). Therefore, by combining the positive attributes of both - while simultaneously negating many of the negative attributes of each – a more fluent and trustworthy packaging design can be presented to consumers in order to more effectively convey important health messages to them, while also satisfying the preferences of more consumers regarding *how* that information is conveyed. Understanding the differences in consumers' ability and desire to process nutrition information has been a focal point of nutrition-related research (e.g., Andrews, Netemeyer, and Burton 2000; Howlett, Burton, and Kozup 2008), and will become increasingly important for marketers and policy makers, alike, as the marketplace and its ever-evolving canvas of products becomes more complex and cluttered.

LIMITATIONS AND FUTURE RESEARCH

As with any study, there are limitations to this research, and as such, the results should be interpreted with caution. The pilot test employed a convenience (student) sample so the results of that study may not be representative of the more general population. In terms of the national population used in the main study, the demographics suggest that the respondents had unusually low levels of education and annual income. Knowing that demographics and socio-demographics are closely related to shopping behavior (Verkleij and van Kreijl 2004), these results may not be consistent with more advantaged shoppers – especially when other specific

nutrition-related individual difference variables such as nutrition knowledge and motivation are taken into consideration (Andrews, Netemeyer, and Burton 2009; Bates et al. 2009). Furthermore, a median split of a continuous variable was used to dichotomize respondents based on their skepticism toward FOP labeling – a common method among consumer researchers that nonetheless has received criticism (Fitzsimons 2008).

This research only examined one product: a moderately healthy one. Future research should address the interactions of both a FOP reductive icon and a FOP integrative summary icon when their presence or absence either confirms or disconfirms previously held notions about multiple products. For example, examining the effects of the presence of both forms of FOP disclosure that suggest that a product traditionally perceived as "unhealthy" (such as Canadian bacon that actually has 1/3 less fat than regular bacon) is indeed moderately to very healthy. In contrast, products traditionally perceived as "healthy" (such as yogurt cups that are actually very high in corn syrup) should also be examined when these specific FOP nutrition disclosure formats are absent or present.

Building upon the proposed research directions directly above, multiple disclosure formats should be examined regarding their contradictory or confirmatory health messages as they relate to *one another* – not necessarily the product itself. That is, controlling for the perceived healthfulness of a product, what would happen if the FOP multi-nutrient disclosure format suggests that the product is not healthy, but the presence of the FOP integrative summary suggests that it is, or vice-versa. While this research has mostly explored the positive side of using these formats in conjunction, the potential drawbacks of a multiple FOP nutrition labeling approach should be studied more vigorously.

Lastly, future research should address the effectiveness of these FOP nutrition disclosure formats as additional information is added to the package. For example, what would the implications be for manufacturers and retailers when additional information is added to the FOP – whether it is confirmatory, contradictory, or completely unrelated – and contributes to more FOP "clutter". Additionally, how would consumers respond to more FOP information messages of varying relevance to one another, and what would the implications for marketing managers and policy makers be? These unanswered questions – or a similar variation of them – are what I plan on investigating in future studies of this dissertation.

CHAPTER 4

EXPERIMENT 2

Chapter 4 will extend Study 1 by introducing a new experimental design, formulating new hypotheses, discussing methodology, and expanding upon both theoretical and managerial contributions. The purpose of Study 2 is to examine how processing fluency – among other variables – is affected by an increase in health-related communications on the front of consumer packaged food items. More specifically, this study was another online survey with the same product (frozen pizza) from Study 1 but with different FOP health communications. The presence and absence of a FOP reductive icon with promoted nutrients was manipulated along with the presence and absence of a FOP interpretive icon and a FOP single nutrient content claim. Through this new design, the study attempts to show the robustness of the effects of Study 1 while examining and discussing new dependent measures of interest to both academicians and marketing managers.

CONCEPTUAL DEVELOPMENT AND HYPOTHESES

Conceptual fluency is defined at the ease of processing the meaning of stimulus (e.g., Whittlesea 1993). The existing literature, however, has paid far more attention to perceptual than conceptual fluency and still little is known about conceptual fluency (Lee, Yoon, and Mitchell 2004). This study will focus more on the latter through a much more specific measure of fluency that more directly assesses a consumer's ability to assess certain levels and the overall healthfulness of the product via FOP information (which will be detailed in later sections). As previously mentioned, the GMA/FMI Facts up Front reductive icon mandates the declaration of calorie, saturated fat, sodium, and sugar levels, but also allows for the promotion of two "positive" nutrients such as potassium or Vitamin A – all information that has previously been available on the back of all packaged food items for nearly two decades. Prior research indicates that conceptual fluency can be generated by prior processing or repeated exposure to a stimulus

item (e.g., Janiszewski and Meyvis 2001). It is likely that consumers are familiar with the nutrient levels and how they are presented in a FOP reductive icon because of their repeated exposure to the Nutrition Facts Panel on the back of all packaged food items. Therefore, the presence of a FOP reductive icon with promoted nutrients (e.g., exact objective levels of 7 different nutrients) should have an effect on the conceptual fluency of FOP health-related information. More specifically, I predict that:

H1: The provision of a FOP reductive icon with promoted nutrients has a positive influence on conceptual fluency.

Existing research on FOP nutrition symbols and icons has shown that that their inclusion on packaging can positively impact the perceived healthfulness of a product (e.g., Mazis and Raymond 1997; Urala, Arvola, and Lahteenmaki 2003; Andrews, Burton, and Kees 2011). In fact, a 2011 study by the International Food Information Council Foundation showed that 63% of Americans would rather be told what *to* eat instead of what *not* to eat – a 7% increase from 2009 (IFIC 2011). Therefore, given that the purpose of a FOP interpretive icon is to label food choices to aid consumers in evaluating the healthfulness of brand alternatives, I predict that:

H2a: The provision of a FOP interpretive icon has a positive influence on perceived product healthfulness.

H2b: The provision of a FOP interpretive icon has a positive influence on product attitudes.

Study 2 includes the provision of a FOP single nutrient content claim that is not directly related to either the reductive or interpretive disclosure. Prior literature shows that a health-related FOP claim – such as “High in Antioxidants” - may serve as a heuristic cue for consumers

and act as a "magic bullet" in which consumers incorrectly attribute health benefits to a product simply based on exposure to the claim (Kemp et al. 2007; Roe, Levy, and Derby 1999). These effects also hold true especially when there is little to no information to help interpret and evaluate the claim, as in the case of an advertisement (Andrews, Netemeyer, and Burton 1998). Indeed, consumers have been shown to prefer specific levels of nutrients over adjectival descriptors (Scammon 1977) and to use specific nutrient levels – especially negative nutrients – to significantly shape their food purchasing decisions (Russo et al. 1986). These preferences may lead to positive halo effects for the product, manufacturer, and retailer, as these effects have been shown to stem from health and nutrient claims (Roe, Levy, and Derby 1999; Andrews, Netemeyer, and Burton 1998). Therefore, I predict that:

H3a: The provision of a FOP single nutrient content claim has a positive influence on perceived product healthfulness.

H3b: The provision of a FOP single nutrient content claim has a positive influence on purchase intentions.

H3c: The provision of a FOP single nutrient content claim has a positive influence on product attitudes.

H3d: The provision of a FOP single nutrient content claim has a positive influence on manufacturer attitudes.

H3e: The provision of a FOP single nutrient content claim has a positive influence on retailer attitudes.

It has also been shown that while consumers claim that they want (and are willing to pay more) for nutrition information, they rarely acquire and use all information made available to

them in their purchasing decisions (Jacoby, Chestnut, and Silberman 1977). Nutrition label use is affected by a number of variables including the importance to the consumer of a product attribute (Moore and Lehmann 1980; Nayga, Lipinski, and Savur 1998). More specifically, consumers are more likely to search for – and use – nutrient information that is considered more diagnostic than information that leads to the consumers' marginal search costs outweighing marginal benefits (Ford, Smith, and Swasy 1990; Garretson and Burton 2000)[1]. Therefore, I predict that:

> **H4a:** The presence of a FOP interpretive icon moderates the effect of a FOP single nutrient content claim. When an interpretive icon is present, the presence or absence of a single nutrient content claim will have little effect on perceived product healthfulness. However, when an interpretive icon is not available, the presence (absence) of a nutrient content claim will lead to higher (lower) perceptions of product healthfulness.

I expect a similar pattern of results for the following dependent measures:

> **H4b:** Purchase Intentions
>
> **H4c:** Product Attitudes
>
> **H4d:** Manufacturer Attitudes
>
> **H4e:** Retailer Attitudes

[1] Study 2 pretest results revealed that a FOP interpretive icon is a significantly more important product characteristic than a FOP single nutrient content claim ($F(1,36)=12.09$, $p < .01$). Therefore, it is likely that when the two icons are presented simultaneously, consumers rely more heavily on the more important of the two to make processing of the FOP information more fluent.

H4f: Conceptual Fluency

Building upon the previous rationale[2], I also predict that:

H5a: The presence of a FOP reductive icon with promoted nutrients moderates the effect of a FOP interpretive icon.

When a reductive icon is present, the presence or absence of an integrative summary disclosure will have little effect on perceived product healthfulness. However, when a quantitative disclosure is not available, the presence (absence) of an interpretive icon will lead to higher (lower) perceptions of product healthfulness.

I also expect a similar pattern of results for the following dependent measures:

H5b: Purchase Intentions

H5c: Product Attitudes

H5d: Manufacturer Attitudes

H5e: Retailer Attitudes

H5f: Conceptual Fluency

Lastly, consumer skepticism toward FOP labeling may moderate some of these effects. Some consumers view FOP nutrition and health claims as persuasion attempts (Szykman, Bloom, and Levy 1997), and consequently substantially discount or even ignore the claims altogether (Friestad and Wright 1994; Garretson and Burton 2000). However, when there are no alternate sources of information easily available, consumers may simply use the nutrition

[2] Additional 2 pretest results reveal that a FOP reductive icon is a significantly more important product characteristic than a FOP interpretive icon ($F(1,36)=14.36$, $p < .01$).

information that is presented to them to make decisions – even if they are skeptical of it (Szykman, Bloom, and Levy 1997). Additionally, it has been shown that the same information - obtained from different sources – may be perceived differently depending upon the perceived trustworthiness of the source (Festinger 1957; Schul and Mayo 1999), suggesting that consumers could process identical FOP health communications differently depending upon their levels of skepticism toward the source. While objective quantitative information in the form of a FOP reductive icon may be met with little skepticism by consumers, subjective evaluative information in the form of a FOP interpretive icon may be received with caution as some consumers see these icons as merely marketing persuasion attempts – a phenomenon referred to as *schemer schema* (Bousch, Friestad, and Rose 1994; Friestad and Wright 1994; Wright 1986). Therefore, I predict that:

> **H6**: Consumer skepticism toward FOP labeling moderates the effect of a FOP interpretive icon on perceived product healthfulness.
>
> For consumers with high skepticism toward labeling, there will be little effect of the presence of an interpretive icon on perceived product healthfulness.
>
> However, for consumers with low skepticism, perceived product healthfulness will be higher (lower) when an interpretive icon is present (absent).

METHODOLOGY

Pretest

Thirty-eight students from a large university in the Southeast were used in a pretest of FOP health communications. A pencil and paper survey was administered in class and the

students received written instructions asking them to, “Imagine you are in your local grocery store and come across food items with the following seals and symbols on the front of the packages. Think about if/how they might affect your shopping behavior. Please examine them each carefully and answer the following questions about each by circling the appropriate number for each question”. They were then shown the FOP reductive icon with promoted nutrients, interpretive icon, and single nutrient content claim and were asked a question about the importance of each regarding their purchasing behavior. Their voluntary participation resulted in course credit.

As previously mentioned, study 2 pretest results revealed that a FOP interpretive icon is a significantly more important product characteristic (M=4.50) than a FOP single nutrient content claim (M=3.81) ($F(1,36)=12.09$, $p < .01$) and that a FOP reductive icon is a significantly more important product characteristic (M=5.43) than a FOP interpretive icon ($F(1,36)=14.36$, $p < .01$).

Study 2 Design, Sample, and Procedure

This study utilized a 2 (FOP reductive icon with promoted nutrients present vs. absent) X 2 (FOP interpretive icon present vs. absent) X 2 (FOP single nutrient content claim present vs. absent) between-subjects design with both gender and nutrition knowledge utilized as covariates. The 207 participants in this national study came from an online survey administered through Amazon Turk (www.mturk.com). Amazon Turk allows for screeners on participation and several were used to ensure that participants were all located in the U.S. and that their prior participation on the site had at least received a 95% average approval rating from those administering previous online tasks to them. Approximately 44% of this sample had at least some college education, the median household income was $40,000-$49,000, approximately

63% were females, and nearly 3/4 (73%) of respondents claimed to be the primary shopper in their household. Subject's ages ranged from 18 to 81.

Each of the respondents received only one randomly assigned version of the frozen pizza package stimuli and ensuing relevant questions. The stimuli used in this study were identical to those used in study 1 except for the addition of the single nutrient content claim and the addition of both calcium and iron nutrient levels to the quantitative disclosure (see Figure 5). Frozen pizza was again chosen for this study in order to be consistent with prior health marketing research that used a nutritionally mixed (moderate) product (e.g., Andrews, Burton, and Kees 2011), as well as to maintain consistency across the studies.

For subjects in conditions with the reductive icon with promoted nutrients and the interpretive icon on the package, the same information was given that was provided in study 1. For the new single nutrient content claim condition, the following information was given, "A packaged food product is eligible for this Stamp of Approval ONLY if it meets certain nutritional standards. More specifically, if a product has sufficiently high levels of antioxidants it will receive the Stamp of Approval. If a product does not meet the guideline, the disclosure will NOT be present on the package".

Dependent Measures

All dependent measures were measured so that higher values indicate more favorable responses. The importance of FOP icons as a product characteristic (Sujan and Bettman 1989) was measured in the pretest through three seven-point bipolar adjective scales. Endpoints were "not at all important/very important", "irrelevant to my choice/very important to my choice", and "a feature I would not consider/a feature I would definitely consider" (i.e., "The 'High in

Antioxidants Seal shown below is:"). The Cronbach's alpha reliability estimates for this scale were .98 for the nutrition claim, .96 for the interpretive icon, and .96 for the reductive icon with promoted nutrients.

A manipulation check was conducted to ensure the effectiveness of the manipulation of the FOP multi-nutrient quantitative and interpretive icons. Respondents were asked "Did you see a 'Healthy Selection Seal' on the front of the package of the food item shown?" to assess awareness of the FOP interpretive icon. Respondents were also asked "Did you see a 'Front of Package Nutrition Label' on the front of the package of the food item shown?" to assess awareness of the FOP reductive icon. Lastly, respondents were asked "Did you see a 'High in Antioxidants Stamp of Approval' on the front of the package of the food item shown?" to assess awareness of the FOP single nutrient content claim. The available responses for all questions were "yes" or "no".

Attitudinal, intent, and perception variables were used to assess the predictions made in the study hypotheses. Attitudes toward the retailer, manufacturer, and the product (Kozup, Creyer, and Burton 2003) were each assessed through three seven-point bipolar adjective scales. Endpoints for attitudes toward the retailer were "unfavorable/favorable", "bad/good", and "negative/positive" (i.e., "Based on the information provided, my overall attitude toward the retailer providing this product is:"). The Cronbach's alpha reliability estimate for this scale was .98. Similarly, endpoints for attitudes toward the manufacturer were "unfavorable/favorable", "bad/good", and "negative/positive" (i.e., "Based on the information provided, my overall attitude toward the manufacturer producing this product is:"). The Cronbach's alpha reliability estimate for this scale was .98. Lastly, endpoints for attitudes toward the product were "unfavorable/favorable", "bad/good", and "negative/positive" (i.e., "Based on the information

provided, my overall attitude toward the product is:"). The Cronbach's alpha reliability estimate for this scale was .97.

Product purchase intentions (modified from Howlett, Burton, and Kozup 2008) were also assessed through three seven-point bipolar adjective scales. Endpoints for purchase intentions were "very unlikely/very likely", "not probable/very probable", and "definitely would not/definitely would" (i.e., "Assuming you were interested in purchasing this type of food, how likely are you to buy this specific item given the information shown on the package?"). The Cronbach's alpha reliability estimate for this scale was .97. Perceived product healthfulness (modified from Garretson and Burton 2000) was assessed through two seven-point bipolar adjective scales. Endpoints for product healthfulness were "not at all nutritious/highly nutritious" and "very unhealthy/very healthy" (i.e., "Please consider the nutrition level of the food product shown. Do you believe that the food product is:"). The Pearson's correlation estimate for this scale was .81 ($p < .01$).

The perceived conceptual fluency of FOP information (modified from Lee and Aaker 2004; Kozup, Creyer, and Burton 2003) was assessed through four seven-point bipolar adjective scales. Endpoints were "strongly disagree/strongly agree". (i.e., "Given the information on the front of the package, it is easy to determine how healthy the product is", "Given the information on the front of the package, it is clear whether the product is high or low in its level of nutritiousness", "I feel confident about whether this product is a healthy or unhealthy choice based on the information on the front of the package", and "It is easy to understand whether this product is a healthy or unhealthy choice given the information shown on the package"). The Cronbach's alpha reliability estimate for this scale was .94.

Consumer skepticism toward FOP labeling was assessed through four seven-point bipolar adjective scales that were modified from Obermiller and Spangenberg's (1998) skepticism toward advertising scale. Endpoints were "strongly disagree/strongly agree" (i.e., "I can depend on getting the truth from most front of package product labeling", "Front of package product labeling's aim is to inform the consumer", "Front of package product labeling is generally truthful", and "Front of package product labeling is a reliable source of information about the quality and performance of products"). The Cronbach's alpha reliability estimate for this scale was .89. Consistent with prior nutrition research (e.g., Andrews, Netemeyer, and Burton 2009), a median split was conducted in order to categorize respondents into two groups for more detailed analysis. This measure was recoded and then as an independent variable in subsequent analyses. The lower skepticism condition (n=95) and higher skepticism conditions (n=112) were well balanced.

Lastly, nutrition knowledge (Howlett, Burton, and Kozup 2008) was utilized as a covariate and assessed through three seven-point bipolar adjective scales. Endpoints were "not at all knowledgeable/extremely knowledgeable (i.e., "In general, how much do you think you know about the topic of nutrition?"), and "strongly disagree/strongly agree" (i.e., "I know a lot about nutrition in general" and "Compared to most people, I am quite knowledgeable about nutrition"). The Cronbach's alpha reliability estimate for this scale was .94. For an overview of all measures used in Study 2, please refer to Appendix C.

RESULTS

The objectives of this study focused on the effects of a FOP reductive icon with promoted nutrients on perceived conceptual fluency (H1), as well as the effects of a FOP interpretive icon

on perceived product healthfulness (H2a) and product attitudes (H2b). The main effects of a FOP single nutrient content claim on perceived product healthfulness (H3a), purchase intentions (H3b), product attitudes (H3c), manufacturer attitudes (H3d), and retailer attitudes (H3e) were also examined.

Additionally, interactions between an interpretive icon and single nutrient content claim for perceived product healthfulness (H4a), purchase intentions (H4b), product attitudes (H4c), manufacturer attitudes (H4d), retailer attitudes (H4e), and conceptual fluency (H4f) were hypothesized, as well as interactions between a reductive icon with promoted nutrients and an interpretive icon for perceived product healthfulness (H5a), purchase intentions (H5b), product attitudes (H5c), manufacturer attitudes (H5d), retailer attitudes (H5e), and conceptual fluency (H5f). See Table 3 for an overview of results (higher values indicate more favorable results for all measures). The next section will discuss these results in detail.

Manipulation Check

Crosstab results indicate a successful manipulation check for the reductive icon (χ^2= 134.83; $p < .001$) (88% of respondents reported seeing it when it was present), for the interpretive icon (χ^2= 105.55; $p < .001$) (90% of respondents reported seeing it when it was present), and for the single nutrient content claim (χ^2= 141.43; $p < .001$) (89% of respondents reported seeing it when it was present). This pattern of results indicates satisfactorily high levels of awareness of the FOP nutrition disclosure format manipulations.

Main Effects of a FOP Reductive and Interpretive Icon

Consistent with H1a, the multivariate results indicated a significant main effect of a FOP reductive icon with promoted nutrients on perceived conceptual fluency, ($F(1, 189) = 18.47$, $p <$

.001), suggesting that fluency was higher when the quantitative disclosure was present (M=4.70) than when it was absent (M=3.82).

Consistent with H2a, the significant main effect of a FOP interpretive icon on perceived product healthfulness, ($F(1,189) = 9.13$, $p < .01$), indicated that the product was perceived as healthier when the interpretive icon was present (M=4.49) than when it was absent (M=3.94). Consistent with H2b, the significant main effect of a FOP interpretive icon on product attitudes, ($F(1,189) = 5.90$, $p < .05$), indicated that attitudes toward the product were more positive when the interpretive icon was present (M=5.21) than when it was absent (M=4.73).

Consistent with H3a, the significant main effect of a FOP single nutrient content claim on perceived product healthfulness, ($F(1,189) = 5.82$, $p < .01$), indicated that the product was perceived as healthier when the content claim was present (M=4.44) than when it was absent (M=3.99). Consistent with H3b, the significant main effect of a FOP single nutrient content claim on purchase intentions, ($F (1,189) = 3.45$, $p < .05$), indicated that intentions were higher when the content claim was present (M=4.95) than when it was absent (M=4.54). Consistent with H3c, the significant main effect of a FOP single nutrient content claim on product attitudes, ($F(1,189) = 4.17$, $p < .05$), indicated that attitudes were more positive when the content claim was present (M=5.17) than when it was absent (M=4.77). Consistent with H3d, the significant main effect of a FOP single nutrient content claim on manufacturer attitudes, ($F (1,189) = 10.05$, $p < .01$), indicated that attitudes toward the manufacturer were more positive when the content claim was present (M=5.31) than when it was absent (M=4.74). Lastly, consistent with H3e, the significant main effect of a FOP single nutrient content claim on retailer attitudes, ($F (1,189) =$

3.19, $p < .05$), indicated that attitudes toward the retailer were more positive when the content claim was present (M=5.11) than when it was absent (M=4.81)[3].

Moderating Effect of a FOP Interpretive Icon

Consistent with H4a, the FOP interpretive icon X FOP single nutrient content claim interaction was significant for perceived product healthfulness, ($F(1,189) = 9.19$, $p < .01$). The plot of means can be found in Figure 6. When the interpretive icon was available, the presence of the nutrient content claim had little effect on perceived product healthfulness ($M_{present}$ =4.44 vs. M_{absent}= 4.55). However, follow-up contrasts reveal that when the interpretive icon was unavailable, the presence of the nutrient claim had a positive influence on perceived product healthfulness ($M_{present}$ =4.43 vs. M_{absent}= 3.45), ($F(1,189) =13.59$, $p < .0001$).

Consistent with H4b, the FOP interpretive icon X FOP single nutrient content claim interaction was significant for purchase intentions, ($F(1,189) = 9.95$, $p < .01$). The plot of means can be found in Figure 7. When the interpretive icon was available, the presence of the nutrient content claim had little effect on purchase intentions ($M_{present}$ =4.74 vs. M_{absent}= 5.02). However, follow-up contrasts reveal that when the interpretive icon was unavailable, the presence of the nutrient claim had a positive influence on purchase intentions ($M_{present}$ =5.16 vs. M_{absent}= 4.06), ($F(1,189) = 9.56$, $p < .01$).

Consistent with H4c, the FOP interpretive icon X FOP single nutrient content claim interaction was significant for product attitudes ($F(1,189) = 14.72$, $p < .001$). The plot of means can be found in Figure 8. When the interpretive icon was available, the presence of the nutrient content claim had little effect on product attitudes ($M_{present}$ =5.04 vs. M_{absent}= 5.39). However,

[3] Effects for H3b and H3e are significant for a one-tailed test.

follow-up contrasts reveal that when the interpretive icon was unavailable, the presence of the nutrient claim had a positive influence on product attitudes ($M_{present}$ =5.31 vs. M_{absent}= 4.15), (F (1,189) = 11.11, $p < .01$).

Consistent with H4d, the FOP interpretive icon X FOP single nutrient content claim interaction was significant for manufacturer attitudes, (F(1,189) = 6.44, $p < .05$). The plot of means can be found in Figure 9. When the interpretive icon was available, the presence of the nutrient content claim had little effect on manufacturer attitudes ($M_{present}$ =5.22 vs. M_{absent}= 5.11). However, follow-up contrasts reveal that when the interpretive icon was unavailable, the presence of the nutrient claim had a positive influence on manufacturer attitudes ($M_{present}$ =5.40 vs. M_{absent}= 4.37) (F(1,189) = 12.85, $p < .0001$).

Contrary to H4e and H4f, however, the FOP interpretive icon X FOP single nutrient content claim interaction was not significant for retailer attitudes (F(1,189) = 1.15, $p > .10$) or conceptual fluency (F(1,189) = 3.59, $p > .05$). The plot of means can be found in Figures 10 and 11, respectively.

Moderating Effect of a FOP Reductive Icon with Promoted Nutrients

Consistent with H5a, the FOP reductive icon X FOP interpretive icon was significant for perceived product healthfulness (F(1,189) = 6.31, $p < .05$). The plot of means can be found in Figure 12. When the quantitative disclosure was available, the presence of the interpretive icon had little effect on perceived product healthfulness ($M_{present}$ =4.21 vs. M_{absent}= 4.11). However, follow-up contrasts reveal that when the quantitative disclosure was unavailable, the presence of the interpretive icon had a positive influence on perceived product healthfulness ($M_{present}$ =4.78 vs. M_{absent}= 3.77), (F(1,189) =8.44, $p < .01$).

Consistent with H5b, the FOP reductive icon X FOP interpretive icon was significant for purchase intentions, ($F(1,189) = 4.47$, $p < .05$). The plot of means can be found in Figure 13. When the quantitative disclosure was available, the presence of the interpretive icon had little effect on purchase intentions ($M_{present} = 4.52$ vs. $M_{absent} = 4.70$). However, follow-up contrasts reveal that when the quantitative disclosure was unavailable, the presence of the interpretive icon had a positive influence on purchase intentions ($M_{present} = 5.24$ vs. $M_{absent} = 4.51$), ($F(1,189) = 5.00$, $p < .05$).

Consistent with H5c, the FOP reductive icon X FOP interpretive icon was significant for product attitudes, ($F(1,189) = 4.47$, $p < .05$). The plot of means can be found in Figure 14. When the quantitative disclosure was available, the presence of the interpretive icon had little effect on product attitudes ($M_{present} = 4.95$ vs. $M_{absent} = 4.92$). However, follow-up contrasts reveal that when the quantitative disclosure was unavailable, the presence of the interpretive icon had a positive influence on product attitudes ($M_{present} = 5.46$ vs. $M_{absent} = 4.55$) ($F(1,189) = 7.48$, $p < .01$).

Consistent with H5d, the FOP reductive icon X FOP interpretive icon was significant for manufacturer attitudes, ($F(1,189) = 4.29$, $p < .05$). The plot of means can be found in Figure 15. When the quantitative disclosure was available, the presence of the interpretive icon had little effect on manufacturer attitudes ($M_{present} = 4.95$ vs. $M_{absent} = 5.04$). However, follow-up contrasts reveal that when the quantitative disclosure was unavailable, the presence of the interpretive icon had a positive influence on manufacturer attitudes ($M_{present} = 5.38$ vs. $M_{absent} = 4.73$) ($F(1,189) = 7.87$, $p < .01$).

Consistent with H5e, the FOP reductive icon X FOP interpretive icon was significant for retailer attitudes, ($F(1,189) = 5.19$, $p < .05$). The plot of means can be found in Figure 16. When

the quantitative disclosure was available, the presence of the interpretive icon had little effect on retailer attitudes ($M_{present}$ =4.67 vs. M_{absent}= 4.99). However, follow-up contrasts reveal that when the quantitative disclosure was unavailable, the presence of the interpretive icon had a positive influence on retailer attitudes ($M_{present}$ =5.32 vs. M_{absent}= 4.86), (F (1,189) =4.47, $p < .05$).

Lastly, consistent with H5f, the FOP reductive icon X FOP interpretive icon was significant for conceptual fluency, (F (1,189) = 12.11, $p < .01$). The plot of means can be found in Figure 17. When the quantitative disclosure was available, the presence of the interpretive icon had little effect on conceptual fluency ($M_{present}$ =4.46 vs. M_{absent}= 4.93). However, follow-up contrasts reveal that when the quantitative disclosure was unavailable, the presence of the interpretive icon had a positive influence on conceptual fluency ($M_{present}$ =4.29 vs. M_{absent}= 3.34), (F (1,189) =4.48, $p < .05$).

Moderating Effect of Consumer Skepticism Toward FOP Labeling

Consistent with H6, the FOP interpretive icon X consumer skepticism toward FOP labeling interaction was significant for perceived product healthfulness, (F (1,189) = 4.79, $p < .05$). The plot of means can be found in Figure 18. For consumers with high skepticism, there was little effect of the presence of an interpretive icon on perceived product healthfulness ($M_{present}$ =3.92 vs. M_{absent}= 3.77). However, follow-up contrasts reveal that for consumers with low skepticism, the presence of the interpretive icon had a positive influence on perceived product healthfulness ($M_{present}$ =5.06 vs. M_{absent}= 4.12), (F (1,189) =8.43, $p < .01$).

GENERAL DISCUSSION

The primary purpose of study 2 was to assess consumer reactions to alternative FOP nutrition labeling systems in the presence of a single nutrient content claim. Specifically, this

study examined differences in perceived nutrition information fluency and trustworthiness, product healthfulness perceptions and purchase intentions, as well as attitudes toward the product, manufacturer, and retailer. Additionally, the effects of consumer skepticism toward FOP labeling on many of those same variables were examined. A discussion of the results of these objectives and their implications follows below.

Main Effects of FOP Interpretive icons, FOP reductive icons with Promoted Nutrients, FOP Single Nutrient Content Claims, and Consumer Skepticism Toward FOP Labeling

As previously mentioned, some FOP interpretive icons – such as the Smart Choices icon launched by the Keystone Group and Nutrition Roundtable – have been met with criticism in the marketplace due to its potentially misleading effects on consumers' product evaluations and shopping behavior (e.g., Center for Science in the Public Interest 2009; Nestle 2009). Previous research has shown positive effects of interpretive icons on a product's overall healthfulness (e.g., Mazis and Raymond 1997; Urala, Arvola, and Lahteenmaki 2003) and further shown how they can serve as an implicit health claims from which consumers can draw inferences from (Andrews, Burton, and Kees 2011). Study 2 results confirm these findings as the pizza was seen as significantly more healthy when the interpretive icon was present rather than absent, despite the fact that the same quantitative nutrition information was made available to all respondents. Additionally, respondents had more positive attitudes toward the pizza when the seal was present, suggesting that foods are more positively received by consumers when they are labeled with a FOP interpretive icon.

The presence of the FOP reductive icon with promoted nutrients, on the other hand, seemed to have little effect on perceived product healthfulness despite the fact that it increased

the conceptual fluency of the FOP nutrition information. When the quantitative disclosure was present, consumers found processing FOP information much easier as opposed to when that information was absent and only available on the Nutrition Facts Panel on the back of the package.

As previously mentioned, Study 2 extended Study 1 by including the provision of a FOP single nutrient content claim. Like the interpretive icon, the addition of the "High in Antioxidants" nutrient claim led to higher perceptions of product healthfulness and more positive product attitudes compared to when the claim was not available. In addition, the content claim led to more positive manufacturer and retailer attitudes, as well as higher purchase intentions – all findings certainly of interest to marketing managers. These findings confirm prior research that indicates that many consumers use specific nutrient levels to significantly shape their food purchasing decisions (e.g., Russo et al. 1986).

Lastly, consumers with lower skepticism toward FOP labeling had higher purchase intentions, and higher perceptions of product healthfulness and conceptual fluency, in addition to more positive product, manufacturer, and retailer attitudes than consumers with higher skepticism. These results suggest that there are defined consumer segments in which FOP health communications are more or less effective in terms of strategically influencing attitudes, perceptions, and intentions.

Moderating Effects of FOP Interpretive icons and FOP reductive icons with Promoted Nutrients

Analyses indicated very similar patterns of results for the FOP reductive icon with promoted nutrients X FOP interpretive icon interactions and the FOP interpretive icon X FOP

single nutrient content claim interactions. Generally speaking, when the more important product attribute was available, the less important attribute had little effect on perceived product healthfulness, purchase intentions, product attitudes, manufacturer attitudes, retailer attitudes, and conceptual fluency. However, in the absence of the more important FOP attribute in each case, the other attribute had a positive influence on the aforementioned dependent measures. The exception, however, were the non-significant FOP interpretive icon X FOP single nutrient content claim interactions for both retailer attitudes and conceptual fluency.

Moderating Effects of Consumer Skepticism Toward FOP Labeling

Consumer skepticism toward FOP labeling was found to moderate the effect of a FOP interpretive icon on perceived product healthfulness. The presence of the disclosure led those with low skepticism to perceive the pizza as healthier and less healthy in its absence, but had little effect on perceptions of highly skeptical respondents. This pattern of results suggests that highly skeptical consumers may already have preconceived perceptions going into the product evaluation process that cannot be changed by FOP health communication and marketing attempts.

Theoretical Contributions

Study 2 extends study 1 by manipulating both the quality and quantity of FOP information and assessing consumers' responses to those changes. This study is among the first to provide a controlled test of multiple FOP nutrition symbols and the only to use a processing fluency theoretical framework.

The results of this study show how FOP communications are perceived differently when presented independently as opposed to simultaneously. It has also shown how consumers

process FOP information as increasingly cluttered information is presented. It is clear that as the cognitive load of consumers increases, they begin weighting attributes and only use certain FOP information to form their attitudes, perceptions, and evaluations (Jacoby, Chestnut, and Silberman 1977). More specifically, these results support prior findings that indicate that consumers weight fluent information more heavily than disfluent cues when making judgments (Shah and Oppenheimer 2007).

This study also examined how both negative (e.g., sodium, sugars, etc.) and positive (e.g., calcium, iron, etc.) information is processed on the front of consumer packaged food items. Therefore, it was possible to not only examine how an increase in FOP information affected a number of dependent measures, but also how contrasting – but related - information affected consumer processing.

Additionally, this study further expanded upon the moderating role of consumer skepticism toward FOP labeling. These findings suggest this individual difference variable affects the processing of FOP communications, and that the source of those communications (e.g., retailers, manufacturers, government agencies) may significantly affect how they are received and processed. These findings help to better understand the relationship between trust and fluency.

Lastly, this study also answered prior calls for additional research on multiple FOP icons (e.g., Andrews, Burton, and Kees 2011) and the effects of source acknowledgement on perceived fluency (Novemsky et al. 2007).

Managerial Implications

A recent study shows that consumer packaged goods companies with a higher proportion healthy food sales demonstrate superior sales growth, returns to shareholders, operating profits, and company reputations (Hudson Institute 2011). To expand further upon these points, the sales of healthy foods experienced higher growth rates than traditional foods between 2007 and 2011, now accounting for almost 40% of U.S. food sales. These companies also experience higher operating profits and profit growth, along with higher BrandPower™ ratings, indicating higher evaluations regarding favorability and reputation (Hudson Institute 2011).

It is becoming increasingly apparent that the manner in which retailers choose to display information about the food products they carry – as well as the nature of that information –is becoming a more substantial point of retail competition (Newman and Kopp 2009). This study shows that the manner in which retailers present nutrition information on products in their assortment can either positively or negatively affect their customers' attitudes toward them (when compared to presenting no FOP nutrition information at all).

The presentation of this information was shown to also affect a number of variables of interest to marketing managers including perceived product healthfulness, product attitudes, and purchase intentions. Our findings suggest that retailers can significantly increase consumers' perceptions of the healthfulness of food products and their attitudes toward them by simply carrying products in their assortments that include an FOP interpretive icon.

Additionally, the provision of a NC on the FOP was shown to lead to higher perceptions of product healthfulness and higher purchase intentions, as well as more positive product, retailer, and manufacturer attitudes. Obviously, these findings – combined with others from this study- have important implications for retailers' private label branding strategies and package

designs. Both the nature and quantity of FOP nutrition communications should be considered when creating private label food items. Additionally, manufacturers should consider these findings, as well, as the results suggested that both consumer attitudes toward manufacturers and purchase intentions of the manufacturers' products can be significantly enhanced by including a NC on the FOP as compared to not including any FOP nutrition communications at all.

Limitations and Future Research

Feunekes et al. (2008) wrote, "There is a multitude of front-of-pack labels that aim to help consumers make a healthier choice. The verdict is still out as to which of these labeling formats is best understood by consumers and which makes it easiest for consumers to make a healthier choice" (pg. 58). Hopefully, this study (and the previous study) has shed some light into how consumers process and use FOP nutrition information via various formats. However, it is certainly not without limitations. A median split was conducted to create two groups of respondents based upon their skepticism toward FOP labeling – a technique that has been publicly criticized (Fitzsimons 2008). Additionally, the levels of nutrients were not varied to display both positive and negative levels and should be in future research. Furthermore, since the same product and product category were used from study 1, future research should examine the found effects across multiple products in multiple product categories.

The facilitation of choice behavior would be a next logical step in this research area. This would help to alleviate some of the limitations just mentioned in addition to allowing for comparison effects. For example, if two granola bars are presented side-by-side on the retail shelf and only one qualified for a FOP interpretive icon, does the qualifying product become healthier in comparison to the non-qualifier, the non-qualifier unhealthier in comparison, or

both? These comparisons would provide a much more realistic test of these effects but still be controlled in a lab setting.

This dissertation seeks to answer some of these questions as Study 3 and beyond will be conducted in the retail lab. Selection, choice, comparisons, and actual purchasing behavior are all possible measures to be undertaken in the future in addition to addressing and overcoming some of the previously mentioned limitations from Studies 1 and 2.

CHAPTER 5

EXPERIMENT 3

Study 3 will extend Study 1 and 2 by introducing a new interpretive labeling system and facilitating the observation of respondents in a retail lab setting, allowing for a more generalizable assessment of measured variables in a realistic shopping environment.

INTRODUCTION

Most prior research on product-health perceptions have only focused on single products in relatively isolated environments (see Hieke and Taylor 2011 for a review). Unfortunately, consumers rarely encounter these situations when shopping in a "real" retail environment; rather, they are faced with making decisions that entail assessing a daunting number of product categories and brand alternatives simultaneously. While FOP icons have been shown to be useful in simplifying the task of evaluating single food products (e.g., Study 1 and 2), their importance and effectiveness when presented on multiple products in multiple categories in a more realistic retail setting is not well documented (Roe, Levy, and Derby 1999). Therefore, it is the purpose of Study 3 and 4 to examine the effects of a new Healthy Stars interpretive icon (discussed below) – as well as the effects of the Facts up Front reductive icon tested previously in the last two studies – on attitudes, perceptions, and intentions when multiple brands and categories are available to consumers in a retail shopping environment.

Background

Some food products are healthier than others, but how can consumers tell? Healthy Stars is an interpretive nutrition labeling system proposed by the Institute of Medicine (IOM) that provides an evaluation of a food product's overall healthfulness to consumers, much like the interpretive icon from the first two studies. However, instead of simply being dichotomous in nature like that icon (i.e., the product either fully qualifies for the seal or it does not at all), the

Healthy Stars provides multiple, gradual levels of healthfulness evaluation while additionally presenting a calories-per-serving value on the FOP. Another important difference is that the Healthy Stars icon is *always* present on the FOP no matter how healthy or unhealthy a product is, as opposed to only appearing on the FOP when a product is healthy.

More specifically, a product can qualify for 0, 1, 2, or 3 stars, with products that have 3 stars being healthier and products that have 0 stars being less healthy. The distribution of stars to products is simple: a product must meet certain nutritional standards to qualify for any stars in the first place (i.e., the product must have less than 4g of saturated fat AND 480mg of sodium). If these standards are met, the product can then receive a star for each of the following conditions that are satisfied:

1) Saturated fat per serving must be less than 10% of recommended daily value (2g saturated fat or less)
2) Sodium per serving must be less than 20% of the recommended daily value (480mg of sodium)
3) Sugars per serving must be less than 5g.

For example, a product that has 1g of saturated fat, 410mg of sodium, and 3g of sugar per serving would qualify for 3 stars; a product that has 1.5g of saturated fat and 470mg of sodium, but 7g of sugar per serving would only qualify for 2 stars; a product that has 3g of saturated fat, 470mg of sodium, and 4g of sugar per serving would only qualify for 2 stars; and a product that has 1g of saturated fat, 500mg of sodium, and 2g of sugar would not qualify for ANY stars because the sodium level is too high to qualify. The calories-per-serving appears at all times with the Healthy Stars system no matter if a product earns 0 or 3 stars.

CONCEPTUAL DEVELOPMENT AND HYPOTHESES

Effects of FOP Nutrition Labeling Systems

Whereas perceptual fluency involves the processing of physical features of a stimulus such as modality or shape (e.g., Jacoby and Dallas 1981; Lee and Labroo 2004), conceptual fluency more directly and specifically involves ease of processing the *meaning* of a stimulus (e.g., Whittlesea 1993) and will again be one of the main focal points of this study. It has been shown that presenting message claims which are easy to understand increases the propensity for consumers to process the quality and meaning of the claim (Davies and Wright 1994). Within the context of health and nutrition messages, it has been shown that nutrition summary information decreases the processing burden of consumers and facilitates better comprehension of numerical nutrition information (Viswanathan 1994; Viswanathan and Hastak 2002). More specifically, existing research on FOP nutrition symbols and icons has shown that that their presence positively impacts the perceived healthfulness of a product (e.g., Urala, Arvola, and Lahteenmaki 2003; Andrews, Burton, and Kees 2011), suggesting that they are effective in impacting consumers' processing of health information. Therefore, when product health information is presented as FOP summary information in the form of either a simpler interpretive icon (e.g., Healthy Stars) or a reductive icon (e.g., Facts up Front), consumers should be more likely to process and interpret that information at the shelf (i.e., conceptual fluency should increase). Thus, testing all of the following hypotheses across two product categories – granola bars and soup (which I will discuss in detail later) - I predict that:

H1: The presence (absence) of (a) reductive and (b) interpretive FOP icons will lead to higher (lower) perceived conceptual fluency of FOP health information.

Perhaps a more conceptually interesting question involves the effect of the simultaneous presentation of both FOP labeling systems (reductive and interpretive) on the perceived conceptual fluency of FOP health information. That is, does the combination of an interpretive and a reductive icon lead to a greater understanding of health information than when either is used independently or not at all? Prior research on processing fluency has shown that experiences are often stored in the mind of consumers as a single, representative fluent experience when they are temporally and thematically related (Johnson-Laird 1980; Wyer and Radvansky 1999; Shen, Jiang, and Adaval 2010). Therefore, it is likely that two complementary related sources of FOP nutrition information can be construed as one fluent health communication. Furthermore, it has been suggested that different types of health information can help to convey meaning to one another (Viswanathan and Childers 1996; Viswanathan and Hastak 2002) and can possibly help consumers more easily understand the messages being communicated to them on food packages. For example, adding interpretive colors to quantitative nutrition labels in the form of a "traffic light" (e.g., green indicates healthy nutrition levels, yellow indicates moderate, red indicates unhealthy) has been shown to result in less error between perceived and actual health levels of foods (Jones and Richardson 2007). Therefore, it is likely that a FOP interpretive icon will increase fluency of health information by providing consumers an evaluation of the quantitative information presented in a FOP reductive icon. Knowing furthermore that consumers have been shown to prefer more detailed nutrition information (Asam and Bucklin 1973; Freiden 1981), I predict that:

H2: The presence of a FOP interpretive icon will moderate the effect of a FOP reductive icon on the perceived conceptual fluency of FOP health information. The presence of the

interpretive icon will increase the positive effect of the reductive icon on perceived fluency.

Building upon the rationale above, it should be expected that a FOP interpretive and reductive icon will interact with objective product nutrition (i.e., how healthy a certain product actually is) to impact the perceived healthfulness of that food product. While previously mentioned studies have shown the positive effects of the presence of FOP icons on health perceptions (e.g., Urala, Arvola, and Lahteenmaki 2003; Andrews, Burton, and Kees 2011), few studies have considered the effects of adding these icons to comparatively healthier and unhealthier products within or across product categories. I argue that it is presumptuous to conclude that the presence of these icons *only* leads to higher perceptions of healthfulness for *healthier* products, and that their presence on relatively *unhealthier* products has little or no effect on perceived healthfulness. Therefore, the presence of both of these icons on products with contrasting healthfulness levels will be considered here.

Because certain FOP icons can only be found on *healthier* products within a specific category, they often lead consumers to think in an oversimplified dichotomous manner (van Kleef and Dagevos 2012). As a result, some FOP labeling systems have been criticized for creating a misleading contrast between healthy and unhealthy foods that does not allow consumers to distinguish between gradations of relative healthiness (Butler 2010). Unlike these systems, however, the detailed, interpretive Healthy Stars icon presents a heuristic that allows a consumer to know if a product did not qualify for 3 stars, 0 stars, or anything in between because the icon is always present on the FOP (while simultaneously providing calorie information for the product which is, generally, likely higher for unhealthier products than healthier products). Therefore, it is likely that when consumers are presented with a “0” star rating and calorie

information on the FOP, healthfulness perceptions for that product will be lower than if that information was not presented in the first place. In other words, the presence of the FOP interpretive icon should contribute to higher perceptions of healthfulness for healthier products (e.g., 3 star products) and lower perceptions of healthfulness for relatively unhealthier products (e.g., 0 star products) compared to when the icon is absent. Similarly, the presence of a reductive icon could provide FOP quantitative nutrition information that accentuates the healthiness (or unhealthiness) of contrasting products in the minds of consumers. However, since it does not provide consumers with any evaluation of the product (i.e., it does not do much of the cognitive "heavy lifting" for the consumer), I expect the moderating effect of the reductive icon to be less than that of the interpretive icon across all measures in this study. More specifically, I predict that:

H3: The presence of (a) reductive or (b) interpretive FOP icon will moderate the effect of objective product nutrition levels on the perception of product healthfulness. When the icon is present (absent), subjective perceptions of healthfulness for objectively healthier products will be higher (lower). Conversely, for objectively unhealthier products, subjective perceptions of healthfulness will be (lower) higher when the icon is present (absent). The moderating effect of the interpretive icon will be stronger than that of the reductive icon.

Lastly, it has been shown that package information that impacts health perceptions also extends to product purchase intentions (Burton et al. 2006; Ford et al. 1996; Kozup, Creyer, and Burton 2003). For example, Green (2006) found that 43% of surveyed consumers believe that FOP labeling has changed at least some or many of the food products they purchase. More specifically, prior literature has shown that the presence of FOP healthy icons leads to higher

purchase intentions (e.g., Keller et al. 1997; Andrews, Burton, and Kees 2011), and that alternative food items in a consideration set can serve as a frame of reference against which a single specific item can be evaluated (Kozup, Creyer, and Burton 2003). Furthermore, it has been demonstrated that the inclusion of reference values results in higher purchase likelihood for products perceived to be healthy than for products that are perceived to be unhealthy (Burton, Biswas, and Netemeyer 1994). Therefore when consumers evaluate products of contrasting healthfulness in a category at the retail shelf, it can be expected that FOP interpretive and reductive icons will interact with objective product nutrition to impact purchase intentions of those food products. As a result, the presence of FOP reductive and interpretive icons should positively impact the likelihood of choosing an objectively healthier product out of a consideration set at the retail shelf. Therefore, I predict that:

H4: The presence of (a) reductive and (b) interpretive FOP icons will moderate the effect of objective product nutrition on product purchase intentions. When the icon is present (absent), purchase intentions for objectively healthier products will be higher (lower). Conversely, for objectively unhealthier products, purchase intentions will be (lower) higher when the icon is present (absent). The moderating effect of the interpretive icon will be stronger than that of the reductive icon.

H5: The presence of (a) reductive and (b) interpretive FOP icons will lead to a higher likelihood of choosing a healthier product out of a categorical consideration set.

METHODOLOGY

Design, Sample, and Procedure

The study utilized a 2 (interpretive FOP icon: IOM stars vs. control) x 2 (reductive FOP icon: Facts Up Front vs. control) x 2 (product healthfulness: more healthful vs. less healthful) mixed experimental design that was conducted across two product categories (granola bars and soup). A mixed sample of 100 students, staff, and members of a subject research pool from a southeastern university was used for this study. Approximately 56% of this sample was female, ages ranged from 18-44, over half (54%) earned less than $30,000 annually, 87% had at least some college education, and 58% claimed to be the primary food shopper in their household. Each respondent was randomly assigned to one of the four conditions, and was either entered into a drawing for a $50 gift card or received course credit for their participation.

The between-subject manipulations were on the front of the granola bar and soup packages and were consistent across and within product categories so that if a respondent was assigned to the Healthy Stars present/Facts Up Front present condition, he/she would see both label formats regardless of product category. Granola bars and soups were chosen as product categories for this study in order to be consistent with prior health marketing research that used nutritionally mixed (moderate) products (e.g., Andrews, Burton, and Kees 2011) and to provide ample variance in nutrition information while still adhering to the strict guidelines proposed for the Healthy Stars labeling system. The nutritional values provided to respondents on each FOP via the Facts Up Front were matched exactly with those on the back of each package. Similarly, the calorie count provided on the FOP via the Healthy Stars was matched exactly with those on the back of each package.

Subjects were first brought – one at a time – to a behavioral research retail lab. Initially each respondent met with the principal researcher in a quiet break-out room and were asked to read a set of instructions before being taken into the lab (which was referred to as a “retail store”

in that document). More specifically, the instructions informed each respondent that, "In just a moment, you are going to enter a small retail store that carries a number of products from cleaning supplies to groceries. We are especially interested in your evaluations of some of the food items the retailer carries". Subsequently, similar to newspaper or web-based articles, the instructions briefed the respondents on both the Facts Up Front and Healthy Stars systems (and the qualifications for the stars), and lastly were told that these systems were voluntary and that the retailer they were about to visit may or may not have chosen to include these systems on their food products. Respondents were given the same set of instructions, regardless of the condition to which they were randomly assigned.

After ensuring that all questions had been answered regarding the functionality and design of the labeling systems, a researcher then escorted each respondent individually into the retail lab. The lab was set up to look like a retail store with a wide range of products (food, cleaning supplies, DVD's, etc.) and arrangements (end caps, aisles, and islands, etc.) being visible to the participants. The respondents were immediately carried to the shelves that held the granola bars and soups, and were told that those were the only two product categories that they should be concerned with for the study. The products were grouped as categories so that the granola bars were on a separate shelf and the soups were together on another shelf. Respondents were allowed to analyze the products as long as they desired and were asked to indicate to the researcher when they were ready to begin the choice tasks.

Products for each category were chosen by the researchers based on two criteria: first and most importantly, compatibility with the Healthy Star guidelines so there was ample variance in the nutritional values of the products, and secondly, availability of the products for purchase in the immediate area. Ultimately, 9 microwavable soups and 9 granola bars were chosen so that

there were 3 healthy (qualified for 3 stars), 3 moderate (qualified for 1 star), and 3 unhealthy products (qualified for 0 stars) in each product category set.

The granola bars used for the study were: Quaker Chewy Peanut Butter Chocolate Chip (3 stars), Kashi Honey Almond Flax (3 stars), Kashi Peanut Peanut Butter (3 stars), Fiber Plus Dark Chocolate Almond (1 star), Quaker Chewy Dipps Caramel Nut (1 star), Nature Valley Sweet and Salty Nut Dark Chocolate, Peanut, and Almond (1 star), Fiber One Oat and Peanut Butter (0 stars), Quaker Chewy Dipps Chocolate Chip (0 stars), and Quaker Chewy Dipps Dark Chocolatey (0 stars). Please refer to Figure19 for an example of the granola bar stimuli.

The soups used for the study were: Campbell's Select Harvest Mexican Style Chicken Tortilla (3 stars), Campbell's Select Harvest Savory Chicken and Long Grain Rice (3 stars), Campbell's Select Harvest Chicken with Egg Noodles (3 stars), Campbell's Tomato (1 star), Campbell's Creamy Tomato (1 star), Campbell's Select Harvest Minestrone (1 star), Campbell's Vegetable (0 stars), Campbell's Vegetable Beef (0 stars), and Campbell's Homestyle Chicken Noodle (0 stars). Please refer to Figure 20 for an example of the soup stimuli.

All products in both categories qualified for their respective star ratings "as is" except for the Quaker Chewy Peanut Butter Chocolate Chip, which would not qualify for 3 stars "as is" because of its sugar level. Therefore, I carefully cut the front and sides off of the package and wrapped /glued it around a box of Quaker Chewy Peanut Butter Chocolate Chip with 25% Less Sugar. The FOP reductive icon matched the information on the nutrition facts panel for the 25% less sugar product, thus qualifying what appeared to respondents as Quaker Chewy Peanut Butter Chocolate Chip for 3 stars. No other alterations were necessary for any granola or soup product

except the concealment of any potentially confounding FOP indicators of product healthfulness (e.g., “Low in Fat” or “30% Daily Value of Fiber”).

Each granola and soup product was stocked so that there was an additional product sitting behind it on the shelf in order to make the retail setting more realistic. The presentation of products on the shelf was counterbalanced throughout the experiment in order to control for any positioning confounds (i.e., prominence due to eye level placement). The presentation of FOP icons was held constant, however, so that icons were positioned on the packages similar to how they would most likely be found in the marketplace (i.e., the FOP reductive icon was never positioned on the bottom right of a package, for example, because it is less likely to be seen that way in a retail store). Please refer to Figure 21 for a photograph of the retail setting.

Respondents were given a shopping basket with handles (identical to those commonly found in any grocery store) and were asked to: 1) select and put into the basket any granola bars that they would consider purchasing, in general, and then 2) select the single granola bar out of their shopping basket that they would be most likely to purchase. The granola bars were then put back onto the shelf and the respondents were asked to: 1) select and put into the basket any granola bars that they consider to be healthy options, and then 2) select the single granola bar out of their shopping basket that they consider to be the healthiest option. The granola bars were then put back onto the shelf again and the respondents were lastly asked to: 1) select and put into the basket any granola bars that they consider to be unhealthy options, and then 2) select the single granola bar out of their shopping basket that they consider to be the unhealthiest option. Afterward, this same set of procedures was repeated exactly for the soups. A researcher stood a few feet away and recorded responses via pencil and paper, so to minimize any unintentional influence or pressure placed upon the respondents.

After the choice tasks were completed, respondents were seated directly in front of the products on the shelf and were asked to fill out a pencil and paper survey. The questions pertained to one 3 star healthy granola bar product (Quaker Chewy Peanut Butter Chocolate Chip) and one 0 star unhealthy granola bar product (Quaker Chewy DIPPS Chocolate Chip), as well as one 3 star healthy soup product (Campbell's Savory Chicken and Long Grain Rice) and one 0 star unhealthy soup product (Campbell's Vegetable Beef). Having the respondents answer these product-related and product category-related questions in the retail lab allowed for the physical handling and examination of products and "real time" comparisons and contrasts in a more natural, realistic retail environment. This survey lasted approximately 15 minutes.

Lastly, after the pencil and paper survey was completed in the lab, respondents were individually taken into a separate break-out room to take a concluding 5 minute online Qualtrics survey. There they answered some concluding questions and provided demographic information. Later, this online data was merged with the choice and product-related data collected via pencil and paper in the retail lab for each respondent to create a master data set.

Dependent Measures and Manipulation Checks

A manipulation check was conducted to ensure the effectiveness of the manipulation of the Healthy Stars and Facts Up Front disclosures. Respondents were asked "Did you see a 'Facts Up Front' nutrition label on the front of the packaged food items that were presented to you in the retail lab?" to assess awareness of the Facts Up Front disclosure. Respondents were also asked "Did you see a 'Healthy Stars Rating System' on the front of the packaged food items that were presented to you in the retail lab?" to assess awareness of the Healthy Stars disclosure. The available responses for both questions were "yes" or "no".

All dependent measures were measured so that higher values indicate more favorable responses. Intent, attitudinal, and perception variables were used to assess the predictions made in the study hypotheses. The perceived conceptual fluency of FOP information (modified from Lee and Aaker 2004; Kozup, Creyer, and Burton 2003) was assessed through four seven-point bipolar adjective scales. Endpoints were "strongly disagree/strongly agree". (i.e., "Given the information on the front of the package, it is easy to determine how healthy the product is", "Given the information on the front of the package, it is clear whether the product is high or low in its level of nutritiousness", "I feel confident about whether this product is a healthy or unhealthy choice based on the information on the front of the package", and "It is easy to understand whether this product is a healthy or unhealthy choice given the information shown on the package"). The Cronbach's alpha reliability estimate was .93 for healthy granola bars, .93 for unhealthy granola bars, .95 for healthy soups, and .97 for unhealthy soups.

Perceived product healthfulness (modified from Garretson and Burton 2000) was assessed through two seven-point bipolar adjective scales. Endpoints for product healthfulness were "not at all nutritious/highly nutritious" and "very unhealthy/very healthy" (i.e., "Please consider the nutrition level of the Quaker Chewy Dipps Chocolate Chip bars shown. Do you believe that the food product is:"). The Pearson correlation was .69 ($p < .01$) for healthy granola bars, .76 ($p < .01$) for unhealthy granola bars, .73 ($p < .01$) for healthy soups, and .87 ($p < .01$) for unhealthy soups.

Product purchase intentions (modified from Howlett, Burton, and Kozup 2008) were assessed through two seven-point bipolar adjective scales. Endpoints for purchase intentions were "very unlikely/very likely" and "not probable/very probable" (i.e., "Assuming you were interested in purchasing the granola bars shown in the retail store, how likely are you to buy

Quaker Chewy Dipps Chocolate Chip bars given the information shown on the package?"). The Pearson correlation was .97 ($p < .01$) for healthy granola bars, .96 ($p < .01$) for unhealthy granola bars, .94 ($p < .01$) for healthy soups, and .97 ($p < .01$) for unhealthy soups. For an overview of all measures used in Study 3, please refer to Appendix D.

RESULTS

One objective of this study focused on the direct effects of a FOP reductive icon (H1a) and a FOP interpretive icon on perceived conceptual fluency (H1b). Additionally, an interaction between a FOP interpretive icon and a FOP reductive icon was hypothesized for perceived conceptual fluency (H2), as well moderating effects of both reductive (H3a) and interpretive (H3b) icons on perceived product healthfulness. Additionally, moderating effects of reductive (H4a) and interpretive (H4b) icons on purchase intentions were also hypothesized. Lastly, it was hypothesized that the presence of a reductive (H5a) and interpretive icon (H5b) would positively impact the likelihood of respondents choosing an objectively healthier product out of a categorical consideration set at the retail shelf. For an overview of results, please refer to Tables 4 and 5 for granola and soup, respectively. These results will be discussed in detail in the next section.

Manipulation Check

Crosstab results indicate a successful manipulation check ($\chi^2 = 92.31$; $p < .001$) for both the interpretive icon ($\chi^2 = 92.31$; $p < .001$) (100% of respondents reported seeing it when it was present; 96% of respondents reported not seeing it when it was absent) and for the reductive icon ($\chi^2 = 68.72$; $p < .001$) (98% of respondents reported seeing it when it was present; 85% of

respondents reported not seeing it when it was absent). This pattern of results indicates satisfactorily high levels of awareness of the FOP nutrition disclosure format manipulations.

Main Effects of FOP Health Communications

It is important to note that while the earlier hypotheses were written in a succinct manner to predict similar results in both categories (granola bars and soup), each hypothesis was tested independently for each category. Thus, the results presented here originate from some separate analyses for both the granola and soup products, as initial analyses indicated differences between the categories.

Consistent with H1a, results indicate a significant main effect of a FOP reductive icon on perceived conceptual fluency of FOP health information for products in both the granola bar category ($F(1,96) = 38.06$, $p < .001$) and the soup category ($F(1,96) = 13.25$, $p < .001$). Fluency was higher when the reductive icon was present ($M_{granola}=4.89$; $M_{soup}=5.16$) than when it was absent ($M_{granola}=3.33$; $M_{soup}=4.18$).

Consistent with H1b, results indicate a significant main effect of a FOP interpretive icon on perceived conceptual fluency of FOP health information for products in both the granola bar category ($F(1,96) = 16.08$, $p < .001$) and the soup category ($F(1,96) = 14.36$, $p < .001$). Fluency was higher when the interpretive icon was present ($M_{granola}=4.62$; $M_{soup}=5.18$) than when it was absent ($M_{granola}=3.60$; $M_{soup}=4.16$).

Moderating Effects of a FOP Reductive Icon and a FOP Interpretive Icon

These main effects were found to be moderated. Partially supporting H2, the FOP reductive icon X FOP interpretive icon interaction was significant for perceived conceptual

fluency of FOP health information for the granola category (F (1,96) = 10.12, $p < .01$), but not the soup category (F (1,96) = 3.57, $p < .10$). The plot of means can be found in Figures 22a and 22b, respectively. For the granola category, perceived conceptual fluency was at its lowest in the control condition (M=2.42). However, when the reductive icon was added in isolation, fluency increased significantly (M=4.79) (F (1, 96) = 43.16, $p < .001$). Similarly, fluency also significantly increased when the interpretive icon was added in isolation (M=4.24) (F (1, 96) = 28.14, $p < .001$). However, fluency was at its highest point when the interpretive icon was added to granola packages that already contained the reductive icon (M=4.99) (F (1, 96) = 4.52, $p < .05$)[4], despite the increase in complexity of the FOP information environment. While the plot of means for the soup category is similar to that of the granola category, it will not be discussed in further detail since the overall interaction did not reach significance.

Inconsistent with H3a, the FOP reductive icon X objective product nutrition interaction was not significant for subjective perceptions of product healthfulness for products in either the granola category (F (1,96) = 2.41, $p > .10$) or the soup category (F (1,96) = 1.33, $p > .10$). The plot of means can be found in Figure 23a and 23b, respectively. While these interactions will not be discussed in further detail since they did not reach significance, it should be noted that the objectively healthier product in the granola category was perceived to be significantly more nutritious when the FOP reductive icon was present (M=4.55) than when it was absent (M=3.92) (F (1,96) = 6.55, $p < .05$).

However, consistent with H3b, the FOP interpretive icon X objective product nutrition interaction was significant for subjective perceptions of product healthfulness for products in both the granola category (F (1,96) = 17.88, $p < .001$) and the soup category (F (1,96) = 17.25, p

[4] Significant for a one-tailed test.

< .001). The plot of means can be found in Figure 24a and 24b, respectively. In the granola category, the objectively healthier product was perceived to be significantly more nutritious when the FOP interpretive icon was present (M=4.54) than when it was absent (M=3.94) (F (1,96) = 6.04, $p < .05$). By contrast, the objectively unhealthier product was perceived to be significantly less nutritious when the FOP interpretive icon was present in the category (M=2.59) than when it was absent (M=3.14) (F (1,96) = 6.02, $p < .05$).

In the soup category, the objectively healthier product was perceived to be significantly more nutritious when the FOP interpretive icon was present (M=5.79) than when it was absent (M=5.36) (F (1,96) = 5.01, $p < .05$). By contrast, the objectively unhealthier product was perceived to be significantly less nutritious when the FOP interpretive icon was present (M=3.56) than when it was absent (M=4.43) (F (1,96) = 10.07, $p < .01$). Cumulatively, these findings for H3b indicate highly similar patterns of results across both product categories.

Inconsistent with H4a, the FOP reductive icon X objective product nutrition interaction was not significant for purchase intentions in either the granola category (F (1,96) = 2.39, $p > .10$) or the soup category (F (1,96) = 1.67, $p > .10$). The plot of means can be found in Figure 25a and 25b, respectively. While these interactions will not be discussed in further detail since they did not reach significance, it should be noted that purchase intentions for the objectively healthier product in the granola category were significantly higher when the FOP reductive icon was present (M=4.73) than when it was absent (M=3.92) (F (1,96) = 4.39, $p < .05$), but purchase intentions for the objectively *unhealthier* product in the soup category were significantly higher when the FOP reductive icon was present (M=4.36) than when it was absent (M=3.35) (F (1,96) = 7.66, $p < .01$).

Consistent with H4b, the FOP interpretive icon X objective product nutrition interaction was significant for purchase intentions for products in both the granola category (F (1,96) = 15.59, $p < .001$) and the soup category (F (1,96) = 11.85, $p < .01$). The plot of means can be found in Figure 26a and 26b, respectively. In the granola category, purchase intentions for the objectively healthier product were significantly higher when the FOP interpretive icon was present (M=4.91) than when it was absent (M=3.74) (F (1,96) = 9.20, $p < .01$). By contrast, purchase intentions for the objectively unhealthier product were lower when the icon was present (M=3.20) than when it was absent (M=3.94) (F (1,96) = 3.63, $p < .05$)[5].

In the soup category, purchase intentions for the objectively healthier product were higher when the FOP interpretive icon was present (M=5.54) than when it was absent (M=4.95) (F (1,96) = 3.56, $p < .05$)[6]. By contrast, purchase intentions for the objectively unhealthier product were significantly lower when the icon was present (M=3.34) than when it was absent (M=4.36) (F (1,96) = 7.89, $p < .01$).

To test H5a and H5b, a hierarchical logistic regression was run with the likelihood of choosing a healthier product out of a categorical consideration set as the dependent variable. The dependent variable was coded so that an objectively healthier choice was indicated by a 1and any other choice was indicated by a 0 when respondents answered the following question asked by a researcher, "Which single product would you be most likely to purchase?" as they were observing the entire granola or soup category at the retail shelf. Results can be seen in Table 6 and Table 7 for the granola and soup categories, respectively. First, nutrition concern, nutrition knowledge, and nutrition behavior were all entered as covariates in model 1, the interpretive icon

[5] Significant for a one-tailed test.
[6] Significant for a one-tailed test.

and reductive icon were centered and then entered in model 2, and lastly the centered interpretive X reductive icon interaction was entered in model 3. The independent variables were centered to help control for any multicollinearity issues (Aiken and West 1991).

Inconsistent with H5a, the presence of a reductive FOP icon did not lead to a higher likelihood of choosing a healthier product out of a consideration set in the granola category (b=.59, SE=.46, p >.10) or the soup category (b=-.35, SE=.45, p >.10). Partially consistent with H5b, however, the presence of an interpretive FOP icon did lead to a higher likelihood of choosing a healthier product out of a consideration set in the granola category (b=1.08, SE=.48, p < .05) but not the soup category (b=.45, SE=.45, p > .10), indicating that the presence of the icon had a positive influence on the purchasing likelihood of healthier granola products. More specifically, the odds ratio for the interpretive icon of 2.29 from a crosstab analysis indicates the benefit of the interpretive icon in increasing the choice of a healthful selection in the granola category. The probability of choosing the healthful product increased from 24% in the control condition to 42% when the icon was present.

DISCUSSION

The primary purpose of Study 3 was to assess consumer reactions to multiple FOP nutrition labeling systems in a realistic, controlled retail lab setting. Specifically, this study examined differences in perceived health information fluency, perceived product healthfulness, and purchase intentions across multiple product categories. A discussion of the results of these objectives and their implications follows below.

Main Effects of FOP Interpretive and Reductive Icons on Fluency

The findings of this study support the potential effectiveness of FOP icons in accurately communicating important nutrition information to consumers that can be used in forming product healthfulness perceptions and shaping purchase intentions across multiple product categories in a retail shopping environment. Overall, the results indicate that the presence of either a reductive or interpretive icon leads to higher fluency of FOP health information, supporting prior research that has shown that the presence of these symbols can positively impact the perceived healthfulness of a product (e.g., Urala, Arvola, and Lahteenmaki 2003; Andrews, Burton, and Kees 2011) and further strengthens the precept that consumers value simplicity of nutrition information (Fuenkes et al. 2008; Lupton et al. 2010).

Moderating Effects of FOP Interpretive and Reductive Icons

The results further show that despite the increase in FOP information complexity, the use of multiple FOP icons simultaneously (i.e, a reductive and an interpretive icon) can lead to *even* higher fluency of health information compared to when none are present at all. However, the presentation of both icons (compared to the presentation of the interpretive icon only) resulted in significantly higher levels of fluency in the granola category, but interestingly not in the soup category. This difference could very well stem from naturally occurring differences in categorical fluencies (i.e., collectively the granola category may have had less perceived nutritional variance than the soup category, thus making FOP icons more effective in positively influencing fluency in one category than the other). This supposition will be expanded upon in the future research section.

Findings also show that the presence of a FOP interpretive icon moderates the effect of objective product nutrition on perceived product nutritiousness. The presence of the interpretive

icon led respondents to perceive more healthful products as healthy, while simultaneously lowering healthfulness perceptions of less nutritious products. This important finding likely stems from the fact that the interpretive Healthy Stars icon can not only identify healthier products, but also enables a consumer to know if a product did not qualify for *any* stars (or one or two stars) since the icon is not simply dichotomous in nature like other former and existing marketplace icons (e.g., Healthy Choices, Walmart's Great for You Icon). The FOP reductive icon, however, was far less effective in accurately influencing consumers' healthfulness perceptions of products, supporting prior conclusions that consumers often have difficulty interpreting quantitative nutrition information (e.g., Hieke and Taylor 2011).

Additionally, the presence of a FOP interpretive icon moderated the effect of objective product nutrition on purchase intentions so that the presence of the icon led to intentions that were higher for healthier products and lower for unhealthy products compared to when no icon was available in both categories. These findings support prior research that has shown that the presence of FOP healthy icons leads to higher purchase intentions when Fact panels are not examined (e.g., Keller et al. 1997; Andrews, Burton, and Kees 2011), and that alternative food items in a consideration set can serve as a frame of reference against which a single specific item can be evaluated (Kozup, Creyer, and Burton 2003). These findings also demonstrate how the inclusion of reference values (i.e., stars) can result in higher purchase likelihoods for healthy products than unhealthy products (Burton, Biswas, and Netemeyer 1994).

Again, however, the reductive icon had a far less positive impact on purchase intentions from a consumer welfare standpoint. While the presence of the reductive icon did lead to increased intentions for the healthy product in the granola category, it also increased intentions to purchase the *unhealthy* product in the soup category, thus narrowing the purchase intention gap

between healthy and unhealthy products in that category. This finding could very well stem from consumers' lack of ability to accurately apply quantitative information to make healthy shopping decisions when faced with multiple products and brands in a given category or across categories. The hierarchical logistic regression results supported these findings, as the interpretive icon led to a higher likelihood of choosing the healthier product in the granola category (but not the soup), and the reductive icon had no significant impact on purchase likelihood for either category.

The theoretical and managerial contributions of this study will be discussed in conjunction with Study 4 later in this document.

CONCLUSION, LIMITATIONS, AND FUTURE RESEARCH

Overall, these findings suggest that the presence of a FOP interpretive icon allows consumers to accurately distinguish between healthier and unhealthier products in large assortments across multiple categories in the presence of realistic package information such as pictures, descriptions, promotions, and brand information. It can also be concluded that consumers are more likely to make healthy purchasing decisions with the aid of the icon by increasing their likelihood to buy more nutritious products while simultaneously decreasing their intentions to buy less nutritious products.

However, this study is not without its limitations. First, while data were collected in a controlled retail setting, actual purchasing behavior data was not employed in these analyses. Furthermore, the sample was a convenience sample of students and staff from a southeastern university, bringing the generalizability of the results to broader populations into question. Additionally, as mentioned earlier, differences in perceived FOP health information fluency

across categories could stem from naturally occurring differences in categorical fluencies. Therefore, Study 4 will utilize a more representative adult sample and use a different product category (macaroni and cheese) to compare against the granola bar category in the same controlled retail setting to enhance the generalizability of results.

CHAPTER 6

EXPERIMENT 4

Study 4 will extend Study 3 by utilizing an adult sample for more generalizable results while also integrating new analyses to better understand consumer attitudes, perceptions, and intentions at the retail shelf. Furthermore, the mediating influence of conceptual fluency will be examined.

CONCEPTUAL DEVELOPMENT AND HYPOTHESES

Effects of FOP Nutrition Labeling Systems

In this study, I will attempt to replicate a number of hypotheses from Study 3 across a new product category, macaroni and cheese, in order to show the robustness of the effects found in the earlier study, as well as to establish any new boundary conditions. To that end, the rationale for the hypotheses will be the same as in Study 3 and will not be repeated here. The four replicated hypotheses can be found below:

H1: The presence (absence) of (a) reductive and (b) interpretive FOP icons will lead to higher (lower) perceived conceptual fluency of FOP health information.

H2: The presence of a FOP interpretive icon will moderate the effect of a FOP reductive icon on the perceived conceptual fluency of FOP health information. The presence of the interpretive icon will increase the positive effect of the reductive icon on perceived fluency.

H3: The presence of (a) reductive and (b) interpretive FOP icons will moderate the effect of objective product nutrition levels on the perception of product healthfulness. When the icon is present (absent), subjective perceptions of healthfulness for objectively healthier products will be higher (lower). Conversely, for objectively unhealthier products,

subjective perceptions of healthfulness will be (lower) higher when the icon is present (absent). The moderating effect of the interpretive icon will be stronger than that of the reductive icon.

H4: The presence of (a) reductive and (b) interpretive FOP icons will moderate the effect of objective product nutrition on purchase intentions. When the icons are present (absent), purchase intentions for objectively healthier products will be higher (lower). Conversely, for objectively unhealthier products, purchase intentions will be lower (higher) when the icons are present (absent). The moderating effect of the interpretive icon will be stronger than that of the reductive icon.

H5: The presence of (a) reductive and (b) interpretive FOP icons will lead to a higher likelihood of choosing a healthier product out of a categorical consideration set.

New Hypotheses

Previous research has shown that when consumers process health and nutrient claims they tend to form more positive evaluations of the food product and minimize additional information search (Roe, Levy, and Derby 1999), sometimes making broad (and potentially misleading) generalizations about the associated product (Andrews, Netemeyer, and Burton 1998). Similarly, nutrition information presented in the form of FOP icons can serve as a heuristic cue of healthfulness and potentially create halo effects (Nesbett and Wilson 1977), thereby providing consumers with more fluent, applicable information from which to from their attitudes toward the overall product on. As such, this easy-to-access and easy-to-interpret information should lead consumers to have more favorable attitudes toward healthier products

(e.g., Kozup, Creyer, and Burton 2003; Andrews, Burton, and Kees 2011), but lead to more negative attitudes toward the *unhealthier* products. Therefore, I predict that:

H6: The presence of (a) reductive and (b) interpretive FOP icons will moderate the effect of objective product nutrition on product attitudes. When the icons are present (absent), attitudes toward objectively healthier products will be higher (lower). Conversely, for objectively unhealthier products, attitudes will be lower (higher) when the icons are present (absent). The moderating effect of the interpretive icon will be stronger than that of the reductive icon.

Fluency has been shown to have a mediating effect in a number of different contexts in the literature. For example, Labroo and Lee (2006) demonstrated the mediating effect of fluency on brand attitudes. More specifically, they showed that consumers' ease of processing an advertisement mediated the effect of goal compatibility on brand evaluations. Similarly, Novemsky et al. (2007) found that the subjective feelings of difficulty consumers experienced when trying to justify their choice of a particular product to purchase in a consideration set mediated the choice itself. The authors concluded that fluency is an important determinant of not only which option will be chosen, but whether a purchase decision will be made at all (Novemsky et al. 2007). Within the context of health and nutrition, previous research has shown that the effects of nutrition information on purchase intentions may be mediated by other product-related beliefs (Burton, Andrews, and Netemeyer 2000; Howlett, Burton, and Kozup 2008; Howlett et al. forthcoming). Therefore, when deliberating over whether to buy a food product, the perceived fluency of FOP health information should mediate the main effects of FOP icons. Thus, I predict the following:

H7: Conceptual fluency mediates the main effect of a (a) reductive and (b) interpretive FOP icon and their interactive effects on purchase intentions for healthier products.

METHODOLOGY

Design, Sample, and Procedure

The procedure was extremely similar to that of Study 3 so only the differences and critical details will be expanded upon in this section. The study utilized a 2 (interpretive FOP icon: IOM stars vs. control) x 2 (reductive FOP icon: Facts Up Front vs. control) x 2 (product healthfulness: more healthful vs. less healthful) mixed experimental design across two product categories (granola bars and macaroni and cheese). A sample of 120 adults with children was used for this study. Approximately 53% of this sample was female, ages of participants ranged from 20 to 65, the average combined household income was between $50,000 and $59,000, 73% had at least some college education, and 76% claimed to be the primary food shopper in their household. Additionally, at least 90% of the sample claimed to have children living at home between the age of 2 and 17, while the number of children (dependents) that respondents reported ranged from 1 to 4. Each respondent was randomly assigned to one of the four conditions and was paid $10 for their time.

Products for each category were chosen solely on two criteria by the researchers: first and most importantly, compatibility with the Healthy Star guidelines so there was ample variance in the nutritional values of the products, and secondly, availability of the products for purchase in the immediate area. Ultimately, 7 microwavable macaroni and cheese products and 7 granola bar products were chosen so that there were 2 healthy (qualified for 3 stars), 3 moderate

(qualified for 1 star), and 2 unhealthy products (qualified for 0 stars) in each product category set.

The granola bars used for the study were: Quaker Chewy Peanut Butter Chocolate Chip (3 stars), Kashi Peanut Peanut Butter (3 stars), Fiber Plus Dark Chocolate Almond (1 star), Quaker Chewy Dipps Caramel Nut (1 star), Nature Valley Sweet and Salty Nut Dark Chocolate, Peanut, and Almond (1 star), Quaker Chewy Dipps Chocolate Chip (0 stars), and Quaker Chewy Dipps Dark Chocolatey (0 stars). Please refer to Figure 27 for an example of the granola bar stimuli.

The macaroni and cheese products used for the study were: Kraft Cheddar Explosion (3 stars), Kraft White Cheddar (3 stars), Kraft Alfredo (1 star), Kraft Cheesy Pizza (1 star), Kraft Cars 2 Shapes (1 star), Kraft Original (0 stars), and Kraft Triple Cheese (0 stars). Please refer to Figure 28 for an example of the macaroni and cheese stimuli and Figure 29 for an example of the overall retail setting.

All products in both categories qualified for their respective star ratings “as is” except for the Quaker Chewy Peanut Butter Chocolate Chip, which did not qualify for 3 stars “as is” because of the sugar level. Therefore, I carefully cut the front and sides off of the package and wrapped /glued it around a box of Quaker Chewy Peanut Butter Chocolate Chip with 25% Less Sugar. The FOP reductive icon matched the information on the nutrition facts panel for the 25% less sugar product, thus qualifying what appeared to respondents as Quaker Chewy Peanut Butter Chocolate Chip for 3 stars. No other alterations were necessary for any granola or soup product except the concealment of any potentially confounding FOP indicators of product healthfulness (e.g., “Low in Fat” or “30% Daily Value of Fiber”).

After the choice tasks were completed, respondents were seated directly in front of the products on the shelf and were asked to fill out a pencil and paper survey. The questions pertained to one 3 star healthy granola bar product and one 0 star unhealthy granola bar product, as well as one 3 star healthy macaroni and cheese product and one 0 star unhealthy macaroni and cheese product. Having the respondents answer these product-related and product category-related questions in the retail lab allowed for the physical handling of products and "real time" comparisons and contrasts in a more natural, realistic retail environment. This survey lasted approximately 15 minutes.

Lastly, after the pencil and paper survey was completed in the lab, respondents were individually taken into a separate break-out room to take a concluding 5 minute online Qualtrics survey. There they answered some concluding questions and provided demographic information. Later, this online data was merged with the choice and product-related data collected via pencil and paper in the retail lab for each respondent to create a concentrated master data set.

Dependent Measures and Manipulation Check

A manipulation check was conducted to ensure the effectiveness of the manipulation of the Healthy Stars and Facts Up Front disclosures. Respondents were asked "Did you see a 'Facts Up Front' nutrition label on the front of the packaged food items that were presented to you in the retail lab?" to assess awareness of the Facts Up Front disclosure. Respondents were also asked "Did you see a 'Healthy Stars Rating System' on the front of the packaged food items that were presented to you in the retail lab?" to assess awareness of the Healthy Stars disclosure. The available responses for both questions were "yes" or "no".

All dependent measures were measured so that higher values indicate more favorable responses. Intent, attitudinal, and perception variables were used to assess the predictions made in the study hypotheses. The perceived conceptual fluency of FOP health information (modified from Lee and Aaker 2004; Kozup, Creyer, and Burton 2003) was assessed through four seven-point bipolar adjective scales. Endpoints were "strongly disagree/strongly agree". (i.e., "Given the information on the front of the package, it is easy to determine how healthy the product is", "Given the information on the front of the package, it is clear whether the product is high or low in its level of nutritiousness", "I feel confident about whether this product is a healthy or unhealthy choice based on the information on the front of the package", and "It is easy to understand whether this product is a healthy or unhealthy choice given the information shown on the package"). The Cronbach's alpha reliability estimate was .95 for healthy granola bars, .95 for unhealthy granola bars, .97 for healthy macaroni and cheese, and .98 for unhealthy macaroni and cheese.

Product attitudes (Kozup, Creyer, and Burton 2003) were assessed through two seven-point bipolar adjective scales. Endpoints were "unfavorable/favorable" and "bad/good" (i.e., "Based on the information shown, what is your overall attitude toward the Quaker Chewy Dipps Chocolate Chip bars shown?"). The Pearson's correlation estimate was .94 ($p < .01$) for healthy granola bars, .89 ($p < .01$) for unhealthy granola bars, .95 ($p < .01$) for healthy macaroni and cheese, and .97 ($p < .01$) for unhealthy macaroni and cheese.

Perceived product healthfulness (modified from Garretson and Burton 2000) was assessed through two seven-point bipolar adjective scales. Endpoints for product healthfulness were "not at all nutritious/highly nutritious" and "very unhealthy/very healthy" (i.e., "Please consider the nutrition level of the Quaker Chewy Dipps Chocolate Chip bars shown. Do you

believe that the food product is:"). The Pearson's correlation estimate was .86 ($p < .01$) for healthy granola bars, .88 ($p < .01$) for unhealthy granola bars, .90 ($p < .01$) for healthy macaroni and cheese, and .91 ($p < .01$) for unhealthy macaroni and cheese.

Product purchase intentions (modified from Howlett, Burton, and Kozup 2008) were assessed through two seven-point bipolar adjective scales. Endpoints for purchase intentions were "very unlikely/very likely" and "not probable/very probable" (i.e., "Assuming you were interested in purchasing the granola bars shown in the retail store, how likely are you to buy Quaker Chewy Dipps Chocolate Chip bars given the information shown on the package?"). The Pearson's correlation estimate was .98 ($p < .01$) for healthy granola bars, .96 ($p < .01$) for unhealthy granola bars, .99 ($p < .01$) for healthy macaroni and cheese, and .98 ($p < .01$) for unhealthy macaroni and cheese.

Brand attitude (modified from Kozup, Creyer, and Burton 2003) and perceived brand healthfulness (modified from Garretson and Burton 2000) were utilized as covariates in the repeated measures analyses and assessed through two seven-point bipolar adjective scales. Endpoints for the brand attitude measure were "unfavorable/favorable" and "bad/good" (i.e., "Overall, what is your general attitude toward the Quaker brand of granola bars?"). The Pearson's correlation estimate was .95 ($p < .01$) for granola bars and .95 ($p < .01$) for macaroni and cheese. Endpoints for the perceived brand healthfulness measure were "not at all nutritious/highly nutritious" and "very unhealthy/very healthy" (i.e., "Overall, what is your general perception of the healthfulness of Quaker granola bars?"). The Pearson's correlation estimate was .93 ($p < .01$) for granola bars and .95 ($p < .01$) for macaroni and cheese.

Lastly, nutrition concern, nutrition knowledge, and nutrition behavior were also utilized as covariates in the hierarchical logistic regression analyses. Nutrition concern was assessed through three seven-point bipolar adjective scales (i.e, "In general, how often do you read the nutrition facts panel that reports nutrient information on food products?", "In general, how interested are you in reading nutrition and health-related information?", and "I really care about nutrition in general"). Endpoints were "not often/very often", "not interested/very interested", and "not at all/very much", respectively. The Cronbach's reliability estimate was .95. Nutrition knowledge was assessed through three seven-point bipolar adjective scales (i.e, "In general, how much do you think you know about the topic of nutrition?", "I know a lot about nutrition in general", and "Compared to most people, I am quite knowledgeable about nutrition"). Endpoints were "not at all knowledgeable/extremely knowledgeable", "strongly disagree/strongly agree", and "strongly disagree/strongly agree", respectively. The Cronbach's reliability estimate was .95. Lastly, nutrition behavior was assessed through five seven-point bipolar adjective scales (i.e, "I eat healthy food at home", "I eat healthy food when I'm traveling", "I eat healthy food when I'm out eating at a restaurant", "Being a healthy consumer is an important part of my self-concept", and "I identify myself as a healthy consumer"). Endpoints were "never/always" for the first three items, respectively, and "strongly disagree/strongly agree" for the last two items, respectively. The Cronbach's reliability estimate was .87. For an overview of all measures used in Study 4, please refer to Appendix E.

RESULTS

The objectives of this study focused on the direct effects of a FOP interpretive icon (H1a) and a FOP reductive icon (H1b) on perceived conceptual fluency. Additionally, an interaction between a FOP interpretive icon and a FOP reductive icon was hypothesized for perceived

conceptual fluency (H2), as well moderating effects of both reductive (H3a) and interpretive (H3b) icons on perceived product healthfulness. Moderating effects of reductive (H4a) and interpretive (H4b) icons on purchase intentions were also hypothesized, as well as the effects of reductive (H5a) and interpretive (H5b) icons on the likelihood of choosing a healthier product out of a categorical consideration set at the retail shelf. Lastly, moderating effects of both reductive (H6a) and interpretive (H6b) icons on product attitudes were hypothesized, along the mediating effects of fluency for the reductive (H7a) and interpretive (H7b) icons on purchase intentions for a healthy product. For an overview of results, please refer to Tables 8 and 9 for granola and macaroni and cheese, respectively. Results will be discussed in detail in the next section.

Manipulation Check

Crosstab results indicate a successful manipulation check for both the interpretive icon (χ^2= 104.00; $p < .001$) (100% reported seeing the icon when it was present; 93% reported not seeing it when it was absent) and the reductive icon (χ^2= 68.98; $p < .001$) (97% reported seeing the icon when it was present; 97% reported not seeing it when it was absent). This pattern of results indicates satisfactorily high levels of awareness of the FOP nutrition disclosure format manipulations.

Main Effects of FOP Health Communications

It is important to note that while the earlier hypotheses were written in a succinct manner to predict similar results in both categories (granola bars and macaroni and cheese), each hypothesis was tested independently for each category. Thus, the results presented here originate from separate analyses for both the granola and macaroni and cheese products.

Consistent with H1a, results indicate a significant main effect of a FOP reductive icon on perceived conceptual fluency of FOP health information for products in both the granola bar category (F (1,112) = 19.98, $p < .001$) and the macaroni and cheese category (F (1,111) = 24.53, $p < .001$), suggesting that fluency was higher when the reductive icon was present ($M_{granola}$=4.53; $M_{macaroni\ and\ cheese}$ =4.49) than when it was absent ($M_{granola}$=3.55; $M_{macaroni\ and\ cheese}$ =3.32).

Consistent with H1b, results indicate a significant main effect of a FOP interpretive icon on perceived conceptual fluency of FOP health information for products in both the granola bar category (F (1,112) = 46.24, $p < .001$) and the macaroni and cheese category (F (1,111) = 35.16, $p < .001$), suggesting that fluency was higher when the interpretive icon was present ($M_{granola}$=4.79; $M_{macaroni\ and\ cheese}$ =4.61) than when it was absent ($M_{granola}$=3.28; $M_{macaroni\ and\ cheese}$ =3.20).

Moderating Effects of a FOP Reductive Icon and a FOP Interpretive Icon

Partially supporting H2, the FOP reductive icon X FOP interpretive icon interaction was significant for perceived conceptual fluency of FOP health information for the granola category (F (1,112) = 23.63, $p < .001$) and the macaroni and cheese category (F (1,111) = 27.60, $p < .001$). The plot of means can be found in Figures 30a and 30b, respectively. For the granola category, perceived conceptual fluency was at its lowest in the control condition (M=2.26). Adding a reductive icon in isolation represented a significant increase in fluency (M=4.31) (F (1,112) = 42.58, $p <.001$), while adding an interpretive icon in isolation also significantly increased fluency (M=4.83) (F (1,112) = 66.51, $p < .001$). Lastly, adding the interpretive icon to the reductive icon

significantly increased the positive effect of the reductive icon on fluency as hypothesized (M=4.75) (F (1,112) = 2.80, $p < .05$)[7].

For the macaroni and cheese category, perceived conceptual fluency was at its lowest in the control condition (M=2.00). Adding a reductive icon in isolation represented a significant increase in fluency (M=4.40) (F (1,111) = 50.72, $p < .001$), while adding an interpretive icon in isolation also significantly increased fluency (M=4.64) (F (1,111) = 61.83, $p < .001$). Lastly, adding the interpretive icon to the reductive icon did not significantly increase the positive effect of the reductive icon on fluency as hypothesized ($p > .10$). Cumulatively, these findings for H2 indicate highly similar patterns of results across both product categories.

The FOP reductive icon X objective product nutrition interaction was not significant for subjective perceptions of product healthfulness for products in the granola category (F (1,112) = .58, $p > .10$), but was significant for the macaroni and cheese category (F (1,109) = 4.00, $p < .05$). However, the pattern of results in the macaroni and cheese category are contradictory to what was hypothesized in H3a, thus leading the author to not reject the null hypothesis. The plot of means can be found in Figures 31a and 31b, respectively. While the interactions won't be expanded upon, it is interesting to note that the addition of the FOP reductive icon led to decreases in healthfulness perceptions of the healthy products in both categories, though these decreases did not reach significance.

Consistent with H3b, the FOP interpretive icon X objective product nutrition interaction was significant for subjective perceptions of product healthfulness for products in both the granola category (F (1,109) = 12.29, $p < .01$) and the macaroni and cheese category (F (1,109) =

[7] Significant for a one-tailed test.

18.96, $p < .001$). The plot of means can be found in Figures 32a and 32b, respectively. In the granola category, the objectively unhealthier product was perceived to be significantly less nutritious when the FOP interpretive icon was present (M=2.73) than when it was absent (M=3.34) (F (1,109) = 6.84, $p < .01$). Similarly, the objectively healthier product was perceived to be more nutritious when the icon was present (M=4.47) than absent (M=4.13) (F (1,109) = 3.05, $p < .05$)[8].

In the macaroni and cheese category, the objectively healthier product was perceived to be significantly more nutritious when the FOP interpretive icon was present (M=3.86) than when it was absent (M=3.21) (F (1,109) = 10.41, $p < .01$). In contrast, the objectively unhealthier product was perceived to be significantly less nutritious when the FOP interpretive icon was present (M=2.61) than when it was absent (M=3.21) (F (1,109) = 8.30, $p < .01$).

For H4a, the FOP reductive icon X objective product nutrition interaction was not significant for purchase intentions in either the granola category (F (1,114) = .322, $p > .10$) or the macaroni and cheese category (F (1,113) = .13, $p > .10$). The plot of means can be found in Figures 33a and 33b, respectively. The plots will not be discussed since they did not reach significance.

However, consistent with H4b, the FOP interpretive icon X objective product nutrition interaction was significant for purchase intentions for products in both the granola category (F (1,114) = 11.94, $p < .01$) and the macaroni and cheese category (F (1,113) = 25.47, $p < .001$). The plot of means can be found in Figures 34a and 34b, respectively. In the granola category, purchase intentions were significantly higher when the FOP interpretive icon was present

[8] Significant for a one-tailed test.

(M=4.74) than when it was absent (M=4.05) (F (1,114) = 5.77, $p < .05$). In addition, purchase intentions for the objectively unhealthier product were significantly lower when the FOP interpretive icon was present (M=2.61) than when it was absent (M=3.30) (F (1,114) = 5.37, $p < .05$).

In the macaroni and cheese category, purchase intentions were significantly higher when the FOP interpretive icon was present (M=4.35) than when it was absent (M=3.49) (F (1,113) = 9.60, $p < .01$). In addition, purchase intentions for the objectively unhealthier product were significantly lower when the FOP interpretive icon was present (M=2.94) than when it was absent (M=4.16) (F (1,113) = 15.38, $p < .001$).

To test H5a and H5b, a hierarchical logistic regression was run with the likelihood of choosing a healthier product out of a categorical consideration set as the dependent variable. The dependent variable was coded so that an objectively healthier choice was indicated by a 1and any other choice was indicated by a 0 when respondents answered the following question asked by a researcher, "Which single product would you be most likely to purchase?" as they were observing the entire granola or macaroni and cheese category at the retail shelf. Results can be seen in Table 10 and Table 11 for the granola and macaroni and cheese categories, respectively. First, nutrition concern, nutrition knowledge, and nutrition behavior were all entered as covariates in model 1, the interpretive icon and reductive icon were centered and then entered in model 2, and lastly the centered interpretive X reductive icon interaction was entered in model 3. The independent variables were centered to help control for any multicollinearity issues (Aiken and West 1991).

Inconsistent with H5a, the presence of a reductive FOP icon did not lead to a higher likelihood of choosing a healthier product out of a consideration set in the granola category

(b=.21, SE=.41, p >.10) or the macaroni and cheese category (b=.18, SE=.41, p >.10). Consistent with H5b, however, the presence of an interpretive FOP icon did lead to a higher likelihood of choosing a healthier product out of a consideration set in both the granola category (b=1.08, SE=.40, p < .01) and the macaroni and cheese category (b=1.10, SE=.39, p < .01), indicating that the presence of the icon had a positive influence on purchasing likelihood in both categories. More specifically, the odds ratio from a crosstab analysis for the interpretive icon of 2.91 for the granola category and 3.06 for the macaroni and cheese category indicates the benefit of the interpretive icon in increasing the choice of a healthful selection. In the granola category, the probability of choosing the healthful product increased from 49% in the control condition to 74% when the icon was present, while the probability of choosing the healthful product in the macaroni and cheese category increased from 37% in the control condition to 64% when the icon was present. The overall model for the granola category had a R^2 value of .08 and a χ^2 value of 10.49 (p > .05), while the overall model for the macaroni and cheese category had a R^2 value of .11 and a χ^2 value of 13.68 (p < .05).

Inconsistent with H6a, the FOP reductive icon X objective product nutrition interaction was not significant for product attitudes for products in either the granola category (F (1,110) = 3.76, p > .05) or the macaroni and cheese category (F (1,112) = .59, p > .10). The plot of means can be found in Figures 35a and 35b, respectively. The plots will not be discussed since they did not reach significance.

Consistent with H6b, the FOP interpretive icon X objective product nutrition interaction was significant for product attitudes for products in both the granola category (F (1,110) = 21.66, p < .001) and the macaroni and cheese category (F (1,112) = 25.15, p < .001). The plot of means can be found in Figures 36a and 36b, respectively. In the granola category, attitudes toward the

objectively healthier product were significantly more positive when the FOP interpretive icon was present (M=5.25) than when it was absent (M=4.50) (F (1,110) = 8.90, $p < .01$). By contrast, attitudes toward the objectively unhealthier product were significantly less positive when the FOP interpretive icon was present (M=2.99) than when it was absent (M=3.78) (F (1,110) = 9.92, $p < .01$).

In the macaroni and cheese category, attitudes toward the objectively healthier product were significantly more positive when the FOP interpretive icon was present (M=4.43) than when it was absent (M=3.48) (F (1,112) = 18.05, $p < .001$). By contrast, attitudes toward the objectively unhealthier product were significantly less positive when the FOP interpretive icon was present (M=3.05) than when it was absent (M=3.80) (F (1,112) = 7.57, $p < .01$).

Lastly, consistent with H7a and H7b, conceptual fluency mediated the main effects of reductive and interpretive FOP icons on purchase intentions for healthy products in both categories. Consistent with Zhao, Lynch, and Chen (2010), a bootstrapping methodology (n = 5,000) was used to test for mediation (Preacher and Hayes 2008). The main effects and the interaction term of FOP icons were included in the model as the key predictors, conceptual fluency as the mediator, and purchase intentions as the dependent variable. For complete results, please see Table 12 and 13 for the granola and macaroni and cheese categories, respectively.

Referring to Table 12 for the granola bar category, model 1 shows significant effects of both the reductive and interpretive icon on purchase intentions**,** model 2 shows significant effects of both icons and the interpretive X reductive icon interaction on the proposed mediator conceptual fluency, and model 3 shows a significant effect of conceptual fluency on purchase intentions when it was included as a predictor (b=.61, $p < .01$) (see Muller et al. 2005).

Differences between models 1 and 3 assess whether the impact of the predictor variables on the dependent variable is reduced after including the mediator (conceptual fluency) in the regression model. As shown in model 3, the previously significant coefficients for the main effects of the interpretive icon and reductive icon were reduced to nonsignificance, while the interpretive X reductive icon interaction was also reduced. To further ensure accuracy of the mediation effects, Sobel tests were also performed (Baron and Kenny 1986). The Sobel test associated with the mediating role of conceptual fluency was significant for the interpretive icon by reductive icon interaction ($z = 2.20$; $p < .05$), as well as for the main effect of the interpretive icon ($z = 4.24$; $p < .001$) and reductive icon ($z = 3.00$; $p < .01$). Lastly, the three confidence intervals resulting from 5,000 bootstrap samples associated with the indirect effects of conceptual fluency (interpretive icon CI = 1.10 to 2.78; reductive icon CI = .91 to 2.18; interpretive X reductive icon interaction CI = -2.71 to -.90) also all indicated significant mediation (i.e., none of the confidence intervals contained a value of zero; see Zhao et al. 2010; Hayes 2011). These bootstrap results also suggest that conceptual fluency mediates the interactive effects of the two icons on purchase intentions, indicating significant mediated moderation. Thus, the pattern of the coefficients in the table, the Sobel test results, and bootstrap test results all suggest a mediating role of conceptual fluency for the direct and moderating effects of FOP interpretive and reductive icons on purchase intentions in the granola category.

Referring to Table 13 for the macaroni and cheese category, model 1 shows significant effects of both the reductive and interpretive icon on purchase intentions**,** model 2 shows significant effects of both icons and the interpretive X reductive icon interaction on the proposed mediator conceptual fluency, and model 3 shows significant effects of the interpretive X reductive icon interaction and conceptual fluency on purchase intentions when it was included as

a predictor (b=.69, $p < .01$) (see Muller et al. 2005). Differences between models 1 and 3 assess whether the impact of the predictor variables on the dependent variable is reduced after including the mediator (conceptual fluency) in the regression model. As shown in model 3, the previously significant coefficients for the main effects of the interpretive icon and reductive icon were reduced to non-significance. To further ensure accuracy of the mediation effects, Sobel tests were also performed (Baron and Kenny 1986). The Sobel test associated with the mediating role of conceptual fluency was significant for the interpretive icon by reductive icon interaction ($z = 2.58$; $p < .01$), as well as for the main effect of the interpretive icon ($z = 4.20$; $p < .001$) and reductive icon ($z = 3.43$; $p < .001$). Lastly, the three confidence intervals resulting from 5,000 bootstrap samples associated with the indirect effects of conceptual fluency (interpretive icon CI = 1.28 to 3.07; reductive icon CI = 1.14 to 2.57; interpretive X reductive icon interaction CI = -2.83 to -1.03) also all indicated significant mediation (i.e., none of the confidence intervals contained a value of zero; see Zhao et al. 2010; Hayes 2011). These bootstrap results also suggest that conceptual fluency mediates the interactive effects of the two icons on purchase intentions, indicating significant mediated moderation that was not hypothesized. Thus, the pattern of the coefficients in the table, the Sobel test results, and bootstrap test results all suggest a mediating role of conceptual fluency for the direct and moderating effects of FOP interpretive and reductive icons on purchase intentions in the macaroni and cheese category.

DISCUSSION

The primary purpose of Study 4 was to extend Study 3 by assessing consumer reactions to multiple FOP nutrition labeling systems in a realistic retail lab setting with a new product category. Additionally, the use of an adult sample (who all had at least 1 child living at home)

was used to increase the generalizability of the results. A discussion of the results of these objectives and their implications follows below.

Main Effects of FOP Interpretive and Reductive Icons

Knowing that it is often difficult for consumers to simultaneously compare the healthfulness of products based on multiple nutrients, and that they often simplify that task by picking one or two nutrients (such as fat) to base their comparisons on (Black and Rayner 1992), it has been suggested that adding some sort of benchmark could help consumers put nutritional information into context (Viswanathan and Hastak 2002). To that end, government agencies, consumer welfare advocates, NGO's, manufacturers, and retailers have responded; at no point in U.S. history have food products ever displayed so many symbols and statements about nutrition and health benefits (Nestle 2010). However, given the persistent dramatic increases in obesity rates in the U.S. (CDC 2010), it is obvious that many consumers still don't fully understand these communications and/or how to effectively incorporate them into their shopping decisions.

The results of this study replicated the main effects of FOP interpretive and reductive icons found in Study 3; that is, the addition of the icons in isolation increased levels of perceived conceptual fluency of FOP health information. These results suggest that FOP icons can be presented in different manners (i.e., objective vs. interpretive approaches) but still be effective in making FOP nutrition and health communications more easily understood by consumers compared to when the icons were not made available to them. More importantly, these findings taken cumulatively from Studies 3 and 4 show the enduring effectiveness of the icons when presented on multiple brands (i.e., Quaker, Campbell's, and Kraft) and in multiple product categories (i.e., granola bars, soup, and macaroni and cheese). These results support and add

validity to prior research that has shown that the presence of these icons can positively impact the perceived healthfulness of a product (e.g., Urala, Arvola, and Lahteenmaki 2003; Andrews, Burton, and Kees 2011).

Moderating Effects of FOP Interpretive and Reductive Icons

These results also show the interactive effects of FOP interpretive and reductive icons on the conceptual fluency of health information when presented simultaneously on a food package. Across both categories, the presentation of the icons independently on the packages led to higher levels of perceived fluency. However, when the interpretive icon was present, the addition of the reductive icon had little effect on fluency. By contrast, the addition of the interpretive icon to the reductive icon did indeed have a positive effect on fluency, although the effects were not significant in either category (these increases in fluency should not be understated, however, given that the task of interpretive icons like the IOM's Healthy Stars is to help consumers better understand nutrition information and make healthier decisions). Overall, these results speak directly to the evaluative power of the FOP interpretive icon and its ability to assist with consumers' cognitive processing of health information when confronted with multiple brands and product categories at the retail shelf – a situation certainly more challenging and realistic than evaluating single products in isolation.

Results also show how a FOP interpretive icon moderates objective nutrition information to affect product attitudes, healthfulness perceptions, and purchase intentions of products across multiple categories. By adding the icon to the packages, attitudes toward the product were more positive and both healthfulness perceptions and purchase intentions increased for healthier products. Conversely, attitudes were more negative and both healthfulness perceptions and

purchase intentions decreased for the *unhealthier* products in the presence of the icon. Adding the reductive icon to packages, however, did little to accurately accentuate healthfulness perceptions or to affect product attitudes and purchase intentions in either category. In fact, the addition of the FOP reductive icon led to *decreases* in healthfulness perceptions of the healthy products in both categories (while these decreases were not statistically significant, they are still worth noting from a consumer health and welfare standpoint). These effects may stem from differences in respondents' previously held beliefs about the healthfulness of the products and the objective nutrition information actually communicated by the reductive icon. Nonetheless, these results again demonstrate the superiority of a FOP interpretive icon over a reductive icon in assisting consumers with accurately evaluating the healthfulness of products. More importantly, the interpretive icon led consumers to be more likely to purchase healthy products and to avoid purchasing unhealthy products when multiple brands and categories of varying nutritional value were available to choose from.

Additional results showed how conceptual fluency mediated the effects of both types of FOP icons on purchase intentions to help further explain and support these results. These results suggest that the effectiveness of FOP icons have in positively impacting purchase intentions is largely dependent upon their effectiveness in accurately assisting consumers with cognitively processing FOP health information. This demonstrates the important role FOP icons have in helping consumers easily, but more importantly correctly, understand the healthfulness of products and then translating that knowledge into healthier intentions.

THEORETICAL CONTRIBUTIONS

Studies 3 and 4 are among the first and few to provide a controlled test of multiple FOP nutrition labeling systems in a controlled retail setting and the only to use a processing fluency theoretical framework. By taking this specific approach, these studies answered prior calls for additional research on multiple FOP icons (e.g., Andrews, Burton, and Kees 2011) and the effects of source acknowledgement on perceived fluency (Novemsky et al. 2007), while overcoming important limitations noted in earlier nutrition labeling studies such as data collection in non-store environments (e.g., Keller et al. 2007; Li, Miniard, and Barone 2000), use of fictitious brand packages (Viswanathan and Hastak 2002), and the use of gender-specific samples (Brucks, Mitchell, and Staelin 1984; Freiden 1981). Furthermore, these studies showed the robustness of certain effects, while establishing new boundary conditions for others.

Cumulatively, the results of studies 3 and 4 show how FOP communications are perceived differently when presented simultaneously as opposed to independently. It also shows how consumers process FOP nutrition information when more realistic package information such as product descriptions, product pictures, and brand information are available, thus taking both perceptual fluency (i.e., color, font size, etc.) and conceptual fluency (i.e., interpretation of FOP icons) into consideration. More specifically, these results support prior findings that indicate that consumers weight fluent information more heavily than disfluent cues when making judgments (Shah and Oppenheimer 2007), and suggest that the effectiveness of FOP labeling systems can vary across products, brands, and ultimately, categories.

These studies also showed how an interpretive icon that is gradual in nature (as opposed to dichotomous) can lead to increases in fluency and positively affect consumer perceptions of product healthfulness so that the presence of the icon can lead to healthier products being seen as healthier, but unhealthier products also being seen as *unhealthier*. Many studies have examined

how the presence of a dichotomous interpretive icon can lead to higher perceptions of healthfulness and purchase intentions (two constructs that have been shown to be positively related to fluency), but very few studies have shown how the presence of a gradual interpretive icon like the IOM's Healthy Stars can also lead to *lower* product attitudes, healthfulness perceptions, and purchase intentions for *unhealthy* products. Overall, these findings show that consumers are capable of overcoming an oversimplified – and potentially troubling – dichotomous mindset (van Kleef and Dagevos 2012) by processing more detailed FOP interpretive information and then accurately applying that information to form contrasting perceptions, attitudes, and intentions toward nutritionally contrarian products.

Lastly, Study 4 demonstrated the mediating influence of conceptual fluency within the context of FOP health communications. This finding builds upon previous research that has shown that the effects of nutrition information may be mediated by other product-related beliefs (Burton, Andrews, and Netemeyer 2000; Howlett, Burton, and Kozup 2008; Howlett et al. forthcoming) and demonstrates the increasing importance of fluency in health-related marketing activities as obesity and other health-related diseases continue to prevail as major problems in the U.S..

MANAGERIAL IMPLICATIONS

Study 3 and 4 facilitated the observation of respondents in a realistic retail setting across multiple product categories, thus providing more validity to results that are certainly of interest to manufacturers, retailers, and marketing managers. Consumers have been shown to believe that FOP labels are useful in making healthier choices (Synovate 2005) and are willing to pay more for products that have more detailed nutrition labels (Loureiro, Gracia, and Nayga, Jr.

2006; SINC 2009). The findings of these studies suggest that manufacturers can boost the perceived healthfulness of their healthier products – and increase related attitudes and purchase intentions – by implementing an interpretive FOP icon on their food packaging. From a health communication standpoint, they can also more effectively articulate the healthfulness of their product by including either a FOP interpretive or reductive icon, or in some cases, presenting both of them together to consumers.

This increase in easily processed nutrition information may trigger an increase in demand for more healthy and functional food in the marketplace. The results of these studies suggest that using an interpretive FOP system that is gradual in nature – rather than dichotomous – can allow consumers to not only accurately recognize the healthier items in a consideration set, but also to *avoid* unhealthier items, as well. In other words, the tested interpretive icon appeared to reduce comprehension differences across healthy and unhealthy products. As FOP labeling systems become more prevalent, manufacturers may have to reformulate some of their products in order to remain competitive in the retail marketplace. One study has shown that many food products were reformulated after the introduction of the *Choices* logo in the Netherlands, resulting in significant reductions in saturated fat, sodium, and calories (Vyth et al. 2010). Furthermore, sales data from two major UK supermarket chains showed that sales of healthier products increased and sales of comparable but less healthy products decreased after the implementation of FOP summary label systems in those stores (Grunert and Wills 2007). If this market shift takes place, it will certainly be welcomed and considered a step in the right direction for many consumer welfare advocates and public policy researchers (e.g., *Federal Register* 2010; IOM 2010; Taylor and Mande 2009).

Retailers may also stand to benefit from the implementation of FOP nutrition labeling systems. Prior research has demonstrated that private label products are more sensitive to FOP nutrition labeling than national brand products, and that 65% of consumers agree that they are more likely to shop at retailers that provide the interpretive *NuVal* FOP labeling system (Hershey et al. 2011). International retailing giant WalMart has seen the value of investing in a private label FOP system and has recently introduced its own FOP nutrition symbol (the Great for You icon) for its Great Value brand (Sterling 2012). By assisting consumers in making healthier choices via an exclusive FOP nutrition labeling system, retailers may be able to create a point of competitive advantage and help build customer satisfaction and loyalty.

CONCLUSION, LIMITATIONS, AND FUTURE RESEARCH

Taken collectively, Studies 3 and 4 provide convergent evidence in support of the utility of FOP icons, although the results indicate that certain types of icons are more effective than others in promoting healthier consumer behavior. Furthermore, these results speak directly to how these icons affect consumers' cognitive processes when used both independently and simultaneously across multiple products, brands, and categories of varying nutritional value, thus providing a "bigger picture" of how these icons actually work in the marketplace. However, Study 4 was not without its limitations. First, while data was collected in a controlled retail setting, actual purchasing behavior data was not employed in these analyses. Furthermore, data was only collected from two product categories; while having multiple categories added to the validity and robustness of the effects, they were still only two of many, many categories that can be found in a real retail store. Therefore, future research should be conducted across more categories in order to replicate these results and to establish any new boundary conditions which may exist. Additionally, while the sample consisted of adults who had children living at home, it

was still built around convenience (i.e., those living and working in Northwest Arkansas). Future research should employ more national sample for even more generalizability.

OVERALL DISSERTATION CONCLUSIONS

Each year in the U.S. approximately 25% of all people are on a diet, spending almost $35 billion per year on weight loss products (Federal Trade Commission 2002). Despite these extravagant expenditures, many are unsuccessful in losing and keeping weight off, contributing to a nation of overweight consumers (Andrews, Netemeyer, and Burton 2009). More specifically, 67% of all U.S. adults are overweight and 33% are considered "obese". It is estimated that by 2015, 75% of all U.S. adults will be overweight and 41% will be obese (Wang and Beydoun 2007). Obesity, largely driven by food and beverage consumption, is a major cause of heart disease (Eckel and Krauss 1998) – a disease that accounts for approximately 29% of all U.S. deaths. Of those deaths, over half occurred among people aged 65 years or younger – age groups that the Center for Disease Control and Prevention (CDC) classify as "premature" (CDC 2004). Obesity is also significantly associated with other serious (some potentially terminal) health problems such as diabetes, high blood pressure, high cholesterol, asthma, and arthritis (Mokdad et al 2003). Because obesity is a very preventable cause of death (Flegal et al. 2004), it is incumbent upon marketers, retailers, manufacturers, and public policy makers to develop a better understanding of how consumers process health information of food products at the retail shelf, as well as how they respond to that information.

As discussed throughout this dissertation, a number of initiatives have been implemented to assist consumers with making healthier decisions regarding food purchases at the retail shelf (e.g., Facts up Front, Healthy Stars, Healthy Choice, Great for You, etc.). However, despite these very visible voluntary efforts taken by the food and beverage industry, the effects of these systems are still not well understood. Therefore, this dissertation sought to objectively examine the effectiveness of multiple types of FOP nutrition labeling systems through the utilization of a processing fluency theoretical framework.

This dissertation consisted of four studies. The purpose of Study 1 was to examine the effects of a FOP reductive and interpretive icon on single product evaluations, while Study 2 demonstrated how the addition of more FOP nutrition information (i.e., a single nutrient content claim) to that product affects the conceptual fluency of health information and product evaluations. Lastly, the aim of Studies 3 and 4 was to provide a more realistic view of how consumers process FOP health information across multiple products, brands, and categories in a retail setting. An overview of each will be discussed below.

Study 1 introduced and explained the processing fluency framework and demonstrated how it can assist with explaining the effectiveness (or lack thereof) of a FOP reductive icon and a FOP dichotomous interpretive icon on a single product in isolation (pizza). Results indicated that the presence of the interpretive icon led to higher perceptions of product healthfulness, but lower perceptions of FOP information trustworthiness. In contrast, the presence of the reductive icon led to higher levels of perceived trustworthiness of FOP information, but lower levels of FOP information fluency. When presented simultaneously on the FOP, the two icons resulted in the highest levels of fluency and trustworthiness (compared to when either was presented independently or not at all). Additionally, a moderating role of consumer skepticism toward FOP labeling was introduced and shown to moderate the effect of the reductive icon on perceptions of retailer trustworthiness.

Study 2 extended Study 1 by adding positive nutrients to the reductive icon and a single nutrient content claim to the FOP environment. Additionally, a new measure of fluency was presented (i.e., conceptual fluency) that dealt more directly with processing FOP health information. The reductive icon with both types of nutrients (positive and negative) led to higher levels of health information fluency when on the FOP, while the presence of the interpretive icon

led to more positive product attitudes and higher levels of perceived healthfulness. The nutrient claim was found to positively affect purchase intentions and product healthfulness, as well as product, retailer, and manufacturer attitudes. In general, when presented on the FOP simultaneously, the reductive icon overpowered the effects of the interpretive icon, but the interpretive icon overpowered the effects of the nutrient content claim on a number of variables including purchase intentions, product healthfulness perceptions, and attitudes toward the product, retailer, and manufacturer.

Study 3 was conducted in the retail lab so that the effects of the labeling systems could be observed across multiple products, brands, and categories of varying nutritional value for more generalizable results. A new tiered interpretive icon (the IOM Healthy Stars) was tested across two categories (granola and soup), while the same reductive icon from Study 1 was again observed. Results showed that the independent presentation of both icons on the FOP increased perceived fluency of health information. Generally, the interpretive icon was more effective than the reductive icon in positively affecting attitudes, perceptions, and intentions for healthy products when nutrition levels of two contrasting products from each category were evaluated by consumers (i.e., the effects of the two icons for both a healthy product and an unhealthy product in each category were examined). Furthermore, the interpretive icon was also effective in negatively affecting attitudes, perceptions, and intentions for *unhealthy* products. Lastly, the interpretive icon was shown to increase the likelihood that consumers will pick an objectively healthier product out of a categorical consideration set at the retail shelf, while the reductive icon was found to not significantly affect product choice.

Lastly, Study 4 enhanced the generalizability of the Study 3 results by employing an adult sample in the retail lab across a new product category (macaroni and cheese). Several

hypotheses from Study 3 were replicated, while additional hypotheses were tested to extend the Study 3 findings. Again, the superiority of the tiered interpretive icon (Healthy Stars) over the reductive icon in shaping attitudes, intentions, and perceptions was demonstrated. The interpretive icon was also shown to again increase the likelihood that consumers will pick an objectively healthier product out of a category consideration set at the retail shelf. Additionally, conceptual fluency was shown to mediate the effects of both icons on purchase intentions of healthier products.

Overall, the results demonstrate how different types of FOP nutrition labeling systems vary in their effectiveness in positively affecting consumers' perceptions, attitudes, intentions, and ultimately their choice of food items in a retail setting. The reductive icon was shown to be more effective when a single product of moderate nutritional value was examined in isolation, while the evaluative power of the interpretive icon seemed to be more effective and practical when multiple products, brands, and categories of mixed nutritional value were considered. Furthermore, of the two types of interpretive icons tested (dichotomous in Study 1 and 2 vs. gradations in Study 3 and 4), the latter seemed to be more effective in providing a heuristic that helps consumers distinguish between objectively healthier and unhealthier products at the retail shelf. The use of an interpretive icon such as the IOM's Healthy Stars that distinguishes between gradations of relative healthiness can help consumers avoid an oversimplified (and often troubling) dichotomous mindset when making food purchasing decisions.

The lab setting used in Studies 3 and 4 allowed for more generalizable conclusions by facilitating the collection of choice data at the retail shelf. These results showed how both FOP quantitative and interpretive nutrition information is processed by consumers in a realistic shopping setting, while the mediating influence of conceptual fluency demonstrated in Study 4

helped expand our knowledge about an underlying process that helps to determine the effectiveness of different types of FOP icons on consumers' purchase intentions.

THEORETICAL CONTRIBUTIONS

This dissertation made several important theoretical contributions. Most processing fluency research has focused on the *quality* of stimuli as it relates to fluency. For example, it has been shown how consumers evaluate a product differently depending upon the color of text relative to the background (Reber and Schwarz 1999) or how easy a product's print font is to read (Novemsky et al. 2007). Few studies, however, have focused on the *quantity* of stimuli processed (i.e., multiple products of varying color, font, size, etc., processed concurrently). While Study 1 and 2 focused on the effects of multiple icons on a single product, Studies 3 and 4 addressed how those icons operate differently across multiple brands and categories. Interestingly, it was determined that the effects of the icons were enhanced when processed simultaneously - as compared to when they were processed independently – even though the perceptual features and communications of the stimuli (as well as the product itself) remained the same. These results speak to the potential of multiple FOP icons to incrementally increase fluency when processed together, while their effectiveness when processed independently was shown to be dependent upon the number of brands and categories on which they are presented.

Next, this dissertation introduced and tested a new moderating role of consumer skepticism toward FOP labeling. It was found that consumer skepticism toward FOP labeling had a main effect on a number of product and retailer-related variables, as well as an interactive effects on perceptions of product healthfulness and retailer trustworthiness. These findings help to better understand the relationship between trust and fluency and how the inclusion of certain

types of FOP icons can lead consumers to generalize more broadly about the product, itself, and the retailer providing it.

Furthermore, Studies 3 and 4 showed how an interpretive icon that is tiered in nature (as opposed to dichotomous) can lead to increases in fluency and positively affect consumer perceptions of product healthfulness so that the presence of the icon can lead to healthier products being seen as healthier, but unhealthier products also being seen as *unhealthier*. This important finding shows how FOP interpretive icons can help consumers more accurately process health information on not only more healthful product packages, but also less healthful product packages, as the cognitive processing burden of consumers increases in the presence of multiple brands and categories in a retail shopping context.

Additionally, this research built upon Novemsky et al.'s (2007) suggestion for future research on the effects of revealing information sources on fluency. Within the context of this research, the sources of the FOP disclosures were disclosed to respondents and may potentially help explain why perceptions of FOP trustworthiness differed across the disclosure manipulations (i.e., the reductive icon stemmed directly from the federally mandated Nutrition Facts panel, while the interpretive icon originated from vested industry members such as food retailers and manufacturers).

Lastly, this dissertation built upon the health and nutrition literature by answering prior calls for additional research on multiple FOP icons (e.g., Andrews, Burton, and Kees 2011; FDA 2009; *Federal Register* 2010). It is among the few experiments to provide a controlled test of multiple FOP icons (both online and in a retail lab setting with multiple brands and categories) and the only one to utilize a processing fluency theoretical framework. Study 2 examined how

both negative (e.g., sodium, sugars, etc.) and positive (e.g., calcium, iron, etc.) information in a reductive icon is processed on the front of consumer packaged food items. Therefore, it was possible to not only examine how an increase in FOP quantitative nutrition information affected a number of dependent measures, but also how contrasting – but related - information affected consumer processing of FOP health information. Furthermore, the use of a realistic shopping setting in Studies 3 and 4 facilitated observation of the icons' effects on consumers' choice across multiple brands and categories at the retail shelf, while overcoming important limitations noted in earlier nutrition labeling studies, such as data collections in non-store environments (e.g., Keller et al. 2007; Li, Miniard, and Barone 2000) and the use of fictitious brand packages (Viswanathan and Hastak 2002).

MANAGERIAL IMPLICATIONS

This dissertation also has important substantive implications. Because FOP nutrition information is typically encountered before similar nutrition information on the side or back of the package (Kozup, Creyer, and Burton 2003), it is likely that this more easily accessible and processed information may serve to confirm or contradict previously held expectations about a particular product (e.g., Tony's Cheese Pizza) or an entire category (e.g., Frozen Pizza). Thus, the scope of these results across all studies is important to manufacturers, retailers, marketing managers, and policy makers. Taken cumulatively, the findings of these four studies suggest that alternative FOP reductive and interpretive icons can significantly affect consumers' attitudes, perceptions, intentions, and ultimately choice of food products in different manners depending upon the strengths and weaknesses of the particular system and the context in which they are presented (i.e., is the product being examined in isolation or is it being evaluated relative to other products and brands in a given category?). However, since the costs associated with the

implementation of a FOP icon can be staggering (the GMA and the FMI are initially investing over $50 million to promote and advertise the campaign [O'Leary 2011; Thompson Marketing 2011]), it is imperative that manufacturers and retailers implement an effective, appropriate labeling system.

Overall, the provision of a FOP reductive icon did little to provide differentiation in healthfulness perceptions or to foster more positive attitudes and higher purchase intentions in any tested category (granola bars, soup, or macaroni and cheese). However, the results suggest that using an interpretive FOP system that is tiered in nature – rather than dichotomous – can allow consumers to not only accurately recognize the healthier items in a consideration set, but also to *avoid* unhealthier items, across all examined categories. In other words, the tiered interpretive icon (IOM Stars) was more effective in reducing comprehension differences across healthy and unhealthy products in a given category than the reductive icon. The provision of the interpretive icon was also found to positively impact purchase intentions and product attitudes for healthier products, while negatively impacting them for unhealthy products.

These findings likely stem from the fact that even very subtle variations in specific nutrient values (i.e., .5 g of sat fat or 1 g of sugar) can be enhanced in the eyes of consumers by processing an interpretive icon. Through the distribution of additional stars in a tiered interpretive icon, previously trivial discrepancies in quantitative nutrition information across several product options in a consideration set can instantaneously become a heuristic cue of healthfulness. This effect can also positively impact consumer attitudes and intentions in a positive manner, as well. However, the provision of a tiered interpretive icon (such as the IOM Healthy Stars) can present a "double-edged sword" for manufacturers and retailers providing assortments of mixed nutritional values (i.e., assortments with both healthy and unhealthy

products), and potentially prove to be detrimental to those providing mostly nutritionally moderate or poor assortments. Conversely, this affords potentially fruitful opportunities to those providers offering mostly healthy product assortments, as they can potentially boost consumers' evaluations and choices of their items by placing an interpretive icon on the front of those packages. As these systems become more prevalent, manufacturers may ultimately reformulate some of their products in order to remain competitive in the retail marketplace. One study has shown that many food products were reformulated after the introduction of the *Choices* logo in the Netherlands, resulting in significant reductions in saturated fat, sodium, and calories (Vyth et al. 2010). Furthermore, sales data from two major UK supermarket chains showed that sales of healthier products increased and sales of comparable but less healthy products decreased after the implementation of FOP summary label systems in those stores (Grunert and Wills 2007). If this market shift takes place, it will certainly be welcomed and considered a step in the right direction for many consumer welfare advocates and public policy researchers (e.g., *Federal Register* 2010; IOM 2010; Taylor and Mande 2009).

Because consumers have been shown to believe that FOP labels are useful in making healthier choices (Synovate 2005) and are willing to pay more for products that have more detailed nutrition labels (Loureiro, Gracia, and Nayga, Jr. 2006; SINC 2009), many retailers and manufacturers are now taking advantage of the opportunities presented by FOP nutrition labeling systems. For example, international retailing giant WalMart has seen the value of investing in a private label nutrition labeling system and has recently introduced its own FOP interpretive icon (the Great for You icon) for its Great Value brand (Sterling 2012). A recent study shows that consumer packaged goods companies with a higher proportion of healthy food sales demonstrate superior sales growth, returns to shareholders, operating profits, and company reputations

(Hudson Institute 2011). Additionally, these companies also experience higher operating profits and profit growth, along with higher BrandPower™ ratings, indicating higher evaluations regarding favorability and reputation (Hudson Institute 2011). Because the sales of healthy foods experienced higher growth rates than traditional foods between 2007 and 2011 (now accounting for almost 40% of U.S. food sales), manufacturers and retailers may be able to create a point of competitive advantage by assisting their customers in making healthier choices. They may also benefit from halo effects from the provision of certain icons on the products they carry (e.g., retailers may be perceived as more trustworthy by presenting products with specific FOP health communications).

LIMITATIONS AND FUTURE RESEARCH

This dissertation was certainly not without its limitations. In Study 1, the pilot test employed a convenience (student) sample so the results of that study may not be representative of the more general population. In terms of the national population used in the main study, the demographics suggest that the respondents had low levels of education and annual income. Knowing that demographics and socio-demographics are closely related to shopping behavior (Verkleij and van Kreijl 2004), these results may not be consistent with more educated shoppers – especially when other specific nutrition-related individual difference variables such as nutrition knowledge and motivation are taken into consideration (Andrews, Netemeyer, and Burton 2009; Bates et al. 2009). Furthermore, a median split of a continuous variable was used to dichotomize respondents based on their skepticism toward FOP labeling – a common method among consumer researchers that nonetheless has received criticism (Fitzsimons 2008). In Study 2, the same product was used as a stimulus from Study 1, thus limiting the generalizability of the results, while skepticism toward labeling was again used as a dichotomous independent variable.

Furthermore, this research only examined one product, a moderately healthy one for the category examined, again limiting conclusions that could be drawn about the effectiveness of the different icons.

While data were collected in a controlled retail setting in Studies 3 and 4, actual purchasing behavior data was never collected and employed in the analyses. Additionally, data were only collected from three product categories across the two studies; while having multiple categories added to the generalizability and robustness of the effects, they were still only two of hundreds of categories that can be found in an actual retail store. Furthermore, the number of brands presented to respondents in the lab was also limited and not necessarily representative of the entire offering available to consumers in a store. Lastly, the sample in Study 3 was a convenience sample composed primarily of students, while the sample used in Study 4 was a convenience sample comprised mostly of faculty and staff from a southeastern university.

Feunekes et al. (2008) wrote, "There is a multitude of front-of-pack labels that aim to help consumers make a healthier choice. The verdict is still out as to which of these labeling formats is best understood by consumers and which makes it easiest for consumers to make a healthier choice" (pg. 58). While this dissertation hopefully provides insight into the effectiveness of certain labeling systems, it is clear that more research is still needed to better understand their effects on consumers' attitudes, perceptions, intentions, and ultimately shopping behavior. Future research should examine the effects of multiple FOP labeling systems across additional products, brands, and categories for more generalizable results and to establish any new boundary conditions which may exist. Also, while choice was examined in the last two studies, actual purchasing behavior should ultimately be measured for more accurate conclusions. Additionally, a dichotomous interpretive icon (like the one used in Studies 1 and 2)

should be tested against the reductive icon and the tiered interpretive icon in a controlled lab setting to more fully examine its effectiveness across multiple products, brands, and categories. Lastly, other heuristic health cues should be further examined to see if the effects of the different labeling systems differ in their presence. For example, the inclusion of a health claim (e.g., 99% fat free) to the FOP environment would be worthwhile to examine, while other packaging characteristics such as color should also be further examined to see how they interact with different FOP icons (e.g., If a product's package is green, does it enhance the effect of a healthy icon? Conversely, if the same product is evaluated poorly by a tiered interpretive icon, are the negative effects minimized by other non-evaluative cues on the package?).

In conclusion, this dissertation has shown how the effectiveness of FOP labeling systems can vary across brands and categories. It is clear that a "one size fits all" approach cannot be taken when deciding what type of FOP icon is most effective because different systems have their own unique strengths and weaknesses that are more (or less) effective in certain situations. The findings of this dissertation contribute to both the processing fluency literature and nutrition labeling literature and provide implications that are of interest to academicians interested in theoretically-based consumer research, as well as marketing managers, manufacturers, retailers, and public policy makers interested in establishing more effective FOP health communications in the marketplace.

REFERENCES

Aiken, Leona S., and Stephen G. West (1991), *Multiple Regression: Testing and Interpreting Interactions*. London: Sage.

Anand, Punam and Brian Sternthal (1991), "Perceptual Fluency and Affect Without Recognition," *Memory and Cognition*, 19 (3), 293-300.

Andrews, J. Craig, Richard G. Netemeyer, and Scot Burton (2009), "The Nutrition Elite: Do Only the Highest Levels of Caloric Knowledge, Obesity Knowledge, and Motivation Matter in Processing Nutrition Ad Claims and Disclosures?" *Journal of Public Policy and Marketing*, 28 (1), 41-55.

----------, Scot Burton, and Jeremy Kees (2011), "Is Simpler Better? Consumer Evaluations of Front-of-Package Nutrition Symbols," *Journal of Public Policy and Marketing*, Forthcoming.

----------, Richard G. Netemeyer, and Scot Burton (1998), "*Consumer Generalization of Nutrient Content Claims in Advertising," Journal of Marketing, 62 (October), 62-75.*

----------*, Scot Burton, and Richard G. Netemeyer (2000), "Are Some Comparative Nutrition Claims Misleading? The Role of Nutrition Knowledge, Ad Claim Type, and Disclosure Conditions," Journal of Advertising, 29 (Fall), 29-42.*

Appel, David (1972), "The Supermarket: Early Development of an Institutional Innovation," *Journal of Retailing*, 48 (1), 39-54.

Asam, Edward H., Louis P. Bucklin (1973), "Nutrition Labeling for Canned Goods: A Study of Consumer Response," *Journal of Marketing*, 37(2), 32-37.

Baird, Nikki (2010), "2010: The Year of Transparent Retailing," (accessed May 8, 2011), [available at http://www.retailsystemsresearch.com/_document/summary/1041].

Baron, Reuben M., and David A. Kenny (1986), "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations," *Journal of Personality and Social Psychology*, 51 (6), 1173-82.

Bates, Kenneth, Scot Burton, Elizabeth Howlett, and Kyle Huggins (2009), "The Roles of Gender and Motivation as Moderators of the Effects of Calorie and Nutrient Information Provision on Away-from-Home Foods," *Journal of Consumer Affairs*, 43(2), 249-73.

Black, A., and M. Rayner (1992), "*Just Read the Label*," London: The Stationary Office.

Bornstein, Robert F. (1989), "Exposure and Affect: Overview and Meta-Analysis of Research, 1968-1987," *Psychological Bulletin*, 106 (September), 265-89.

Bourque, Lisa (2011), "Food Industry Launches Front-of-Package Labels Ahead of FDA Guidance," (accessed April 13, 2011), [available at http://product-liability.weil.com/uncategorized/food-industry-launches-front-of-package-labels-ahead-of-fda-guidance/].

Bousch, David M., Marian Friestad, and Gregory M. Rose (1994), "Adolescent Skepticism Toward TV Advertising and Knowledge of Advertiser Tactics," *Journal of Consumer Research,* 21 (June), 165-75.

Broniarezyk, Susan M., Wayne D. Hoyer, and Leigh McAlister (1998), "Consumers' Perceptions of the Assortment Offered in a Grocery Category: The Impact of Item Reduction," *Journal of Marketing Research,* 35 (May), 166-76.

Brucks, Merrie, Andrew A. Mitchell, and Richard Staelin (1984), "The Effect of Nutritional Information Disclosure in Advertising: An Information Processing Approach," Journal of Public Policy & Marketing, 3 (1): 1-25.

Burton, Scot, Abhijit Biswas, and Richard Netemeyer (1994), "Effects of Alternative Nutrition Label Formats and Nutrition Reference Information on Consumer Perceptions, Comprehension, and Product Evaluations," *Journal of Public Policy and Marketing,* 13 (1), 36-47.

---------, J. Craig Andrews, and Richard G. Netemeyer (2000), "Nutrition Ad Claims and Disclosures: Interaction and Mediation Effects for Consumer Evaluations of the Ad and the Brand," *Marketing Letters,* 11 (August), 235-48.

--------, Elizabeth H. Creyer, Jeremy Kees, and Kyle A. Huggins (2006), "Attaching the Obesity Epidemic: The Potential Health Benefits of Providing Nutrition Information in Restaurants," *American Journal of Public Health,* 96 (September), 1669-1675.

Butler, Kimberly Mei Ling (2010), "Making Smart Choices: Health Claims, Regulation, and Food Packaging," (accessed March 13, 2012), [available at http://d-scholarship.pitt.edu/7067/1/Butler_K_April_2010.pdf130208/unrestricted/Butler_K_April_2010.pdf:%20University%20of%20Pittsburgh].

Calfee, John E. (1991), "FDA Underestimates Food Shoppers," *Wall Street Journal,* May 29, A10, 4.

-----, and Janis K. Pappalardo (1991), "Public Policy Issues in Health Claims for Foods," *Journal of Public Policy and Marketing,* 10 (Spring), 33-53.

Centers for Disease Control and Prevention (CDC) (2004), "Disparities in Premature Deaths from Heart Disease – 50 States and the District of Columbia, 2001," (accessed February 24, 2011), [available at http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5306a2.htm].

------ (2010), "Overweight and Obesity: Data and Statistics," (accessed May 7, 2011), [available at: http://www.cdc.gov/obesity/data/index.html].

Center for Science in the Public Interest (2009), "Food Labeling Chaos: The Case for Reform," (accessed September 25, 2011), [available at http://cspinet.org/new/pdf/food_labeling_chaos_report.pdf].

Chandon, Pierre, J. Wesley Hutchinson, Eric T. Bradlow, and Scott H. Young (2006), "Measuring the Value of Point-of-Purchase Marketing with Commercial Eye-Tracking Data," (accessed January 13, 2011), [available at http://www.mktgweb.wharton.upenn.edu/ hutch/Chandon%20Hutchinson%20et%20al%2006.pdf].

Creyer, Elizabeth, Scot Burton, and John Kozup (2008), "How Modification of the Nutrient Facts Panel Influences Consumers at Risk for Heart Diseases: The Case of Trans Fat," *Journal of Public Policy and Marketing,* 27 (1), 83-97.

Darley, John M., and Paget H. Gross (1983), "A Hypothesis-Confirming Bias in Labeling Effects," *Journal of Personality and Social Psychology,* 44 (1), 20-33.

Davies, Mark, and Len T. Wright (1994), "The Importance of Labelling Examined in Food Marketing," European Journal of Marketing, 28 (2), 57-67.

Dodds, William B., Kent B. Monroe, and Dhruv Grewal (1991), "Effects of Price, Brand, and Store Information on Buyers' Product Evaluations," *Journal of Marketing Research,* 28 (3), 307-19.

Eckel, Robert H., and Ronald M. Krauss (1998), "American Heart Association Call to Action: Obesity as a Major Risk Factor for Coronary Heart Disease," *Circulation,* 97, 2099-2100.

Federal Register (2010), "Front-of-Pack and Shelf Tag Nutrition Symbols; Establishment of Docket; Request for Comments and Information," (accessed May 7, 2011), [available at http://www.federalregister.gov/articles/2010/04/29/2010-9939/front-of-pack-and-shelf-tag-nutrition-symbols-establishment-of-docket-request-for-comments-and].

Federal Trade Commission (FTC) (2002), "Weight Loss Advertising: An Analysis of Current Trends," Report. (accessed February 12, 2011), [available at http://www.ftc.gov/ bcp/reports/weightloss.pdf].

Feenstra, M. H. (1990), "Conserveermiddelen Noodzaak?" Dutch Institute for Consumer Research, SWOKA, 1-41.

Festinger, L. (1957), "*A Theory of Cognitive Dissonance*," Stanford: Stanford University Press.

Feunekes, Gerda I.J., Ilse A. Gortemaker, Astrid A. Willems, Rene Lion, and Marcelle van den Kommer (2008), "Front-of-Pack Nutrition Labelling: Testing Effectiveness of Different Nutrition Labelling Formats Front-of-Pack in Four European Countries," *Appetite,* 50, 57-70.

Fitzsimons, Gavan J. (2008), "Death to Dichotomizing," *Journal of Consumer Research,* 35 (June), 5–8.

Flegal, Katherine M., David F. Williamson, Elsie R. Pamuk, and Harry M. Rosenberg (2004), "Estimating Deaths Attributable to Obesity in the United States," *American Journal of Public Health,* 94 (9), 1486-89.

Food and Drug Administration (FDA) (2003), *Federal Register*, 58 (3), 2066-964.

----- (2010), "Fact Sheet: Key Findings from 2002 and 2008 U.S. Food and Drug Administration's Health and Diet Survey," (accessed April 13, 2011), [available at http://www.fda.gov/food/labelingnutrition/ucm202780.htm].

Food Marketing Institute (FMI) (1996), "*Trends in the United States: Consumer Attitudes and the Supermarket, 1992*," Washington, DC: Food Marketing Institute.

------- (2011), "Health and Wellness: Nutrition Keys Front-of-Pack Labeling System," (accessed February 22, 2011), [available at http://www.fmi.org/health- wellness/?fuseaction =front_of_pack].

Food Standards Agency (2006), "Food Labelling Requirements: Qualitative Research, Final Report," London.

Ford, Gary T., Manoj Hastak, Anusree Mitra, and Debra Jones Ringold (1996), "Can Consumers Interpret Nutrition Information in the Presence of a Health Claim? A Laboratory Investigation," *Journal of Public Policy and Marketing,* 15 (1), 16-27.

-------, Darlene B. Smith, and John L. Swasy (1990), "Consumer Skepticism of Advertising Claims: Testing Hypotheses from Economics of Information," *Journal of Consumer Research,* 16 (March), 433-41.

Fransen, Marieke L., Bob M. Fennis, and Ad Th. H. Pruyn (2010), "Matching Communication Modalities: The Effects of Modality Congruence and Processing Style on Brand Evaluation and Brand Choice," *Communication Research,* 37 (4), 576-98.

Freiden, Jon B. (1981), "The Effect of Nutrition Information on Brand Rating: Test for a Non-Use Benefit," *Journal of Consumer Affairs*, 15 (1), 106-114.

Friestad, Marian, and Peter Wright (1994), "The Persuasion Knowledge Model: How People Cope with Persuasion Attempts," *Journal of Consumer Research,* 21 (June), 1-31.

Garretson, Judith A., and Scot Burton (2000), "Effects of Nutrition Facts Panel Values, Nutrition Claims, and Health Claims on Consumer Attitudes, Perceptions of Disease-Related Risks, and Trust," *Journal of Public Policy and Marketing,* 19 (2), 213-27.

Geiger, Constance J. (1998), "Health Claims: History, Current Regulatory Status, and Consumer Research," *Journal of the American Dietetic Association,* 98 (11), 1312-22.

-----, B.Wyse, C. Parent, and R.G. Hansen (1991), "Review of Nutrition Labelling Formats," *Journal of the American Dietetic Association,* 91, 808–12.

Green, R. (2006), "Green for Go?" *Food Manufacture,* 81(9), 48.

Grunert, Klaus G., and Josephine M. Wills (2007), "A Review of European Research on Consumer Response to Nutrition Information on Food Labels," *Journal of Public Health,* 15 (5), 385-99.

Hasher, Lynn, David Goldstein, and Thomas Toppino (1977), "Frequency and the Conference of Referential Validity," *Journal of Verbal Learning & Verbal Behavior*, 16 (February), 107-12.

Hansen, Jochim, Alice Dechene, and Michaela Wanke (2008), "Discrepant Fluency Increases Subjective Truth," *Journal of Experimental Social Psychology,* 44 (3), 687-91.

Hershey, James E., Kelly C. Wohlgenant, Katherine M. Kosa, Joanne E. Arsenault, and Mary K. Muth (2011), "Policy Research for Front of Package Nutrition Labeling: Environmental Scan and Literature Review," (accessed March 20, 2012), [available at http://aspe.hhs.gov/sp/reports/2011/FOPNutritionLabelingLitRev/index.shtml#6.3.6].

Hieke, Sophie, and Charles R. Taylor (2011), "A Critical Review of the Literature on Nutrition Labeling," *Journal of Consumer Affairs,* 46(1), 120-56.

Horai, Joann, Nicholas Naccari, and Elliot Fatoullah (1974), "The Effects of Expertise and Physical Attractiveness Upon Opinion Agreement and Liking," *Sociometry,* 37 (4), 601-06.

Hovland, Carl I., and Walter Weiss (1951), "The Influence of Source Credibility on Communication Effectiveness," *Public Opinion Quarterly,* (Winter) 15, 635-50.

Howlett, Elizabeth, Scot Burton, and John Kozup (2008), "How Modification of the Nutrient Facts Panel Influences Consumers at Risk for Heart Diseases: The Case of Trans Fat," *Journal of Public Policy and Marketing,* 27 (1), 83-97.

-------, Scot Burton, Andrea Heintz Tangari, and Myla Bui-Nguyen (forthcoming), "Hold the Salt! Effects of Sodium Information Provision, Sodium Content, and Hypertension on Perceived Cardiovascular Disease Risk and Purchase Intentions," *Journal of Public Policy and Marketing,*

Hudson Institute (2011), "Better-For-You-Foods: It's Just Good Business," (accessed January 11, 2012), [available at http://www.hudson.org/files/documents/BFY%20Foods%20Executive%20Summary.pdf].

Institute of Medicine (IOM) (2010), "Examination of Front-of-Package Nutrition Rating Systems and Symbols: Phase 1 Report," Washington, DC: The National Academies Press, October 13, 1-175.

International Food Information Council (IFIC) (2007), "2007 Food & Health Survey: Consumer Attitudes Toward Food, Nutrition, & Health," (accessed April 13, 2011), [available at http://www.foodinsight.org/Content/6/2007Survey-FINAL.pdf].

International Food Information Council (IFIC) (2011), "2011 Food & Health Survey: Consumer Attitudes Toward Food Safety, Nutrition & Health," (accessed September 20, 2011), [available at http://www.foodinsight.org/Resources/Detail.aspx?topic=2011_Food_Health_Survey_Consumer_Attitudes_Toward_Food_Safety_Nutrition_Health}.

Ippolito, Pauline, and Alan Mathios (1989), "*Health Claims in Advertising and Labeling: A Study of the Cereal Market,"* Washington, DC: Federal Trade Commission.

Jacoby, Jacob, Robert W. Chestnut, and William Silberman (1977), "Consumer Use and Comprehension of Nutrition Information," *Journal of Consumer Research,* 4 (September), 119-28.

Jacoby, Larry L., and Mark Dallas (1981), "On the Relationship Between Autobiographical Memory and Perceptual Learning," *Journal of Experimental Psychology: General,* 110 (September), 306-40.

-------, and Lee R. Brooks (1984), "Nonanalytic Cognition: Memory, Perception, and Concept Learning," in *The Psychology of Learning and Motivation: Advances in Research and Theory,* Gordon H. Bower, ed. Orlando: Academic Press, Inc., 1-43.

-------, and Colleen M. Kelley (1987), "Unconscious Influences of Memory for a Prior Event," *Personality and Social Psychology Bulletin,* 13 (March), 314-36.

-------, James A. Debner, and Janine F. Hay (2001), "Proactive Inference, Accessibility Bias, and Process Dissociations," *Journal of Experimental Psychology: Learning, Memory, and Cognition,* 27 (3), 686-700.

Janiszewski, Chris (1988), "Preconcious Processing Effects: The Independence of Attitude Formation and Conscious Thought," *Journal of Consumer Research,* 15 (September), 199-209.

------- (1990), "The Influence of Print Advertisement Organization on Affect Toward a Brand Name," *Journal of Consumer Research,* 17 (June), 53-65.

------ (1993), "Preattentive Mere Exposure Effects," *Journal of Consumer Research,* 20 (December), 376-92.

------ and Tom Meyvis (2001), "Effects of Brand Logo Complexity, Repetition, and Spacing on Processing Fluency and Judgment," Journal of Consumer Research, 28 (June), 18-32.

Johnson-Laird, P.N. (1980), "Mental Models in Cognitive Science," *Cognitive Science,* 4, 71-115.

Jones, Gary, and Miles Richardson (2007), "An Objective Examination of Consumer Perception of Nutrition Information Based on Healthiness Ratings and Eye Movements," *Public Health Nutrition,* 10(3), 238-244.

Kauppinen-Raisanen, Hannele (2010), "The Impact of Extrinsic and Package Design Attributes on Preferences for Non-Prescription Drugs," *Management Research Review,* 33 (2), 161-73.

Keller, Scott B., Mike Landry, Jeanne Olson, Anne M. Velliquette, Scot Burton, and J. Craig Andrews (1997), "The Effects of Nutrition Package Claims, Nutrition Facts Panels, and

Motivation to Process Nutrition Information on Consumer Product Evaluations," *Journal of Public Policy & Marketing,* 16 (Fall), 256-69.

Kemp, Elyria, Scot Burton, Elizabeth H. Creyer, and Tracey A. Suter (2007), "When Do Nutrient Content and Nutrient Content Claims Matter? Assessing Consumer Tradeoffs Between Carbohydrates and Fat," *Journal of Consumer Affairs,* 41 (1), 47-73.

Khemlani, Anand (2012), "How Much Pizza Do American Eat Each Year?" (accessed April 27, 2012), [available at http://betweenthenumbers.net/2012/02/how-much-pizza-do-americans-eat-each-year/].

Kozup, John, Elizabeth Creyer, and Scot Burton (2003), "Making Healthful Food Choices: The Influence of Health Claims and Nutrition Information on Consumers' Evaluations of Packaged Food Products and Restaurant Menu Items," *Journal of Marketing,* 67 (2), 19-34.

Labroo, Aparna A., and Angela Y. Lee (2006), "Between Two Brands: A Goal Fluency Account of Brand Evaluations," *Journal of Marketing Research,* 43 (August), 374-85.

Layton, Lyndsey (2011), "Food Industry Unveils Plan for Nutrition Labels on Package Fronts," (accessed May 8, 2011), [available at http://www.washingtonpost.com/wp-dyn/content/article/2011/01/24/AR2011012404685.html].

Lee, Angela Y. (2002), "Effects of Implicit Memory on Memory-Based Versus Stimulus Based Brand Choice," *Journal of Marketing Research,* 39 (November), 440-54.

--------, and Aparna A. Labroo (2004), "The effect of conceptual and perceptual fluency on brand evaluation" *Journal of Marketing Research,* 41 (2), 151-165.

--------, and Jennifer L. Aaker (2004), "Brining the Fame into Focus: The Influence of Regulatory Fit on Processing Fluency and Persuasion," *Journal of Personality and Social Psychology,* 86(February), 205-18.

Lee, Michelle P., Carolyn Yoon, Andrew A. Mitchell (2004), "Perceptual and Conceptual Fluency as Antecedents of the Mere Exposure Effect," (accessed February 25, 2011), [available at http://www.smu.edu.sg/research/publications/pdf/MichelleLee-PerceptualFluency.pdf].

Levy, Alan S. (1995), "*PHS Food Label Health Claims Focus Group Report: Executive Summary*," Unpublished document, Food and Drug Administration, Center for Food Safety and Applied Nutrition Division of Market Studies.

Levy, Alan S., and Brenda M. Derby (1996), "The Impact of NLEA on Consumers: Recent Findings from FDA's Food Label and Nutrition Tracking System," paper prepared for the Office of the Commissioner, Food and Drug Administration, Washington, DC (January).

Li, Faun, Paul W. Miniard, and Michael J. Barone (2000), "The Facilitating Influence of Consumer Knowledge on the Effectiveness of Daily Value Reference Information," *Journal of the Academy of Marketing Science,* 28 (3), 425-436.

Liebman, Bonnie (1999), "Designed to Deceive," *Nutrition Action Healthletter,* 26 (1), 8.

Loureiro, Maria L., Azucena Gracia, and Rodolfo M. Nayga, Jr. (2006), "Do Consumers Value Nutritional Labels?" *European Review of Agricultural Economics*, 33 (2), 249-268.

Luce, Mary Frances, John W. Payne, and James R. Bettman (1999), "Emotional Trade-Off Difficulty and Choice," *Journal of Marketing Research,* 36 (2), 143-59.

Menon, Geeta, and Priya Raghubir (2003), "Ease-of-Retrieval as an Automatic Input in Judgments: A Mere-Accessibility Framework?" *Journal of Consumer Research,* 30 (September), 230-43.

Miller, Jeremy K., Marianne E. Lloyd, and Deanne L. Westerman (2008), "When Does Modality Matter? Perceptual versus Conceptual Fluency-Based Illusions in Recognition Memory," *Journal of Memory and Language*, 58 (4), 1080-94.

Ministry of Agriculture, Fisheries, and Food (MAFF) (1986), *Survey of Consumer Attitudes to Food Additives*. London: HMSO.

Mitra, Anu, Manoj Hastak, Gary T. Ford, and Debra Jones Ringold (1999), "Can the Educationally Disadvantaged Interpret the FDA-Mandated Nutrition Facts Panel in the Presence of an Implied Health Claim?" *Journal of Public Policy and Marketing,* 18 (1), 106-17.

Mokdad, Ali H., Earl S. Ford, Barbara A. Bowman, William H. Dietz, Frank Vinicor, Virginia S. Bales, and James S. Marks (2003), "Prevalence of Obesity, Diabetes, and Obesity-Related Health Risk Factors, 2001," *Journal of the American Medical Association,* 289 (1), 76-79.

Moore, William L., and Donald R. Lehmann (1980), "Individual Differences in Search Behavior for a Nondurable," *Journal of Consumer Research,* 7, 296-307.

Moorman, Christine (1990), "The Effects of Stimulus and Consumer Characteristics on the Utilization of Nutrition Information," *Journal of Consumer Research,* 17 (3), 362-74.

----- , Rohit Deshpande, and Gerald Zaltman (1993), "Factors Affecting Trust in Market Research Relationships," *Journal of Marketing Research,* 29 (August), 314-28.

----- (1996), "A Quasi Experiment to Assess the Consumer and Informational Determinants of Nutrition Information Processing Activities: The Case of Nutrition Labeling and Education Act," *Journal of Public Policy and Marketing,* 15 (1), 28-44.

Morales, Andrea, Barbara E. Kahn, Leigh McAlister, Susan M. Broniarczyk (2005), "Perceptions of Assortment Variety: The Effects of Congruency Between Consumers' Internal and Retailers' External Organization," *Journal of Retailing*, 81 (2), 159-69.

Muller, Dominique, Charles M. Judd, and Vincent Y. Yzerbyt (2005), "When Moderation is Mediated and Mediation is Moderated," *Journal of Personality and Social Psychology*, 89 (6), 852-863.

Nayga, Jr., Rodolfo M., Daria Lipinski, and Nitin Savur (1998), "Consumers' Use of Nutritional Labels While Food Shopping and at Home," *Journal of Consumer Affairs,* 32 (1), 106-120.

Nedungadi, Prakash (1990), "Recall and Consumer Consideration Sets: Influencing Choice Without Altering Brand Preference," *Journal of Consumer Research,* 17 (December), 263-76.

Nelson, Taylor (1990), *A Family Food Panel Special Report: Healthy Eating and Environmental Concern.* Epsom: Surrey.

Nesbett, Richard E., and Timothy DeCamp Wilson (1977), "The Halo Effect: Evidence for Unconscious Alteration of Judgments," *Journal of Personality and Social Psychology,* 35 (4), 250-56.

Nestle, Marion (2002), "*Food Politics: How the Food Industry Influences Nutrition and Health*," 2nd edition. Berkley and Los Angeles, University of California Press, 1-510.

---------- (2009), "Not-So-Smart Choice Labels," *The Daily Green,* (accessed September 25, 2011), [available at http://www.thedailygreen.com/healthy-eating/blogs/healthy-food/smart-choice-labels-50092309].

---------- (2010), "Front-of-Package Food Labels: Public Health or Propaganda?" *The Journal of the American Medical Association,* 303 (8), 771-72.

Neuman, William (2009), "For Your Health, Froot Loops," (accessed April 21, 2011), [available at http://www.nytimes.com/2009/09/05/business/05smart.html?_r=1].

Newman, Christopher L**.** and Steven W. Kopp (2009) "It's Cool: Review and Anticipated Impacts of the New Country of Origin Food Labeling Law". Proceedings of the 2009 Marketing and Public Policy Conference (Washington D.C., May 28-30). Page 163.

Novemsky, Nathan, Ravi Dhar, Norbert Schwartz, and Itamar Simonson (2007), "Preference Fluency in Choice," *Journal of Marketing Research,* 44 (3), 347-56.

O'Leary, Noreen (2011), "Food Trade Groups Prepare 'Nutrition Keys' Labeling: Omnicom Shops Win Consumer Education Pitch," (accessed April 23, 2011), [available at http://www.adweek.com/news/advertising-branding/food-trade-groups-prepare-nutrition-keys-labeling-130576].

Panda, Monisha (2008), "The Evolution of Food Labeling: How Are Labeling Practices Going to Affect Consumers?" (accessed April 13, 2011), [available at http://www.pitt.edu/~sorc/sda/imagesnew/evolution%20of%20food%20labeling.pdf].

Peterson, Esther, Satenig St. Marie, and Frederick D. Sturdivant (1977), "The Future of Consumerism in Retailing," *Journal of Retailing,* 53 (3), 99-112.

Petty, Richard E., and John T. Cacioppo (1986), "The Elaboration Likelihood Model of Persuasion," in *Advances in Experimental Social Psychology*, L. Berkowitz, ed. Harcourt Brace: American Press, 123-205.

Pornpitakpan, Chanthika (2006), "The Persuasiveness of Source Credibility: A Critical Review of Five Decades' Evidence," *Journal of Applied Social Psychology,* 34 (2), 243-81.

PRWeb (2011), "Associated Wholesale Grocers Adding Nutrition Keys on Private Label Food Products," (accessed April 14, 2011), [available at http://www.prweb.com/releases/2011/04/prweb5216334.htm].

Reber, Rolf, Piotr Winkielman, and Norbert Schwarz (1998), "Effects of Perceptual Fluency on Affective Judgments," *Psychological Science,* 9 (1), 45-48.

-------, and Norbert Schwarz (1999), "Effects of Perceptual Fluency on Judgments of Truth," *Consciousness and Cognition,* 8 (3), 338-42.

Roe, Brian, Alan S. Levy, and Brenda M. Derby (1999), "The Impact of Health Claims on Consumer Search and Product Evaluation Outcomes: Results from FDA Experimental Data," *Journal of Public Policy & Marketing,* 18 (Spring), 89-105.

Ruiz, Rebecca (2009), "Smart Choices Foods: Dumb As They Look?" (accessed April 21, 2011), [available at: http://www.forbes.com/2009/09/17/smart-choices-labels-lifestyle-health-foods.html].

Scammon, Debra L. (1977), "Information Load and Consumers," *Journal of Consumer Research,* 13 (June), 48-70.

Schul, Y., and R. Mayo (1999), "Two Sources are Better Then One: The Effects of Ignoring One Message on Using a Different Message from the Same Source," *Journal of Experimental Social Psychology,* 35, 327–345.

Schwarz, Norbert, Herbert Bless, Fritz Strack, Gisela Klumpp, Helga Rittenauer-Schatka, and Annette Simons (1991), "Ease of Retrieval as Information: Another Look at the Availability Heuristic," *Journal of Personality and Social Psychology,* 61 (2), 195-202.

---------- (2004), "Meta-Cognitive Experiences in Consumer Judgment and Decision Making," *Journal of Consumer Psychology,* 14 (4), 332-48.

Scott, V., and A.F. Worsely (1994), "Tick, Claims, Tables and Food Groups: A Comparison for Nutrition Labelling," *Health Promotion International,* 9, 27-37.

Seamon, John G., Pepper C. Williams, Michael J. Crowley, Irene J. Kim, Samantha A. Langer, Peter J. Orne, and Dana L. Wishengrad (1995), "The Mere Exposure Effect Is Based On Implicit Memory: Effects of Stimulus Type, Encoding Conditions, and Number of Exposures on Recognition and Affect Judgments," *Journal of Experimental Psychology: Learning, Memory, and Cognition,* 21 (3), 711-21.

Shah, Anuj K., and Daniel M. Oppenheimer (2007), "Easy Does It: The Role of Fluency in Cue Weighting," *Judgment and Decision Making,* 2(6), 371-379.

Sharma, Lisa L., Stephen P. Teret, and Kelly D. Brownell (2010), "The Food Industry and Self-Regulation: Standards to Promote Success and to Avoid Public Health Failures," *American Journal of Public Health,* 100 (2), 240-46.

Shen, Hao, Yuwei Jiang, and Rashmi Adaval (2010), "Contrast and Assimilation Effects of Processing Fluency," *Journal of Consumer Research,* 36 (5), 876-89.

Simonson, Itamar (1999), "The Effect of Product Assortment on Buyer Preferences," *Journal of Retailing,* 75 (3), 347-70.

SINC (2009), "More Spent on Products with Detailed Nutritional Information," (accessed March 22, 2012), [available at http://www.medicalnewstoday.com/releases/170240.php].

Skiba, Katherine (2011), "Wal-Mart Joins Michelle Obama's Fight against Obesity," *(accessed April 21, 2011),* [available at http://seattletimes.nwsource.com/html/health/2013991617_walmart21.html].

Spiggle, Susan, and Murphy A. Sewall (1987), "A Choice Sets Model of Retail Selection," *Journal of Marketing,* 51 (2), 97-111.

Sterling, Scott (2012), "Walmart Introduces New 'Great For You' Healthy Food Label," (accessed March 20, 2012), [available at http://www.scpr.org/blogs/environment/2012/02/08/4590/walmart-introduces-new-great-you-healthy-food-labe/].

Sugarman, Carole, and Richard Morin (1992), "Poll Shows Skepticism Over Health & Nutrition Claims," *Washington Post,* December 9, E1, E14.

Sujan, Mita, and James R. Bettman (1989), "The Effects of Brand Positioning Strategies on Consumers' Brand and Category Perceptions: Some Insights from Schema Research," *Journal of Marketing Research,* 26 (4), 454-67.

Synovate (2005), "Quantitative evaluation of alternative food signposting concepts: Report of findings," COI on behalf of the Food Standards Agency.

Szykman, Lisa R., Paul N. Bloom, and Alan S. Levy (1997), "A Proposed Model of the Use of Package Claims and Nutrition Labels," *Journal of Public Policy and Marketing,* 16 (2), 228-41.

Taylor , Michael and Jerold Mande (2009), "Letter to the Smart Choices Program," (August 19), [available at: http://www.fda.gov/Food/LabelingNutrition/LabelClaims/ucm180146.htm].

Taylor, Stuart, and Kristin Chaudoir (2009), “Too Much Choice and Variety: Assortment Realities,” (accessed January 11, 2011), [available at http://www.nielsen.com/ nielsenwire/consumer/too-much-choice-and-variety-assortment-realities/]

Thompson Marketing (2011), “Food Industry Launches Front-of-Package Labeling Program,” (accessed April 13, 2011), [available at http://www.thompson.com/public/newsbrief. jsp?cat=FOODDRUG&id=3334].

Tsai, Claire I., and Ann L. McGill (2011), "No Pain, No Gain? How Fluency and Construal Level Affect Consumer Confidence," *Journal of Consumer Research*, 37 (5), 807-21.

Tufts University Health and Nutrition Letter (2001), “Quicker Approval of Health Claims Help Marketers, Not Consumers,” 19 (March), 6.

Tuttle, M. (2008), “Seeing Spots in the Supermarket? Learn How Nutrition Symbols Influence Which Foods We Buy,” *ADA Times,* 5 (4), 12-16.

Tversky, Amos, and Daniel Kahneman (1973), “Availability: A Heuristic for Judging Frequency and Probability,” *Cognitive Psychology*, 5 (2), 207-32.

Tybout, Alice M., Brian Sternthal, Prashant Malaviya, Georgios A. Bakamitsos, and Se-Bum Park (2005), “Information Accessibility as a Moderator of Judgments: The Role of Content Versus Retrieval Ease,” *Journal of Consumer Research,* 32 (June), 76-85.

Ulkumen, Gulden, Manoj Thomas, and Vicki G. Morwitz (2008), “Will I Spend More in 12 Months or a Year? The Effect of Ease of Estimation and Confidence on Budget Estimates,” *Journal of Consumer Research,* 35 (August), 245-56.

Urala, Nina, Anne Arvola, and Liisa Lähteenmäki (2003), “Strength of Health-Related Claims and Their Perceived Advantage,” *International Journal of Food Science and Technology*, 38 (September), 815–86.

van Dillen, S. M., Hiddink, G. J., Koelen, M. A., de Graaf, C., & van Woerkum, C. M. (2004), “Perceived Relevance and Information Needs Regarding Food Topics and Preferred Information Sources Among Dutch Adults: Results of a Quantitative Consumer Study,” *European Journal of Clinical Nutrition*, 58(9), 1306–313.

Van Kleef, Ellen, Hans Van Trijp, Frederic Paeps, and Laura Fernandez-Celemin (2007), “Consumer Preferences for Front-of-Pack Calories Labelling,” *Public Health Nutrition,* 11 (2), 203-13.

----- , and Hans Dagevos (2012), “The Growing Role of Front-of-Pack Nutrition Profile Labeling: A Consumer Perspective on Key Issues and Controversies”, (accessed March 13, 2012), [available at http://www.mcb.wur.nl/NR/rdonlyres/AD18BC6C-ED0F-4B54-AE6D481F16353E3A/155099/VanKleefandDagevosFrontofPacknutritionlabellingpap. Pdf]

Venkatesan, M., Wade Lancaster, and Kenneth W. Kendall (1986), "An Empirical Study of Alternate Formats for Nutritional Information Disclosure in Advertising," *Journal of Public Policy and Marketing*, 5, 29-43.

Verkleij, H., & van Kreijl, C. (2004), "Bei¨nvloedbaarheid van de voiding," In C. van Kreijl & A. Knaap (Eds.), *Ons eten gemeten. Houten: Bohn Stafleu van Loghum*.

Viswanathan, Madhubalan (1994), 'The Influence of Summary Information on the Usage of Nutrition Information," *Journal of Public Policy and Marketing*, 13(1), 48-60.

--- and Terry L. Childers (1996), "Processing of Numerical and Verbal Product Information," *Journal of Consumer Psychology*,5 (4), 359-86.

----- and Manoj Hastak (2002), "The Role of Summary Information in Facilitating Consumers' Comprehension of Nutrition Information," *Journal of Public Policy and Marketing*, 21 (2), 305-18.

Vyth, Ellis L., Ingrid H.M. Steenhuis, Sanne F. Mallant, Zinzi L. Mol, Johannes Brug, Marcel Temminghoff, Gerda I. Feunekes, Leon Jansen, Hans Verhagen, and Jacob C. Seidell (2009), "A Front-of-Pack Nutrition Logo: A Quantitative and Qualitative Process Evaluation in the Netherlands," *Journal of Health Communication,* 14 (7), 631-45.

-------, Steenhuis, Ingrid H.M. Steenhuis, Annet JC Roodenburg, Johannes Brug, and Jacob B. Seidell (2010), "Front-of-Pack Nutrition Label Stimulates Healthier Product Development: A Quantitative Analysis," *International Journal of Behavioral Nutrition and Physical Activity*, 7: 65.

Wang, Youfa, and May A. Beydoun (2007), "The Obesity Epidemic in the United States: Gender, Age, Socioeconomic, Racial/Ethnic, and Geographical Characteristics: A Systematic Review and Meta-Regression Analysis," *Epidemiological Reviews,* 29, 6-28.

Wansink, Brian (2005), "*Marketing Nutrition: Soy, Functional Foods, Biotechnology, and Obesity*," Urbana: University of Illinois Press.

Werth, Lioba, and Fritz Strack (2003), "An Inferential Approach to the Knew-It-All-Along Phenomenon," *Memory,* 11 (4/5), 411-19.

Whittlesea, Bruce W. A. (1993), "Illusions of Familiarity," *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 19 (November), 1235-53.

----------, and Lisa D. Williams (1998), "Why do Strangers Feel Familiar, but Friends Don't? A Discrepancy Attribution Account of Feelings of Familiarity," *Acta Psychologica*, 98, 141-65.

-------, and Jason P. Leboe (2003), "Two Fluency Heuristics (and How to Tell Them Apart)," *Journal of Memory and Language*, 49 (1), 62-79.

Williams, Peter G. (2005), "Consumer Understanding and Use of Health Claims for Foods," *Nutrition Reviews,* 63 (7), 256-64.

Winkielman, Piotr, and John T. Cacioppo (2001), "Mind at Ease Puts a Smile on the Face: Psychophysiological Evidence that Processing Facilitation Leads to Positive Affect," *Journal of Personality and Social Psychology*, 81 (6), 989-1000.

-----, Norbert Schwarz, Tetra Fazendeiro, and Rolf Reber (2003), "The Hedonic Marking of Processing Fluency: Implications for Evaluative Judgment," in *The Psychology of Evaluation: Affective Processes in Cognition and Emotion*, Jochen Musch and Karl C. Klauer, eds. Mahwah, Erlbaum, 189-217.

Wood, Gordon (1978), "The Knew-It-All-Along Effect," *Journal of Experimental Psychology: Human Perception and Performance,* 4 (2), 345-53.

Worsley, A. (1989), "Perceived Reliability of Sources of Health Information," *Health Education Research,* 4, 367–376.

Wright, Peter L. (1986), "Schemer Schema: Consumers' Intuitive Theories about Marketers' Influence Tactics," in *Advances in Consumer Research,* Richard J. Lutz, ed. Provo, Association for Consumer Research, 1-3.

Wright, Len Tiu (1997), "Exploring the need for Extended Research: An Investigation of Consumer Attitudes to Product Labeling," *Journal of Product and Brand Management,* 6 (6), 417-27.

Wyer, Robert S., and G. A. Radvansky (1999), "The Comprehension and Validation of Social Information: The Role of Situation Models," *Psychological Review,* 106, 89-118.

Zajonc, Robert B. (1968), "Attitudinal Effects of Mere Exposure," *Journal of Personality and Social Psychology,* 9 (2), 1-27.

Zhao, Xinshu, John G. Lynch, Jr., and Qimei Chen (2010), "Reconsidering Baron and Kenny: Myths and Truths about Mediation Analysis," *Journal of Consumer Research,* 37 (2), 197-206.

APPENDIX

Table 1: Study 1 Cell Means*

Dependent Variables	Reductive icon (Present)	Reductive icon (Absent)	Interpretive icon (Present)	Interpretive icon (Absent)	Skepticism Toward FOP Labeling (High)**	Skepticism Toward FOP Labeling (Low)**
Retailer Benevolence	4.00	3.67	3.94	3.73	3.35	4.32
Retailer Attitude	4.79	4.68	4.79	4.68	4.38	5.09
Retailer Trustworthiness	4.81	4.69	4.76	4.75	4.35	5.16
Purchase Intentions	4.43	4.18	4.39	4.22	4.09	4.52
Product Healthfulness	3.78	3.58	3.98	3.39	3.42	3.94
FOP Trust	5.19	4.51	4.67	5.04	4.40	5.30
FOP Fluency	5.92	6.28	6.04	6.16	5.99	6.21

***Note: All dependent variables were measured on a 7 point Likert scale where higher scores indicate more favorable responses.**

****Note: A median split was conducted in order to dichotomize respondents based upon their levels of skepticism toward FOP labeling (M=4.31, High Skepticism n=179, Low Skepticism n=184).**

Table 2: Study 1 Effects of FOP Reductive Icon, FOP Interpretive Icon, and Consumer Skepticism Toward FOP Labeling

	MANOVA Results		Univariate F Values						
Independent Variables	**Wilks λ**	**F-Value**	**Retailer Benevolence**	**Retailer Attitude**	**Retailer Trust**	**Purchase Intentions**	**Product Health**	**FOP Trust**	**FOP Fluency**
Reductive icon (RI)	.844	9.23***	5.770*	.786	1.185	2.445	2.829	28.129***	9.223**
Interpretive icon (II)	.879	6.70***	2.095	.924	.021	1.117	24.290***	8.277**	1.149
Labeling Skepticism (LS)	.805	12.10***	48.515***	35.429***	53.202***	7.439**	18.905***	49.428***	3.339
RI x II	.957	2.25*	.252	.911	1.903	.262	.081	11.413**	9.527**
RI x LS	.981	.96	3.780	3.813	4.738*	1.713	2.570	2.586	1.935
II x LS	.984	.71	.968	.062	.006	1.758	3.490	1.934	.000
RI x II x LS	.970	1.55	.600	.026	1.543	1.179	.482	1.983	.043

Note: MANOVA = multivariate analysis of variance
***p < .05, **p <.01, ***p < .001**

Table 3: Study 2 Effects of FOP Reductive Icon with Promoted Nutrients, FOP Interpretive Icon, FOP Single Nutrient Content Claim, and Consumer Skepticism Toward FOP Labeling

	MANOVA Results		Univariate F Values						
Independent Variables	**Wilks λ**	**F-Value**	**Product Health**	**Purchase Intentions**	**Product Attitudes**	**Man. Attitudes**	**Retailer Attitudes**	**FOP Trust**	**FOP Fluency**
Reductive icon (RI)	.851	4.56***	.420	1.454	.121	.102	2.414	.005	18.467***
Interpretive icon (II)	.919	2.30**	9.127***	1.559	5.897**	2.386	.167	.233	1.386
Nutrient Claim (NC)	.928	2.04*	5.82**	3.452*	4.165**	10.049***	3.188*	.293	.009
Labeling Skepticism (LS)	.772	7.74***	16.762***	10.295***	16.723***	8.435***	6.581**	23.266***	41.342***
RI x II	.921	2.25**	6.311**	4.468**	5.019**	4.290**	5.191**	2.204	12.112**
RI x NC	.983	.47	.189	.643	1.954	1.701	.235	.004	.138
RI x LS	.977	.61	1.229	.696	1.051	.012	.061	1.883	.993
II x NC	.904	2.78***	9.186***	9.953***	14.733***	6.445**	1.152	1.661	3.594*
II x LS	.950	1.38	4.789*	.435	.545	.011	.124	.132	2.748*
NC x LS	.965	.96	1.109	.006	.081	2.690	3.448	1.581	1.115
RI x II x LS	.966	.92	.040	1.458	.637	2.553	.341	.133	.783
RI x II x NC	.978	.59	.126	.951	.340	.469	.771	.805	.341
RI x NC x LS	.969	.74	.426	.649	1.061	1.095	2.374	.159	.196
II x NC x LS	.983	.46	.082	.326	.000	.043	.006	1.316	.430
RI x II x NC x LS	.90	2.80***	4.914**	2.451	7.649***	2.304	3.049	12.593***	6.376**

Note: MANOVA = multivariate analysis of variance
***p < .10, **p < .05, ***p <.01**

Table 4: Study 3 Effects of Interpretive Icon, Reductive Icon, and Objective Product Nutrition - Granola Bar Category

F Values for Dependent Variables (Sphericity Assumed)

Independent Variables	**Conceptual Fluency**	**Perceived Healthfulness**	**Purchase Intentions**
Interpretive Icon (II)	16.08***	0.02	0.5
Reductive Icon (RI)	38.06***	4.68*	2.06
Product Nutrition (PN)	2.38	99.82***	9.71**
II X RI	10.12**	0.58	0.15
PN X II	1.02	17.88***	15.59***
PN X RI	0.55	2.42	2.39
PN X II X RI	0.08	1.42	1.58

*** p<.05, **p<.01, ***p<.001**

Table 5: Study 3 Effects of Interpretive Icon, Reductive Icon, and Objective Product Nutrition - Soup Category

F Values for Dependent Variables (Sphericity Assumed)

Independent Variables	**Conceptual Fluency**	**Perceived Healthfulness**	**Purchase Intentions**
Interpretive Icon (II)	14.36***	1.53	0.76
Reductive Icon (RI)	13.25***	0.05	8.19**
Product Nutrition (PN)	19.12***	101.79***	35.08***
II X RI	3.57	1.7	6.03*
PN X II	0.29	17.25***	11.85**
PN X RI	6.81*	1.33	1.67
PN X II X RI	1.5	0.01	0.7

*** p<.05, **p<.01, ***p<.001**

Table 6: Study 3 Hierarchical Logistic Regression Model Results for Likelihood of Purchasing a Healthy Product – Granola Bar Category

	Regression Coefficients (SE)		
Purchase Likelihood Predictors	**Model 1: Individual Difference Variables**	**Model 2: FOP Health Icons**	**Model 3: Interactive Effects**
Nutrition Concern	-.26 (.17)	-.29 (.19)	-.29 (.18)
Nutrition Knowledge	.00 (.23)	-.07 (.24)	-.07 (.23)
Interpretive Icon (II)		1.02 (.47)**	1.08 (.48)**
Reductive Icon (RI)		.53 (.45)	.59 (.46)
II X RI			-.89 (.92)
Model χ^2 value	4.12	10.74**	11.69**
χ^2 – change value	___	6.62	.36
Model R^2	.04	.10	.11

Note: All coefficients are unstandardized. N = 100
***p < .10, **p < .05, ***p < .01**

Table 7: Study 3 Hierarchical Logistic Regression Model Results for Likelihood of Purchasing a Healthy Product – Soup Category

Purchase Likelihood Predictors	Regression Coefficients (SE) Model 1: Individual Difference Variables	Model 2: FOP Health Icons	Model 3: Interactive Effects
Nutrition Concern	-.08 (.18)	-.10 (.19)	-.10 (.19)
Nutrition Knowledge	.81 (.27)***	.81 (.27)**	.84 (.27)**
Interpretive Icon (II)		.44 (.45)	.45 (.45)
Reductive Icon (RI)		-.37 (.45)	-.35 (.45)
II X RI			-1.25 (.91)
Model χ^2 value	17.77***	19.29***	21.22***
χ^2 – change value	___	1.52	1.93
Model R^2	.16	.18	.19

Note: All coefficients are unstandardized. N = 100
***p < .10 **p < .05 ***p < .01**

Table 8: Study 4 Effects of FOP Reductive Icon, Interpretive Icon, and Product Nutrition – Granola Bar Category

F Values for Dependent Variables (Sphericity Assumed)

Independent Variables	Product Healthfulness	Purchase Intentions	Product Attitudes	FOP Fluency
Interpretive Icon (II)	.696	.000	.007	46.237***
Reductive Icon (RI)	1.298	1.291	.219	19.977***
Product Nutrition (PN)	.006	1.183	2.802	6.541*
Brand Attitude (BA)	.176	11.415**	2.994	3.067
Brand Nutrition (BN)	27.294***	2.705	4.970*	2.673
II X RI	.072	.061	1.032	23.625***
PN X II	12.290**	11.936**	21.661***	.316
PN X RI	.575	.322	3.763	.669
PN X BA	.426	1.698	.893	.704
PN X BN	.082	.236	.079	7.118**
PN X II X RI	.047	1.183	.967	1.180

Note: Brand Attitude (BA) and Brand Nutrition (BN) were used as covariates.
***p < .05, **p <.01, ***p<.001**

Table 9: Study 4 Effects of FOP Reductive Icon, Interpretive Icon, and Product Nutrition – Macaroni and Cheese Category

F Values for Dependent Variables (Sphericity Assumed)

Independent Variables	Product Healthfulness	Purchase Intentions	Product Attitudes	FOP Fluency
Interpretive Icon (II)	.026	.701	.318	35.156***
Reductive Icon (RI)	.122	6.928*	3.142	24.528***
Product Nutrition (PN)	.184	1.372	.453	1.091
Brand Attitude (BA)	.965	46.986***	43.058***	4.180*
Brand Nutrition (BN)	69.922***	.857	4.338*	5.240*
II X RI	.023	1.734	.094	27.600***
PN X II	18.959***	25.468***	25.145***	.011
PN X RI	4.004*	.130	.594	.190
PN X BA	.324	2.510	1.840	.126
PN X BN	2.499	11.662**	9.905**	1.789
PN X II X RI	1.449	1.397	1.717	.314

Note: Brand Attitude (BA) and Brand Nutrition (BN) were used as covariates.
***p < .05, **p <.01, ***p<.001**

Table 10: Study 4 Hierarchical Logistic Regression Model Results for Likelihood of Purchasing a Healthy Product – Granola Bar Category

	Regression Coefficients (SE)		
Purchase Likelihood Predictors	**Model 1: Individual Difference Variables**	**Model 2: FOP Health Icons**	**Model 3: Interactive Effects**
Nutrition Concern	-.30 (.20)	-.31 (.21)	-.29 (.21)
Nutrition Knowledge	.29 (.22)	.22 (.22)	.21 (.23)
Nutrition Behavior	-.08 (.12)	-.05 (.13)	-.05 (.13)
Interpretive Icon (II)		1.07 (.40)***	1.08 (.40)***
Reductive Icon (RI)		.18 (.41)	.21 (.41)
II X RI			.48 (.80)
Model χ^2 value	2.60	10.13	10.49
χ^2 – change value	___	7.53	.36
Model R^2	.02	.08	.08

Note: All coefficients are unstandardized. N = 120, *p < .10, **p < .05, ***p < .01

Table 11: Study 4 Hierarchical Logistic Regression Model Results for Likelihood of Purchasing a Healthy Product – Macaroni and Cheese Category

Purchase Likelihood Predictors	Regression Coefficients (SE) Model 1: Individual Difference Variables	Model 2: FOP Health Icons	Model 3: Interactive Effects
Nutrition Concern	.01 (.19)	.01 (.20)	-.02 (.20)
Nutrition Knowledge	.07 (.21)	-.01 (.22)	.04 (.22)
Nutrition Behavior	-.15 (.12)	-.12 (.12)	-.12 (.12)
Interpretive Icon (II)		1.08 (.39)***	1.10 (.39)***
Reductive Icon (RI)		.18 (.40)	.18 (.41)
II X RI			-1.39 (.78)*
Model χ^2 value	2.22	10.47*	13.68**
χ^2 – change value	___	8.25	3.21
Model R^2	.02	.08	.11

Note: All coefficients are unstandardized. N = 121, *p < .10 **p < .05 ***p < .01

Table 12: Study 4 Tests of the Mediated Moderation: Interpretive Icons, Reductive Icons, and the Mediating Role of Conceptual Fluency on Product Purchase Intentions – Granola Bar Category

	Model 1 Purchase Intentions		**Model 2 Conceptual Fluency (Mediator)**		**Model 3 Purchase Intentions**	
Independent Variables	Coefficient	T-values	Coefficient	T-values	Coefficient	T-values
Interpretive Icon (II)	1.55	3.45***	3.08	8.25***	-.32	-.65
Reductive Icon (RI)	1.08	2.41**	2.48	6.66***	-.43	-.93
II X RI	-1.05	-1.65	-2.82	-5.37***	.67	1.09
Conceptual Fluency	-	-	-	-	.61	6.28***

Note: All coefficients are unstandardized.
*** *p* < .05, one-tailed, ** *p* <. 05, *** *p* < .01**

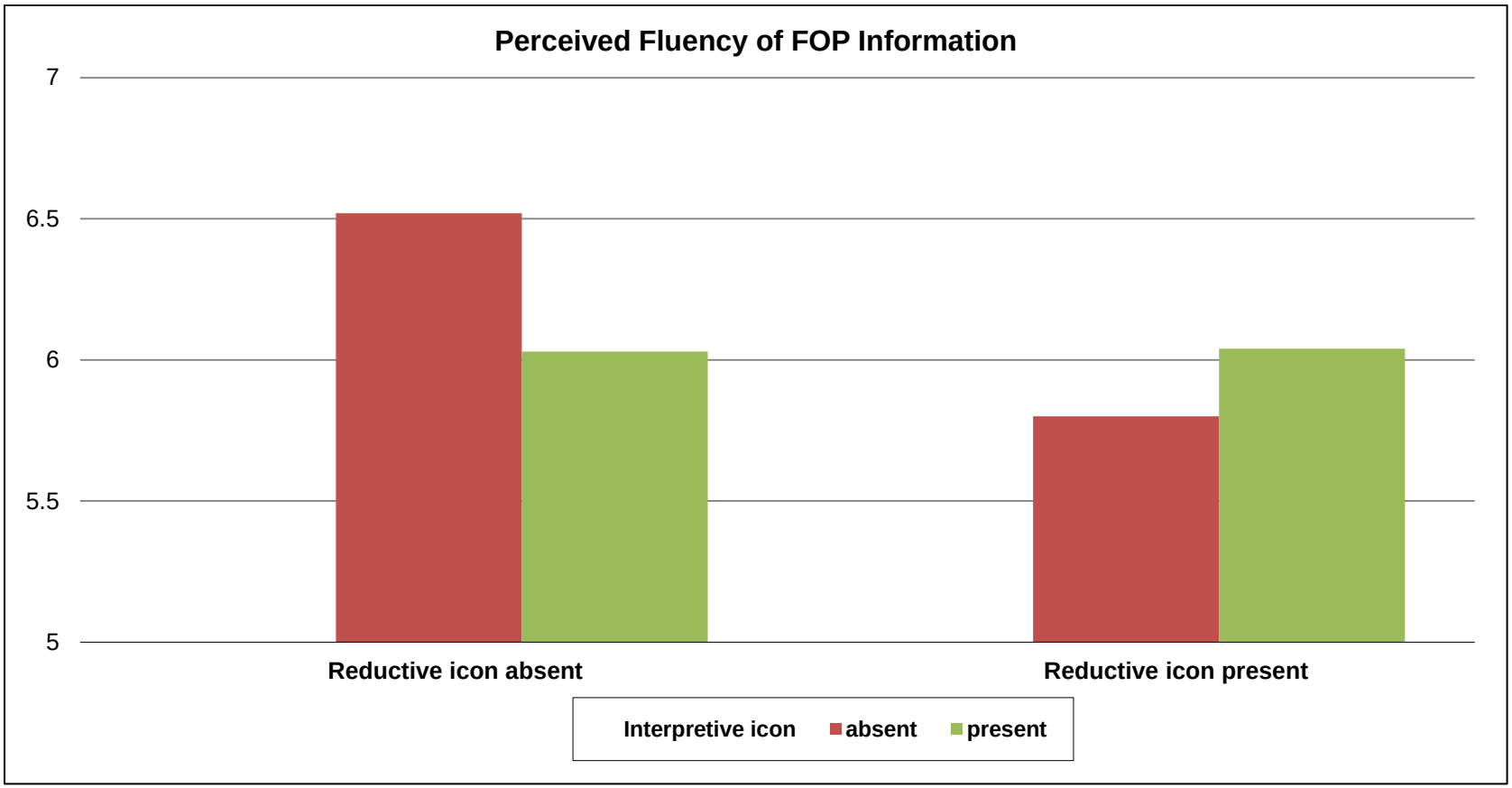
Table 13: Study 4 Tests of the Mediated Moderation: Interpretive Icons, Reductive Icons, and the Mediating Role of Conceptual Fluency on Product Purchase Intentions – Macaroni and Cheese Category

	Model 1 Purchase Intentions		**Model 2 Conceptual Fluency (Mediator)**		**Model 3 Purchase Intentions**	
Independent Variables	Coefficient	T-values	Coefficient	T-values	Coefficient	T-values
Interpretive Icon (II)	1.54	3.07***	3.02	8.03***	-.54	-1.01
Reductive Icon (RI)	1.00	1.97*	2.60	6.86***	-.80	-1.54
II X RI	-.51	-.71	-2.71	-5.09***	1.37	2.02**
Conceptual Fluency	-	-	-	-	.69	6.43***

Note: All coefficients are unstandardized.
**** p < .05, one-tailed, **p < .05, ***p < .01***

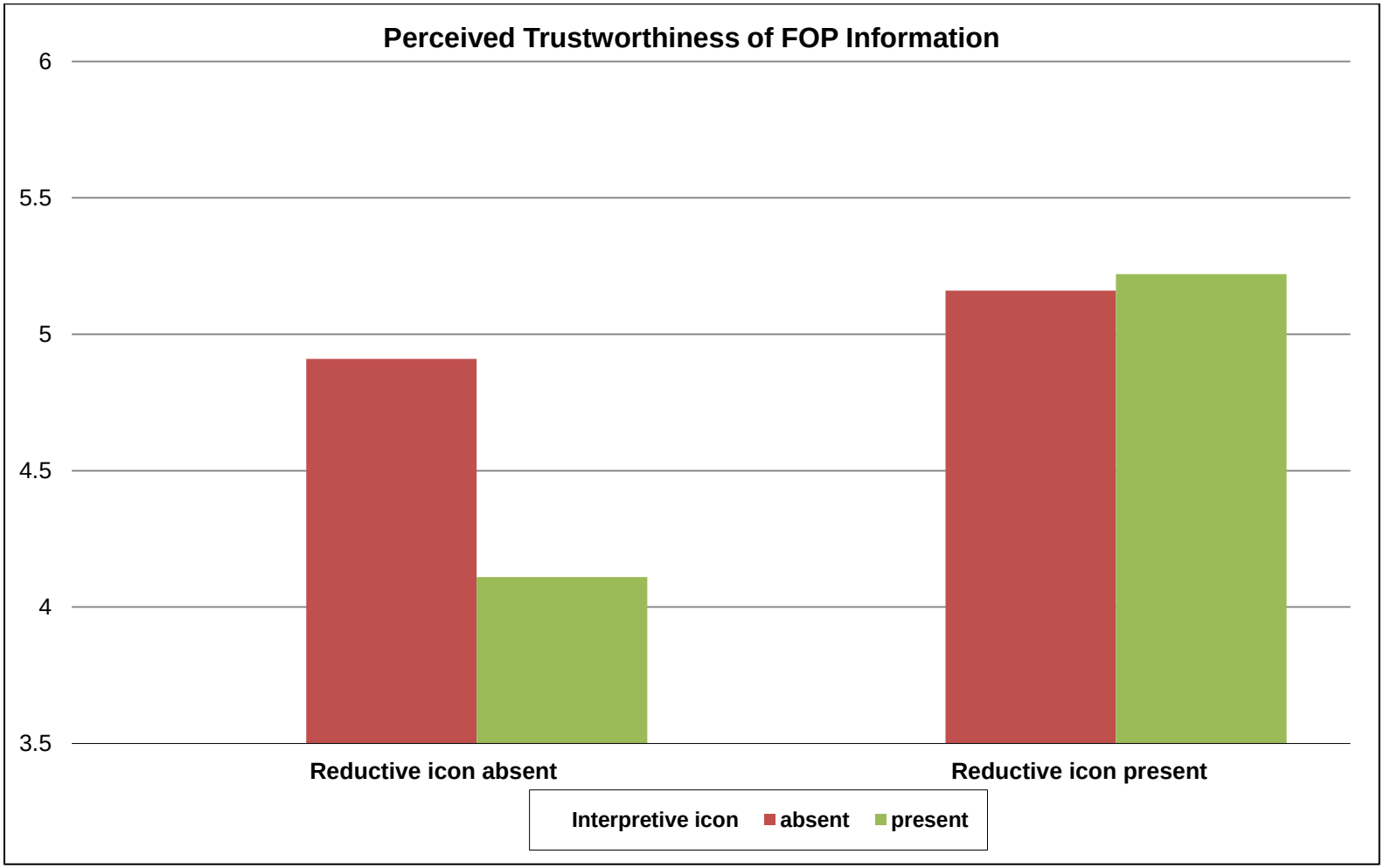
Figure 1: Study 1 Stimuli Used When Both FOP Nutrition Disclosure Manipulations Were Present

*Figure 2: Study 1 Effects of FOP Reductive Icon and FOP Interpretive Icon on Perceived Processing Fluency of Surrounding FOP Information**



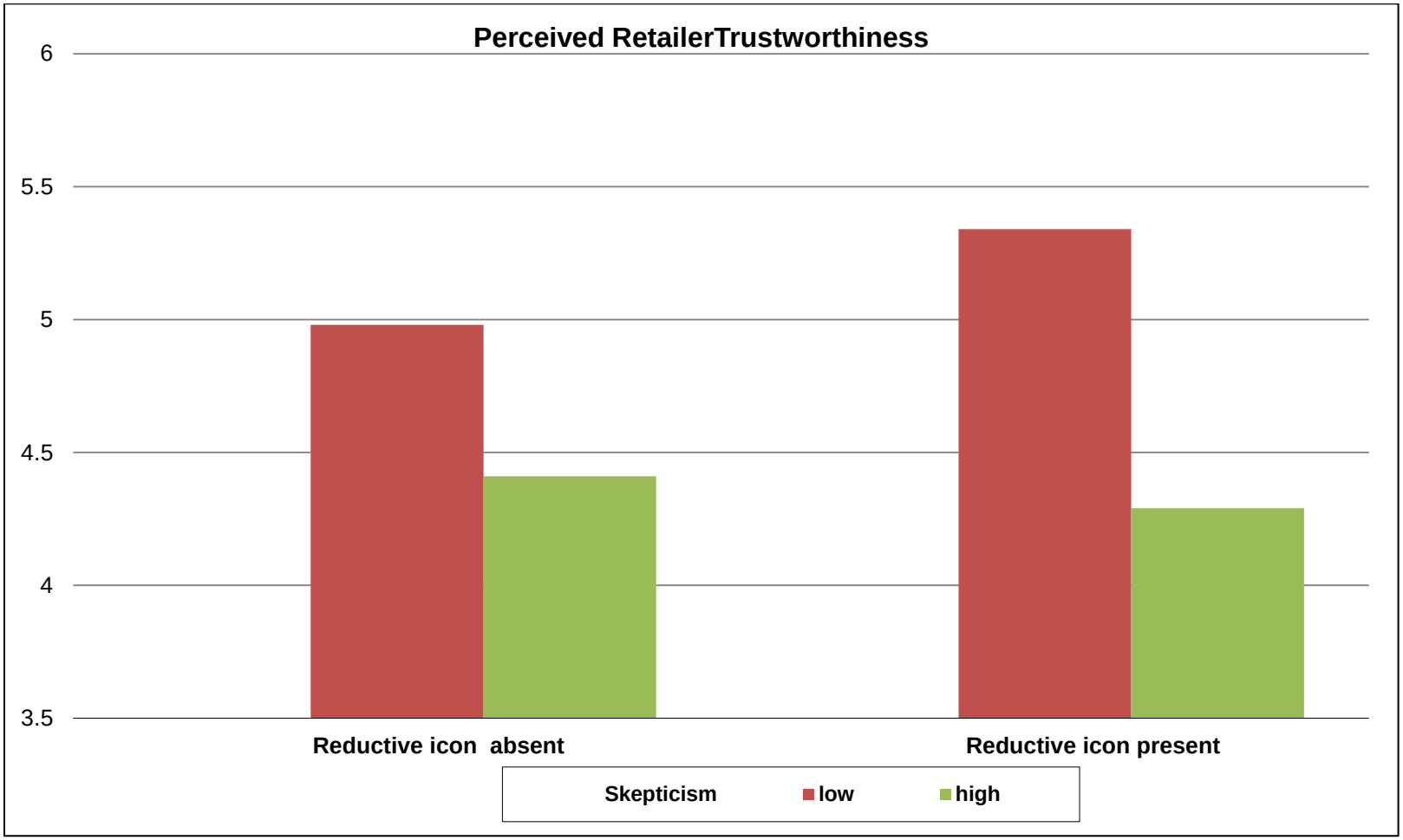
***Note: Higher values indicate higher levels of perceived fluency.**

*Figure 3: Study 1 Effects of FOP Reductive Icon and FOP Interpretive Icon on Perceived Trustworthiness of Surrounding FOP Information**



***Note: Higher values indicate higher levels of perceived trustworthiness.**

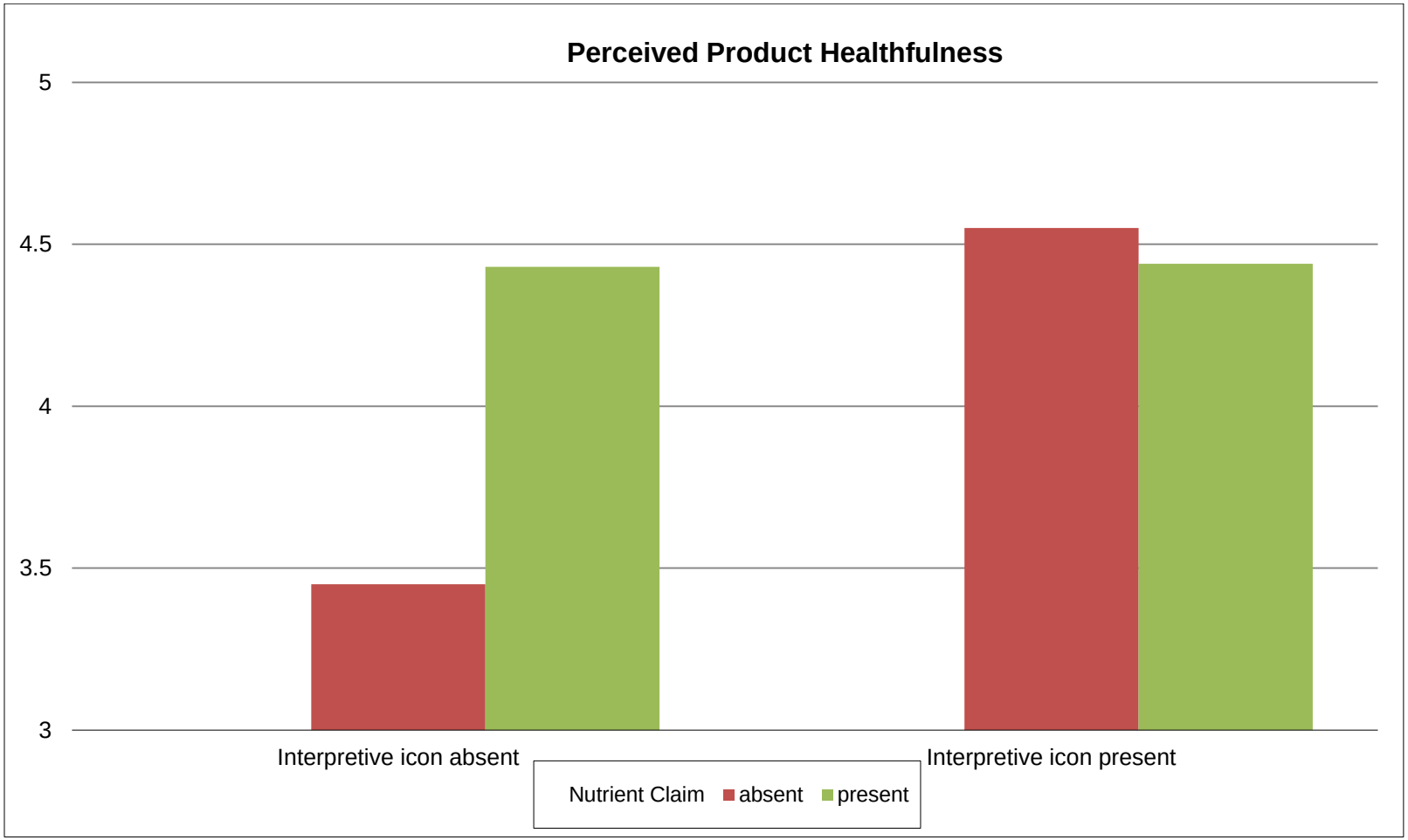
*Figure 4: Study 1 Effects of FOP Reductive Icon and Consumer Skepticism Toward FOP Labeling on Perceived Retailer Trustworthiness**



**Note: Higher values indicate higher levels of perceived trustworthiness.

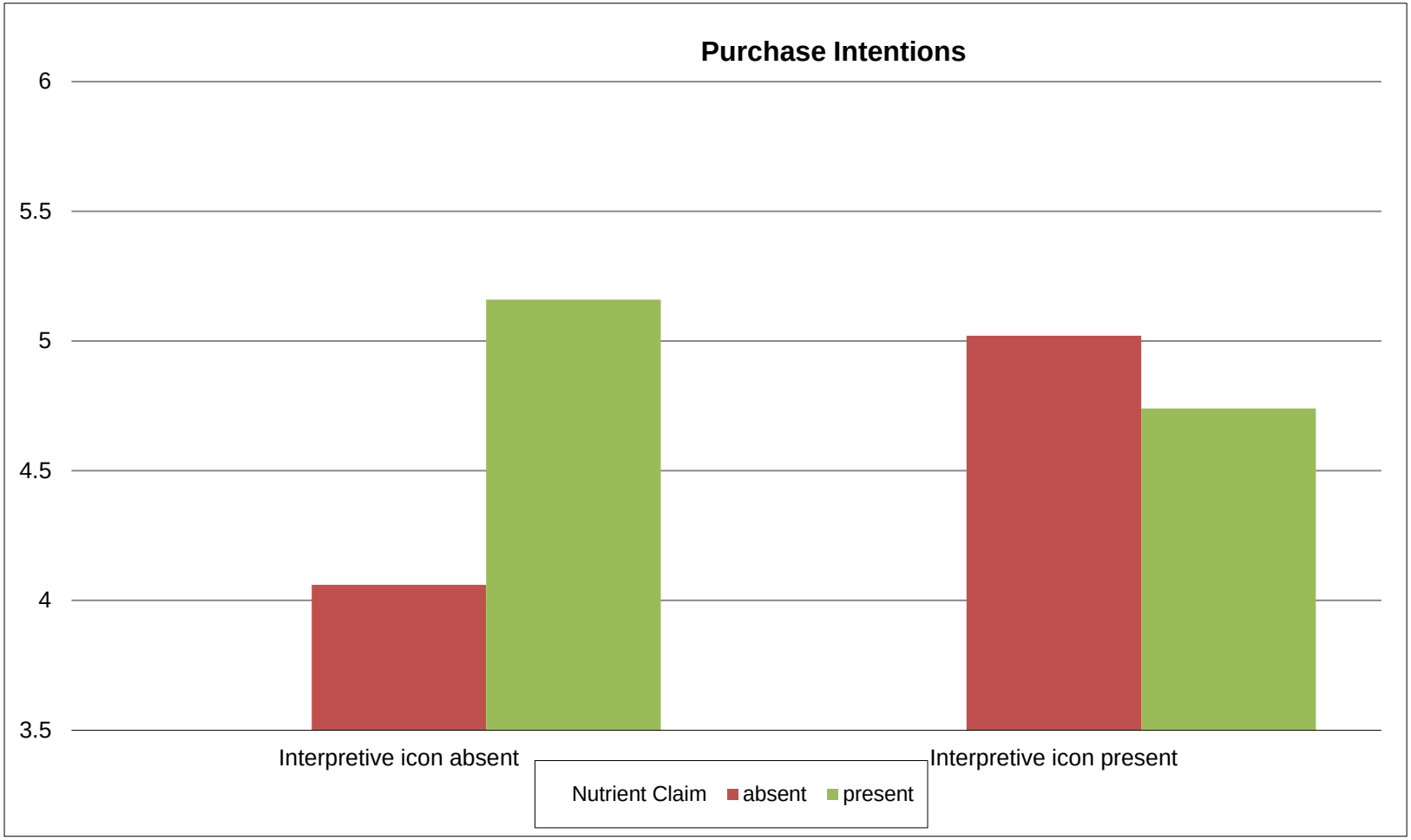
Figure 5: Study 2 Stimuli Used When All 3 FOP Nutrition Disclosure Manipulations Were Present

Figure 6: Study 2 Effects of FOP Single Nutrient Content Claim and FOP Interpretive Icon on Perceived Product Healthfulness*



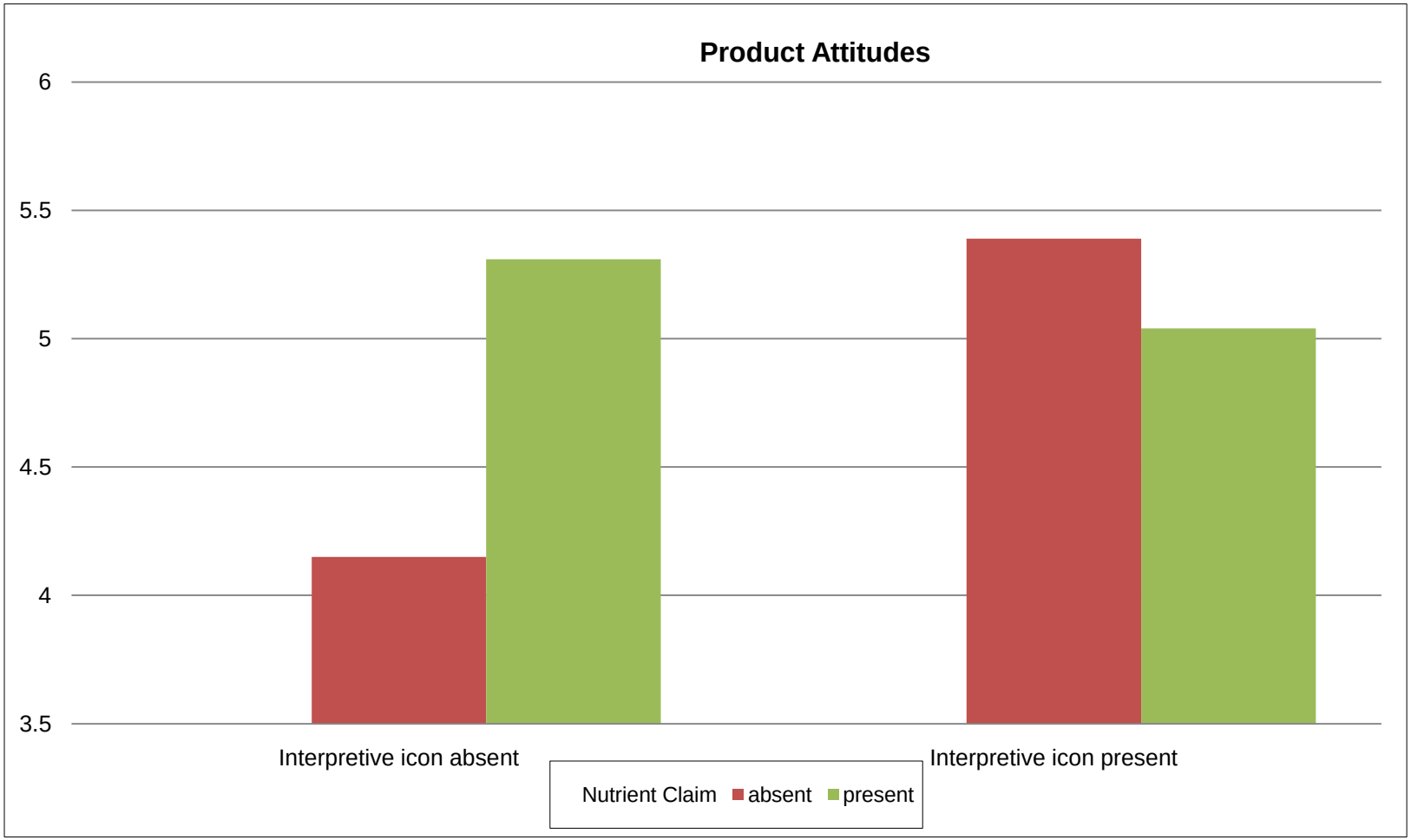
***Note: Higher values indicate higher perceived product healthfulness.**

Figure 7: Study 2 Effects of FOP Single Nutrient Content Claim and FOP Interpretive Icon on Product Purchase Intentions*



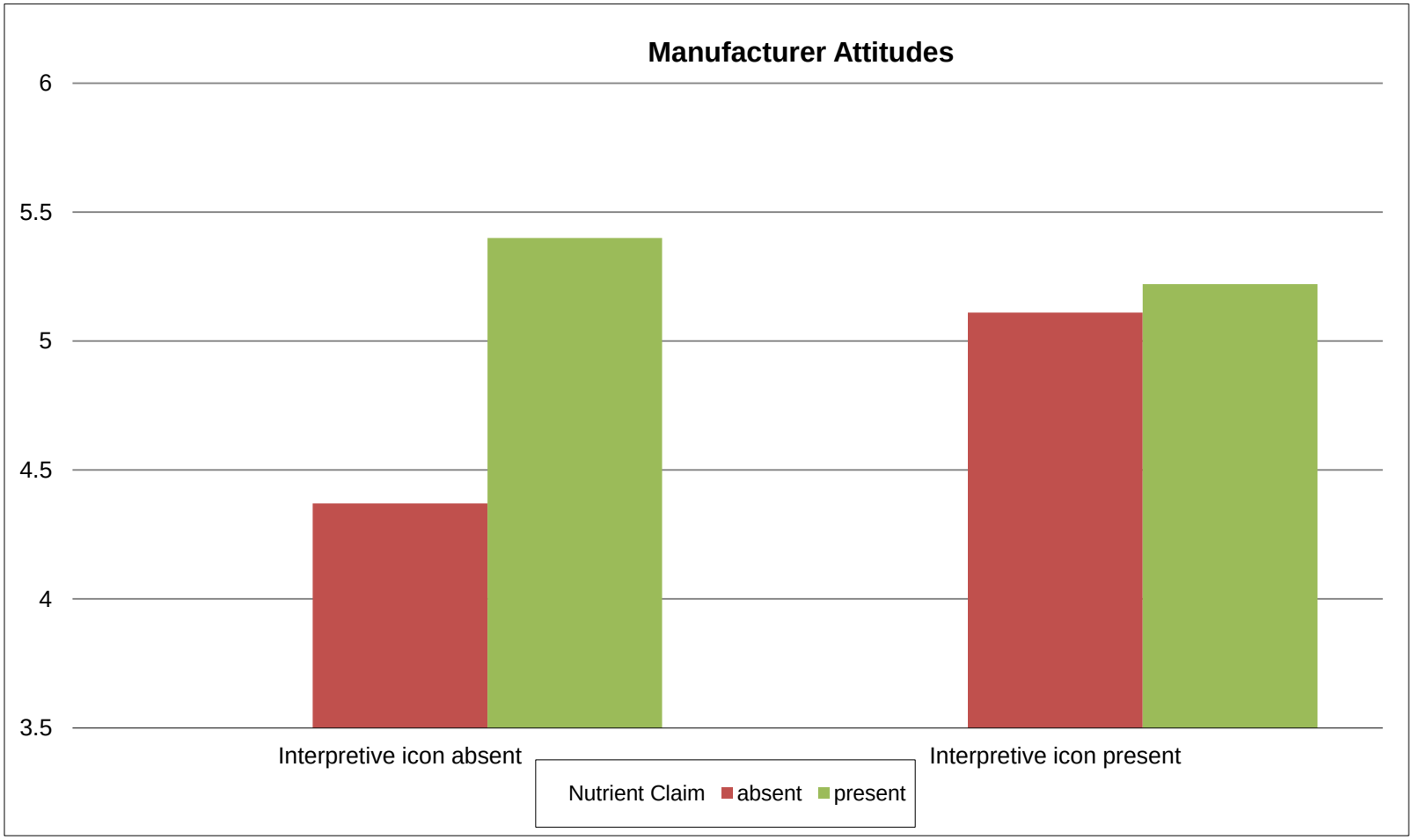
***Note: Higher values indicate higher purchase intentions.**

*Figure 8: Study 2 Effects of FOP Single Nutrient Content Claim and FOP Interpretive Icon on Product Attitudes**



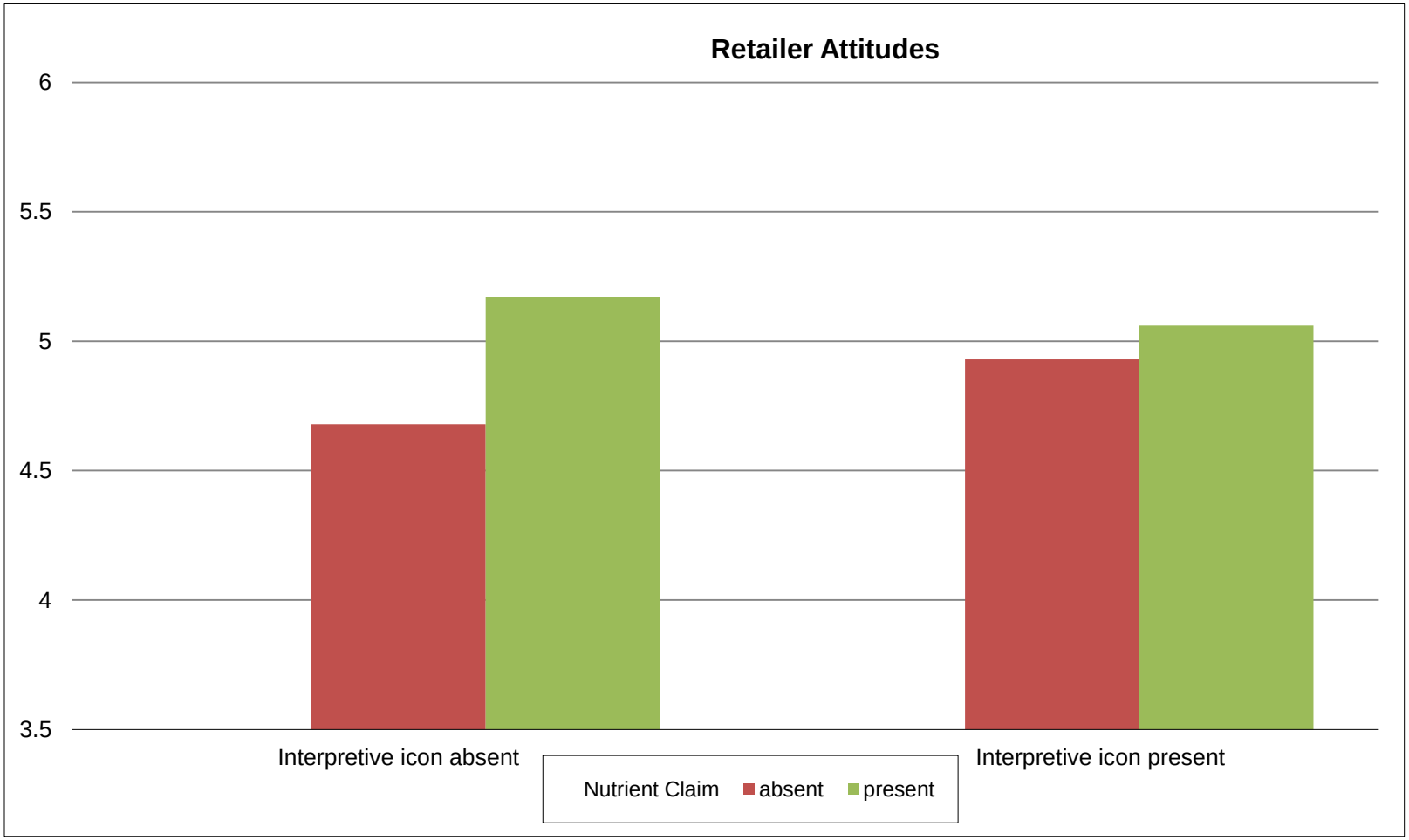
***Note: Higher values indicate more positive product attitudes.**

*Figure 9: Study 2 Effects of FOP Single Nutrient Content Claim and FOP Interpretive Icon on Manufacturer Attitudes**



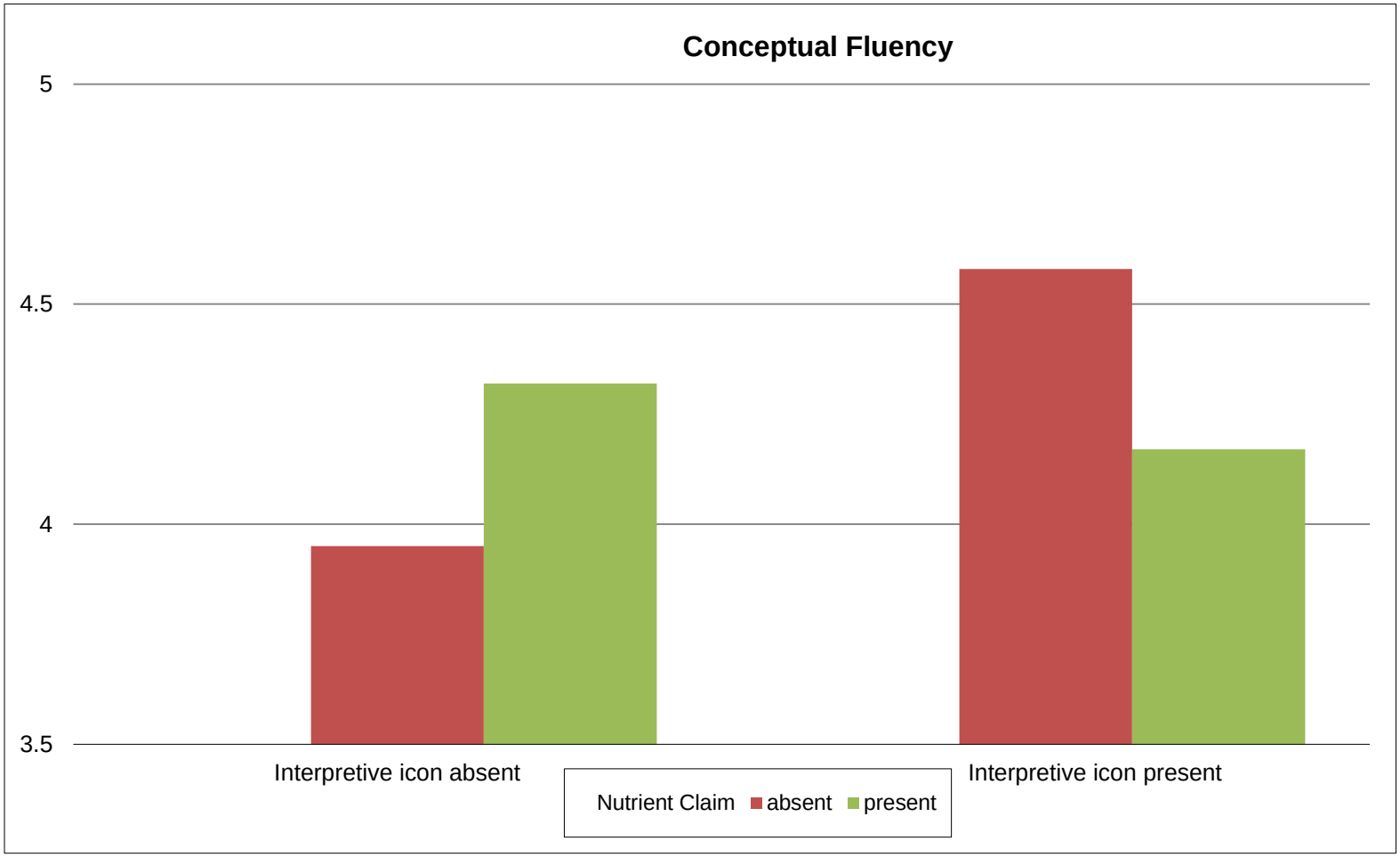
***Note: Higher values indicate more positive manufacturer attitudes.**

*Figure 10: Study 2 Effects of FOP Single Nutrient Content Claim and FOP Interpretive Icon on Retailer Attitudes**



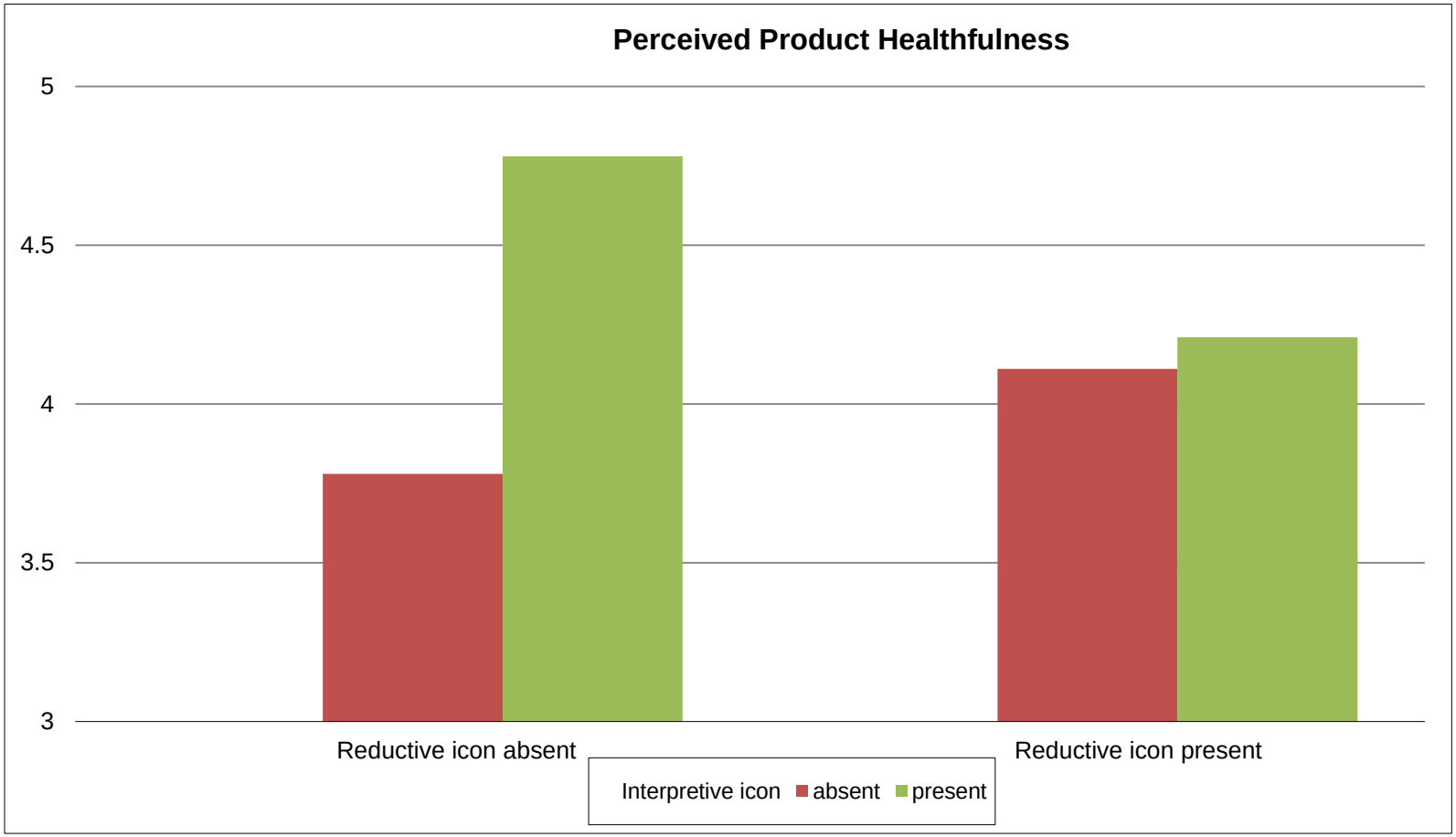
***Note: Higher values indicate more positive retailer attitudes.**

*Figure 11: Study 2 Effects of FOP Single Nutrient Content Claim and FOP Interpretive Icon on Conceptual Fluency**



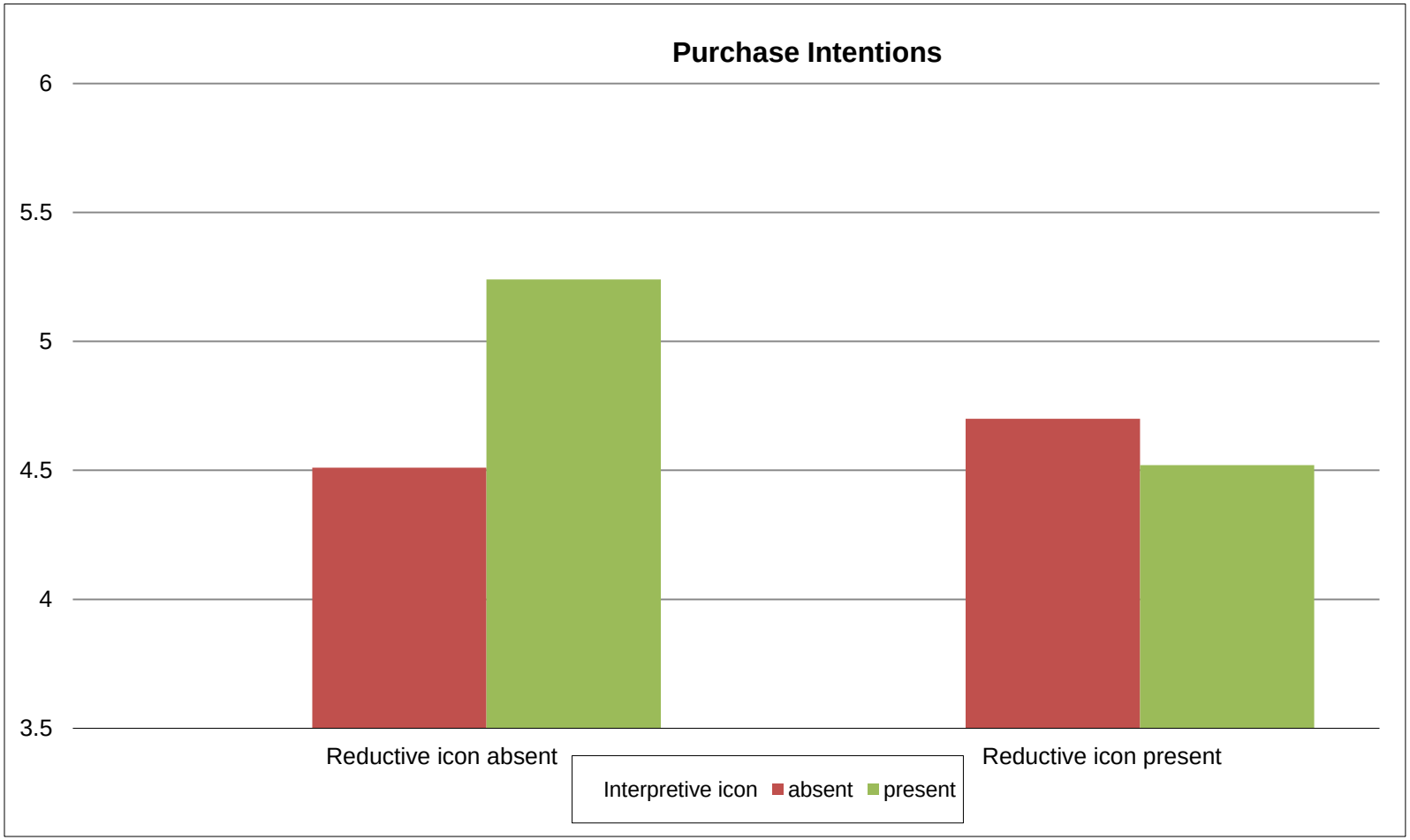
***Note: Higher values indicate higher levels of conceptual fluency.**

*Figure 12: Study 2 Effects of FOP Reductive Icon and FOP Interpretive Icon on Perceived Product Healthfulness**



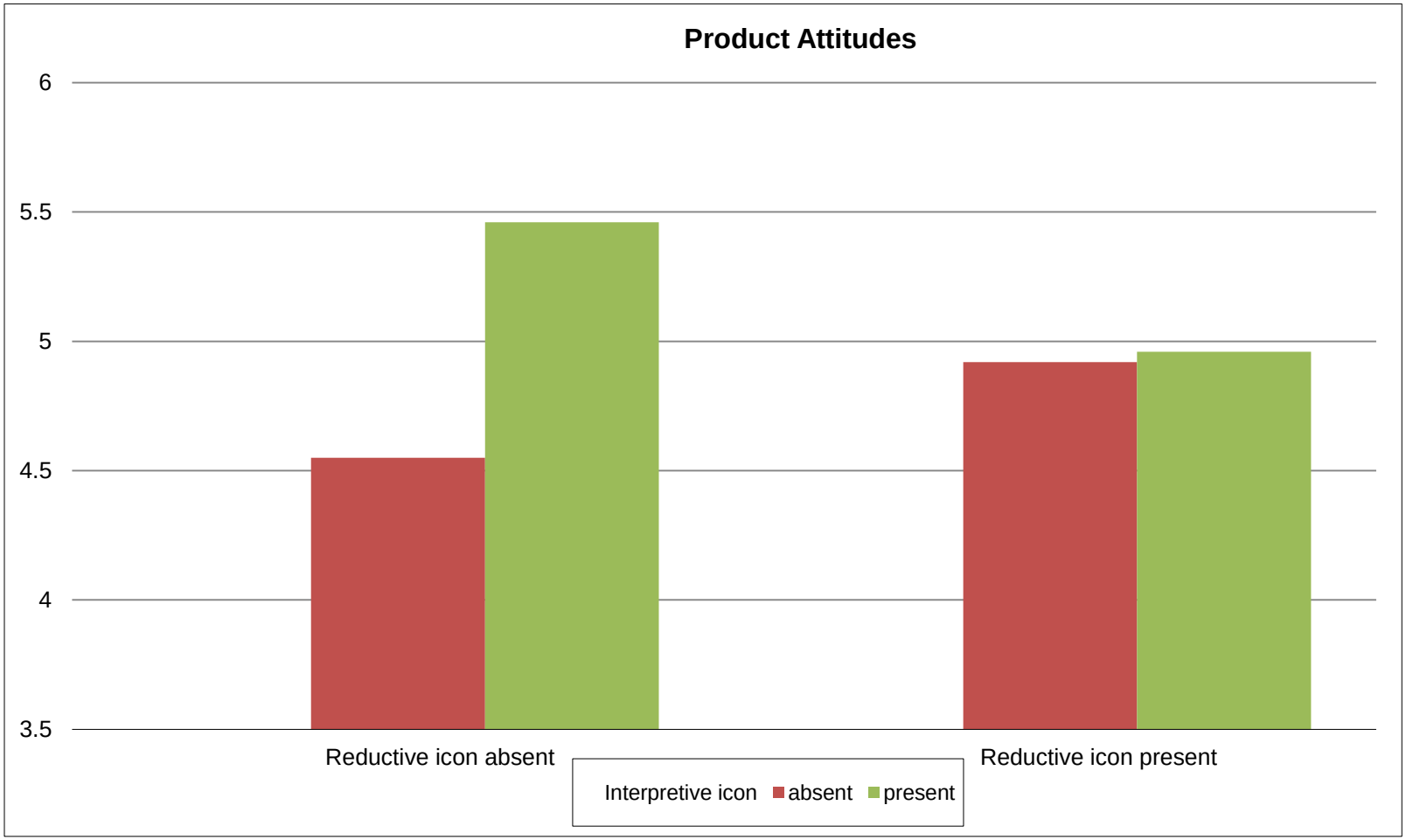
***Note: Higher values indicate higher levels of perceived product healthfulness.**

*Figure 13: Study 2 Effects of FOP Reductive Icon and FOP Interpretive Icon on Purchase Intentions**



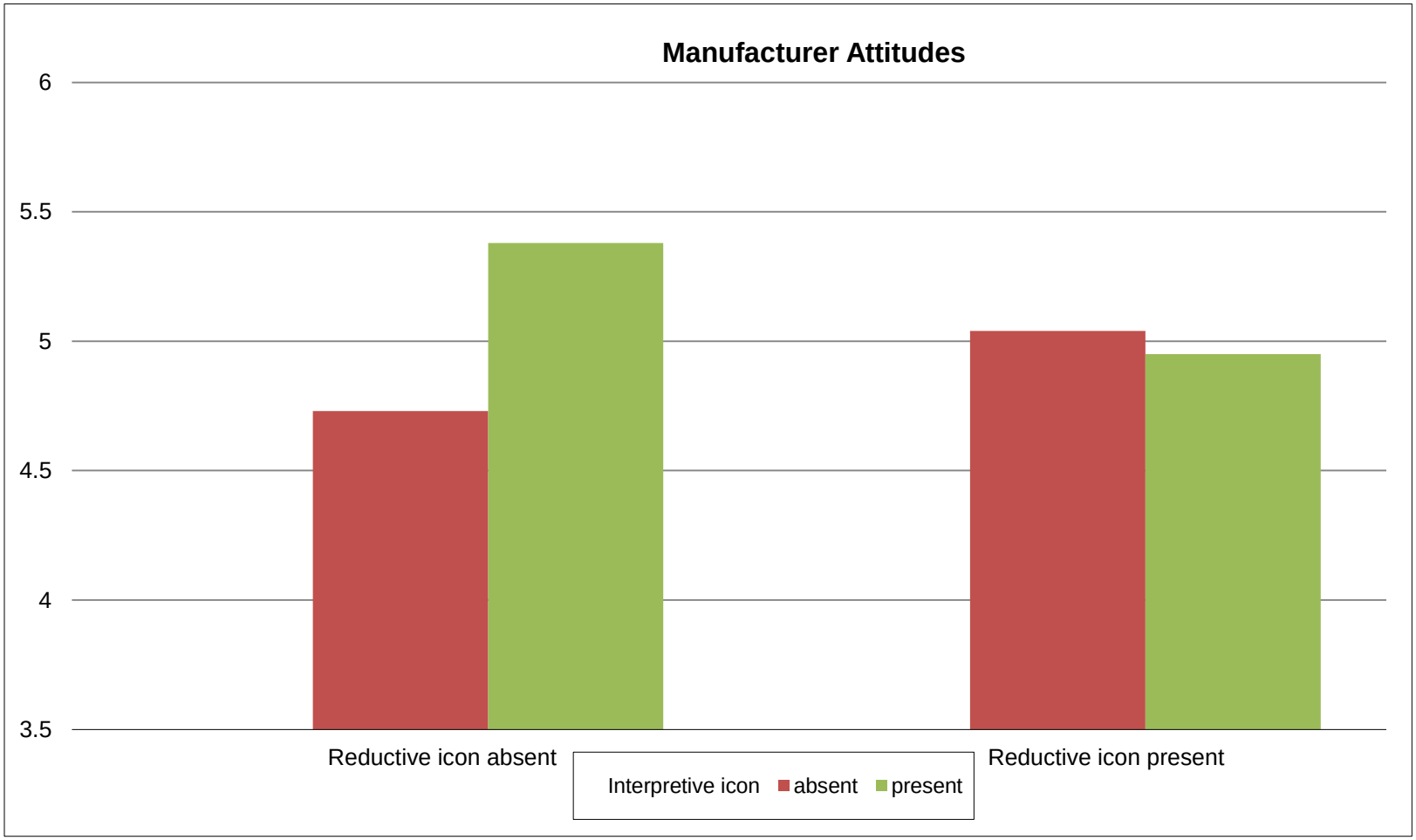
***Note: Higher values indicate higher levels of purchase intentions.**

*Figure 14: Study 2 Effects of FOP Reductive Icon and FOP Interpretive Icon on Product Attitudes**



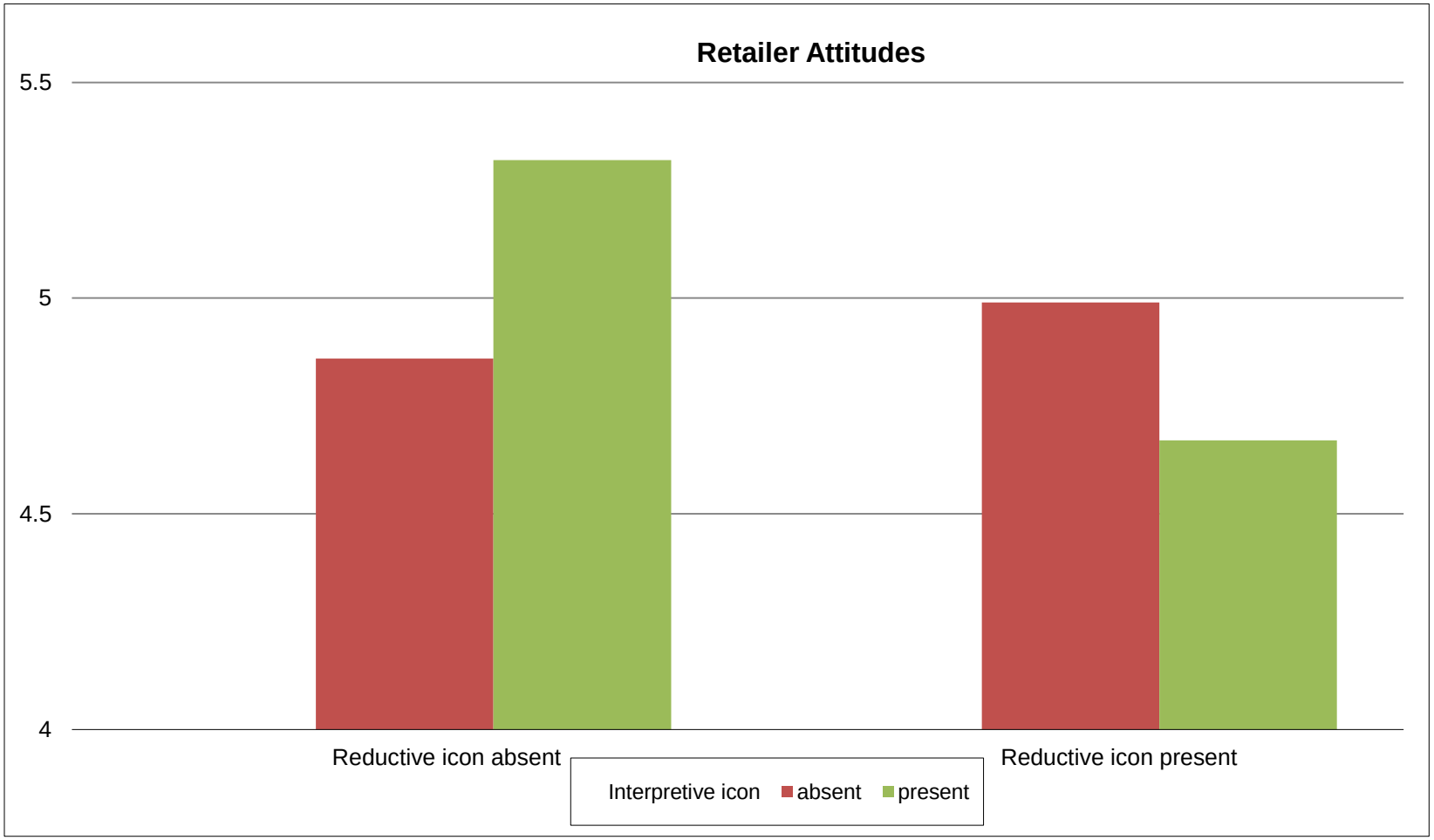
***Note: Higher values indicate more positive product attitudes.**

*Figure 15: Study 2 Effects of FOP Reductive Icon and FOP Interpretive Icon on Manufacturer Attitudes**



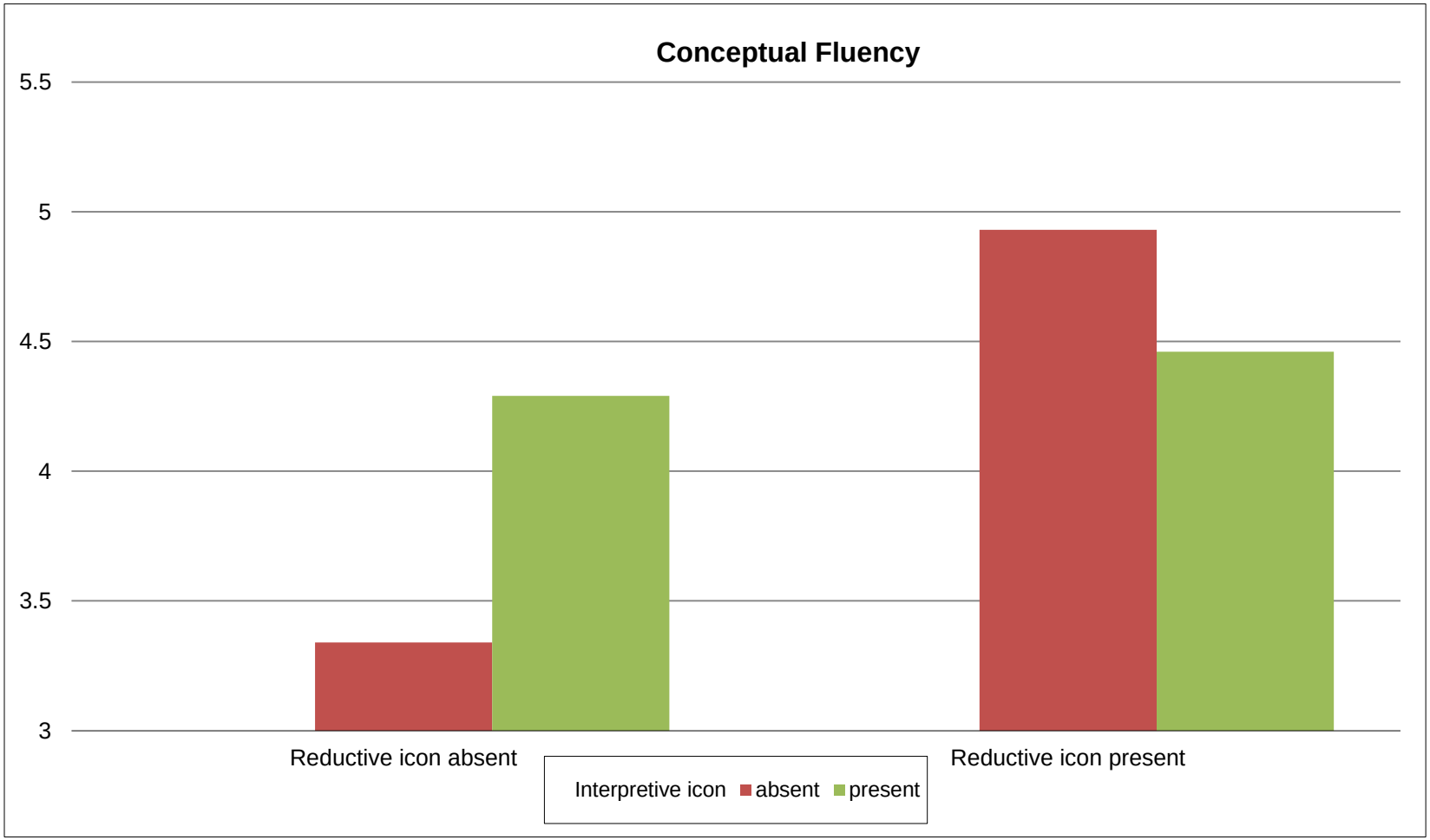
***Note: Higher values indicate more positive manufacturer attitudes.**

*Figure 16: Study 2 Effects of FOP Reductive Icon and FOP Interpretive Icon on Retailer Attitudes**



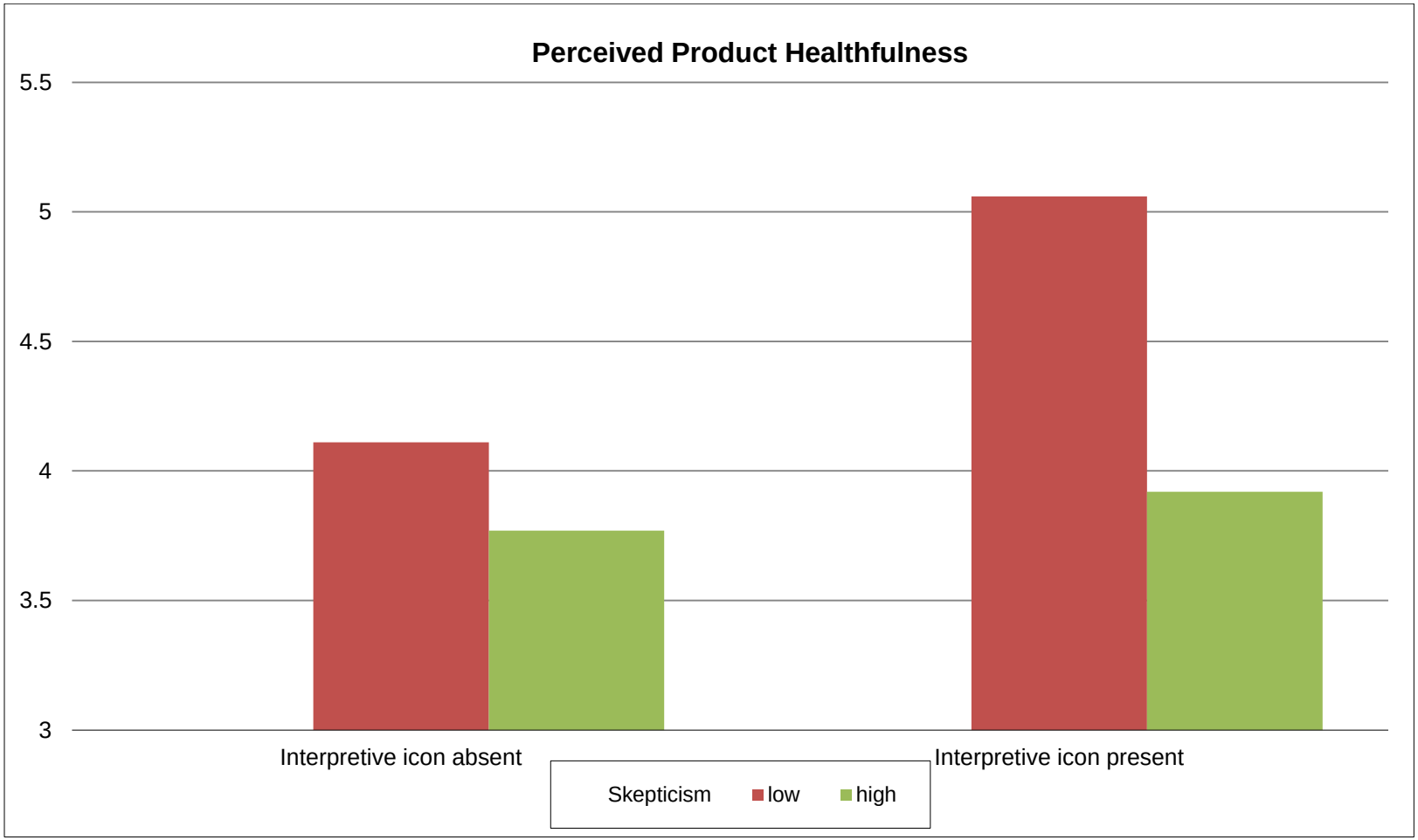
***Note: Higher values indicate more positive retailer attitudes.**

*Figure 17: Study 2 Effects of FOP Reductive Icon and FOP Interpretive Icon on Conceptual Fluency**



***Note: Higher values indicate higher conceptual fluency.**

Figure 18: Study 2 Effects of Consumer Skepticism toward Labeling and FOP Interpretive Icon on Perceived Product Healthfulness*



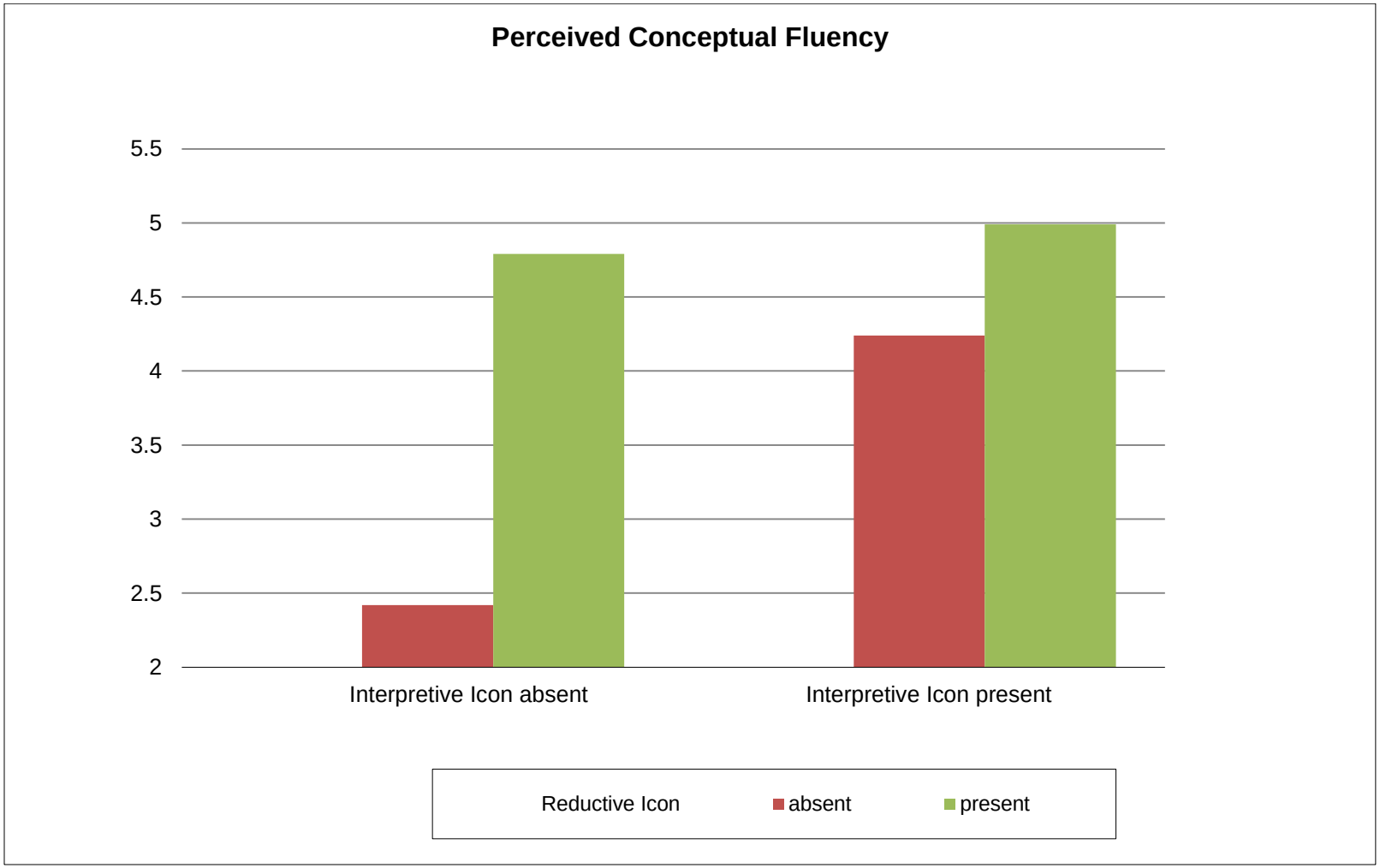
***Note: Higher values indicate higher perceptions of product healthfulness.**

Figure 19: Study 3 Stimuli Used When Both FOP Interpretive and Reductive Icons Were Present – Granola Bar Category

Figure 20: Study 3 Stimuli Used When Both FOP Interpretive and Reductive Icons Were Present – Soup Category

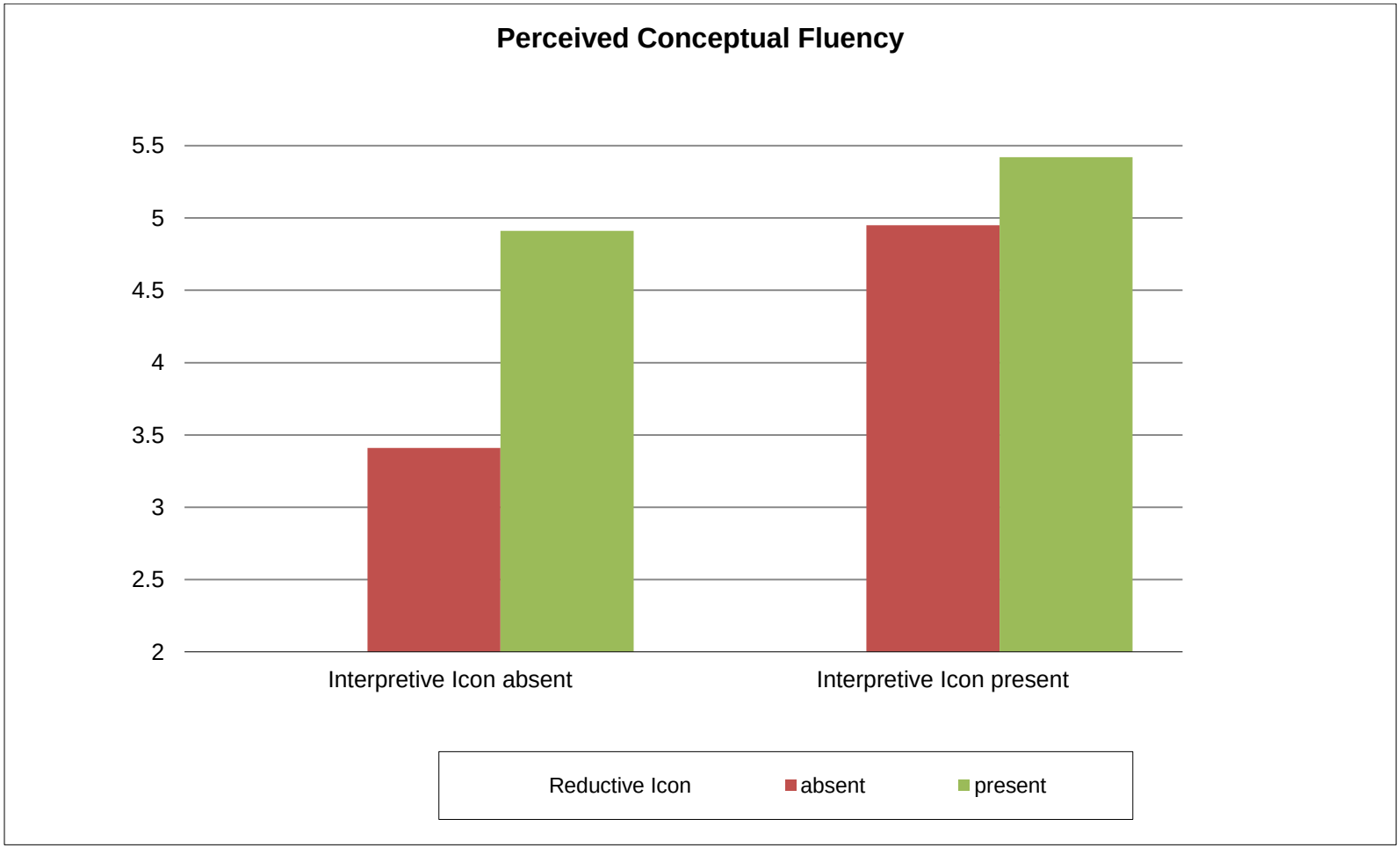
Figure 21: Study 3 Retail Setting Displaying Both Product Categories

Figure 22a: Study 3 Effects of FOP Interpretive Icon and FOP Reductive Icon on Perceived Conceptual Fluency – Granola Category*



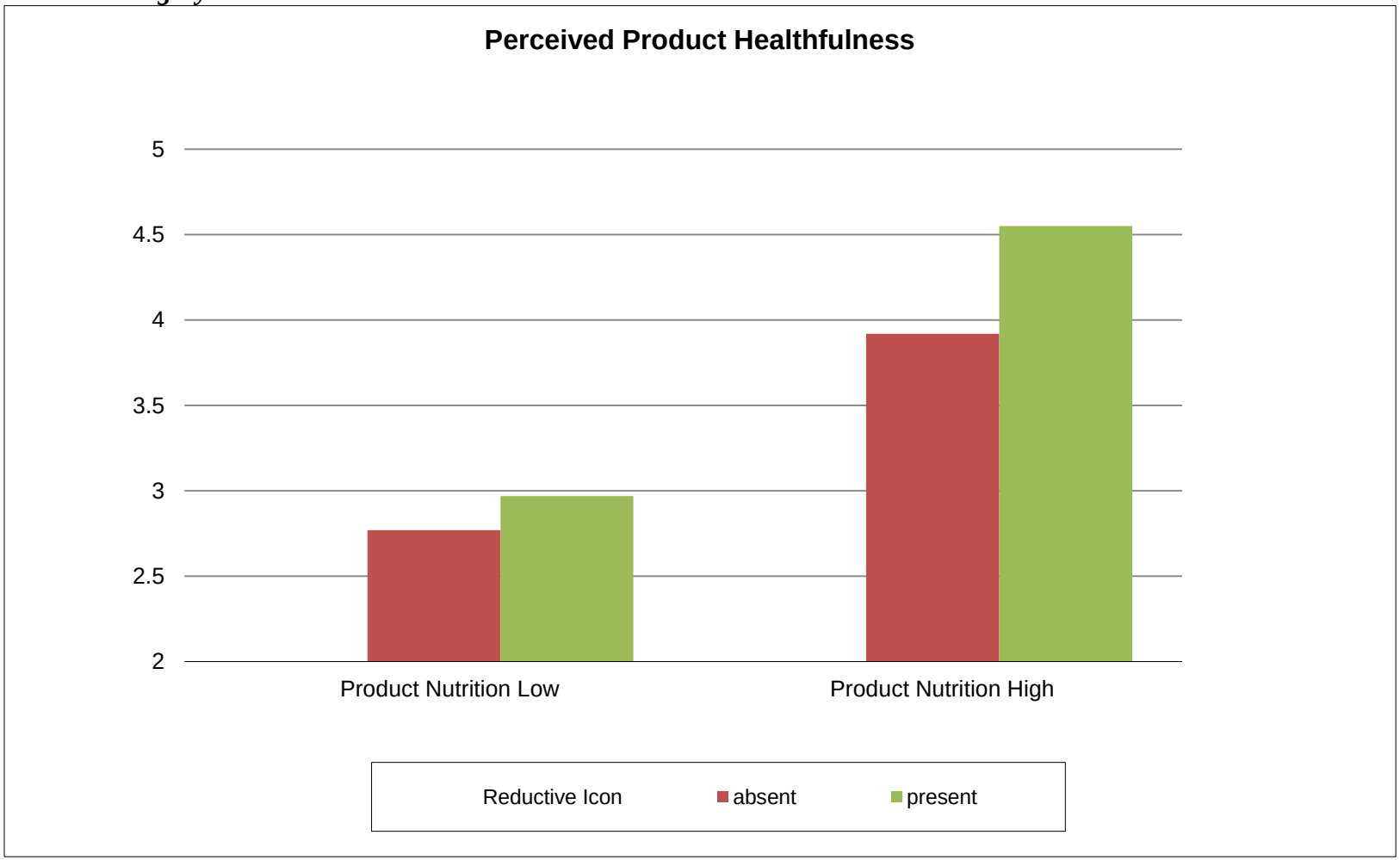
***Note: Higher values indicate higher perceptions of conceptual fluency.**

*Figure 22b: Study 3 Effects of FOP Interpretive Icon and FOP Reductive Icon on Perceived Conceptual Fluency – Soup Category**



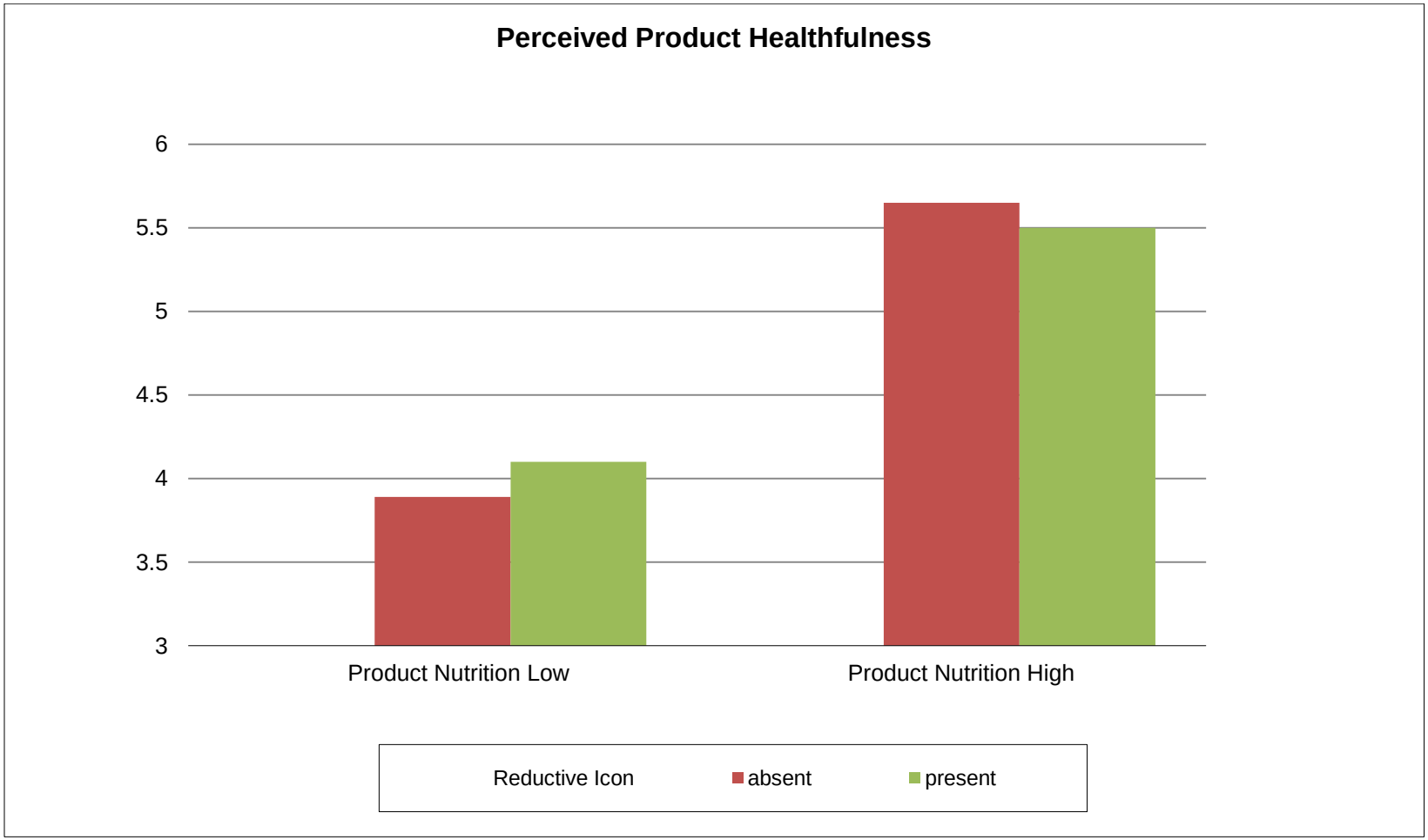
***Note: Higher values indicate higher perceptions of conceptual fluency.**

*Figure 23a: Study 3 Effects of FOP Reductive Icon and Objective Product Nutrition on Perceived Product Healthfulness – Granola Category**



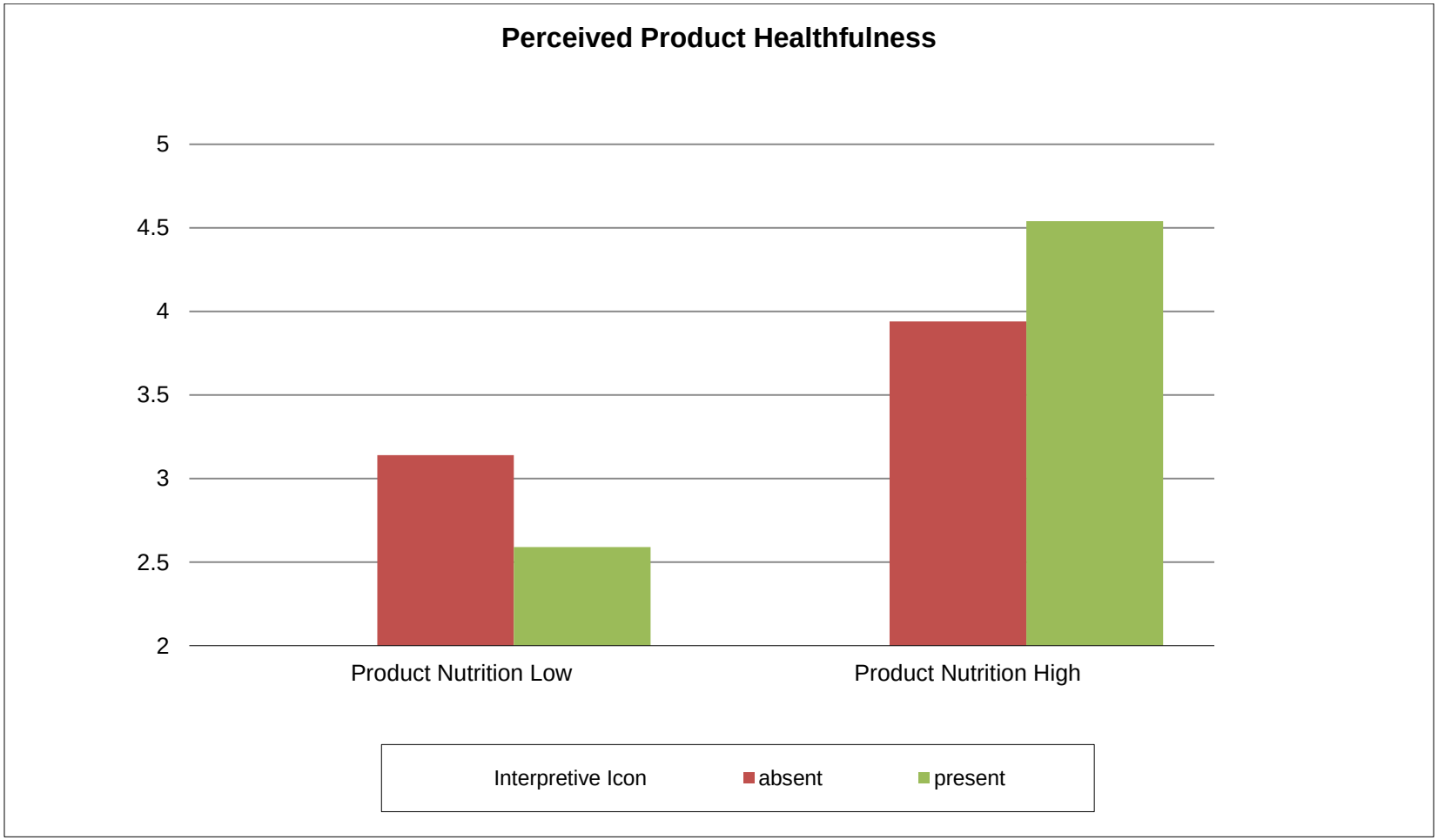
***Note: Higher values indicate higher perceptions of product healthfulness.**

Figure 23b: Study 3 Effects of FOP Reductive Icon and Objective Product Nutrition on Perceived Product Healthfulness – Soup Category*



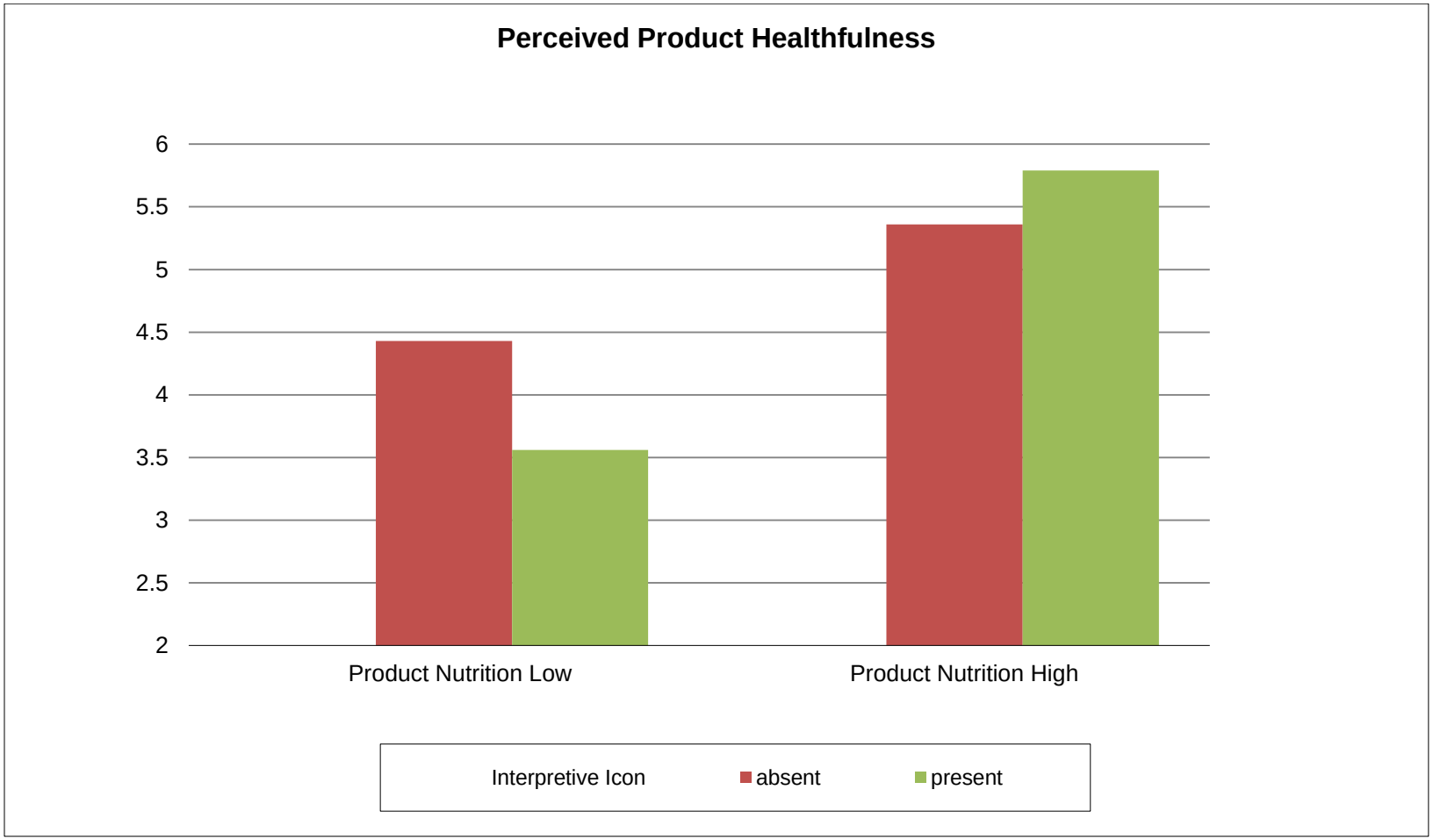
***Note: Higher values indicate higher perceptions of product healthfulness.**

Figure 24a: Study 3 Effects of FOP Interpretive Icon and Objective Product Nutrition on Perceived Product Healthfulness – Granola Category*



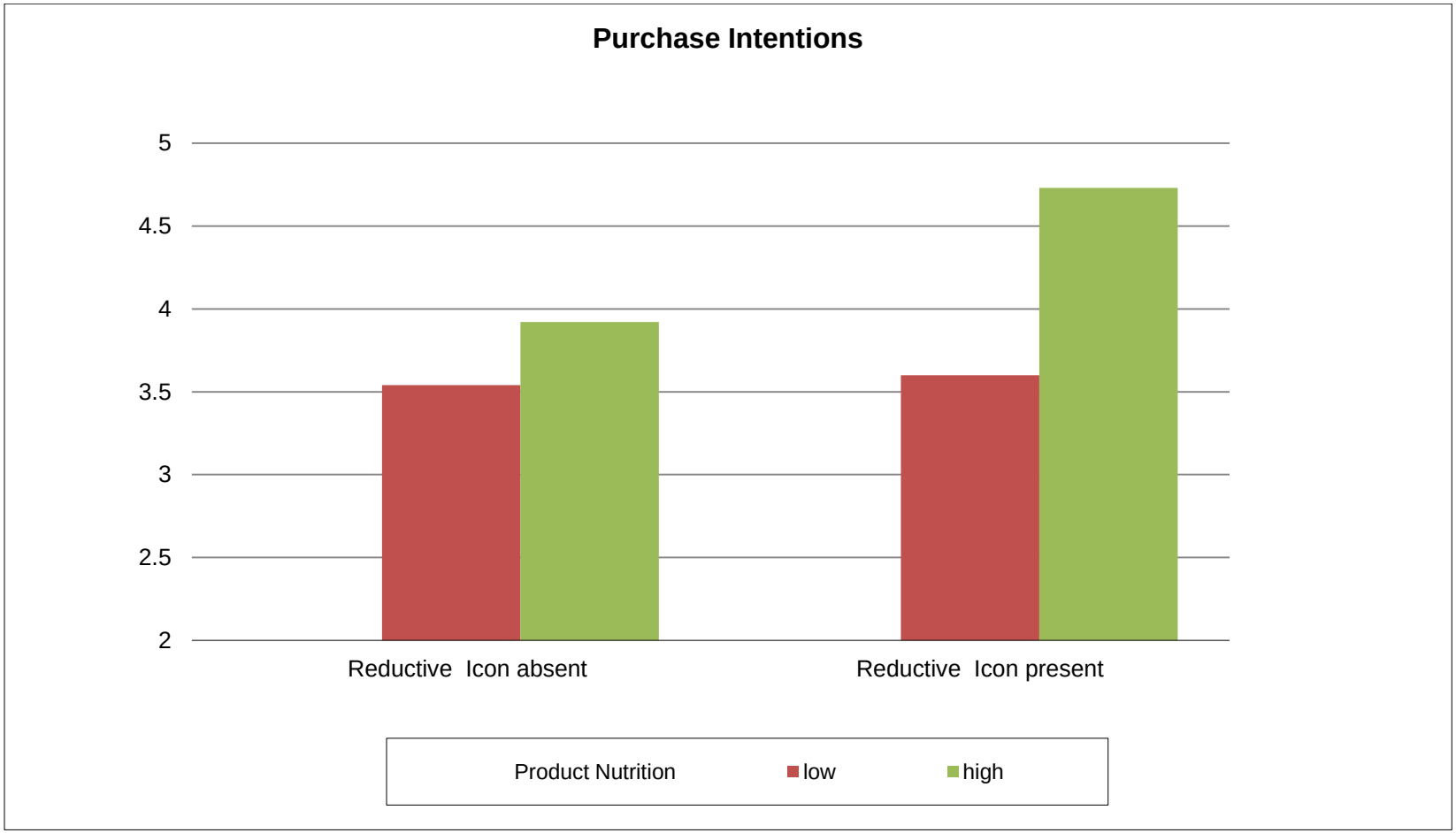
***Note: Higher values indicate higher perceptions of product healthfulness.**

Figure 24b: Study 3 Effects of FOP Interpretive Icon and Objective Product Nutrition on Perceived Product Healthfulness – Soup Category*



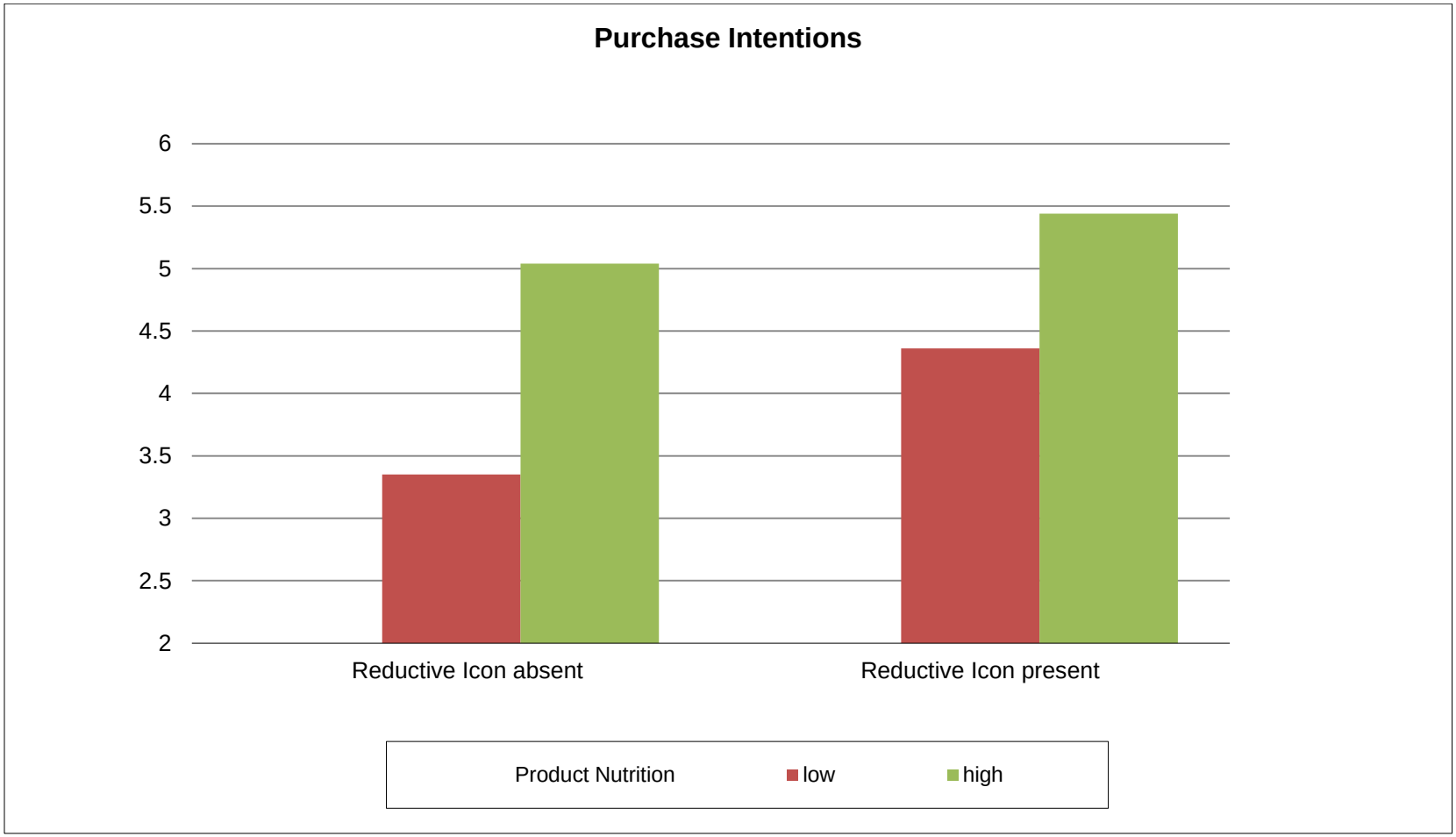
***Note: Higher values indicate higher perceptions of product healthfulness.**

Figure 25a: Study 3 Effects of FOP Reductive Icon and Objective Product Nutrition on Product Purchase Intentions – Granola Category*



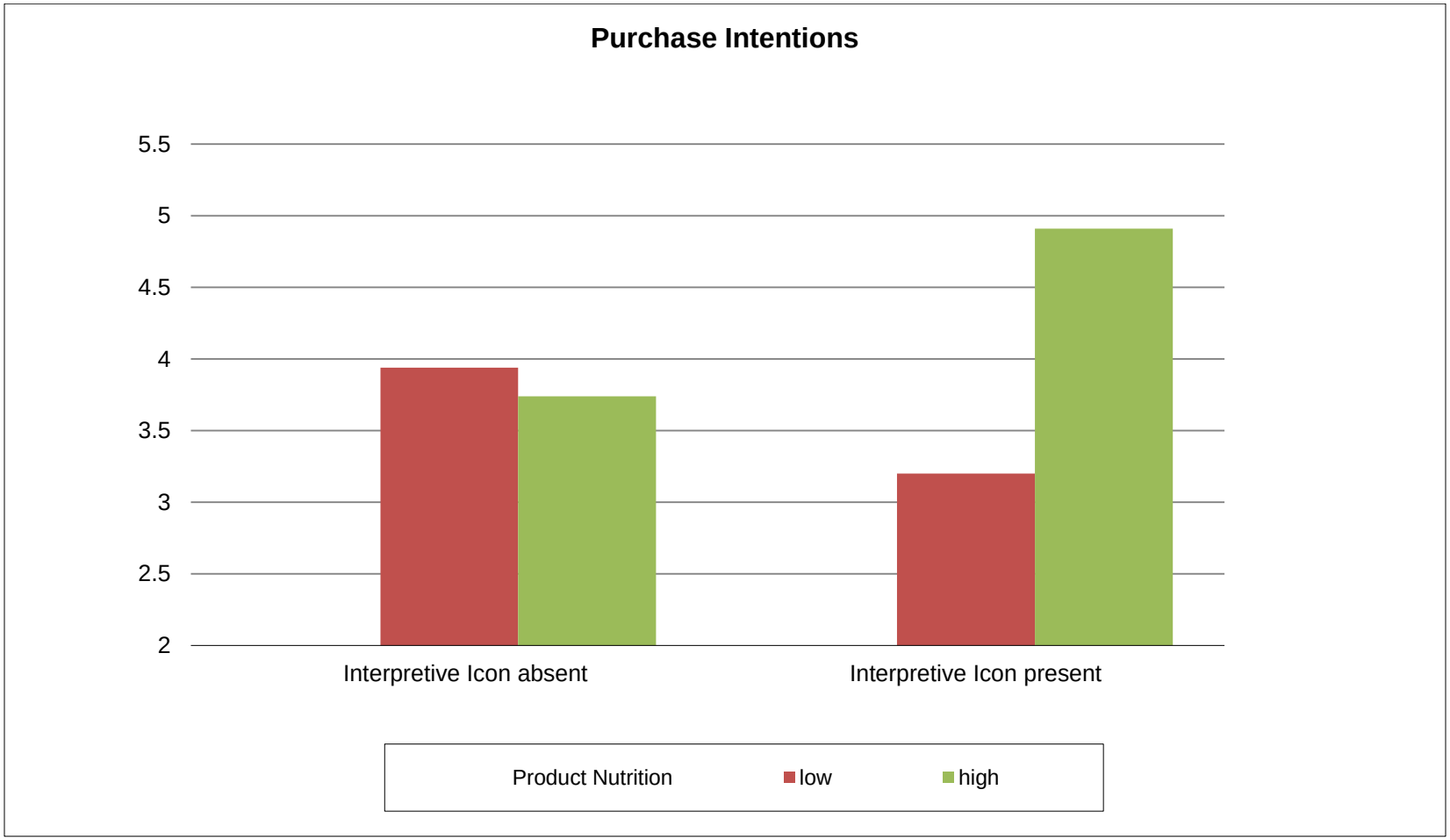
***Note: Higher values indicate higher purchase intentions.**

Figure 25b: Study 3 Effects of FOP Reductive Icon and Objective Product Nutrition on Product Purchase Intentions – Soup Category*



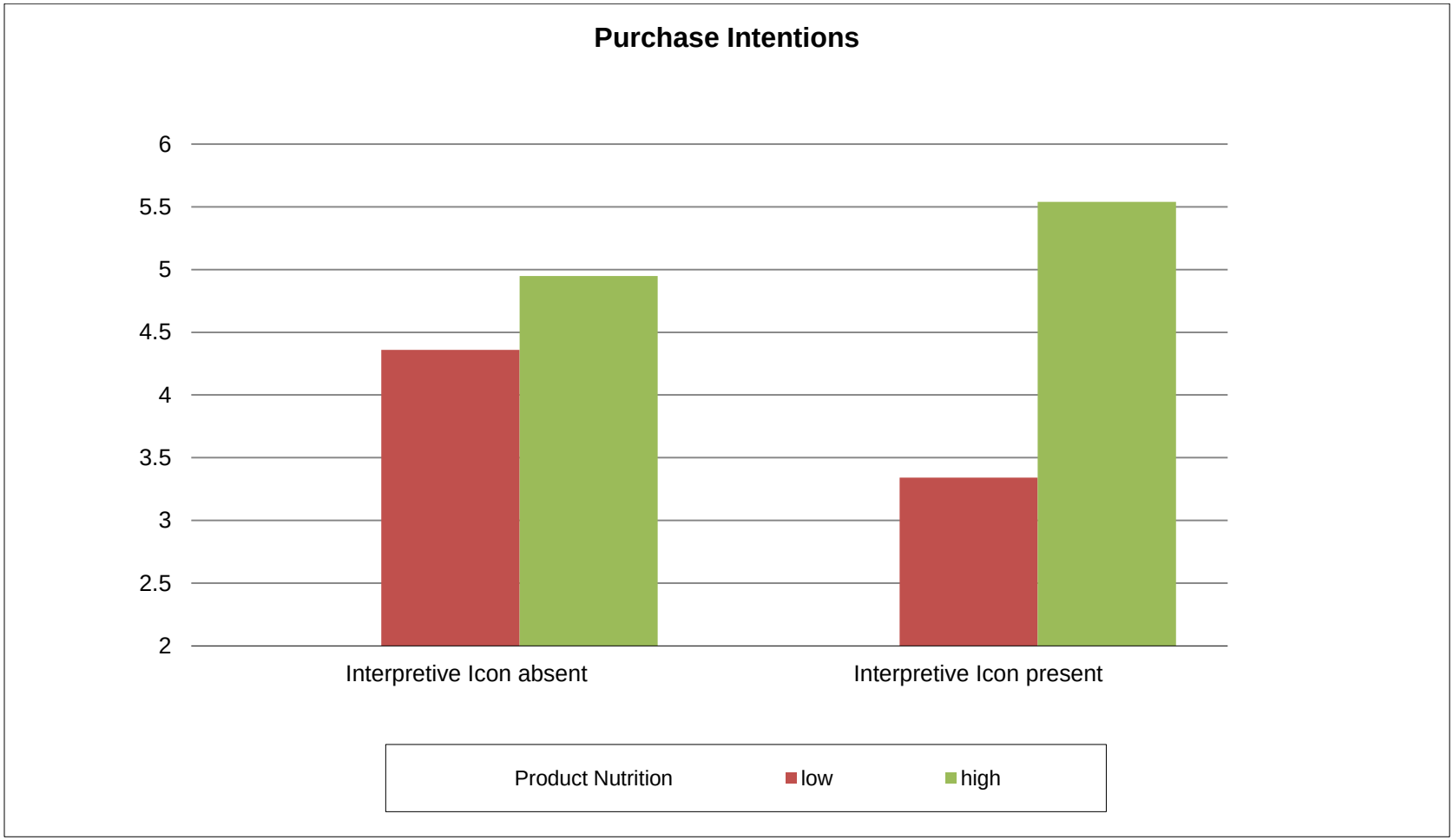
***Note: Higher values indicate higher purchase intentions.**

Figure 26a: Study 3 Effects of FOP Interpretive Icon and Objective Product Nutrition on Product Purchase Intentions – Granola Category*



***Note: Higher values indicate higher purchase intentions.**

*Figure 26b: Study 3 Effects of FOP Interpretive Icon and Objective Product Nutrition on Product Purchase Intentions – Soup Category**



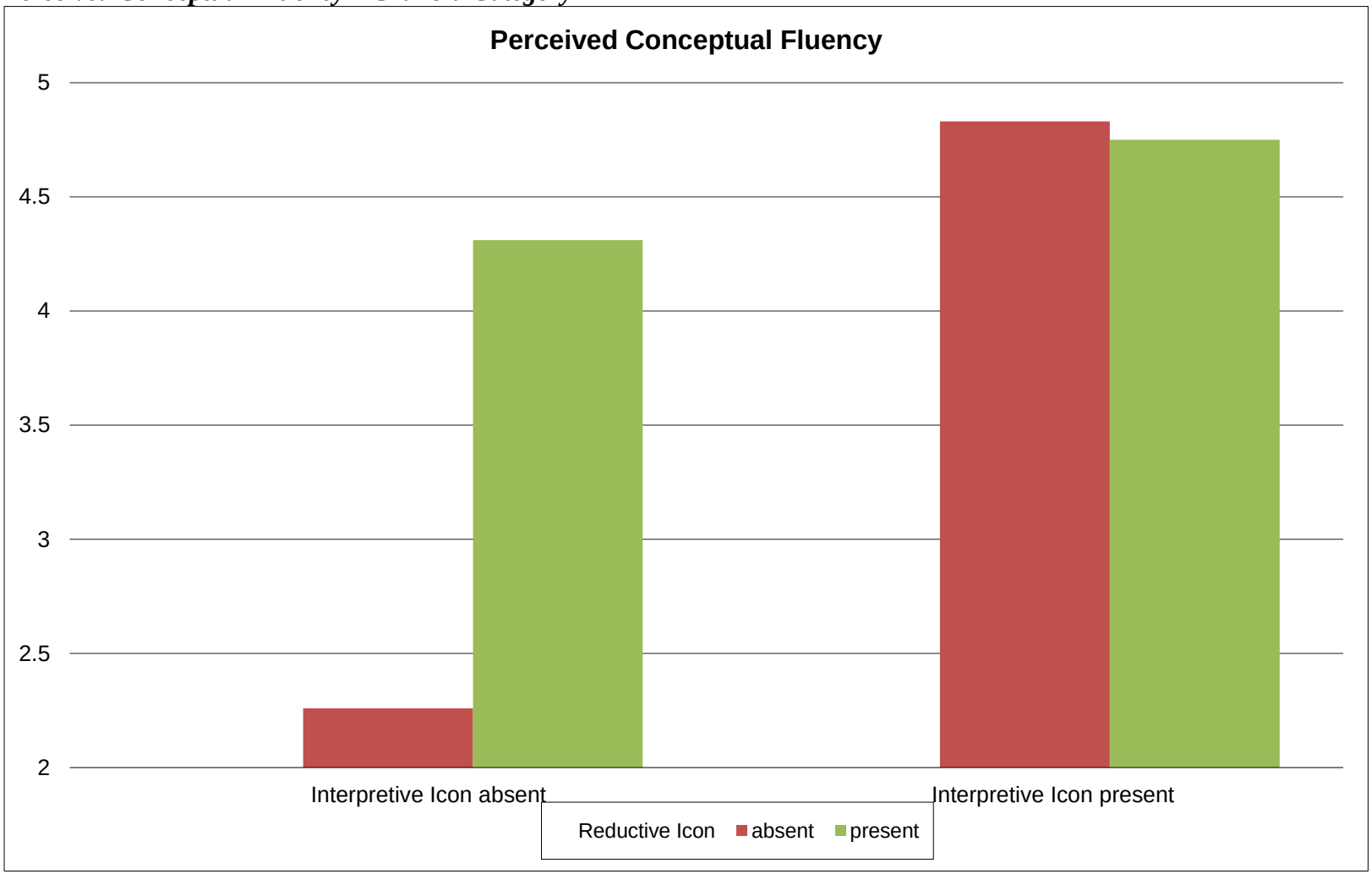
***Note: Higher values indicate higher purchase intentions.**

Figure 27: Study 4 Stimuli Used When Both FOP Interpretive and Reductive Icon Were Present – Granola Bar Category

Figure 28: Study 4 Stimuli Used When Both FOP Interpretive and Reductive Icon Were Present – Mac and Cheese Category

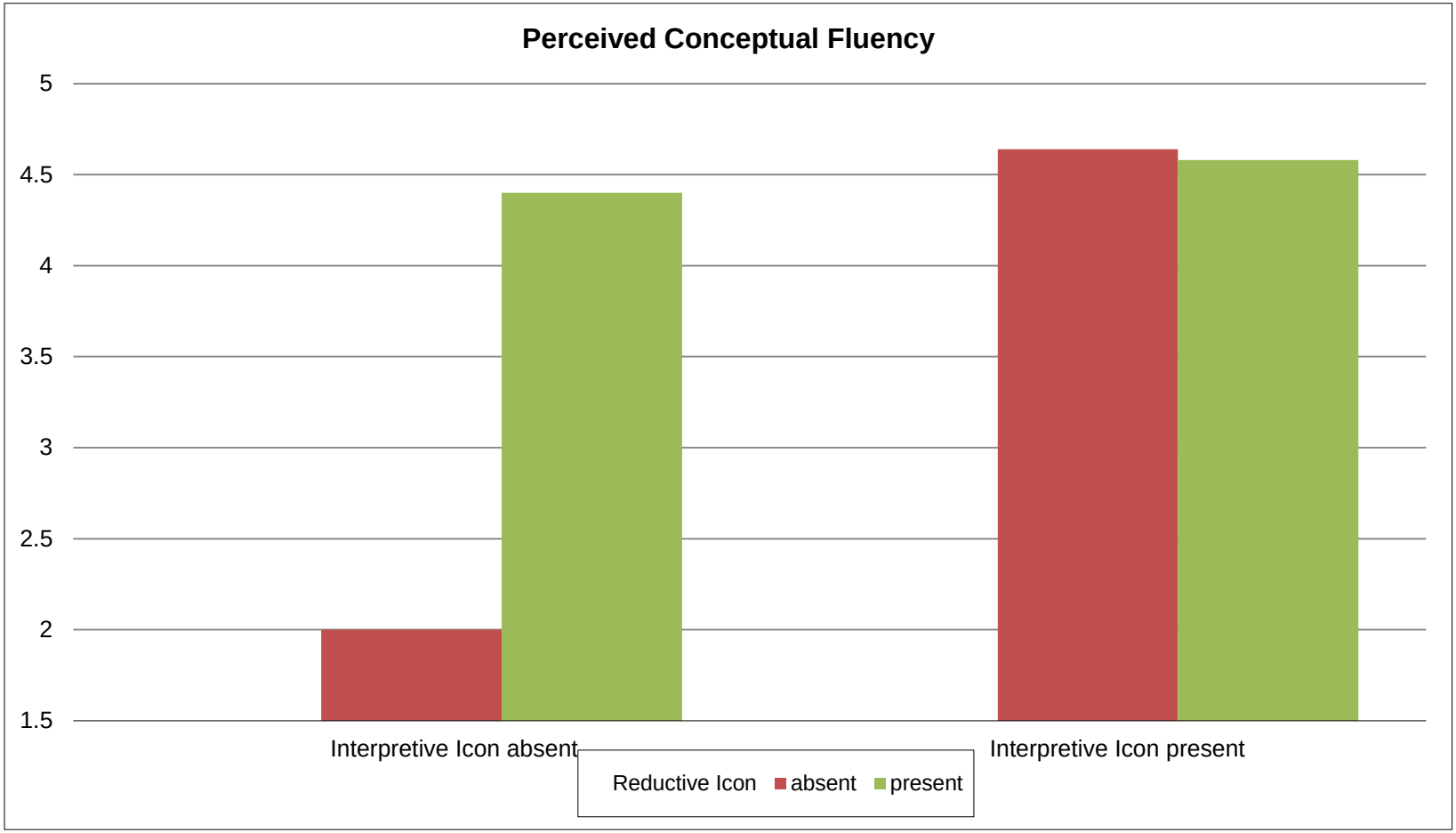
Figure 29: Study 4 Retail Setting Displaying Both Product Categories

Figure 30a: Study 4 Effects of FOP Interpretive Icon and Reductive Icon on Perceived Conceptual Fluency – Granola Category*



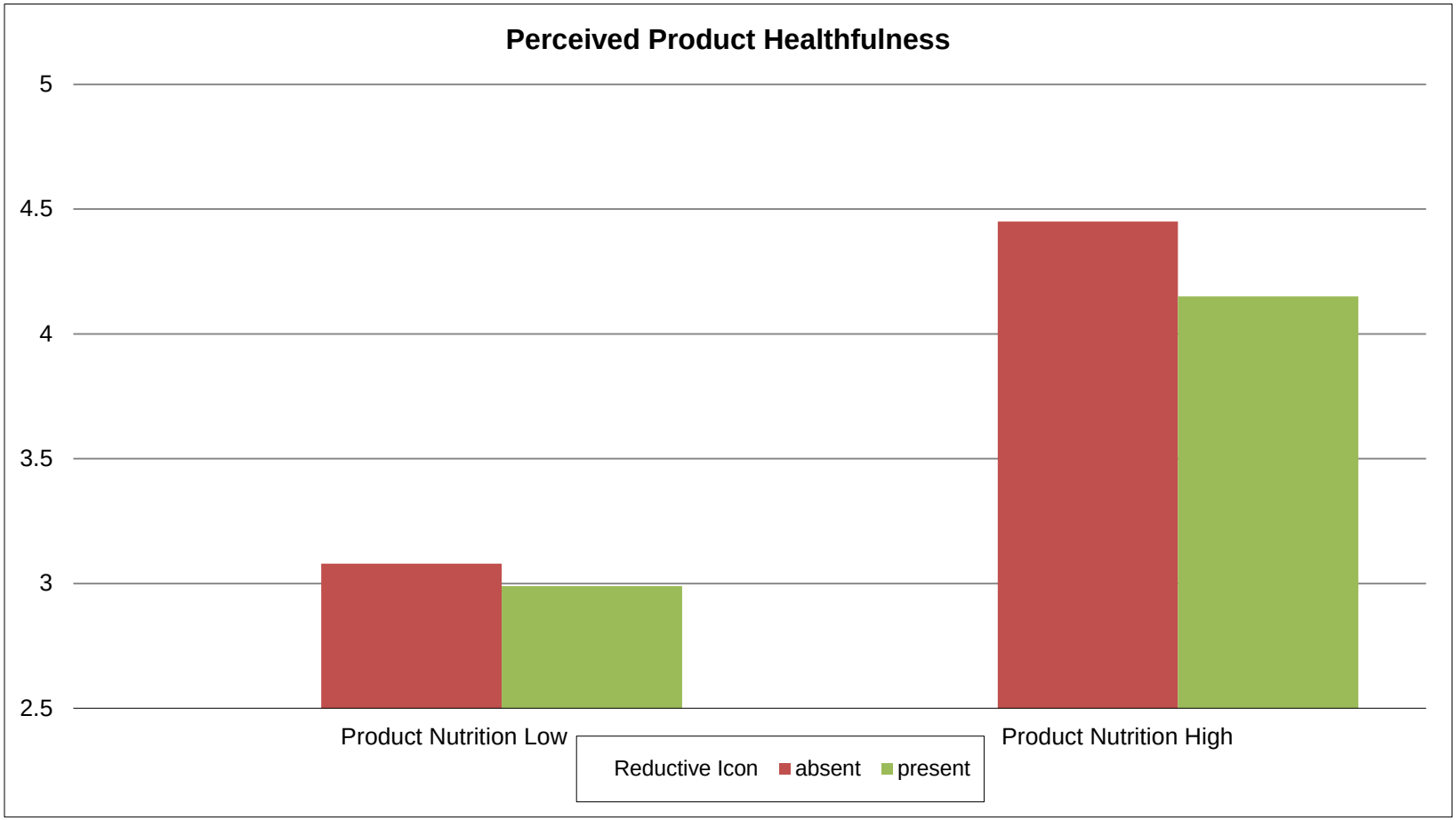
***Note: Higher values indicate higher perceptions of fluency.**

Figure 30b: Study 4 Effects of FOP Interpretive Icon and Reductive Icon on Perceived Conceptual Fluency – Macaroni & Cheese Category*



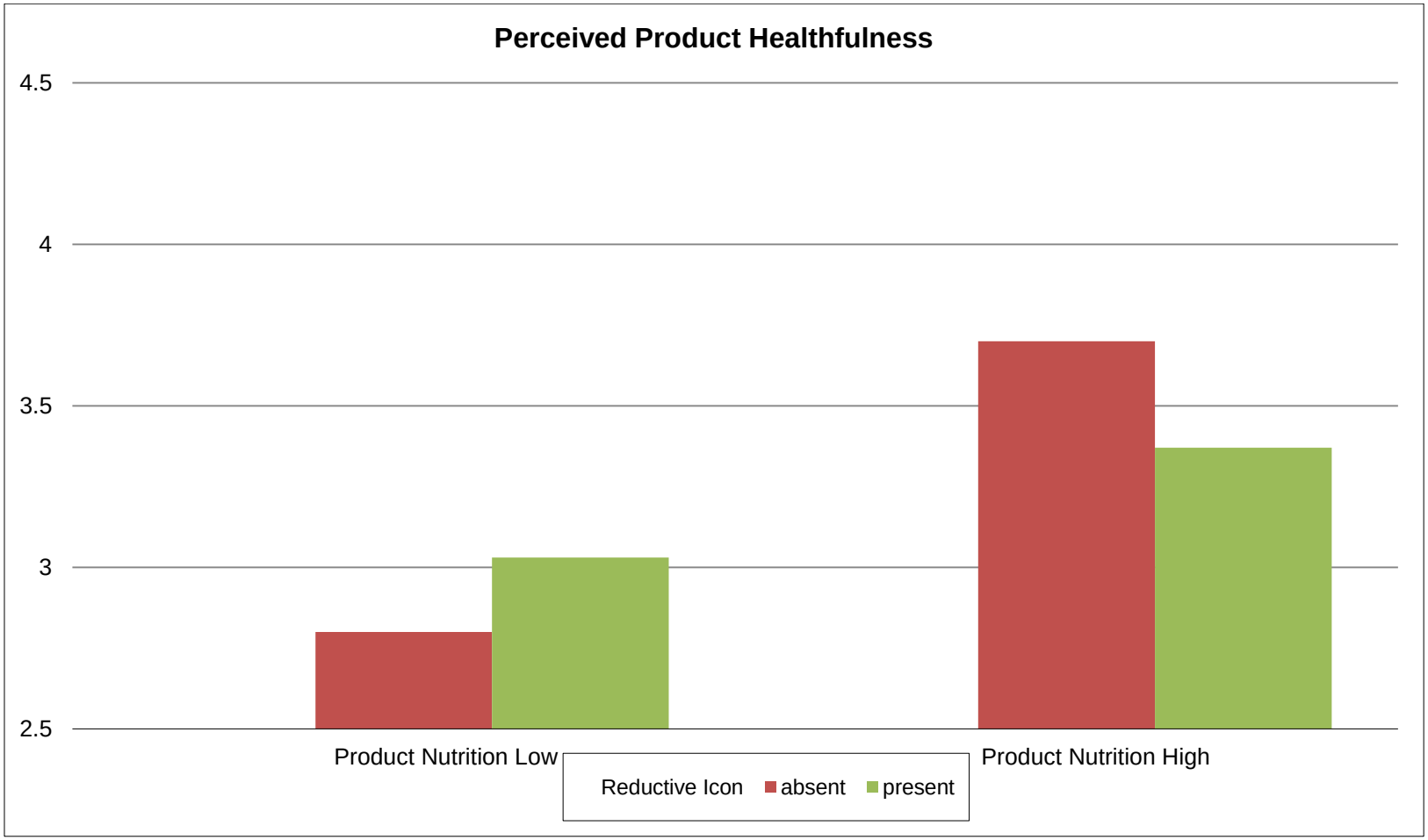
***Note: Higher values indicate higher perceptions of fluency.**

Figure 31a: Study 4 Effects of FOP Reductive Icon and Product Nutrition on Perceived Product Healthfulness – Granola Category*



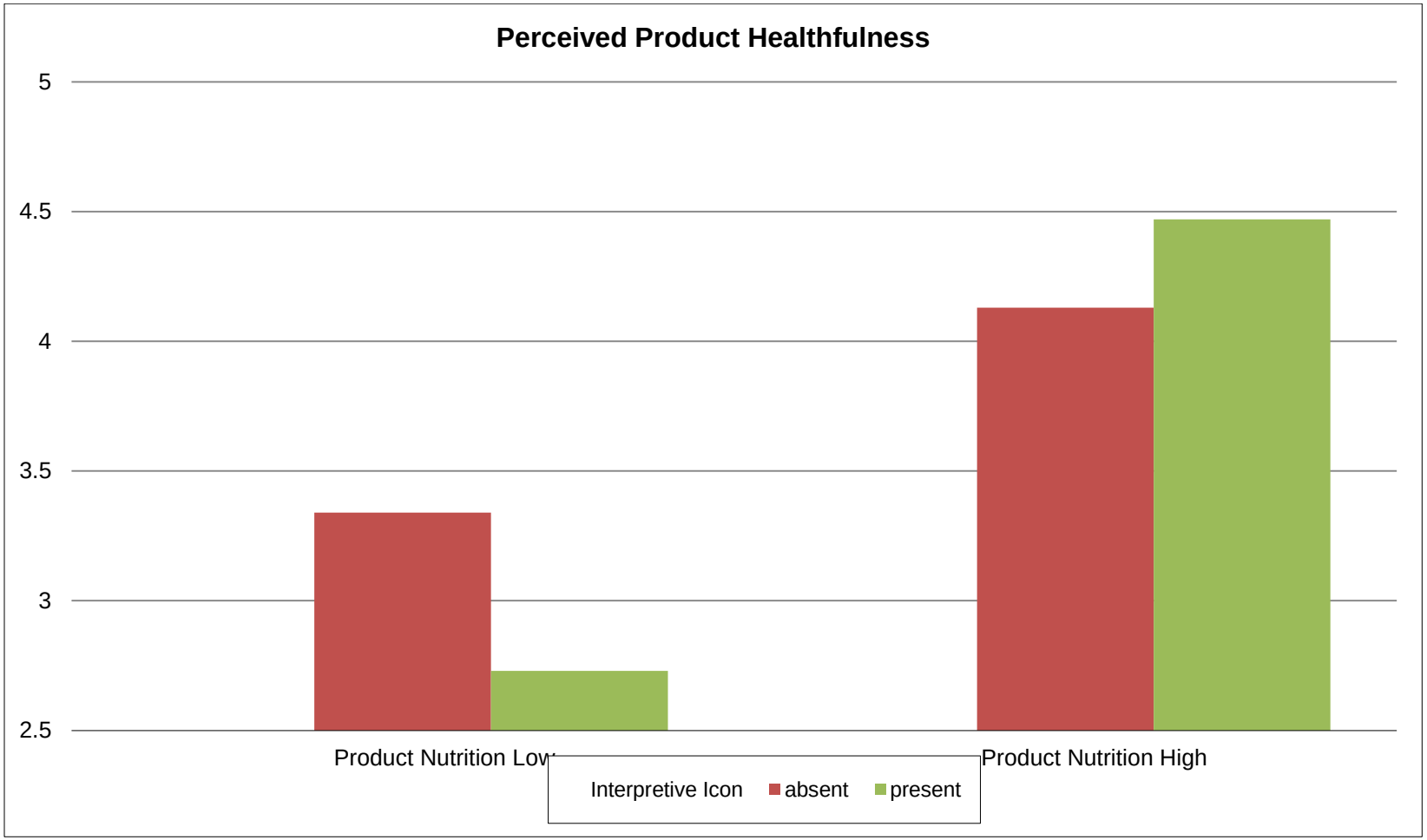
***Note: Higher values indicate higher perceptions of product healthfulness.**

Figure 31b: Study 4 Effects of FOP Reductive Icon and Product Nutrition n Perceived Product Healthfulness – Macaroni & Cheese Category*



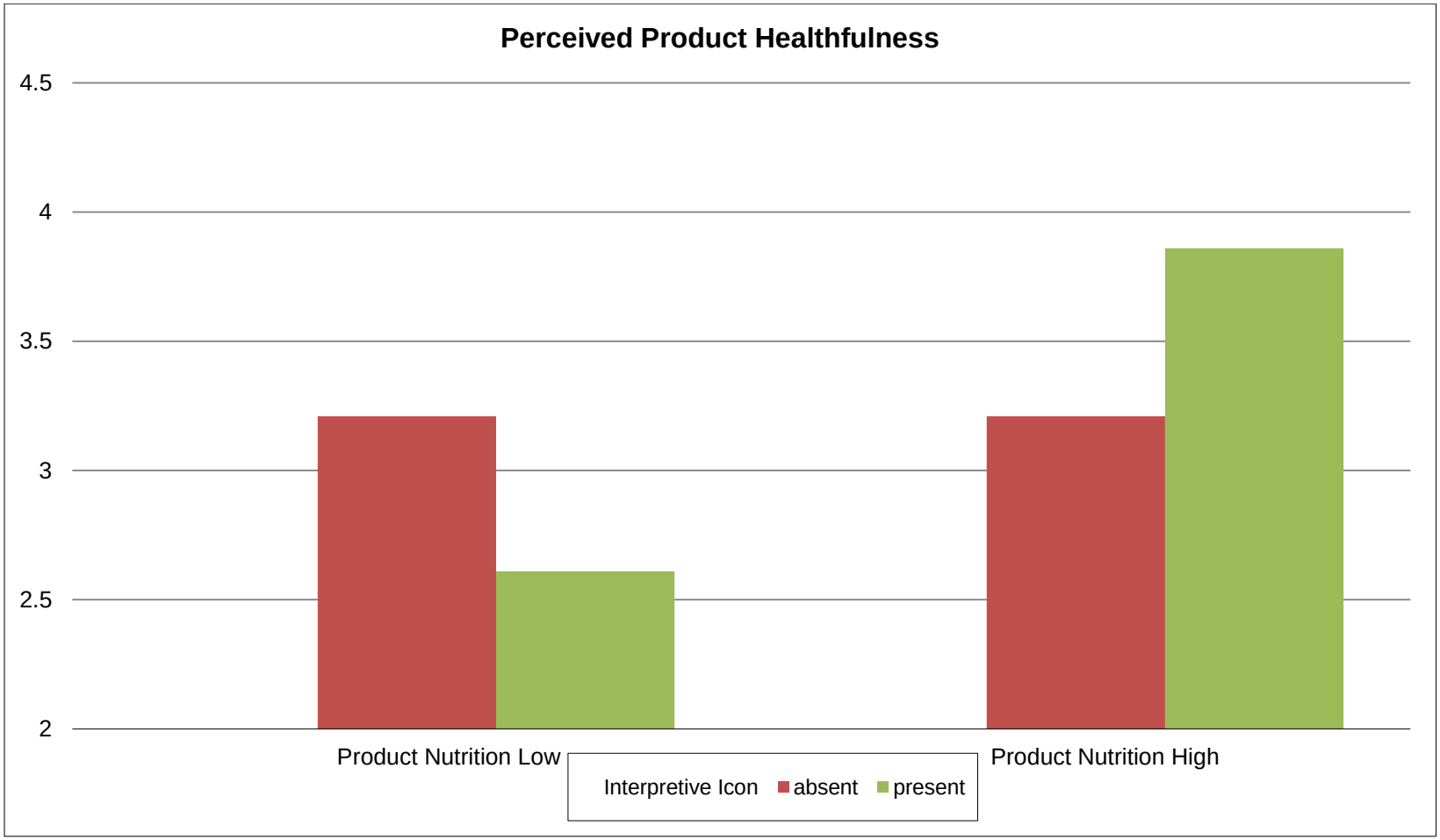
***Note: Higher values indicate higher perceptions of product healthfulness.**

Figure 32a: Study 4 Effects of FOP Interpretive Icon and Product Nutrition on Perceived Product Healthfulness – Granola Category*



***Note: Higher values indicate higher perceptions of product healthfulness.**

Figure 32b: Study 4 Effects of FOP Interpretive Icon and Product Nutrition on Perceived Product Healthfulness – Macaroni & Cheese Category*

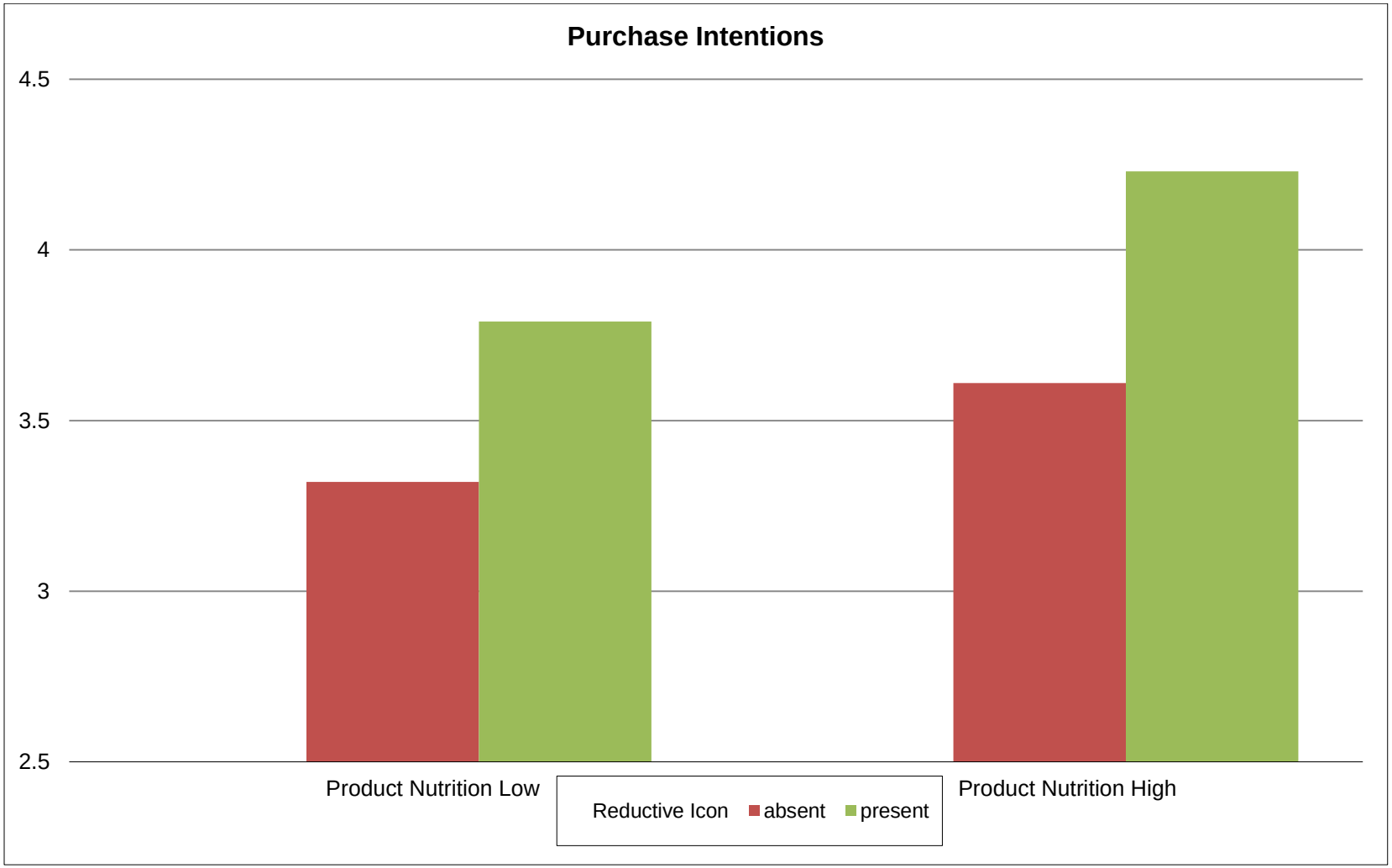


***Note: Higher values indicate higher perceptions of product healthfulness.**

*Figure 33a: Study 4 Effects of FOP Reductive Icon and Product Nutrition on Purchase Intentions – Granola Category**

***Note: Higher values indicate higher purchase intentions.**

Figure 33b: Study 4 Effects of FOP Reductive Icon and Product Nutrition on Purchase Intentions – Macaroni & Cheese Category*

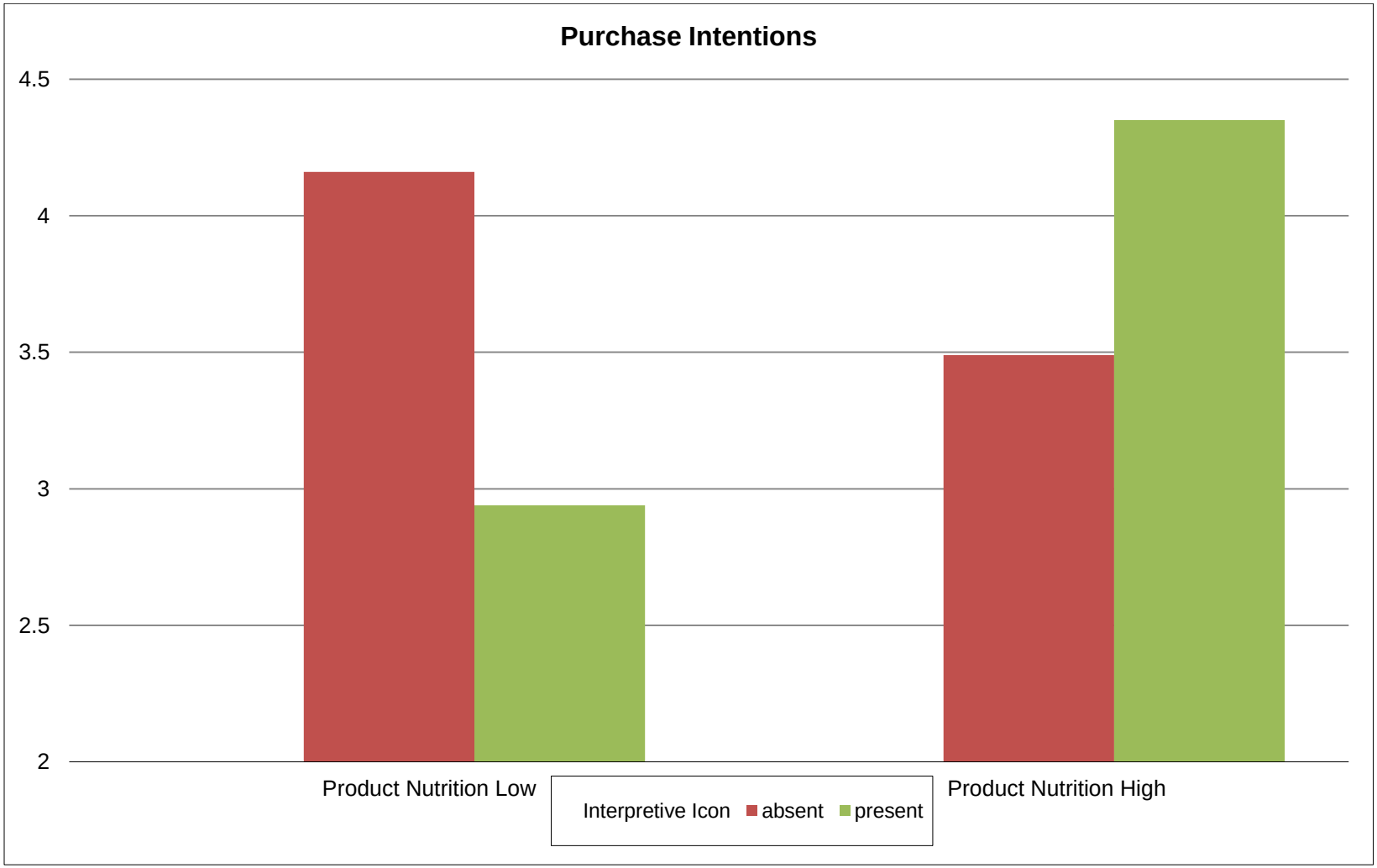


***Note: Higher values indicate higher purchase intentions.**

*Figure 34a: Study 4 Effects of FOP Interpretive Icon and Product Nutrition on Purchase Intentions – Granola Category**

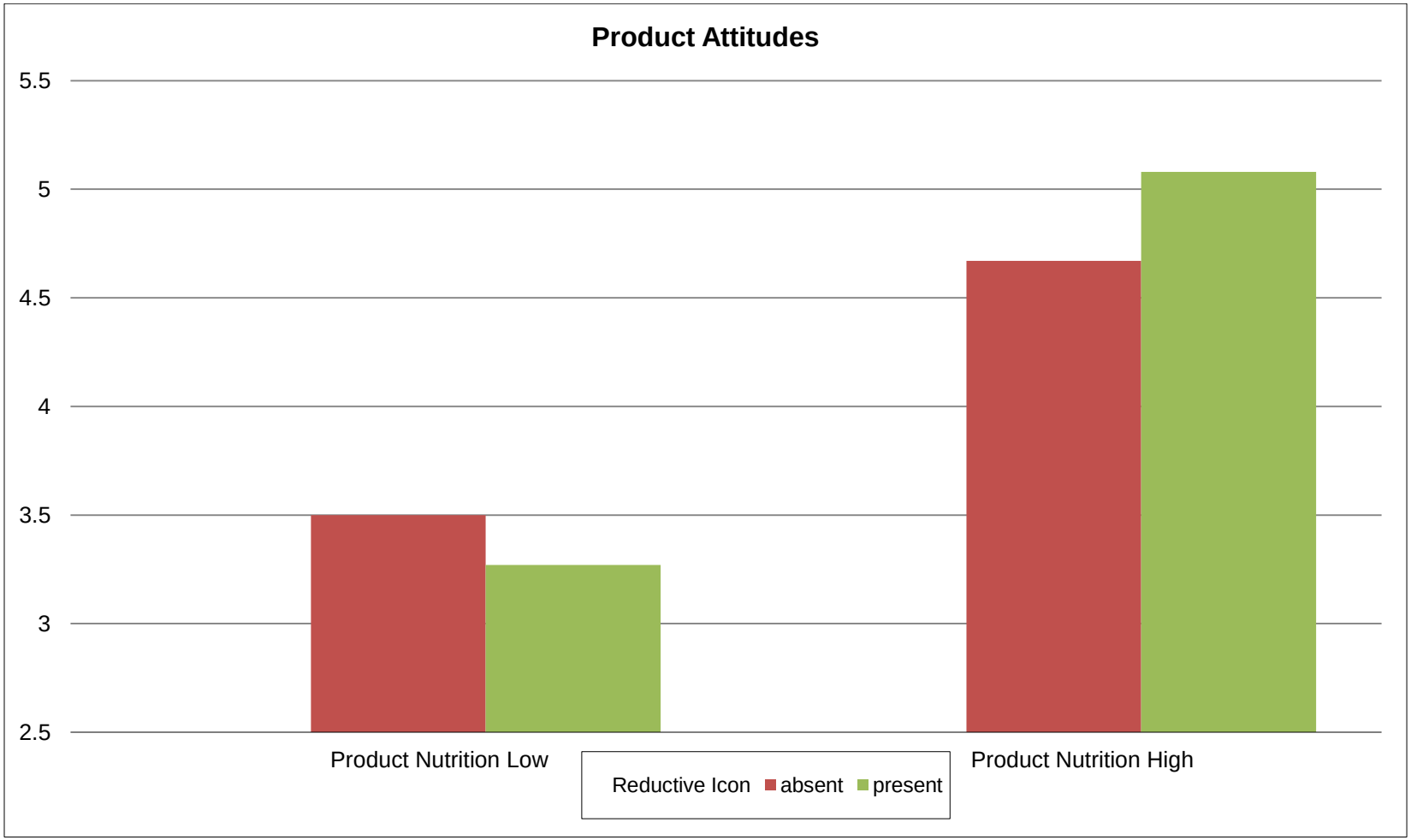
***Note: Higher values indicate higher purchase intentions.**

Figure 34b: Study 4 Effects of FOP Interpretive Icon and Product Nutrition on Purchase Intentions – Macaroni & Cheese Category*



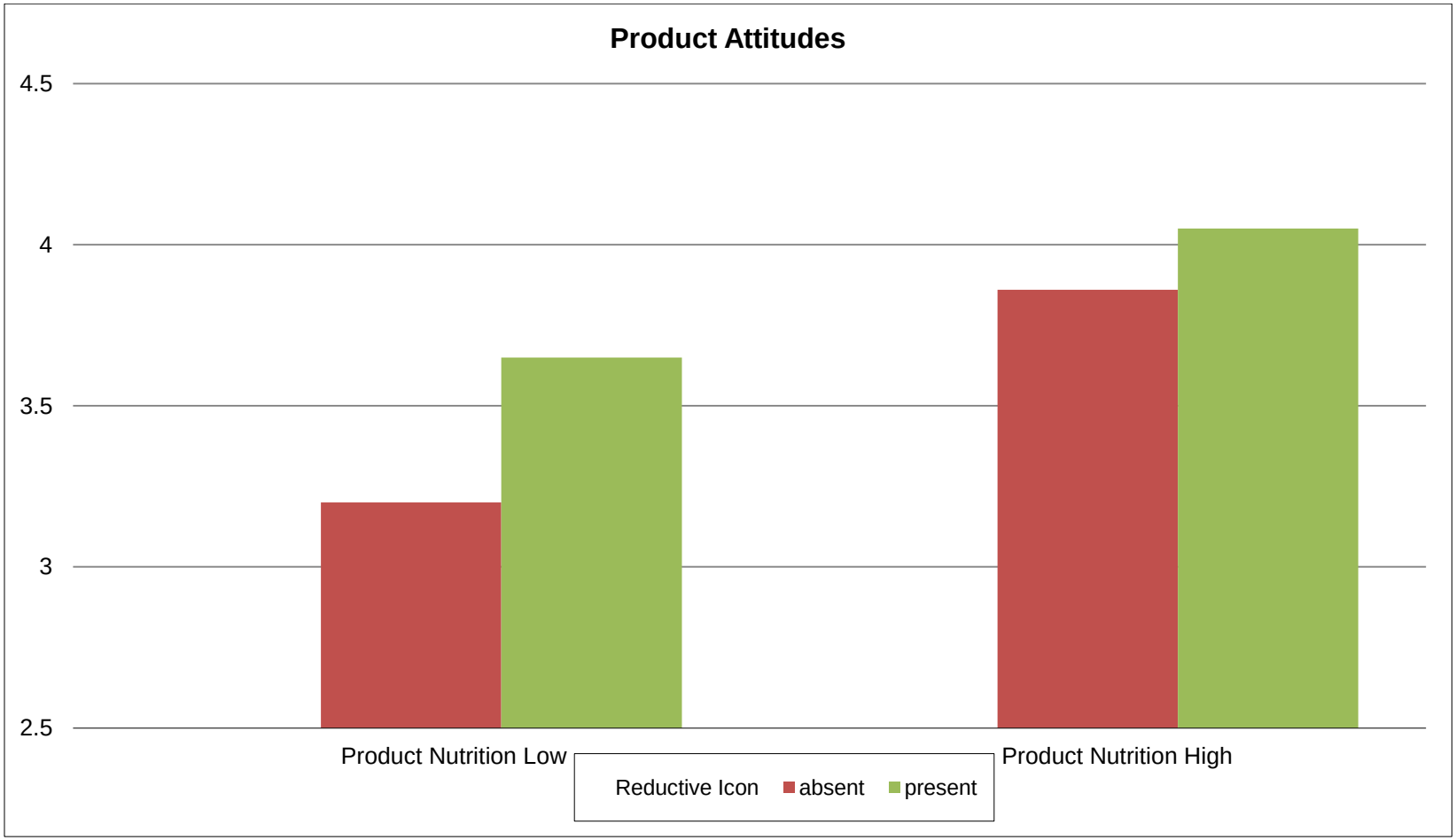
***Note: Higher values indicate higher purchase intentions.**

*Figure 35a: Study 4 Effects of FOP Reductive Icon and Product Nutrition on Product Attitudes – Granola Category**



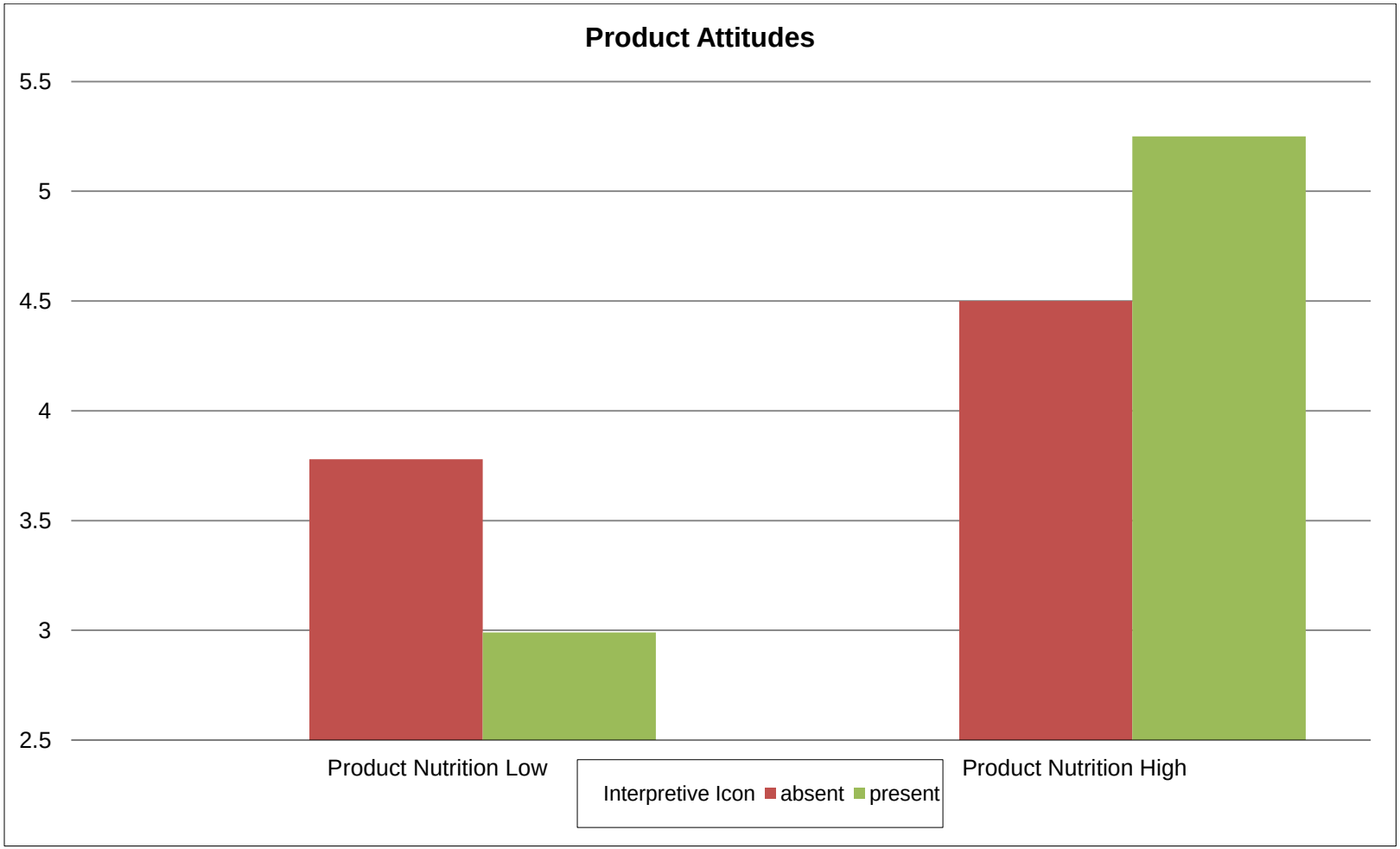
***Note: Higher values indicate more positive product attitudes.**

Figure 35b: Study 4 Effects of FOP Reductive Icon and Product Nutrition on Product Attitudes – Macaroni & Cheese Category*



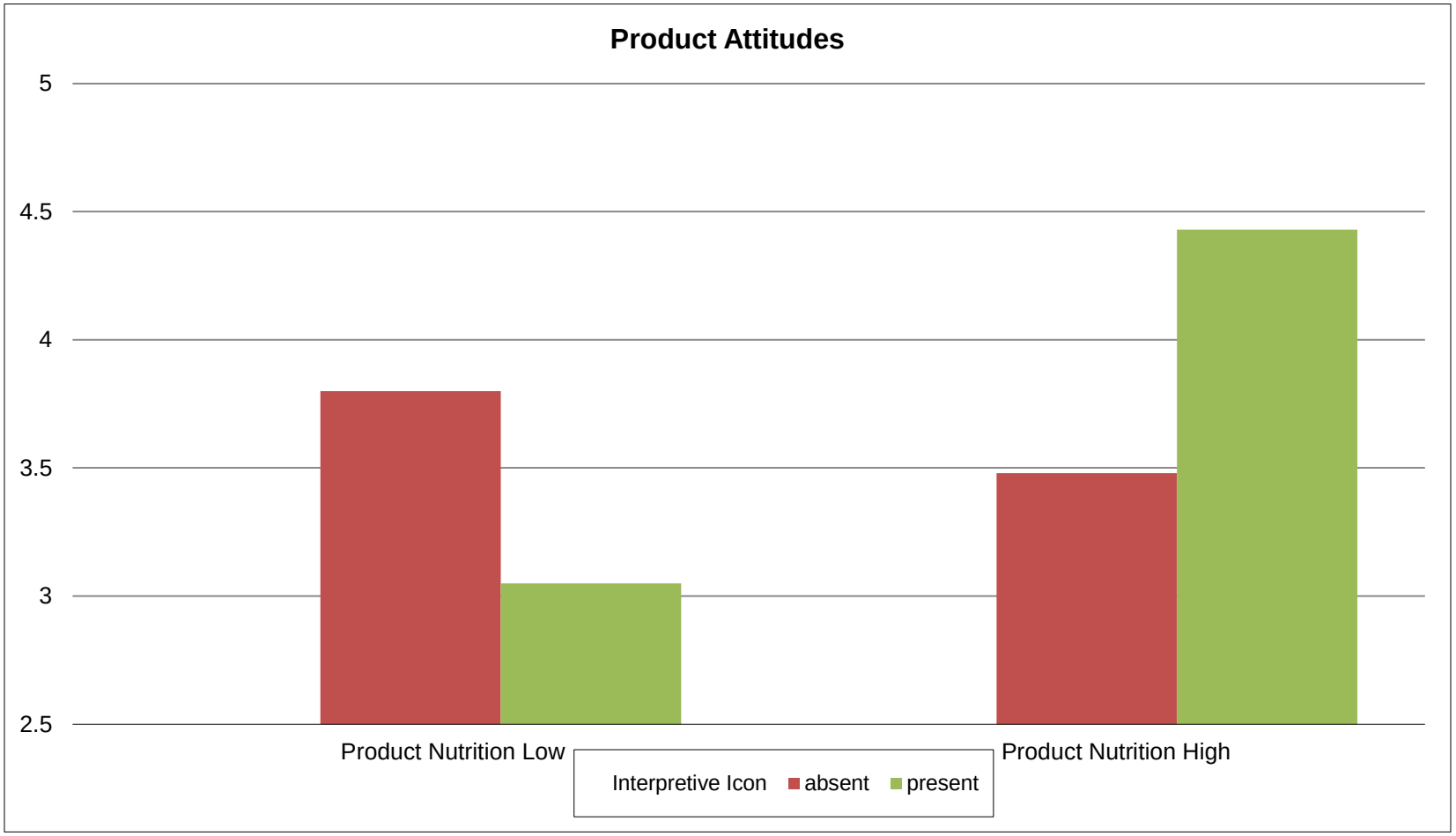
***Note: Higher values indicate more positive product attitudes.**

*Figure 36a: Study 4 Effects of FOP Interpretive Icon and Product Nutrition on Product Attitudes – Granola Category**



***Note: Higher values indicate more positive product attitudes.**

Figure 36b: Study 4 Effects of FOP Interpretive Icon and Product Nutrition on Product Attitudes – Macaroni & Cheese Category*



***Note: Higher values indicate more positive product attitudes.**

Measures Used for Study 1

Pilot Test

Perceived Fluency of FOP Icons (α = .96 for reductive icon, α = .95 for interpretive icon; modified from Lee and Aaker 2004)

- The nutrition information provided on the front of the package was:

  Endpoints: "very hard to understand/very easy to understand", "very hard to interpret/very easy to interpret", "very hard to process/very easy to process", and "very hard to comprehend/very easy to comprehend"

Manipulation Check

- Did you see a "Healthy Selection Seal" on the front of the package of the food item shown? (χ^2= 239.74; $p < .001$)
- Did you see a "Front of Package Nutrition Key" on the front of the package of the food item shown? (χ^2= 284.46; $p < .001$)

  Endpoints: "no/yes"

Main Study

Retailer Attitudes (α = .98; modified from Kozup, Creyer, and Burton 2003)

- Based on the information provided, my overall attitude toward the retailer providing this product is:

  Endpoints: "unfavorable/favorable", "bad/good", and "negative/positive"

Perceived Retailer Trustworthiness (α = .97; modified from Kozup, Creyer, and Burton 2003)

- Based on the information provided, I believe the retailer providing this product is:

  Endpoints: "not dependable/dependable", "untrustworthy/trustworthy", and "dishonest/honest"

Product Purchase Intentions (α = .98; modified from Kozup, Creyer, and Burton 2003)

- Assuming you were interested in purchasing this type of food, how likely are you to buy this specific item given the information shown on the package?

  Endpoints: "very unlikely/very likely", "not probable/very probable", and "definitely would not/definitely would"

Perceived Retailer Benevolence (α = .97; modified from Howlett, Burton, and Kozup 2008)

- Based on the information provided, I believe that the retailer providing this product has my best interests at heart.

  Endpoints: "strongly disagree/strongly agree", "not at all/very much so", and "not probable/very probable"

Perceived Product Healthfulness (r = .81, p < .01; modified from Garretson and Burton 2000)

- Please consider the nutrition level of the food product shown. Do you believe that the food product is

  Endpoints: "not at all nutritious/highly nutritious" and "very unhealthy/very healthy"

Perceived Fluency of FOP Information (α = .94; modified from Lee and Aaker 2004)

- In general, the information presented on the front of the package is:

Endpoints: "very hard to understand/very easy to understand", "very hard to interpret/very easy to interpret", "very hard to process/very easy to process", and "very hard to comprehend/very easy to comprehend"

Perceived Trustworthiness of FOP Information (α = .96; modified from Kozup, Creyer, and Burton 2003)

- In general, the information presented on the front of the package is:

  Endpoints: "not at all dependable/highly dependable", "not at all credible/highly credible", "not at all trustworthy/highly trustworthy", "not at all accurate/highly accurate", "dishonest/honest"

Consumer Skepticism Toward FOP Labeling (α = .92; modified from Obermiller and Spangenberg 1998)

- I can depend on getting the truth from most front of package product labeling.
- Front of package product labeling's aim is to inform the consumer.
- Front of package product labeling is generally truthful.
- Front of package product labeling is a reliable source of information about the quality and performance of products.

  Endpoints: "strongly disagree/strongly agree"

APPENDIX C

Measures Used for Study 2

Pretest

Perceived Importance of Icons as a Product Characteristic (α = .98 for nutrition claim, α = .96 for interpretive icon, α = .96 for reductive icon; Sujan and Bettman 1989)

- e.g., The "High in Antioxidants" Seal shown below is:

  Endpoints: "not at all important/very important", "irrelevant to my choice/very important to my choice", and "a feature I would not consider/a feature I would definitely consider"

Manipulation Check

- Did you see a "Healthy Selection Seal" on the front of the package of the food item shown? (χ^2= 105.55; $p < .001$)
- Did you see a "Front of Package Nutrition Key" on the front of the package of the food item shown? (χ^2= 134.83; $p < .001$)
- Did you see a 'High in Antioxidants Stamp of Approval' on the front of the package of the food item shown? (χ^2= 141.43; $p < .001$)

  Endpoints: "no/yes"

Main Study

Retailer Attitudes (α = .98; modified from Kozup, Creyer, and Burton 2003)

- Based on the information provided, my overall attitude toward the retailer providing this product is:

  Endpoints: "unfavorable/favorable", "bad/good", and "negative/positive"

Manufacturer Attitudes ($\alpha = .98$; modified from Kozup, Creyer, and Burton 2003)

- Based on the information provided, my overall attitude toward the manufacturer providing this product is:

  Endpoints: "unfavorable/favorable", "bad/good", and "negative/positive"

Product Attitudes ($\alpha = .97$; modified from Kozup, Creyer, and Burton 2003)

- Based on the information provided, my overall attitude toward the product is:

  Endpoints: "unfavorable/favorable", "bad/good", and "negative/positive"

Product Purchase Intentions ($\alpha = .97$; modified from Howlett, Burton, and Kozup 2008)

- Assuming you were interested in purchasing this type of food, how likely are you to buy this specific item given the information shown on the package?
- Endpoints: "strongly disagree/strongly agree", "not at all/very much so", and "not probable/very probable"

Perceived Product Healthfulness ($r = .81$, $p < .01$; modified from Garretson and Burton 2000)

- Please consider the nutrition level of the food product shown. Do you believe that the food product is

  Endpoints: "not at all nutritious/highly nutritious" and "very unhealthy/very healthy"

Perceived Conceptual Fluency of FOP Health Information (α = .94; modified from Lee and Aaker 2004; Kozup, Creyer, and Burton 2003)

- Given the information on the front of the package, it is easy to determine how healthy the product is.
- Given the information on the front of the package, it is clear whether the product is high or low in its level of nutritiousness.
- I feel confident about whether this product is a healthy or unhealthy choice based on the information on the front of the package.
- It is easy to understand whether this product is a healthy or unhealthy choice given the information shown on the package.

  Endpoints: "strongly disagree/strongly agree"

Consumer Skepticism Toward FOP Labeling (α = .89; modified from Obermiller and Spangenberg 1998)

- I can depend on getting the truth from most front of package product labeling.
- Front of package product labeling's aim is to inform the consumer.
- Front of package product labeling is generally truthful.
- Front of package product labeling is a reliable source of information about the quality and performance of products.

  Endpoints: "strongly disagree/strongly agree"

Nutrition Knowledge (α = .94; Howlett, Burton, and Kozup 2008)

- In general, how much do you think you know about the topic of nutrition?

Endpoints: "not at all knowledgeable/extremely knowledgeable"

- I know a lot about nutrition in general.
- Compared to most people, I am quite knowledgeable about nutrition.

Endpoints: "strongly disagree/strongly agree"

APPENDIX D

Measures Used for Study 3

Manipulation Check

- Did you see a "Facts Up Front" nutrition label on the front of the packaged food items that were presented to you in the retail lab? (χ^2= 105.55; $p < .001$)
- Did you see a "Healthy Stars Rating System" on the front of the packaged food items that were presented to you in the retail lab? (χ^2= 134.83; $p < .001$)

  Endpoints: "no/yes"

Main Study

Product Purchase Intentions (r = .97, p < .01 for healthy granola bar, r = .96, p < .01 for unhealthy granola bar, r = .94, p < .01 for healthy soup, r = .97, p < .01 for unhealthy soup; modified from Howlett, Burton, and Kozup 2008)

- e.g., Assuming you were interested in purchasing the granola bars shown in the retail store, how likely are you to buy Quaker Chewy Dipps Chocolate Chip bars given the information shown on the package?

  Endpoints: "not at all/very much so" and "not probable/very probable"

Perceived Product Healthfulness (r = .69, p < .01 for healthy granola bar, r = .76, p < .01 for unhealthy granola bar, r = .73, p < .01 for healthy soup, r = .87, p < .01 for unhealthy soup; modified from Garretson and Burton 2000)

- Please consider the nutrition level of the food product shown. Do you believe that the food product is

  Endpoints: "not at all nutritious/highly nutritious" and "very unhealthy/very healthy"

Perceived Conceptual Fluency of FOP Health Information (α = .93 for healthy granola bar, α = .93 for unhealthy granola bar, α = .95 for healthy soup, α = .97 for unhealthy soup; modified from Kozup, Creyer, and Burton 2003)

- Given the information on the front of the package, it is easy to determine how healthy the product is.
- Given the information on the front of the package, it is clear whether the product is high or low in its level of nutritiousness.
- I feel confident about whether this product is a healthy or unhealthy choice based on the information on the front of the package.
- It is easy to understand whether this product is a healthy or unhealthy choice given the information shown on the package.

  Endpoints: "strongly disagree/strongly agree"

APPENDIX E

Measures Used for Study 4

Manipulation Check

- Did you see a "Facts Up Front" nutrition label on the front of the packaged food items that were presented to you in the retail lab? (χ^2= 105.55; $p < .001$)
- Did you see a "Healthy Stars Rating System" on the front of the packaged food items that were presented to you in the retail lab? (χ^2= 134.83; $p < .001$)

  Endpoints: "no/yes"

Main Study

Product Purchase Intentions (r = .98, p < .01 for healthy granola bar, r = .96, p < .01 for unhealthy granola bar, r = .99, p < .01 for healthy macaroni, r = .98, p < .01 for unhealthy macaroni; modified from Howlett, Burton, and Kozup 2008)

- e.g., Assuming you were interested in purchasing the granola bars shown in the retail store, how likely are you to buy Quaker Chewy Dipps Chocolate Chip bars given the information shown on the package?

  Endpoints: "very unlikely/very likely" and "not probable/very probable"

Perceived Product Healthfulness (r = .86, p < .01 for healthy granola bar, r = .88, p < .01 for unhealthy granola bar, r = .90, p < .01 for healthy macaroni, r = .91, p < .01 for unhealthy macaroni; modified from Garretson and Burton 2000)

- e.g., Please consider the nutrition level of the Quaker Chewy Dipps Chocolate Chip bars shown. Do you believe that the food product is:

  Endpoints: "not at all nutritious/highly nutritious" and "very unhealthy/very healthy"

Perceived Conceptual Fluency of FOP Health Information ($\alpha = .95$ for healthy granola bar, $\alpha = .95$ for unhealthy granola bar, $\alpha = .97$ for healthy macaroni, $\alpha = .98$ for unhealthy macaroni; modified from Lee and Aaker 2004; Kozup, Creyer, and Burton 2003)

- Given the information on the front of the package, it is easy to determine how healthy the product is.
- Given the information on the front of the package, it is clear whether the product is high or low in its level of nutritiousness.
- I feel confident about whether this product is a healthy or unhealthy choice based on the information on the front of the package.
- It is easy to understand whether this product is a healthy or unhealthy choice given the information shown on the package.

  Endpoints: "strongly disagree/strongly agree"

Product Attitudes ($r = .94$, $p < .01$ for healthy granola bar, $r = .89$, $p < .01$ for unhealthy granola bar, $r = .95$, $p < .01$ for healthy macaroni, $r = .97$, $p < .01$ for unhealthy macaroni; Kozup, Creyer, and Burton 2003)

- Based on the information provided, my overall attitude toward the product is:

  Endpoints: "unfavorable/favorable" and "bad/good"

Brand Attitudes ($r = .95$, $p < .01$ for granola bars, $r = .95$, $p < .01$ for macaroni and cheese; modified from Kozup, Creyer, and Burton 2003)

- e.g., Overall, what is your general attitude toward the Quaker brand of granola bars?
- Endpoints: "unfavorable/favorable" and "bad/good"

Perceived Brand Healthfulness ($r = .93$, $p < .01$ for granola bars, $r = .95$, $p < .01$ for macaroni and cheese; modified from Kozup, Creyer, and Burton 2003)

- e.g., Overall, what is your general perception of the healthfulness of Quaker granola bars?
- Endpoints: "not at all nutritious/highly nutritious" and "very unhealthy/very healthy"

Nutrition Concern ($\alpha = .95$)

- In general, how often do you read the nutrition facts panel that reports nutrient information on food products?
- In general, how interested are you in reading nutrition and health-related information?
- I really care about nutrition in general.

  Endpoints: "not often/very often", "not interested/very interested", and "not at all/very much"

Nutrition Knowledge ($\alpha = .95$)

- In general, how much do you think you know about the topic of nutrition?
- Endpoints: "not at all knowledgeable/extremely knowledgeable"
- I know a lot about nutrition in general.

- Compared to most people, I am quite knowledgeable about nutrition.

  Endpoints: "strongly disagree/strongly agree" and "strongly disagree/strongly agree"

Nutrition Behavior ($\alpha = .95$)

- I eat healthy food at home.
- I eat healthy food when I'm traveling.
- I eat healthy food when I'm out eating at a restaurant.

  Endpoints: "never/always"

- Being a healthy consumer is an important part of my self-concept.
- I identify myself as a healthy consumer.

  Endpoints: "strongly disagree/strongly agree"